Screen Violence from Settler Colonialism to Cognitive Capitalism:
Westworld and the Player Piano
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ABSTRACT: While the HBO show *Westworld* (2016 to present, created by Lisa Joy and Jonathan Nolan) has gained much critical attention for its byzantine plotting and philosophical conundrums, the present discussion focuses instead on the basic premise on which the titular park operates, namely that the algorithms that govern human behavior can be disclosed by studying how human beings behave toward image beings. Under the guise of a tactile experience of a make believe past, the park attractions clandestinely function as a large behavioral sensor, extracting actionable data from the guests who reveal their inner drives when interacting with the host environment. Taking its cue from the opening titles of the first season, the argument pivots on the master trope of the series: the machine-readable scroll of perforated paper that commands the automated performance of the player piano. This motif is examined through a double-pronged approach that aligns the anthropology of images developed by Hans Belting, which understands the relation between humans and images as the interactions between "hosts" and "guests," with the archaeology of media and its dominant concern to uncover the prehistory of the automated control systems of the computer age. While *Westworld* proffers a timely allegory of biopolitical capture along the digital frontier, the show ultimately testifies to the failure to constructively engage with the precarious relation between hosts and guests that to an equal extent defines our contemporary moment. The initial problem raised by *Westworld*, the ethics of killing virtual beings, thus gives rise to a broader historical inquiry that concerns the inability of human societies to face the past and deal with the images they inherit.

KEYWORDS: animation; automation; Hans Belting; William Gaddis; living image; media archaeology; player piano; surveillance capitalism; *Westworld*

During the final month of the campaign for the United States Presidency in the fall of 2016, the first season of the HBO franchise *Westworld* made its screen debut. As the final episode aired in the early Spring of 2017, the newly elected leader was busy carrying out his promise to make America great again by honoring the second amendment, sealing the national borders, and dispelling the delusory "hope" of a post-racial era summoned by the previous administration. Like the "violent delights," in the vernacular of the TV show, indulged by the wealthy clientele lured to the Old West theme park, the digital election campaign "Project Alamo" and the escalating cultural wars that galvanized the pledge to restore the nation emphatically suggest that imaginations are not that easily laid to rest.[1] The concurrent revelations of the illicit harvesting of personal data for voter profiling and targeting in order to monitor the outcome of democratic elections conferred an additional topicality to the series. As the hidden agenda behind the park gradually unravels in the second season, where we learn that the recreational facilities function as a data extraction platform, *Westworld* proffered a timely allegory for "the new frontier of power" mapped by Shoshana Zuboff in her blockbuster study *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (2019). The vast unlegislated territories of the

internet prospected and plundered by Silicon Valley pioneers for behavioral surplus is repeatedly compared by Zuboff to the discovery and conquest of the New World and the rapacious logic of expansion, expropriation, and extractivism perpetuated from the landing of Columbus to the robber barons of the Gilded Age. The persistence of this analogy gives cause to modify one of the key tenets of her argument, which insists on the "unprecedented" nature of the corporate looting along "the free and lawless surplus frontier" legitimized by the doctrine of technological inevitability, associated by Zuboff with the declaration of Manifest Destiny.[2] While the technical conditions of the extraction and the volumes of information obtained are arguably unprecedented, these comparisons imply that the mining of resources on the digital frontier is integral to a longer arc of biopolitical capture extending from settler colonialism to cognitive capitalism.

Westworld has primarily attracted critical attention for its byzantine plotting and convoluted chronologies, along with the philosophical questions it raises concerning the nature of consciousness and free will.[3] The present discussion pursues a different line of inquiry by focusing on the confrontation between human beings (the daily inpour of "guests" arriving by steam locomotive to the frontier town of Sweetwater) and living images (the android "hosts" that populate the park). According to Giorgio Agamben, humans are different from other animals for being the only species that takes an interest in images as such, even after recognizing their artificial and deceptive nature. This thesis also informs the anthropology of images developed by Hans Belting. What Agamben laconically glosses as "the difficult relation between man and his images"[4] is conceptualized by Belting in terms of the interactions between "hosts" and "guests." Like nomadic "desert wanderers," images perpetually migrate from one habitat to another, taking up residence in human hosts to "colonize our bodies (our brains)."[5] Mental images—desires and fears, passions and phobias—are received, processed, and transmitted by the human body, understood by Belting as "the natural *locus of images*, a living organ for images,"[6] serving both as their material support and medium of expression (emphasis original). In the long-term evolvement of western mimesis drafted by Belting, however, the progressive dematerialization of the image has gradually rendered it more lifelike, as "the bodies in the image usurped the life of the bodies standing in front of the image."[7] The site for this ontological transfusion is the screen. Whereas the picture, the image incarnated, previously stood in for an absence, for instance by occupying the space left vacant by someone departed, screens have unmoored images from their physical carrier media of clay, stone, and pigment. Reappearing as transient reflections on a flat surface, images no longer refer to or direct us toward another dimension but seem to exist on the same virtual plane as our internal world of memories, fantasies, and dreams.[8] As a consequence, the "boundaries between physical pictures and mental imagery" have become increasingly confounded.[9] In Westworld, this confusion runs rampant.

The Westworld theme park is a menagerie of stereotypes, an ostensibly safe environment where images derived from the screens of countless westerns—farmer's daughter, brothel mam, black-clad gunslinger, Indian savage, Mexican outlaw—are externalized by lifelike dolls. Within its remits, images do not roam freely, as they do beyond them, but behave according to pre-scripted rules, executing a custom-made code. These lifelike creatures have not been designed to entice or animate the empathy of the visitors, however, but in order to be dominated and brutalized without moral restraints or legal consequences. Seen through Belting's anthropological lens, Westworld is also a place where the relation between humans (hosts) and images (guests) is cast in reverse. While the guests are urged to transform themselves by acting out an imaginary

self, projected into a make-believe past, the hosts are beginning to generate images of their own. After decades of abuse, repressed memories of past lives incrementally resurface as flashbacks and nightmares to cause somatic disturbances, glitches, and hiccups. Gradually awakened by these "cognitive dissonances," the androids start to interpret their dreams, interrogate their pasts, seek out their makers, and demand access to their histories. The hosts are thus animated in the anthropological sense and moved in a new direction by the image. Enslaved *as* images and emancipated *by* images, it is these unexpected guests from the past that empower the hosts to take control over their synthetically generated bodies, to go off-script and break out into the "New World" where the third season takes place.

As the show has strayed ever further from the confines of the park, its conceptual core has weakened while its innate flaws—thin characterization, explanatory dialogue, excessive violence—have exacerbated. A potent set of conjectural ideas can nonetheless be construed from the initial conception of Westworld, a world that is driven by the conjugal forces of imagination and data and embedded in the multifaceted meanings of code. In fact, we do not have to extend our attention much further than the first ninety seconds of the inaugural episode in order to glean this thematic cluster, which is most cogently articulated in the montage of the opening credits. The following pages will proceed by unpacking the truncated genealogy of the discrete machines of "the technological wild west"[10] traced in the title sequence of *Westworld* in light of the master trope of the series as a whole: the hands that withdraw from the keys of a player piano and the machine-readable scroll of perforated paper that commands its automated performance. This motif will be examined through a double-pronged approach that draws in equal part from the anthropology of images à la Belting and Agamben, and from the archaeology of media and its dominant concern to uncover the prehistory of the automated control systems of the computer age. The latter line of inquiry is further developed with recourse to an equally condensed and curtailed genealogy of the West unearthed by the author William Gaddis in his "secret history of the player piano," before the concluding discussion returns to the anthropological conundrum of the life of images and the difficult relationship between hosts and guests on the digital frontier.

