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Introduction

WALT DISNEY AT THE RIVER ROUGE

On August 23, 1948, Walter Elias Disney arrived in Detroit with his colleague and animator Ward Kimball. The two had just spent the past four days traveling to the Chicago Railroad Fair and took a daytrip to visit the Ford plant in Dearborn, Michigan.[1] Arriving early, at 7:15 a.m., they were picked up at the train station by Robert R. Young, leader of the Chesapeake and Ohio Railway, who drove them out to Dearborn. There, they spent the morning perusing the collection of antique automobiles and locomotives at the museum and the late afternoon enjoying the historical reconstructions at Greenfield Village. In a pithy account of Greenfield Village, Kimball would recount how they "had [their] picture taken in old tin type shop" and rode "through the village in horse-drawn buckboard wagon—what a sight!" And, in the middle of the day, they set their sights on what was perhaps the most impressive marvel on the site: the Ford Motor Company's River Rouge plant (fig. i.1). Upon seeing the Rouge, Kimball would write in his diary, "Good god! What a sight! My mouth hung open!"

This was not Walt Disney's first trip to the Ford megaplex, having come on two other well-documented visits, on April 12, 1940, and August 20, 1943.[2] In 1940, the *Greenfield Village Journal* recounted that Disney "showed great interest in everything mechanical, examining engines and old autos closely."[3] And, in a letter dated February 18, 1943, to the director of the Ford News Bureau regarding a potential movie collaboration for the war effort, Disney likewise states, "I enjoyed my visit to the Ford plant very much, especially the informal chat with Mr. Edsel Ford," then-president of the Ford Motor Company.[4] The other 1943 visit seems to suggest a purely business-oriented trip that must have involved a tour through the Rouge plant, just as Walt Disney offered visiting colleagues a tour of the studio lot.[5]

i.1. Aerial view of the Ford Motor Company's River Rouge plant, Administration Building, and Ford Rotunda, circa 1945. The Henry Ford, THF145195.

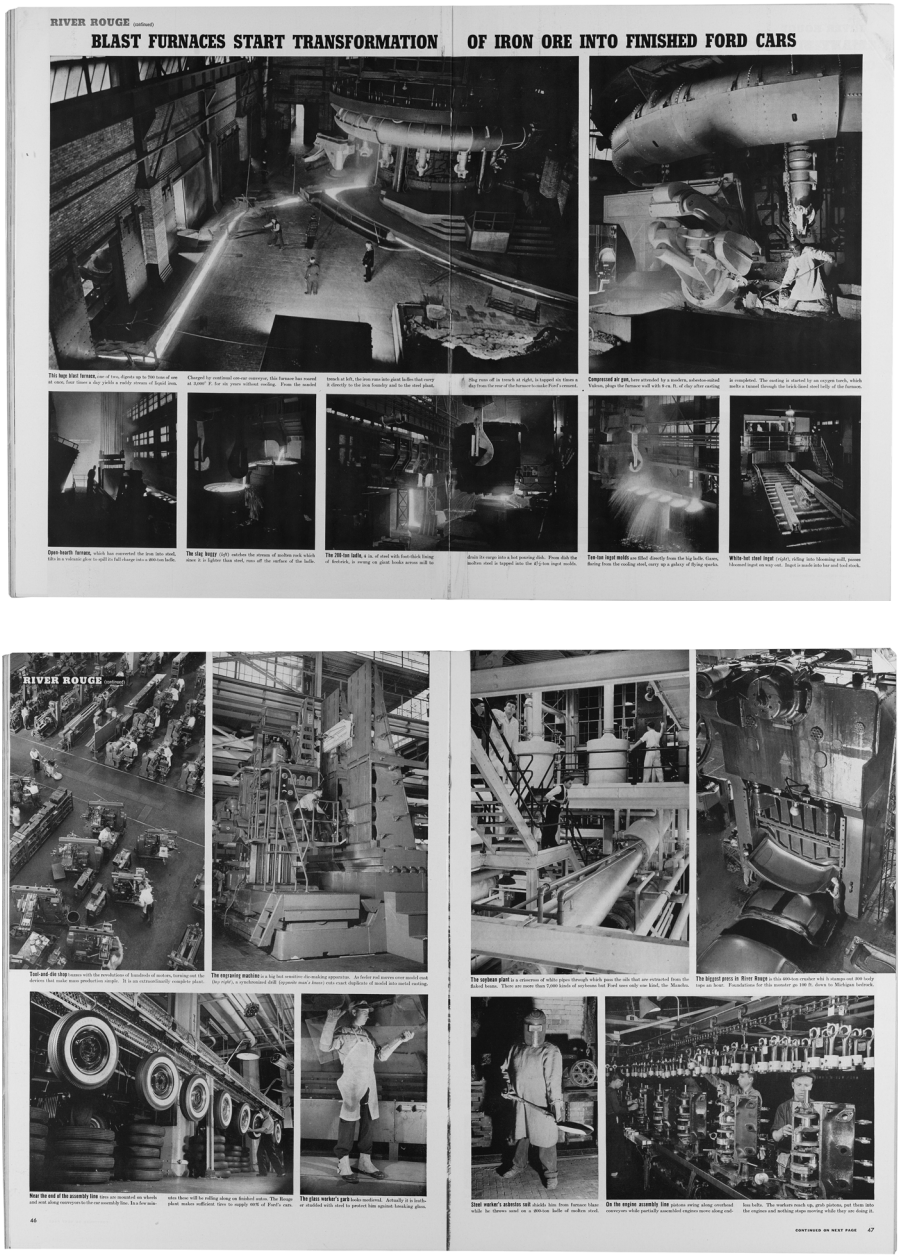
Walt Disney's 1948 visit with Kimball has been largely attributed as the spark for the development of Disneyland, which would open several years later on July 17, 1955. The "themed" spaces of Greenfield Village and the Chicago Railroad Fair, presenting sanitized and romanticized views of American history, clearly provided models for the areas and motifs of the future Disneyland Park. As Robert Neuman has expertly demonstrated, these sites were articulated at Disneyland with the artistic and technical know-how of studio craftspeople whose labor had designed the Hollywood backlots of the era.[6] Yet what has often been overlooked in the origins, conceptualization, and development of the American theme park is its deep entanglements with the rise of automation in the period.