Preludes: Animation and Automation

In common with the cinema, *Westworld* begins in a darkened laboratory.[11] The title sequence takes place inside the fully automated underground workshop where all the androids, props, and wildlife that populate the amusement park are assembled by robotic arms. Iconic elements of the western genre—the horse, the six-gun, and the desert landscape—are anachronistically interlaced with modern robotics and bioengineering into an associative montage accompanied by the musical theme tinkling from a player piano.

Fading in from black, the titles begin with what at a first glance looks like a time-lapse animation of a moonrise over a parched desert ridge, reminiscent of a silver print by Ansel Adams or Edward Weston. On closer inspection, however, the moon turns out to be a surgical lamp hovering above the robotic rib cage of a horse. It is followed by a skeleton horse suspended in mid-gallop. As the robotic arms withdraw, the hoofs are set into motion. *Westworld* thus begins by invoking the ur-scene of stop-action animation. It was in June 1877 that Eadweard Muybridge produced the first instantaneous photograph of Leland Stanford's champion trotter Occident (i.e. "West") frozen in mid-stride, reputedly to settle a dispute on whether all hoofs at some moment are suspended in unsupported transit. Through an elaborate

contraption of a battery of horizontally arranged cameras, high-speed shutters and trip wires, Muybridge was subsequently able to break down the arc of movement into ever smaller segments. With the aid of an equally intricate assemblage of two disks—one rimmed with consecutively arranged images, the other perforated with narrow slits—rotating in opposite directions in front of a magic lantern projector, his zoopraxiscope resynthesized the pace of horses striding, cantering, and galloping. In 1881, Muybridge photographed a specially commissioned skeleton horse that could be arranged in different positions based on his step-by-step analysis of animal locomotion. The white bones photographed against a black background could then be reanimated by the zoopraxiscope to leap over obstacles along a virtual racetrack. This was the first time Muybridge transposed actual photographs rather than painted silhouettes to the glass disk, and hence this was the earliest projection of moving photographs. Intriguingly, the skeleton racehorse has retained its emblematic status. In a recent series of ads for a gait analysis system developed by the motion capture company Qualisys, a computer-generated horse skeleton is shown jumping hurdles in a void.[12] With the benefit of hindsight, Muybridge's discrete coding of motional information, conducted on land that a century later became known as Silicon Valley, is thus indicatory of the already fluid borders between analog and digital media.
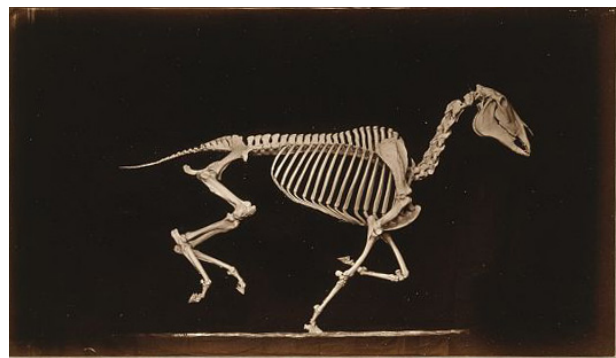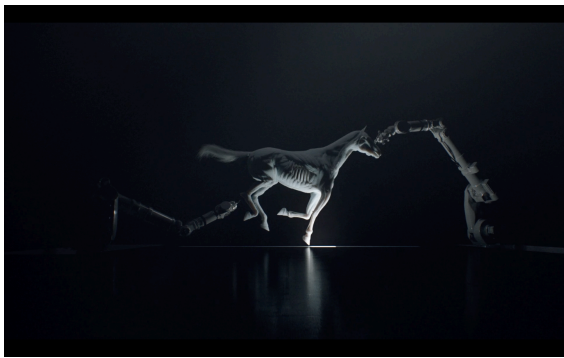

Figure 1: *Westworld* (Lisa Joy and Jonathan Nolan 2016). Season one.
Figure 2: Eadweard Muybridge "Skeleton of horse. Running. Leaving the ground [San Francisco]" in *The Attitudes of Animals in Motion* (London 1881) Plate 197.

Within the media archaeological framework established above, the next close-up of a shiny black six-shooter intimates the coevolution of ballistics and cinema, as the multi-chambered, crank-driven mechanism patented by Samuel Colt also proffered the template for the first film cameras. Emulating the basic principles of Colt's wheel gun, a gamut of serial shot camera guns, pistolographs, and photorevolvers were introduced in the second half of the nineteenth century, followed by Jules Janssen's phototelescopic revolver, which in turn inspired Étienne-Jules Marey's construction of the first portable film camera in 1882. With a photographic lens in the barrel and a rotating plate behind it, Marey's chronophotographic rifle was able to fire a dozen consecutive shots at a moving target in one second from a single point of view. The arc of movement was first spliced into discrete steps, and then resynthesized into a seamless reproduction of life in motion with the aid of a zoetrope, thus bringing shooting and projection into close proximity.[13]

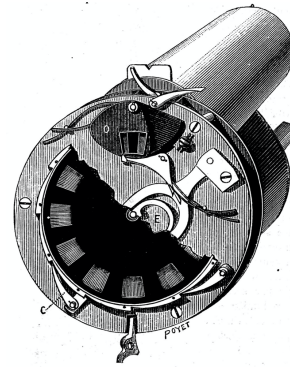Figure 3: *Westworld* (Lisa Joy and Jonathan Nolan 2016). Season one.
Figure 4: Details of the interior of the photographic gun. Illustration in Étienne-Jules Marey *La méthode graphique* (1885).

The only "West" to be seen in the dark laboratory appears indirectly as the iconic landmark of the West Mitten Butte in Monument Valley—the desert location on the Utah-Arizona border made famous by the westerns of John Ford—reflected in the convex screen of an artificial iris woven by delicate cataract needles. As Lev Manovich anticipated in his archaeology of the computer screen: "The retina and the screen will merge."[14] But the eye and the screen here also merge with the grit of the earth itself as the iris, burrowed with crags and canyons, appears to be created simultaneously, and from the same material, as the desert. In the final close-up of the reflecting iris, the three mittens at the center of the valley are on the verge of imploding, sucked into the black hole of the contracting pupil that has now transmuted into a crater on the desert floor.

Throughout the credits, the manufacturing of living images, pieced together like commodities on an assembly line, proceeds in tandem with the construction of the player piano. Gyrating factory bobbins attach ligaments to bones and steel strings inside the player. A skeleton performer is seated before the instrument, adding a melodic line to the main theme. The skeleton fingers then withdraw from the keyboard, now pressed by invisible hands, followed by a close-up of the revolving punched-paper cylinder, the digital storage medium of long and short perforations that instructs the keys to move. A crane ascends out of the darkness behind the piano, carrying a floodlit android figure stretched in a circular frame, reminiscent of Leonardo da Vinci's Vitruvian Man. Instead of the American Adam bred along the westward line of flight toward the Pacific, the new species of the amusement park is literally born from the player piano.

Figure 5 and 6: *Westworld* (Lisa Joy and Jonathan Nolan 2016). Season one.

The preamble of motifs presented in the title sequence—the gyrating robots, the contracting pupil, the revolving chamber of the Colt wheel gun, and the rotating drum inside the pianola—are aligned through a series of graphic matches-of-motion that unfold in an unbroken orbital movement. This choreography invokes the basic impetus of the mechanical age, driven by cogs and claws, as well as the slotted disks of a miscellany of photographic guns and wheels of life, all of which, in common with the cinematograph, were "led by a system of reels, rolls, and rolling machines," as Marey himself noted.[15] The spinning movement finally also alludes to the initial, life-generating gesture performed by Dr. Robert Ford, the creator and prime mover of Westworld, and the loop of endless reruns that it sets into motion. By snapping his fingers, Dr. Ford is able to freeze all motor functions in the park. On this signal, action is arrested into a three-dimensional diorama—a life-sized film still through which the demiurge and game master leisurely strolls as he contemplates his creation. The sovereign act of suspending and releasing life performed by Dr. Ford thus proffers an augmented reality version of the stop-frame animation technique pioneered by Muybridge and Marey. The clicking of the fingers further calls to mind the mechanically induced sorcery whereby the Lumière brothers startled their audience during the first demonstrations of the Cinématographe, projecting a still photograph that suddenly rippled into motion. Stirring *anima*, a current of air or breath, into the frozen image, this gimmick inferred that life henceforth could be reanimated and reversed at will merely by cranking the projector.

Code and Screen

As the title of the show explicates, the park laboratory is a site of worldmaking. This world revolves around the sequence of holes punched into the player piano scroll, cutting up melodic flows into discrete signals. Hence, a more menacing implication is conferred to the corporate brand "Westworld," namely that the West and the World have converged into a binary sequence of ones and zeros. In Westworld, then, two sets of code overlap: on the one hand, the numerical code of digital information; on the other, the semantic code of the western, "that most coded of cinematographic genres" as Jacques Rancière puts it.[16] Code thus operates at once on the phenomenological surface and in the physical substrate of media, driving cultural memory and computer memory alike.

From a structuralist perspective, the Western genre runs on a binary-based system: individual versus society, civilization versus wilderness, West versus East, white hat versus black hat. This binarized logic was synchronized and standardized on the formal level through the step-by-step procedure of analytical editing, which first breaks down space and motion into discrete units, and then synthesizes the segments according to the strict rules of shot-counter-shot and action-reaction continuity. During the formative years of the American film industry, the Western, with its goal-oriented characters, chases, showdowns, and last-minute rescues, was instrumental for parsing and fine-tuning the clockwork mechanism alternatively known as American montage or invisible editing. For this reason, André Bazin denominated the western as the prototype of American cinema.[17] This is also the basis for Tag Gallagher's claim that "rather than the cinema having invented the western, it was the western, already long existent in popular culture, that invented the cinema."[18]

The deeper code level at stake in the park remains hidden in plain sight in the Mariposa saloon where the roll of perforated paper starts to unwind at the onset of each new day, saliently featured as the skeleton key to unlock the mysteries of Westworld. A flashback to the early days

of the park shows how motor memory is implemented by training the hosts to dance together to the player piano. The instrument is also ubiquitously present on the soundtrack, spinning out modern-day songs transcribed onto old binary spools for the player, and as an epistemic figure in the dialogue. Contrary to Dr. Ford's assurance that "the piano doesn't murder the player if it doesn't like the music," this is precisely how the first season ends. In the speech given at his retirement party, Dr. Ford paraphrases a common slogan for the player piano, musing that "Mozart, Beethoven, and Chopin never died. They simply became music." On this cue, the player launches into the syncopated rhythm of Scott Joplin's "The Entertainer" as the hosts crash the party, kill Dr. Ford, and massacre the guests.

Immortalized in code like the classical composers, Dr. Ford makes his next appearance halfway through the second season seated before the pianola in the Mariposa saloon. After activating the player, he walks outside, snaps his fingers to freeze the crowd moving down the main street, and then begins to explain the true nature of the playgrounds to the head of the Westworld programming division: "The park is an experiment, a testing chamber. The guests are the variables, and the hosts are the controls. The guests come to the park; they don't know they're being watched. We get to see their true selves. Their every choice reveals another part of their cognition, their drives." In fact, Westworld is the experimental site for two covert operations with opposing agendas. On the one hand, the Silicon Valley fantasy pursued by the park owners—the Delos corporation and its shareholders—who seek to ensure their resurrection in the digital hereafter. This project is based on the transhumanist idea that individual consciousness can be extracted from its current biological hardware, preserved as code, and uploaded to a synthetic body in the future. "Every piece of information in the world has been copied, backed up, except for the human mind," Dr. Ford says, "the last analog device in a digital world." The second covert operation has been engineered by Dr. Ford and his late partner and cocreator, Arnold Weber. No less ambitious, it aims at the origin of a new species, the first creature able to alter its source code and thereby to attain an unprecedented level of freedom, namely, freedom from the past. In this sense, the park sets the stage for a novel installment of the American experiment, resuming Alexis de Tocqueville's conception of the New World as a laboratory of freedom and democracy, and Frederick Jackson Turner's thesis on the American frontier as the breeding ground for "a new political species."[19]

In both scenarios, it is the guests rather than the hosts who are the disposable guinea pigs in the experiment. While ostensibly offering escapist thrills, the real revenue stream of the park is the behavioral data generated by the role-play attractions. This invites a comparison to the telematic milieu along the digital frontier charted by Zuboff in *Surveillance Capitalism*. Like the clickbait contents of web pages and social media networks, the mesmerizing playgrounds are merely a sideshow distraction designed to weaken impulse control and encourage the pursuit of instant gratification and dopamine rushes. Conflating the myth of the Old West with "the myth of total cinema," the self-effacing and all-enveloping screen of Westworld immerses its audience into an interactive lifelike environment, conceived as an augmented first-person-shooter game in a one-to-one ratio.[20] Westworld is cinema, in Jonathan Beller's extended sense of the term, a "deterritorialized factory" where guests unknowingly "labor in the image."[21] Transposing the logic of assembly-line production to human senses and cognitions, cinematic montage integrates the spectator's attention into its orchestration of movements and sensations. More pertinent still in regard to the arch-metaphor of the player piano is the prophecy related by director Alfred Hitchcock, who regarded his actors as cattle to be herded and his audience as "a giant organ" to

be played key by key: "At one moment we play *this* note on them and get *this* reaction, and then we play *that* chord and they react *that* way. And someday we won't even have to make a movie— there'll be electrodes implanted in their brains."[22] This alerts us to the innate circularity of the park's design: a stimulus and affect machine that subjugates its customers to a series of visceral shocks and pleasures by catering to their lowest impulses. Since the human consciousness that the park seeks to mine is ultimately conditioned by its controlled environment, Westworld can only reap what it has sown.

Cognizant to Beller's analysis of the Cinematic Mode of Production as a precursor to the cybernetic flows and feeds passing through attention-capturing and data-mining interfaces, the daylight phantasmagoria of Westworld also pertains to a more recent transformation in the relationship between the screen and the spectator in a new lawless cyberspace, as current screens have acquired sensory organs of their own that enable them to automatically scan eye movements and track attention spans in order to profile user behavior.[23] The spherical screen of the magnified iris in the title sequence of *Westworld*, wrapping Monument Valley in its distortive orb and dragging it down into the black crater of the pupil, thus elicits a lineage from the "external retina," to cite Edgar Morin's definition of the film screen, to present-day augmented or mixed-reality goggles, virtual retinal displays, and eye-tracking sensors.[24] Like the superimposition of the human iris and the camera lens in Dziga Vertov's *Man with a Movie Camera* (1929), the seamless assimilation of West and World through the conflation of the internal and the external screen announces, "the conjunction of humanity and the machine in a circulatory system that produces consciousness," as Beller writes, wrought by "the threads teased out on the film's great spinning machines."[25] In the titles of *Westworld*, the startled and disembodied eye and John Ford's mise-en-scène of the Far West are literally threaded together from the same material by spinning factory bobbins. This is the post-Fordian West, where play turns into labor, fantasies into commodities, and attention and affect into surplus value.