In this book, we will look at how the plurality of means that made Disneyland's rides, design, and labor possible came directly from industrial automation, alongside its demand that companies wholly rethink processes, designs, and labor organization to suit the new technological affordances. From roughly 1947 to 1965, Amer-

ican audiences would be fixated on this newly minted word—automation—and its implications for labor and society, heralded repeatedly as the second Industrial Revolution. While automation was a revision of earlier words, like automatization, this new formulation described the escalation of mechanized practices on the factory assembly line enhanced with automatic feedback controls developed in part during World War II. In this period, automation sought to redefine how labor, manufacturing, design, and even leisure were conceived and organized in society. Here, the aim is to demonstrate how Disneyland's technologies, systems of control, and broader corporate practices emerged from within the logic of the fully automated factory, featuring the latest technologies, systems, and practices of automation. In 1948, during Walt Disney's visit to the Ford Rouge plant, "automation" had just been given its name behind these very walls.

River Rouge was an imposing complex, towering and sprawling. While not the only factory of the Ford Motor Company, it was the icon of Ford manufacturing in the American imagination, synonymous with mass production and the assembly line. In 1940, River Rouge even received a lushly illustrated profile in *Life* magazine that walked readers through its 1,200 acres. High-contrast color images of the foundry show molten ore flowing in glowing rivulets across trenches, while black-and-white images present crisp scenes of ceaseless overhead conveyors carrying tires and engines on the various assembly lines (fig. i.2). The technological allure of the factory is emphasized with a language of transformation and transmutation, ceaseless and fluid movement. River Rouge's importance is succinctly described, "as a complete and concise cross-section of modern US industry."[7] In contemporaneous tour maps of the River Rouge, we can observe the way in which visitors were loaded and unloaded from their tour bus along different stops. Their circuit across the factory emulated the flow of production as they followed the transformation of raw ore into the finished automobile, which, as *Life* magazine remarked, all happened in under twenty-eight hours (fig. i.3).

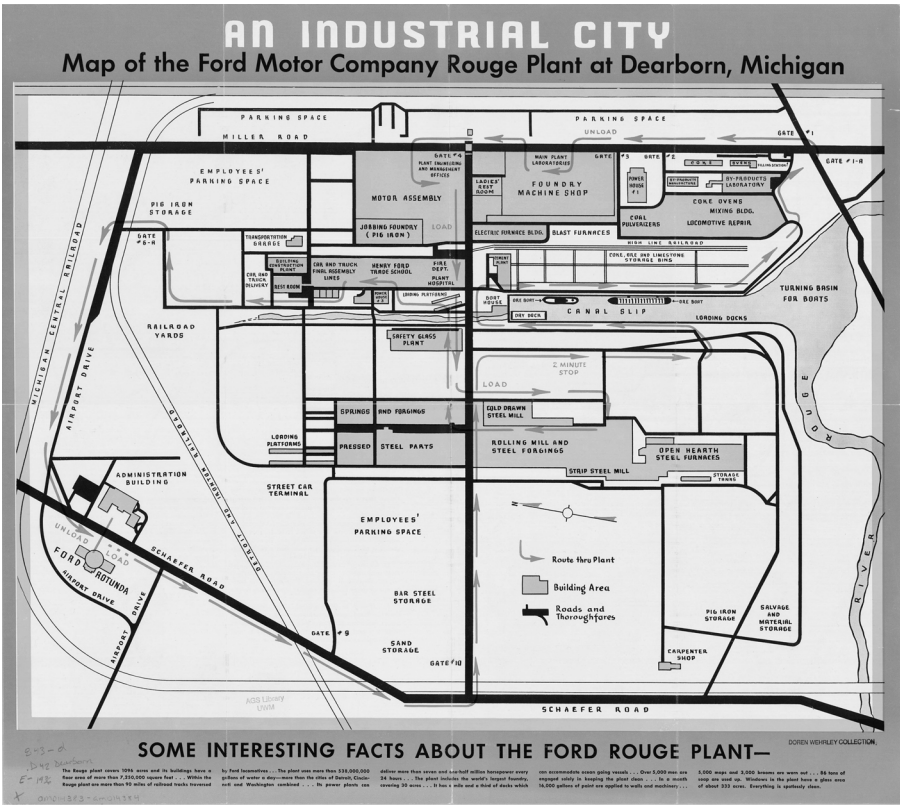
After their morning visit to the museum, Disney and Kimball were met by a Mr. St. Louis, a Ford personnel representative, who took them around the River Rouge plant.[8] Kimball recounts that they "saw the coke ovens, steel plant, R. R. [railroad], the motor assembly line!" Their movements through River Rouge, as recounted here, follow the progression of the manufacturing process neatly depicted in the *Life* magazine flowchart, starting at the dual-pronged processes of the coke ovens on one end and the steel plant on the other, flowing into the motor and car assembly lines and united by the interplant railroad.[9] However, it was the motor assembly line that most fervently captured Kimball's attention that entire day, writing emphatically:



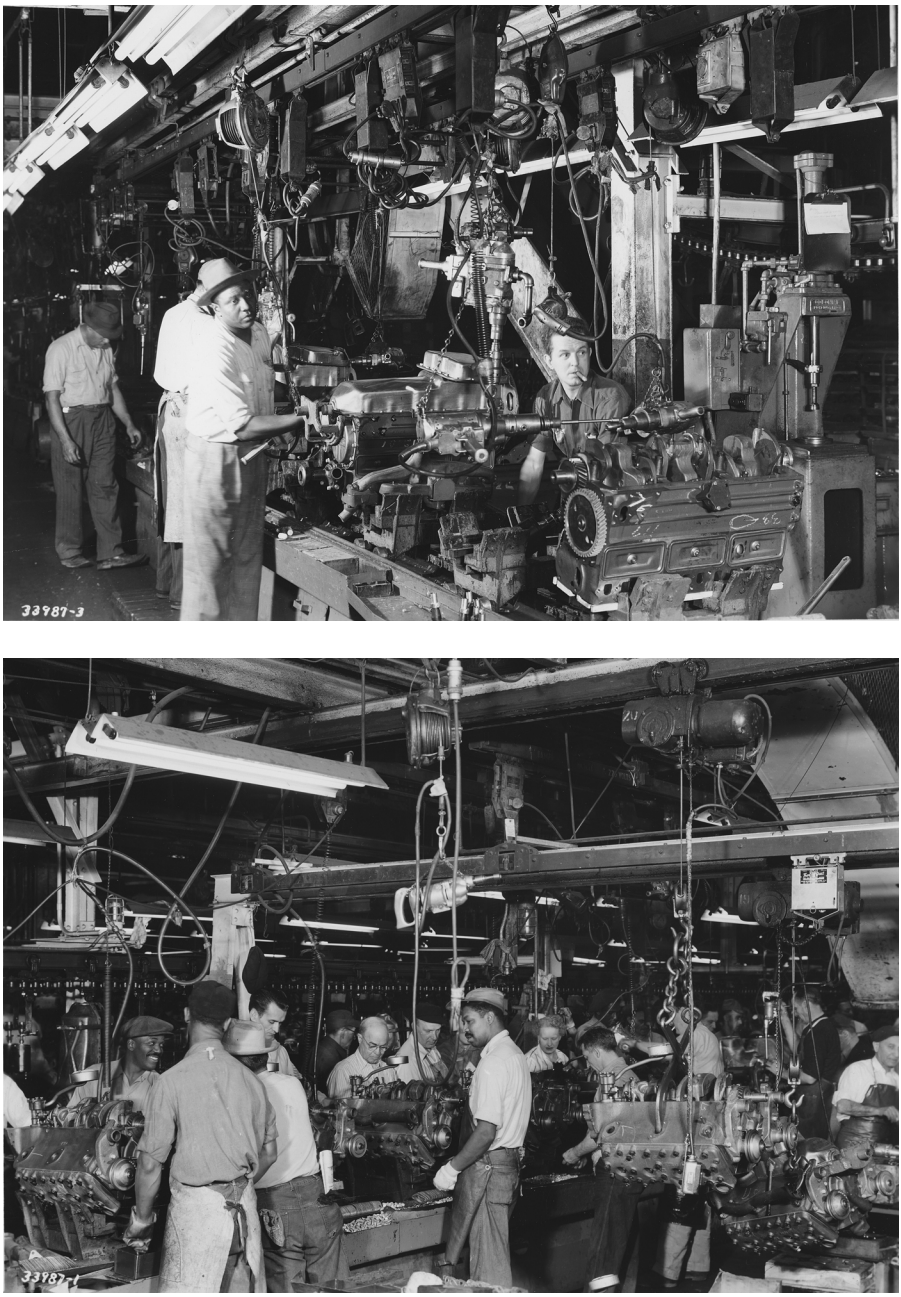
i.2. (↑↑) Blast furnaces converting iron ore into a stream of molten metal, and **(↑)** conveyors, machinery, and workers on the assembly line. Published in *Life* magazine, August 19, 1940.

> What a sight, miles upon miles of endless moving part belts and men (black and white) and women assembling the engines, just like Chaplin's *Modern Times*—IT FLOORED ME! We later walked the entire assembly line and watched the Fords roll off at the end![10]

Images from the same year attest to Kimball's description with a striking acuity. Documentary photographs taken by the Ford Engineering Department on January 19, 1948, show an integrated workforce, consumed within an ordered nest of overhead tramrails, suspended tools, hanging parts, moving conveyor belts, and an endless flow of materials, all resulting in shiny, new automobiles that drive right off the factory floor (fig. i.4).



i.3. Ford Motor Company, *Souvenir of Your Trip Through the Ford Rouge Plant*, 1936. American Geographical Society Library, University of Wisconsin-Milwaukee Libraries.



i.4. (↑↑) Men and women working and **(↑)** overhead conveyors on the engine assembly line at the Ford River Rouge Plant, January 10, 1948. The Henry Ford, THF145665 and THF145664.