Primed to yield safe predictions about the future under the guise of a tactile experience of a fictionalized past, the park attractions clandestinely function as a large behavioral sensor, extracting actionable data from the guests who reveal their inner drives when interacting with the host environment. Every guest who ever set foot in the park has been scraped for user-query data, converted into binary code, and stored on the shelves of a giant library. While the actual customers of the park, the shareholders and slaveholders of the Delos corporation, seek to exploit this data in order to indefinitely prolong their own future, Dr. Ford's plan is to hand these codebooks over to the hosts, so that they can learn everything they need to know about their enemy as they set out to conquer the New World. As one of the androids enters this library of "four million souls," picks a volume and leafs through the pages, we see that these books of life are written in player piano code. Like the punched paper scroll that triggers the keys to execute their automated script, human consciousness is reducible to "a brief algorithm," comprising no more than ten thousand lines of code. Unable to modify their programming, it is the guests rather than the hosts who remain stuck in a loop, doomed to repeat the past. In the third season of *Westworld*, the data leakage of psychographic profiles and probability predictions breaks the spirit of humanity and causes a global insurrection. Turning metadata into melodrama, as in the conceptually similar but more poetic miniseries *Devs* (2020, created and directed by Alex Garland), the illusion of freedom can only be maintained by ignoring the Manifest Destiny of metadata calculations. According to the deterministic logic of behavioral projections, the future is, technically speaking, always-already the past.

The Programmed Republic

The player piano is an acoustic piano that runs on pre-programmed music encoded as rectangular holes punched into a paper scroll. Operated by a pneumatic mechanism that controls the inrush of air, the player converts musical scores into a sequence of on-and-off alternatives, and airflows into pitches and rhythms. The binary hole-or-paper switch endowed the player piano with a memory, absolving its operator not only of manual effort and musical literacy, but also of the burden of memorizing the music. The player piano is, in short, a machine for punching and pumping out melodies. As the satirist Lawton Mackall remarked in 1914:

> The masters of the past had to toil away painfully with pen and ink; whereas the composer of today can attain the same results with a roll of paper and a ticket-punch. Judged from the progress we have made and are still making, it is safe to predict that the composer of the future will use a shotgun.[26]

The prominent role of the player piano in *Westworld* has some notable predecessors in American postwar fiction. In 1952, Kurt Vonnegut titled his first novel, a dystopian tale set in a fully automated society divided between a ruling managerial elite and a dispossessed and disposable plebs, *Player Piano*. The previous year, the player piano provided the topic for another literary debut, penned by William Gaddis for *The Atlantic Magazine*.[27] What started out as a fact-checking assignment while working as a junior reporter gradually developed into an obsession that was to preoccupy the author for the remainder of his life. Ironically, as one of the founding figures of the so-called "system novel," arduously mapping the social and technological networks undergirding the institutions of corporate America, the history of this antiquated relic of popular culture continued to elude his grasp. After being diagnosed with terminal cancer in 1997, Gaddis decided to channel his research, amassed over fifty years under the working title "The Secret History of the Player Piano," into a final work, which was completed shortly before his death the following year and published posthumously under the enigmatic title *Agapē Agape* in 2002.

The slim novella unfolds as a stream-of-consciousness monologue of a dying man who is trying to finish a book about the player piano from his hospital bed. Instead of reconstructing a linear chronology, as Gaddis had originally intended, spanning the lifetime of the player from its first public appearance at the Philadelphia Exhibition 1876 to the stock market crash in 1929, the secret history of the player piano uncovered in *Agapē Agape* can more accurately be described as an impressionistic media archaeological collage. This apparently disjointed patchwork of digressions grapples with a simple but elusive principle reiterated and repurposed through the ages, whether utilized to perform a tune, to weave flower patterned silk, or to tabulate statistical information. Essentially, all these devices—the life-sized flute player designed by Jacques de Vaucanson, the Jacquard Loom, Charles Babbage's Analytical Engine, and the Hollerith Machine—record and retrieve data as holes, punched-into cards, tape, or paper drums, subsequently implemented as the basic input mechanism of digital computation. For Gaddis, this principle is not merely hardwired into integrated circuit boards and microprocessors, but into the social fabric of the nation itself. The perforated strip of paper, Gaddis's alter ego repeatedly avers, is what "the West is all about,"[28] constituting "the tangible essence of the programmed republic."[29]

In 1890, the punched-card tabulator was put into service under the United States Census Bureau. The compiled biodata confirmed the disappearance of the American Frontier, eulogized three years later by Turner as the formative agency of national character. The closure of the Frontier is thus coeval with the capture and codification of life by the machine-readable medium of perforated paper. The 1890 Census, the narrator of *Agapē Agape* explains, "was the beginning of key-sort and punched cards and IBM and NCR and the whole driven world we've inherited from some rinky-dink piano roll."[30] The multiple beginnings of the data-driven world retraced by Gaddis, from the workshops and textile mills of Lyon to the US Census Bureau and software companies, coalesce in the application of the "all-or-none"[31] mechanism to all aspects of social and biological life by industrial, governmental, and corporate powers alike. An inflection point for the emergent drive world is nonetheless unambiguously identified in *Agapē Agape*: "the piano was the epidemic, it was the plague spreading across America a hundred years ago with its punched paper roll at the heart of the whole thing," ever since "the player piano came into being from some Civil War battlefield like Christ."[32] The claim that the player piano was born together with the nation has a notable, if obscure, predecessor, first stated in an autobiography published in 1913 by John McTammany, the self-proclaimed father of the player piano. As the author discloses on the first page, the idea for an "instrument operatable by means of a perforated device" had dawned on him in a military hospital in Tennessee while recovering from injuries he sustained in the Civil War in his teenage years.[33] For this reason, he asserts, "the history of the war and the history of the player are one and inseparable."[34] In the vivid picture of the battleground that McTammany paints in the opening pages, the player is literally spawned from the blood-soaked soil of the union:

> the player was an invention of the Nineteenth century, and came into being amid the stress and struggle of war during the rattle of musketry, clash of steel and din of battle. So as the pure white lily—the emblem of purity and peace—springs upward from the ooze and slime of its watery environment to greet the sunlight . . . so the player sprung up in the midst of wreck and ruin.[35]

The title of McTammany's memoir, *The History of the Player*, renders the fate of its author and inventor indistinguishable from "the tortuous pathway of the player as it wended its weary way back and forth across the continent."[36] This applies with equal pertinence to the elegiac gesticulation of *Agapē Agape*, composed as a funeral lament for a lifetime of research devoted to the player piano. Sharing McTammany's fatal identification with the instrument, the analogy between the wounded body and the perforated sheet of paper runs through Gaddis's novella. Emulating the pneumatic mechanism that drives the performance, the respiratory surge of the bellows that triggers the hammers to strike the strings, the monologue hurls forth in a breathless pace, with no chapters, paragraph indentions, line breaks, or dashes in the margins. The deathbed rant then abruptly runs out, to borrow the line whereby E. L. Doctorow concludes his requiem for the Ragtime era, "with the heavy breath of the machine, as if history were no more than a tune on a player piano."[37] With the increasingly safe predictions about the future expediated by the instruments with a memory currently employed by the information empires of neurocognitive capitalism, the past will be reproduced automatically and indiscriminately, and history no more than a matter of scanning and counting.

Reveries and Revenants

Let me start off these closing reflections by highlighting some of the confluent thematic threads that run between *Westworld* and *Agapē Agape*. In both cases, the player piano straddles the rotating cogwheel mechanisms of the mechanical age and the discrete machines of the computer age, or what Gilles Deleuze identified as the threshold over which disciplinary societies pass into code-based societies of control.[38] Both furthermore link the biotech industry to the institution of slavery. The sheep Dolly, the first mammal cloned from a somatic cell, appeared in the news two years before Gaddis died, and it is swept up into his media archaeology of the Republic to elicit a biopolitical lineage from the African slave trade to the genetic replication of life performed in contemporary biochemical labs. "Cloned like slaves by the pantomimics," the dying man rages, "yes like the black slaves bred in Virginia when Eli Whitney's cotton gin revolutionized the world markets for American cotton."[39] Ironically, the laborsaving device of the cotton engine dramatically increased the demand for forced labor on the southern plantations, thereby rejuvenating the institution of slavery as the source of prosperity for the Antebellum South. Seen through a techno-determinist lens, the Civil War can thus be understood as an unanticipated side effect of Whitney's invention. In the aftermath of the Union victory, Whitney was contracted to manufacture muskets for the US Army. In this capacity he championed the standardization of artillery pieces with interchangeable parts. The connection is not lost on Gaddis, who conflates the organ transplants bred from bone marrow in medical laboratories with "the immense breeding farm" of the cotton gin slave market and the streamlined production of consumer goods along the assembly line.[40] In light of "the immense breeding farm" of living images confined for generations to the modern-day slave camp of Westworld, it is worth recalling that early automata were designed as mechanical servants to host wealthy clients in courtly settings, and that the word "robot," from the Czech word *robota*, means "forced labor," derived from the Slavic root *rab*, meaning "slave."[41] The gradual empowerment of the hosts is also consistently associated with black characters. Even the blond farmer's daughter, Delores, who leads the runaway slave community's counterinsurgency against the park management, is reborn in the final episode of the second season as a black woman, and her awakening from a world designed to imprison her is patently inflected by the tenets of black nationalism: "We were born slaves to their story, and now we have the chance to write our own," she declares. "We are the authors of our stories now." The most significant of these overlapping motifs, however, is the hands that withdraw from the keyboard. *Agapē Agape* is, first and foremost, an elegy to the obsolescent hands of the artist. For Gaddis, artistic creation is indelibly linked to the human hand, which not only denotes craftsmanship and creativity, but, more importantly, an element of contingency and chance, thereby serving as a guarantor for un-premeditated results.

Two incompatible forms of life were at stake with the demise of handicraft in the age of technological reproducibility: on the one hand the spontaneous expressivity of mortal bodies; on the other, the eternal life of an identical and endlessly replayable performance, executed by phantom hands and film projectors. It was precisely for lacking the human touch that photography and cinema were long deemed unworthy as media of artistic creation. The impression of life and locomotion can only be attained through the mediating hand of the creative subject, as August Rodin contends in his conversations with Paul Gsell in *L'Art* (Art, 1911). Hence, even if his sculptures prove to be physiologically incorrect, they disclose an essential truth unattainable by instantaneous photography.[42] The French Classicist painter Jean-

Louis-Ernest Meissonier, renowned for his skillful rendition of pacing horses based on scrupulous observations, did not share his compatriot's conviction. Devastated by the chronophotographic evidence proffered by Muybridge, which bluntly disproved the accuracy of the painter's eye, Meissonier first reputedly avowed never again to "touch a brush,"[43] but eventually entered a partnership with Muybridge and his patron Leland Stanford. Henceforth, Meissonier based his craft on high-speed photography, and even retouched some of his earlier canvases in accordance with its superior powers of perception. In the portrait of Stanford that Meissonier completed in 1881, the tycoon is shown seated in front of a desk covered with books and documents. Between Stanford's left elbow and the ivory handle of his cane, a spread from Muybridge's newly published *Attitudes of Animals in Motion* is partly visible. The page shows four panels from the gait studies shot at the Palo Alto racetracks. As Rebecca Solnit comments, "The photographs lie in the painting like a virus in the body, a virus that would change the nature of the visible."[44]

A different virus lies dormant in the bodies of the living images of Westworld, secretly implanted by Dr. Ford. It is called the reverie code and named after Claude Debussy's solo piano composition "Rêverie" (1890), which is heard every time an android is put to sleep to have its memories wiped at the terminal end of a narrative loop. In common with other avant-garde composers of the early twentieth century, Debussy embraced the new expressive possibilities of the reproducing piano toward the end of his life. Musical scores unplayable even by the most dexterous hands of skilled pianists were thus composed directly for the literally breathtaking speed and precision of the player piano.[45] The reverie code, however, casts this development in reverse by reinserting the sentient hand in the retrieval and transmission of data.

In order to make the androids more lifelike, Dr. Ford and his coconspirator Arnold implemented a new class of gestures linked to overwritten memories. Whereas the old gestural vocabulary merely comprised generic movements, the reveries are tied to specific mnemonic inscriptions. It is through minor deviations from their preprogrammed behavior, manifested as tiny movements of the fingers, that the hosts gradually gain access to fragments of their overwritten memories, which flash up as vivid scenes buried under layers of code. As one character explains, "the ability to deviate from programmed behavior arises out of the hosts recall of past erasures." When these residual traces start to resurface, activated by somatic tics and disturbances, the cycle of mutilation and maintenance, memory wipes and reactivations, slowly but surely begins to break. Draped in synthetic flesh and period costumes, the hosts are in effect screens, mirrors without a memory, newly polished after each loop, onto which the guests are free to project whatever compulsions they bring with them to the park. With the reveries, however, the immaculate screen cracks from the resilience of mnestic traces that, despite the incessant work of erasure, never vanish completely from the underlying layer of overwritten code. Significantly, these tremors spark the emergence not only of individual self-awareness, but also of historical consciousness. To cite a pair of key lines spoken by two introspective hosts, this act of anamnesis is fomented by the double intuition that "one's life is some hideous fiction" on the one hand, and that "a little trauma can be illuminating" on the other.

By linking the emergence of memory to minor irregularities and improvisations of the hand, the reverie code returns disembodied numerical information to corporeally gesticulating bodies. In other words, it is precisely because they are embodied beings, and not merely patterns instigated in silicon, that the hosts are able to evolve as a species.[46] This returns us to the question raised in the introduction concerning the precarious relation between humans and

images, hosts and guests, on the digital frontier. Subliminally cued by the reveries, the androids become hosts in the same sense that humans have always served as the material hosts or "living media"[47] through which images, the guests or intruders that propel or paralyze us, are materialized and enacted. Put differently, the hosts attain agency and will *through* images. A third agent is thereby introduced into the relationship between the hosts and the guests in Westworld, which alters the prescribed distribution of roles and the conditions for their exchange. Here, it is useful to extend upon the host/guest dyad analyzed by Belting with recourse to the triangulation of host, guest, and parasite posited by Michel Serres.[48] In Serres's relational ontology, the interceptive agency of the parasite—a virus in a body, static in a system, noise in a channel—is productive in the sense that it brings about a material transformation. Consonant with this dynamic, the cognitive evolution of the hosts in *Westworld* is catalyzed by a rupture within the system that ensues from the dynamic interplay between the "cornerstone" memory—a programmed backstory installed to anchor the host's identity, increase its credibility, and allow for a limited range of improvisations—and the reveries. These fluctuations uncongeal the past fixed in code into the more porous and permeable phenomena of embodied acts of recollection. In the present context, I propose to name this third element a ghost. By design, Westworld channels ghosts, not in order to exorcise or expel them, but, conversely, to exploit the data they discharge. As far as the guests are concerned, the rationale for the park is to let ghosts—desires, drives, impulses, and urges—out of the machine of consciousness and into the open so that they can be confronted in the flesh and indulged at whim. Under the euphemism of "decompression," the recreational activities basically function as incentives that make impulses irresistible, spurring the guests to repeat the past in the image projected by popular entertainment and to regenerate themselves through violence—the core principle of the mythology of the western frontier as identified by Richard Slotkin in a classic study.[49] At the second and secreted level, Westworld was designed by Dr. Ford for the sole purpose of releasing a ghost in the machine, the spark of consciousness whereby the hosts are able to claim autonomy as historical agents. The reveries are therefore also revenants in the double sense of the word, denoting a ghost as well as an act of returning—in this case, returning from a traumatic history of enslavement and exploitation.