But Kimball's words capture the critical sentiment that this walk-through factory tour might, in some ways, place visitors into a movie, like Chaplin's *Modern Times*, much like Disneyland would eventually aim to do. While this might seem like a glib observation or an overstatement, the experience of the River Rouge factory was (and continues to be) a carefully staged tourist attraction. Since 1924, four years before its opening date, the factory offered tours that struck the fancy of visitors and drummed up the mythic power of the River Rouge.

Visitors were shuttled around the complex in custom Ford tour buses, which had panoramic windows along the sides and a glass roof to provide viewers with an unobstructed and immersive experience (fig. i.5). Souvenir brochures from the period attest to the factory tour's popularity, heralding the plant as "the world's largest industrial city!" and providing a take-home glimpse of the mechanical wonders of the plant.[11] A filmed tour of River Rouge, from around 1939, not only gives a sense of the bus ride but also of the visitors' walk through the

i.5. Visitors' tour bus with panoramic windows and glass roof at the Ford River Rouge plant, April 1940. The Henry Ford, THF275140.

factory.[12] There, we can appreciate the careful infrastructure built for the express purpose of conveying visitors through the plant; we can note railings throughout the factory, giving guests staged views high above the blast furnaces or at ground level on the assembly line (fig. i.6). Here, visitors could enjoy a face-to-face confrontation with the machinery and processes of production, flowing through their tour just as fluidly and seamlessly as the parts and automobiles on the line.

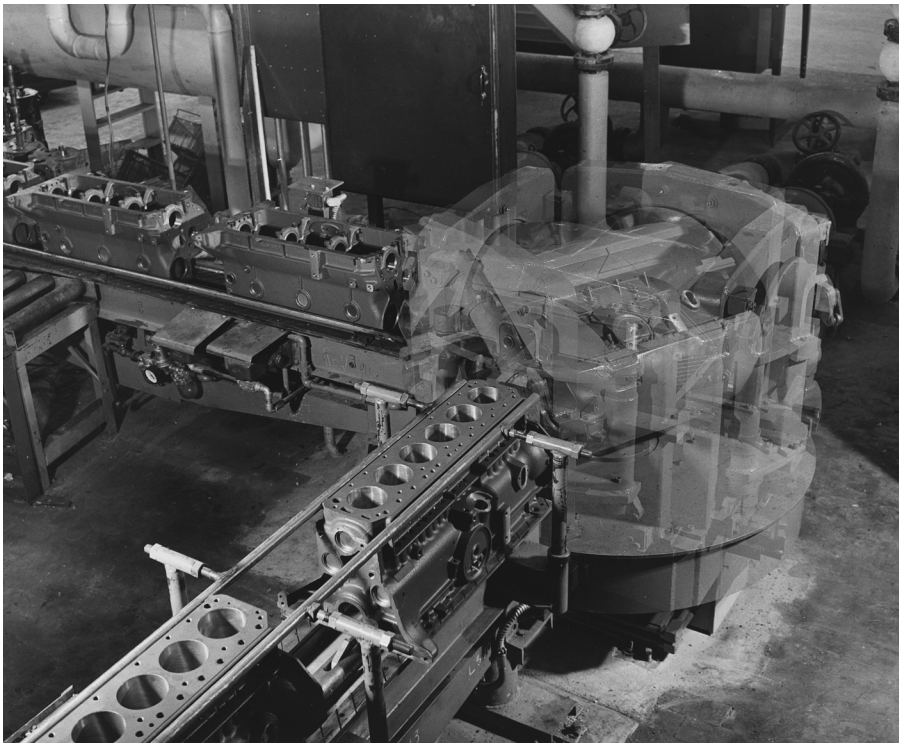
If Greenfield Village presented an idyllic vision of a bygone American streetscape that might inspire Disneyland's Main Street, USA, and if the Western and Indian villages of the Chicago Railroad Fair depicted the opportunities of Disneyland's Frontierland, then surely it was the River Rouge that presented the possibilities of Disneyland's Tomorrowland, showcasing the latest advancements in technology akin to the industry pavilions at a world's fair. In fact, the Ford Rotunda that towered over the River Rouge and welcomed guests as the first stop of their tour had been made for the 1933–34 A Century of Progress exhibition in Chicago, designed by Albert Kahn and later relocated to Dearborn after the exposition.[13] There, guests began their tour of the River Rouge, getting their tickets and viewing a large globe presenting Ford's global network in the central courtyard, as well as viewing an informative motion picture along with various displays and exhibitions.[14] In some capacities, the River Rouge most accurately captured the experience of a permanent world's fair or a Hollywood studio tour with an immersive experience into the very infrastructure of industry and to a degree that would have never been possible elsewhere.