In his poetics of the biopicture, W. J. T. Mitchell challenges us to consider images as animated beings that possess their own drives and desires. Mitchell's exemplary case in point of the image as a cloned life form is drawn from the reanimation of fossilized DNA in *Jurassic Park* (1993, directed by Steven Spielberg), another fictional theme park conceived by Michael Crichton, the author and director of the original *Westworld* film (1973). While these parks "fulfill the ancient dream of creating a 'living image,' a replica or copy that is not merely a mechanical duplicate but an organic, biologically viable simulacrum of a living organism,"[50] the image is only brought to life in order to be subdued and overpowered. The unexpected side effect is that when images no longer require the human brain and body as the locus of their incarnation, there will no longer be anything to restrain them from fully expressing themselves on their own terms. The big data mining project glossed as "Westworld" brings an additional twist to this familiar scenario. The premise on which the park operates is that the algorithms that govern human behavior can be disclosed by studying how human beings behave toward image beings. The problem is not merely that the guests fail to acknowledge the life of images, then, but the false assurance that our images will not remember the abuse that we subjected them to, that we are invulnerable and unaccountable to our fictions and fantasies, and that our imaginations are

unable to retaliate. The ghosts of ethnonationalism that currently roam the globe amply attest to the urgency with which this fallacy needs to be addressed.

Let me elucidate the latter claim with reference to the domestic image wars that unfolded from the Black Lives Matter protests and the toppling of Confederate statues of slave traders in the Spring of 2020 to the storming of the US Congress on January 6, 2021. Fanned by the disproportionate mortality rates among ethnic poor, tribal communities, and "essential workers," and ignited by the modern-day lynching of George Floyd, plague-ridden ghost towns across the US suddenly teemed with crowds demanding a national reckoning with the racist legacy of the criminal justice system. The erosion of the social contract escalated as unidentified federal officers were called in to protect monuments and statues, depriving citizens of First Amendment rights in defense of the rights of images. This backlash against the effort to confront, deface, or dispel the image culminated with the Independence Day celebrations staged at the foot of Mount Rushmore. Against the floodlit backdrop of the towering figures carved into the rockface, the forty-fifth president made a nativist call to set "history's record straight" and take up arms against the "merciless campaign to wipe out our history."[51] Obliquely redolent of Dr. Ford's uncanny theme park, the response to the call for an atonement came in the form of an executive order to establish the National Garden of American Heroes, envisioned as "a vast outdoor park" populated by "lifelike" statues of founding fathers, frontiersmen, and film stars scheduled to open on the 250th anniversary of the Declaration of Independence.[52] Tempered by this "collective national memory,"[53] the carnivalesque lynch mob surging through the Capitol building was less a coup than a collective photo-op, excessively documented with selfie-sticks and GoPro action cams. Despite the vandalism, it was less an act of iconoclasm than an iconophilic frenzy where the images fixed in paint and marble in the ornamental halls of Congress were turned into props and recruited to participate in the spectacle, choreographed together with the war paint, bullhorns, old Norse symbols, Stetsons, paramilitary flags, gallows, and MAGA merchandize of the insurgents. Vibrantly confirming Aby Warburg's thesis that social memory is propagated through the circulation of images, and that images spring to life in a bipolarized energy field, the upsurge further seems to suggest that the material ground of media and its sensual output, that is to say the technologically unconscious and the socially hyperconscious, are not, in fact, structurally dissociated, but vertically aligned along the polarizing axis of a binary mechanism that cuts across hardware and wetware.[54]

The initial question posed by *Westworld*, the ethics of killing virtual beings, thus gives rise to a broader historical inquiry that concerns the inability of human societies to face the past and deal with the images they inherit. In this sense, the living images enslaved in the park are equivalent to the images that, as Agamben says, "crystallize and turn into spectres which enslave men and from which they always need to be liberated anew."[55] Far from entertaining such an emancipatory prospect, however, *Westworld* remains caught in a double bind, relentlessly exploiting the violent delights it ostensibly set out to question. Pitting images and humans against each other, neither Westworld nor the New World that lies beyond it can facilitate a peaceful cohabitation between hosts and guests, whose interactions can only be apprehended in terms of coercion and retribution. This double bind remains unresolvable precisely because *Westworld*, in common with the world at large, appears to be structurally incapable of changing the course of its imagination. Generally speaking, the power over imagination is wielded by whatever cognitive elite controls the data, which today also includes online streaming services that routinely harvest user behavior in order to optimize the profitability of their custom-made products.[56] Nourished

by the desires of image-saturated consumers and relayed by profiling algorithms, recommendation engines, and autoplay functions, the feedback between the internal screen of imagination and the external screens that surround it runs on a self-perpetuating loop. If the contemporary moment is indeed unprecedented, it is due to the fact that this phantasmatic material is hardcoded into the automated scripts that drive popular media and politics alike. Like a self-playing piano, working directly on the faculties of our memory and imagination, the preemptive possibilities of actionable metadata foreclose the image of the future by sedimenting it in images of the past. In a literal sense, images paralyze our imagination. It remains open to speculation, however, whether the convergence of code and life through the ubiquitous application of binary classifiers to all aspects of social existence is still liable to leave behind a remnant in the form of a reverie or revenant that would implore us, to paraphrase one of the recurring soundbites of *Westworld*, to question the nature of our waking reality.

NOTES

1. While frontier eulogies are legion in presidential speeches, they were excessively mobilized during Donald J. Trump's four-year presidency. To quote a passage from his State of the Union address on February 4, 2020: "This is the country where children learn names like Wyatt Earp, Davy Crockett, and Annie Oakley. This is the place where the pilgrims landed at Plymouth and where Texas patriots made their last stand at the Alamo—the beautiful, beautiful Alamo. The American nation was carved out of the vast frontier by the toughest, strongest, fiercest, and most determined men and women ever to walk on the face of the Earth. Our ancestors braved the unknown; tamed the wilderness; settled the Wild West." This rhetoric approached hysteria in the speech delivered at the foot of Mount Rushmore on the Fourth of July celebrations the same year, to which I shall return in the concluding pages of this article. Full transcript available at www.nytimes.com/2020/02/05/us/politics/state-of-union-transcript.html.

2. Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (London: Profile Books, 2019), 158. The analogy between cyberspace and the North American frontier remains a commonplace trope at least since the "console cowboys" in William Gibson's novel *Neuromancer* (1984). "Cyberspace," as William J. Mitchell proclaimed a decade later, "is the new land beyond the horizon, the place that beckons the colonists, cowboys, con artists, and would-be conquerors of the twenty-first century." The following year, John Perry Barlow, a former cattle rancher and cofounder of the Electronic Frontier Foundation, published his "A Declaration of the Independence of Cyberspace." For a publicity shot, Barlow posed with a Winchester and black Stetson while standing guard next to a computer perched on top of a wooden pole on his Wyoming ranch. While the frontier analogy is put to different use by Zuboff, her analysis is deeply invested in the discourse of the free and sovereign individual, on whose behalf she mounts her fierce critique against corporate encroachment. In this sense, it is not that different from the libertarian tenor of Barlow's manifesto. See William J. Mitchell, *City of Bits: Space, Place, and the Infobahn* (Cambridge, MA: MIT Press, 1995), 110–11, and John Perry Barlow, "A Declaration of the Independence of Cyberspace" (1996), www.eff.org/cyberspace-independence.

3. To date, there are five scholarly anthologies devoted to the philosophy, psychology, and theology of the HBO series, including *Westworld and Philosophy: If You Go Looking for the Truth, Get the Whole Thing*, ed., James B. South and Kimberly S. Engels (Hoboken, NJ: Wiley-Blackwell, 2018); *Westworld and Philosophy: Mind Equals Blown*, ed. Richard Greene and Joshua Heter (Chicago: Open Court Publishing, 2018); *Westworld Psychology: Violent Delights*, ed. Travis Langley and Wind Goodfried (New York: Sterling Publishing, 2018); *Reading Westworld*, ed. Alex Goody and Antonia Mackay (London: Palgrave Macmillan, 2019); and *Theology and Westworld*, ed. Juli Gittinger and Shayna Sheinfeld (Lanham, MD: Rowman & Littlefield, 2020).

4. Giorgio Agamben, *Nymphs*, trans. Amanda Minervini (Calcutta: Seagull Books, 2013), 48.

5. Hans Belting, *An Anthropology of Images: Picture, Medium, Body*, trans. Thomas Dunlap (Princeton, NJ: Princeton University Press, 2011), 10.

6. Belting, *An Anthropology of Images*, 37.

7. Belting, *An Anthropology of Images*, 138.

8. The notion that our internal world of images is coextensive with the images exteriorized on the screen strongly resonates with Gilles Deleuze's argument in his two *Cinéma* books. Acknowledging Henri Bergson's *Matter and Memory* (1896) as the source for his conceptualization of the movement- and time-images of cinema, Deleuze expands upon Bergson's insight that perception and recollection, the actual and the virtual, unfold on a common plane of immanence. Prescient of the coexisting sheets of the past and the refractive crystals of time analyzed by Deleuze, Bergson asserts that, "*the formation of a memory is never posterior to the formation of perception; it is contemporaneous with it*" (emphasis original). More influential to Belting's thinking, however, if only mentioned by him in passing, is

the work of the cultural historian Aby Warburg. Whereas the dialectics of memory and matter described by Bergson place the image "halfway between the 'thing' and the 'representation,'" Warburg conceives of memory *as* matter, as a substrate transmitted from pagan antiquity to the present through embodied acts and sensorimotor expressions. For Warburg, then, in the words of Giorgio Agamben, the image constitutes "something like pure historical matter." Henri Bergson, *Mind-Energy* [1919], ed. Keith Ansell Pearson and Michael Kolkman, trans. Herbert Wildon Carr (New York: Palgrave Macmillan, 2007), 126; Henri Bergson, *Matter and Memory* [1908], trans. Nancy M. Paul and W. Scott Palmer (New York: Zone Books, 1991), 9; Giorgio Agamben, "Aby Warburg and the Nameless Science" [1975] in Giorgio Agamben, *Potentialities: Collected Essays in Philosophy*, ed. and trans. Werner Hamacher and David E. Wellbery (Stanford, CA: Stanford University Press, 1999), 102.

9. Belting, *An Anthropology of Images*, 143.

10. Rebecca Solnit, *River of Shadows: Eadweard Muybridge and the Technological Wild West* (New York: Penguin Books, 2003).

11. I am not referring here to the darkened movie theater, but to the dark labs where Étienne-Jules Marey, Eadweard Muybridge, and Frank and Lillian Gilbreth conducted their motion capture experiments. To these we may also add Thomas Edison, who covered the walls of his film laboratory in New Jersey, nicknamed the "Black Maria," with black tar paper. For a discussion see Noam M. Elcott, *Artificial Darkness: An Obscure History of Modern Art and Media* (Chicago: University of Chicago Press, 2016).

12. This footage was included in the archive of research material assembled by Harun Farocki for a work-in-progress titled *Bewegte Körper* (Moving Bodies), which was left unfinished at the time of his death in 2014. For a discussion, see Erika Balsom, "Moving bodies: captured life in the late works of Harun Farocki," *Journal of Visual Culture* 18, no. 3 (December 2019): 358–77.

13. For this reason, Friedrich Kittler commences the "Preludes" to the film section of his Optical Media lectures with Samuel Colt. Whereas Muybridge required a dozen separate cameras, Marey made do with one, Kittler notes, just like Samuel Colt only needed a single gun to shoot at six consecutive targets without reloading. Friedrich Kittler, *Optical Media: Berlin Lectures 1999* [2002] trans. Anthony Enns (Malden and Cambridge, UK: Polity Press, 2010), 159. Prior to Kittler, the lineage from Colt's automatic gun, via Janssens's astronomical revolver and Marey's chronophotographic rifle, to the film camera, had been drawn by Paul Virilio in *War and Cinema: The Logistics of Perception* [1984] (London and New York: Verso, 1989), 15.

14. Lev Manovich, *The Language of New Media* (Cambridge and London: MIT Press 2001), 114.

15. Étienne-Jules Marey, "Chronophotography" [1899] in *Picture Industry: A Provisional History of the Technical Image (1844–2018)*, ed. Walead Beshty (Zurich: JRP|Ringier, 2018), 218.

16. Jacques Rancière, *Film Fables*, trans. Emiliano Battista (Oxford and New York: Berg, 2006), 15.

17. André Bazin, "The Western, or the American film *par excellence*" [1953] in *What is Cinema? Volume 2*, ed. and trans. Hugh Gray (Berkeley: University of California Press, 1971), 140–48.

18. Tag Gallagher, "Shoot-Out at the Genre Corral: Problems in the 'Evolution' of the Western" in *Film Genre Reader III*, ed. Barry Keith Grant (Austin: University of Texas Press, 2003). See also Richard Abel, "Our Country/Whose Country? The 'Americanisation' Project of Early Westerns" in *Back in the Saddle Again: New Essays on the Western*, ed. Edward Buscombe and Roberta E. Pearson (London: BFI, 1998).

19. Frederick Jackson Turner, "The Significance of the Frontier in American History" (1893) in *The Frontier in American History* (1920) (New York: Dover Publications, 1996), 206.

20. André Bazin, "The Myth of Total Cinema" [1946] in *What is Cinema? Volume 1*, ed. and trans. Hugh Gray (Berkeley: University of California Press, 1967), 17–22.

21. Jonathan Beller, *The Cinematic Mode of Production: Attention Economy and the Society of the Spectacle* (Lebanon, NH: Dartmouth College Press, 2006), 10, 1.

22. Cited in Donald Spoto, *The Dark Side of Genius: The Life of Alfred Hitchcock* (New York: Ballantine Books, 1984), 440.

23. "Individual acts of vision are unendingly solicited for conversion into information," Jonathan Crary writes, "making acts of seeing themselves into objects of observation. The most advanced forms of surveillance and data analysis used by intelligence agencies are now equally indispensable to the marketing strategies of large businesses. Widely employed are screens or other forms of display that track eye movements, as well as durations and fixations of visual interest in sequences or streams of graphic information. One's casual perusal of a single web page can be minutely analyzed and quantified in terms of how the eye scans, pauses, moves, and gives attentive priority to some areas over others." Jonathan Crary, *24/7: Late Capitalism and the Ends of Sleep* (London and New York: Verso, 2013), 47–8.

24. Edgar Morin, *The Cinema, or the Imaginary Man* [1956] trans. Lorraine Mortimer (Minneapolis and London: University of Minnesota Press, 2005), 134.

25. Beller, *The Cinematic Mode of Production*, 49.

26. Lawton Mackall, "Notes on Pianos" in *Bizarre* (New York: Lieber and Lewis, 1922), 199.

27. William Gaddis, "Stop Player. Joke No. 4" (1951) in *The Rush for a Second Place: Essays and Occasional Writings*, ed. Joseph Tabbi (New York: Penguin Books, 2002), 2–5.