Yet the River Rouge plant also afforded Walt Disney an intimate view of what the latest technological advancements could allow for the creation of the future Disneyland. The River Rouge plant that Disney and Kimball stepped into was not just the Rouge of past decades, but a rising beast in the latest technological advancement and anxiety that would dominate America during the next decade and a half: automation. Between 1945 and 1965, the Ford Motor Company would dedicate itself to developing what would come to be referred to in popular literature as "Detroit automation."[15] Detroit automation was synonymous with the use of transfer machinery, which automatically moved parts between different tools and machines without the intervention of human hands. Unlike the earlier assembly line that required human intervention along every stage of movement, Detroit automation sought the streamlining of this process. This would find its matured manifestation in the Cleveland Engine Plant that would open in 1952 and become a symbol of automation writ large. In one multiple-exposure photograph, Ford's press department captured the dynamism of automation by visualizing the machine's ability to seamlessly flip engine blocks along the production

i.6.
From top to bottom: Visitors moving along a railed walkway above blast furnaces, watching parts fly by on overhead conveyor, observing the assembly line as car a chassis is lowered into place from behind a railing, and departing the assembly line as finished cars roll out the plant from "Tour Through the Rouge Plant," circa 1939. National Archives at College Park, NAID 93713.

line in an unceasing flow (fig. i.7).[16] The Cleveland Engine Plant was heralded in *Business Week* magazine as "a factory that runs itself," where you could drop raw materials in one end and collect the finished product out the other, "the engineer's dream—complete automation."[17] But all these changes were first put into use and experimented with at the River Rouge plant.

In the years following the end of the war, the Ford Motor Company had been afflicted by a series of challenges.[18] During the war, Ford had dedicated many of its operations to produce bombers and aircraft engines at the Rouge, while also struggling at achieving its own production targets.[19] In 1943, Edsel Ford, president of Ford, passed away and the decrepit Henry Ford took back the reins of the flailing company until finally stepping down in 1945. It was then that Henry Ford II would take control of the company and rebuild it with the help of various colleagues in industry, including Ernest Breech of General Motors.[20] This period



i.7. Two-directional automation device at the Ford Motor Company's Cleveland Engine Plant, January 1952. The Henry Ford, THF723464.

was marked by major hiring initiatives that reworked the executives and that redefined the organizational and managerial models of the company.

One person in particular would have a lasting impact beyond the scope of Ford alone: Delmar S. Harder, who served as Ford's vice president for manufacturing. It was Harder who would give a name to the new developments in industry at the time. While today we might think of automation as synonymous with the early days of Ford, interchangeable with mass production and the assembly line, Harder first used the term and created the Automation Department in April 1947. Within industry, the term would be popularized by a special report published in the trade magazine *American Machinist* in October 1948 titled "Ford Handles by Automation." The article opens by defining this new term:

> Essentially, automation is the art of applying mechanical devices to manipulate workpieces into and out of equipment, turn parts over between operations, remove scrap, and to perform these tasks in timed sequence with the production equipment so that the line can be put wholly or partially under pushbutton control at strategic stations.[21]

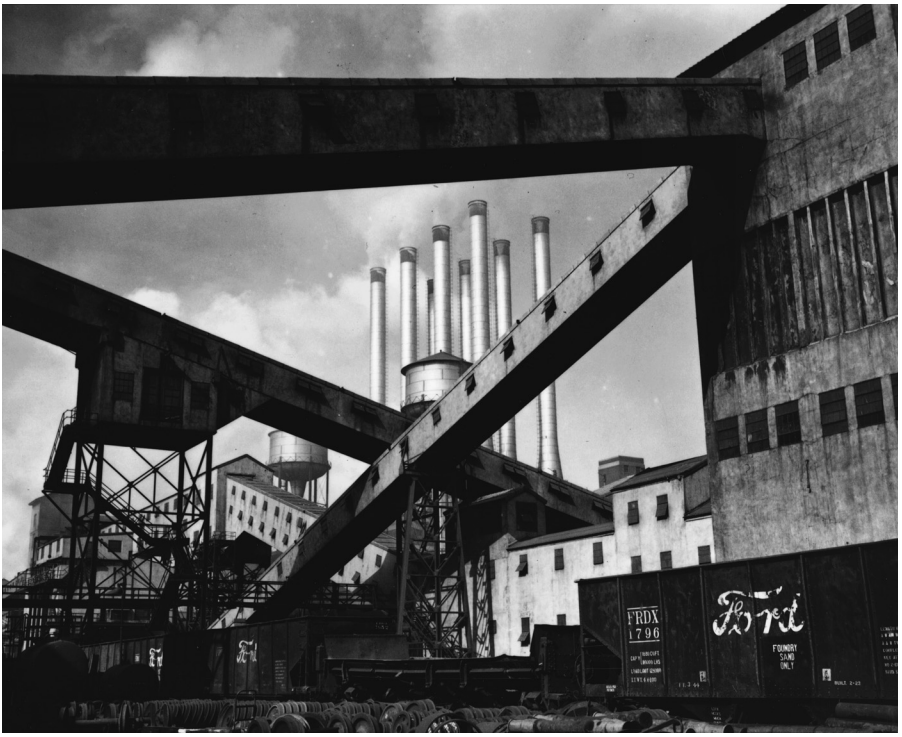
While the conveyor belt might seem like the perfect icon of automation, these conveyors were highly susceptible to human lag. J. M. Waggoner, manager of the Motor Group at the Rouge plant at the time, accounted for the need for automation by explaining how endless conveyors would move along parts to various operations, but if the operator was not ready for the part, the conveyors would stall and jam. Therefore, "to eliminate the conveyor problem we put in automation," since this allows stock to be in constant movement from operation to operation, with design and machines that are perfectly timed to have finished the operation as soon as the next piece of stock is ready for machining.[22] This, in Waggoner's words, allowed for a system that "just keeps moving, like perpetual motion," where parts are handled automatically, "without human hands touching them."[23]

When Walt Disney arrived in Dearborn, Michigan, in late August 1948, the new beast of automation had just been given a name, and River Rouge was its primordial lair. Following the war, the River Rouge plant had to be refurbished for peacetime production again. The neglect and challenges of the Ford Motor Company had left its mark on the icon of Fordism. One Ford executive, Charles H. Patterson, returning to the Rouge plant in 1945, noted the mistreatment that the factory had suffered during the war effort, remarking that the "deterioration since he had left was shocking" and that the war effort "had just about wrecked

the place."[24] In 1947, *Fortune* magazine did a cover story on "The Rebirth of Ford," praising the initiatives of "the Court of Henry II" at revitalizing the company and even commissioning a series of photographs from Walker Evans for the occasion (fig. i.8).[25] Yet, as the author bluntly puts it, describing the state of things at the Rouge plant, "it goes without saying that lots of Ford's machines are worn-out and obsolescent."[26] Just as Waggoner described, *Fortune* recounts the problem of bottlenecks in the motor assembly line, "where the machines are bumper to bumper and the men work like demons. It is the only spot in the Ford plant that really resembles Charlie Chaplin's *Modern Times* satire." Here, Chaplin's satire is hardly a source of wonderment or praise, given the Rouge's inability to keep up with its "relatively slow-moving assembly line." But the *Fortune* piece ends on a comforting note for its managerial readers, stating that once machines (now on order) are in, Ford will be revived by the end of the year.[27]

In 1948, then, the River Rouge that Disney and Kimball gawked at was not simply an overhauled attraction, but one that was being equipped (by necessity) with the most cutting-edge processes and technologies of automation. The Rouge would no longer just be known as the showpiece of the Fordist assembly line, but of this newfangled term, automation. *American Machinist* editor Burnham Finney dedicated his introduction to automation in that aforementioned issue, imperatively informing his readers: "Automation is a new word with which you should become familiar," noting that while it sounds like it was coined by some government bureaucrat, it actually originated far from the Potomac, on the banks of the Rouge.[28] As Waggoner succinctly recalled, "This philosophy [of automation] was developed to a great extent at the Rouge," roughly during the period from 1947 to 1950.[29] In March 1947, *Mill & Factory* first covered the extensive "reorganization" underway at the Rouge's Motor Building, reporting that an extensive renovation of the plant was planned with the goal of "eliminating much manual work."[30] By early August 1948, *Automotive Industries* covered Ford's use of the latest transfer machines, describing in detail the sequence of operations that these machines, such as the Cross Company's "Transfer-matic," were capable of undertaking.[31] The more sensational and anthropomorphic "Iron Hand" of the Sahlin Engineering Company, for example, could automatically remove large metal pieces from a machine and flip them upside down.[32]

Walt Disney's visit to the Ford factory came at an auspicious time. In many ways, the visit to the River Rouge served as a poignant foreshadowing of the labor strife that automation would cause in the American workforce, stoking anxieties about mass unemployment and the deskilling of labor. This "degradation of



i.8. The Ford River Rouge plant, as photographed by Walker Evans for the May 1947 issue of *Fortune* magazine. The Metropolitan Museum of Art, Walker Evans Archive, 1994.254.1829–.1984.

work," as Harry Braverman called it in 1974, would also lead to critical interrogations about the "deskilling" of crafts in postwar art practices that would ultimately seek to reposition the artist as "worker" in the 1960s.[33]

Across the early 1940s, the River Rouge plant had been a symbol of labor activism, an association that Ford would have to work hard in this period to shake off. Most notoriously, it was the site of the so-called Battle of the Overpass, where Ford security forces viciously attacked Walter P. Reuther and other members of the United Auto Workers union in 1937.[34] This history, along with Henry Ford's virulent antisemitism, was so well known and so detrimental to the company's image that *Life* magazine began its article on River Rouge by distancing the plant from Henry Ford: "The importance of the Ford Motor Co. does not lie in the personality or the politics or the prejudices of its 77-year-old founder," the piece opened. "Henry Ford's nonautomotive philosophy never made as much hard

sense as Henry Ford's automobiles."[35] In every capacity, River Rouge was a symbol of American mass production, labor, and the assembly line; a model of bad and good governance, marked by continuous labor disturbances. These labor disturbances peaked in the 1941 strike at the Rouge that gained the recognition of the United Auto Workers, a strike that was echoed at Walt Disney Production's own 1941 animators' strike.[36] And, it is clear that these matters were at the forefront of Walt Disney's mind after his visit to the Rouge.

A day after their visit, on August 25, Disney opened up to Kimball about his feelings about the 1941 strike. While admiring the New Mexico landscape, Kimball explained that he and Disney got into a "hot argument" about the House Un-American Activities Committee (HUAC). Disney's views on these matters had been infamously put on display in October 1947, less than a year before, when he willingly testified before HUAC on communism in the motion picture industry. There, Disney had described the strike as a product of communist influence, saying, "I definitely feel it was a Communist group trying to take over my artists and they did take them over."[37] Disney tells how these alleged communists "called my plant a sweat-shop," and later, he explained the need for them "to be smoked out" because we "must keep the American labor unions clean. We have got to fight for them."[38] In the course of his testimony, Walt Disney expressed his candid views about communism and even named former employees and colleagues who he suspected were communists, including William Pomerance, David Hilberman, and Hollywood labor activist Herbert K. Sorrell.