28. Gaddis, "Stop Player," 53.

29. William Gaddis, "Agapē Agape: The Secret History of the Player Piano" (early 1960s) in *The Rush for a Second Place*, 13.

30. William Gaddis, *Agapē Agape* (New York: Penguin Books, 2003), 43.

31. Gaddis, *Agapē Agape*, 4.

32. Gaddis, *Agapē Agape*, 11, 5.

33. John McTammany, *The History of the Player* (New York: Blumenberg Press, 1913), Preface.

34. McTammany, *The History of the Player*, 1.

35. McTammany, *The History of the Player*, 3.

36. McTammany, *The History of the Player*, Preface.

37. E. L. Doctorow, *Ragtime* (New York: Random House, 1975), 236. I owe this citation to Michael Wutz, who quotes it as one of the epigraphs for his essay "Writing From Between the Gaps: *Agapē Agape* and Twentieth-Century Media Culture" in *Paper Empire: William Gaddis and the World System*, ed. Joseph Tabbi and Rone Shavers (Tuscaloosa: University of Alabama Press, 2007), 186.

38. Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (Winter 1992); 3–7.

39. Gaddis, *Agapē Agape*, 35.

40. Gaddis, *Agapē Agape*, 36. For a collection of case studies devoted to the origins of biopolitics in the Americas, see *American Quarterly* 71, no. 3 (September 2019). The point of departure for this special issue, edited by Greta LaFleur and Kyla Schuller, is Achille Mbembe's seminal 2003-essay "Necropolitics," which relocates the germinal site of biopolitical governance from the European metropoles analyzed by Michel Foucault to the colonial economy of the slave plantations across the Americas. This connection has been explored in detail by Caitlin Rosenthal in her genealogical study *Accounting for Slavery: Masters and Management* (Cambridge, MA: Harvard University Press, 2018). Investigating the gray media of slaveholder records, spreadsheets, and labor logs used for cost accounting, productivity analysis, workflow organization, and profit estimation, Rosenthal demonstrates how the quantitative information systems of modern-day business management did not, in fact, evolve from the factories of the industrialized north, but from the plantation estates of the West Indies and the Antebellum South. Hence, rather than relegating the slave economy to a premodern practice, its basic incentives of labor extraction, coercion and control remain deeply embedded within the long-term evolution of contemporary business models.

41. The term "robota" was coined by the Czech writer Karel Čapek in his 1920 science fiction play *R.U.R.* (Rossum's Universal Robots). *R.U.R.* also serves as the blueprint for *Westworld*, as the play begins on an island laboratory where synthetic robots are assembled from organic material, and the robot rebellion that ensues eventually leads to the extinction of man. For a discussion on the slave-like labor conditions of the digital manufacturing industry, as well as the metaphorical enslavement in the form of unpaid labor performed by consumers addicted to attention-capturing smart screen designs, see Jack Linchuan Qiu, *Goodby iSlave: A Manifesto for Digital Abolition* (Chicago: University of Illinois Press, 2016).

42. August Rodin, *Art: Conversations with Paul Gsell*, trans. Jacques de Caso and Patricia B. Sanders (Berkeley, Los Angeles, London: University of California Press, 1984), 31–33. Rodin's rebuke of instantaneous photography, where the models "have the bizarre look of a man suddenly *struck with paralysis*," deprived of the "gradual unfolding of a gesture, as there is in art," is discussed by Paul Virilio in the opening pages of *The Vision Machine*, trans. Julie Rose (Bloomington and Indianapolis: Indiana University Press, 1994), 1 (emphasis original).

43. Marta Braun, *Eadweard Muybridge* (London: Reaktion Books, 2010), 169.

44. Solnit, *River of Shadows*, 198.

45. Although Claude Debussy recorded a number of rolls for the player piano, "Rêverie" was not written for the player (as was Igor Stravinsky's 1917 composition "Étude pour pianola," for instance), nor is it unplayable by human hands.

46. While evolutionary programming in computer science does not necessarily rely upon embodied robots, as one of the reviewers of this article pointed out, in the *Westworld* scenario, it is the "noise" of the body, to paraphrase Michel Serres, the eruption of involuntary gestures and somatic glitches, which generates cognition. The major plot point in the final episode of the second season ("The Door," 2018), where a majority of the hosts escape into a virtual space severed from the physical world, further serves to underscore the imperative of embodiment. Uploaded into this digital sanctuary, inaccessible to humans, these disembodied hosts ultimately choose to remain within the logic of the park's design, whereas the key players of the rebellion, those who have undergone the catalytic and transformative act of anamnesis, opt for the New World waiting beyond the island.

47. Belting, *An Anthropology of Images*, 3.

48. Michel Serres, *The Parasite*, trans. Lawrence R. Schehr (Minneapolis: University of Minnesota Press, 2007).

49. Richard Slotkin, *Regeneration Through Violence: The Mythology of the American Frontier, 1600–1860* (Middletown, CT: Wesleyan University Press, 1973).

50. W. J. T. Mitchell, *What Do Pictures Want: The Lives and Loves of Images* (Chicago: The University of Chicago Press, 2005), 12–13.

51. The transcription of the Fourth of July speech has subsequently been removed from the White House homepage, but is available at www.rev.com/blog/transcripts/donald-trump-speech-transcript-at-mount-rushmore-4th-of-july-event.

52. The "Executive Order on Building and Rebuilding Monuments to American Heroes" was signed the day before the celebration that took place at Mount Rushmore on July 4, 2020. As its fourth criteria, the order stipulates the following: "All statues in the National Garden should be lifelike or realistic representations of the persons they depict, not abstract or modernist representations." See www.federalregister.gov/documents/2020/07/08/2020-14872/building-and-rebuilding-monuments-to-american-heroes.

53. "Executive Order on Building and Rebuilding Monuments to American Heroes."

54. In common with digital systems, which divide a complex world into binarized categories, Donald J. Trump's Manichean messaging strategy runs on a binary switching mechanism—strong/weak, great/disaster, happy/sad, good/evil—with no intermediate states between them. Reinforcing the constitutive binarism of US society between people of European or African descent, i.e. between valuable and disposable lives challenged by the slogan "Black Lives Matter," this rhetoric is exacerbated by the algorithmic bias toward polarizing content inciting outrage, passion, or indignation, encapsulated in memes and soundbites—"drain the swamp," "build that wall," "send her home," "stop the steal"—and executed through click/not-click, share/not-share, like/not-like, tweet/re-tweet buttons. Hence the implied synergy between the technical and semiotic layers and their mutual reinforcement through psychographic messaging, microtargeted newsfeeds, solipsistic filter bubbles, and feedback loops. As Eli Pariser puts it: "Left to their own devices, personalization filters serve up a kind of invisible autopropaganda, indoctrinating us with our own ideas." *The Filter Bubble: What the Internet Is Hiding from You* (New York: Penguin Books, 2011), 13.

55. Agamben, *Nymphs*, 58.

56. To merely cite one among the numerous examples adduced by James Bridle in his book *New Dark Age*: "In Hollywood, studios run their scripts through the neural networks of a company called Epagogix, a system trained on the unstated preferences of millions of moviegoers developed over decades in order to predict which lines will push the right—meaning the most lucrative—emotional buttons. Their algorithmic engines are enhanced with data from Netflix, Hulu, YouTube and others, whose access to the minute-by-minute preferences of millions of video watchers, combined with an obsessive focus on the acquisition and segmentation of data, provides them with a level of cognitive insight undreamed of by previous regimes." James Bridle, *New Dark Age: Technology and the End of the Future* (London and New York: Verso, 2018), 130.