On the train ride, Disney praised HUAC, calling it "good for this country—we've got to get rid of those damn pinkos and reds!" Disney went on to rant about how "New Deal labor" screwed the studio, reflecting on the 1941 animators' strike and complaining at great lengths about Art Babbitt, one of the strike's leaders, decrying "those Jewish New Dealers" and exclaiming "I saw those high and mighty bastards during the war!" Kimball wrote in his diary, "I SHUT UP LIKE A CLAM," a damning judgment on his boss and the politics that he staunchly disagreed with.[39] In many ways, Kimball's account of this trip presents a perspicacious glance at this moment in history, and it demonstrated the postwar anxieties of American industrialists at the rise of automation. Through the pages of his diary, Kimball unwittingly captured the technological change, labor strife, and social anxieties of the dawning age of industrial automation from which Disneyland would emerge.

On August 31, 1948, just five days after returning to Los Angeles, Walt Disney would send a memo to Dick Kelsey, one of his production designers, describing his idea for a "Mickey Mouse Park." In this memo, we find one of the most coher-

ent outlines of the park that would become Disneyland. Intended to be located in Burbank, the park would include a main village with a railroad station with various stores, restaurants, horse-drawn carts and stables, a carnival section with roller coasters, merry-go-rounds, "typical Midway stuff. (This will be worked out later)," and a Western and Indian village.[40]

The parallels between these sites are undeniable, especially when one compares the official guidebooks of the Chicago Railroad Fair and Greenfield Village with the contents of the memo to Kelsey and the drawings produced under Disney's direction in subsequent years. For instance, in 1951, when Walt Disney returned to his amusement park idea, he would have Harper Goff draw up several proposals for a park on Riverside Drive in Burbank. In one piece of concept art, the park features a notable railroad encircling it, along with an old western town, an Indian village, train station, and a Mississippi steamboat. In another plan by Goff from the same period, and annotated in what appears to be Walt Disney's hand, is a neat layout that includes a bird sanctuary, carousel, carnival, horse cart, fairgrounds, old mill town, gravity flow canal boats, a stage coach route, livestock farm, and castle, among other clearly labeled attractions.[41]

Looking at the Disneyland that would eventually be built, we can see the striking parallels between the Santa Fe Railroad's Indian Village (fig. i.9) and Disneyland's Frontierland (fig. i.10), as well as between Greenfield Village's Suwanee Steamboat (fig. i.11), a replica of an original flatbottom steamboat from around 1880 built in 1929, and Disneyland's own Mark Twain Riverboat (fig. i.12). Even elements of future Disneyland expansions, such as New Orleans Square, can be seen at the Chicago Railroad Fair's New Orleans Street. However, building on the well-established and well-trodden history of the world's fairs and similar amusement park spaces such as these, the regurgitation of these potential citations often proves little more than superficial in understanding the driving logic that dominated the Disneyland Park. That driving logic, I argue here, was one of automation, understood as encompassing not only automation's technologies, but also how it approached industry and labor holistically.

While these sites had a clear impact on Disney's vision, the technologies that would make Disneyland a reality were adapted for the amusement park from the workings of the assembly line and the newfound uses of automation. From 1953 to 1955, Walt Disney and his various collaborators would design and build Disneyland on the backbone of the very automation technologies of material handling and automatic control that were in their infancy at the Ford plant in 1948. There, Walt Disney got to experience the full, unbridled possibilities of automation, intimating

i.9. (↑↑) Santa Fe Railroad's "Indian Village" at the Chicago Railroad Fair, 1948. The Griffin Museum of Science and Industry, Chicago.

i.10. (↑) Entrance to Frontierland at Disneyland. Keystone-France / Getty Images.

i.11. (↑↑) Suwanee Steamboat in Greenfield Village of the Edison Institute, circa 1935. The Henry Ford, THF133825.

i.12. (↑) Mark Twain Riverboat on the Rivers of America in Frontierland at Disneyland, 1957. Photo by Clinton H. Betz. Los Angeles Photographers Collection / Los Angeles Public Library.

the new horizons of technology that would eventually be repurposed at Disneyland to create the amusement park.

In the most technical definition of automation, nearly every Disneyland ride features the same technologies of the automated assembly line, where vehicles are automatically conveyed from operation to operation, where sensors and limit switches trigger actions to be undertaken, and where animatronics are run by magnetic tape, just like the automated milling machines of the period. In the 1950s (and even to this day), outside of the factory, there is no other place but the theme park where people can experience the full scale of automation and the assembly line firsthand, a point that will be better articulated over the course of this book. Car chassis flying through the air, like Peter Pan's enchanted galleon, vehicles moving seamlessly on tracks as various operations were undertaken on them, and the sensational walk-throughs of the factory floor and the exhibits on American industry and history; these were the models of automation that the Ford factory offered to Walt Disney in 1948. But, more than just being a model for the theme park, these technologies and practices would become a primary concern of Americans during the period.

During the decade after Walt Disney's visit, automation captured the popular imagination, seduced by daydreams of computers and the fully automated push-button factory. But it also sparked a widespread anxiety about mass unemployment and a world run by machines that would contribute nothing to the economy. To put automation's impact alongside the rise of Disneyland in perspective, it is worth noting that the first occurrence of "automation" in the *New York Times* appears in an article from April 1950, titled "Automatic Devices Sweeping Industry," with three additional appearances that year. Similar numbers appear the following two years, with a slight uptick to eleven in 1953. In 1954, however, we witness a notable jump to fifty-one. And, in 1955, the same year that Disneyland opened, there are a staggering 256 articles that mention automation in some capacity. Three months after Disneyland's opening, a nine-day congressional hearing on "Automation and Technological Change" was held before the subcommittee on economic stabilization, and two subsequent congressional hearings on automation would occur over the next two years.[42]

Much of this mounting interest was fueled, not by the actions of Ford, which were largely relegated to the trade press, but by the simultaneous coining of the term in John Diebold's enormously influential book, *Automation: The Advent of the Automatic Factory*, from 1952. *Automation* was widely read and Diebold swiftly became a household name, receiving the epithet in the popular press of "Mr. Automation" and being called on in congressional hearings to define and

establish what the term meant for the proceedings.[43] On November 12, 1954, Walter Reuther, the man who had stood up to Ford in 1937 at the Battle of the Overpass and built the United Auto Workers union, foregrounded automation in his policy speech on the campaign for the guaranteed annual wage at the Congress of Industrial Organizations' annual convention. This speech and subsequent appearances garnered the interest of the *New York Times*, *Time* magazine, and other national coverage, attributed to "stir[ring] new interest in the factory of the future."[44]

In 1953, the UAW-CIO had adopted a resolution declaring their stance on automation, embracing its affordances for a more equitable world while warning that if "improperly used for narrow and selfish purposes" it would create an "economic nightmare," where humans were "made obsolete as producers because the mechanical monsters around them cannot replace them as consumers."[45] Reuther's comments, however, were nonsensational, policy- and data-driven in their approach to automation. He highlighted the concerns while noting the possibilities of automation, tempering any panic. As stated in the published proceedings,

> Automation must be met sanely and constructively so that the miracle of mass production—and the ever greater economic abundance made possible by automation—can find expression in the lives of people through improved economic security and a fuller share of happiness and human dignity.[46]

Nevertheless, the popular press appears to have largely amplified the concerns, fanning the fires of the mass unemployment panic.[47] It is for these reasons that the term gained such critical popularity by 1955. Diebold's book placed the term into the popular lexicon, perfectly capturing the newness and specificity of these technological concerns, while the work of activists, like Reuther, and various management consultants made it the key issue of the day.

By 1957, concerns reached such a fever pitch that in his opening remarks for *See It Now*'s ninety-minute special on automation, host Edward R. Murrow stated with caution, "Automation is a young, new word, heavy with promise and with problems. As a matter of fact, several people have suggested to us that it's a little too heavy for a Sunday afternoon in June."[48] Staged as an evolutionary development or a revolutionary innovation, automation was the prime question on people's mind during the period, second only to the Cold War. After the term gained popularity in the 1950s, Harder would then boast that he had coined it as early as 1936 while he was at General Motors.[49] Yet, at the same

time, the term had become so fraught that in 1953 General Motors banned its executives from using the word to describe their own automated practices because it both drew attention to its competitor and carried "bad" connotations.[50] Whether the term signaled progress or demise varied greatly, yet it was the perfect sign of the times, and it was under the aegis of automation that Disneyland opened its doors in July 1955.

A few months before Disneyland's opening, Peter Drucker published an essay in *Harper's* April issue, "The Promise of Automation," as part of a multipart series dedicated to reflecting on America's next twenty years.[51] Peter Drucker was a management consultant who served as a powerful voice for manufacturers in the early days of automation. His 1946 book *The Concept of the Corporation*, an incisive look into the operations of General Motors, had served as a road map for the rebuilding of Ford in the late 1940s.[52] In *Harper's*, Drucker would address all the usual concerns that troubled Americans in the period about automation: mass unemployment, the deskilling of labor, the need to retrain workers, and more specific concerns like the 1954 recession and the call for a "guaranteed annual wage" by the Congress of Industrial Organizations that year.

Amid all the usual waving away of labor concerns, Drucker pushed against the notion that automation could ever be reduced to its technological means. He advocated for the necessary "'re-thinking' of the product" and went on to summarize his argument with blunt precision: "Automation is not a box of tricks or a bagful of gadgets. Automation is a methodology, with all the strengths and limitations that the term implies."[53] Rather than a set of technological tools, Drucker argued that what America had to reckon with was "the logic of Automation," defined by three motivating principles. First, there is the principle of "economic activity as process," which states that in automation "the entire activity of the business is a whole entity which must be harmoniously integrated to perform at all." Drucker gives the example that, if in the old job shop, skill organized work; or, if in Henry Ford's assembly line, product organized production, in automation the whole activity of a business, from sourcing to consumer, must be treated as a unified and singular entity. Second comes the principle of "pattern, order, or form," which argues that all aspects of the economic universe in which the business operates must be understood to function with a set system of behavioral patterns; it "must have rhyme, rhythm, or reason." This extends from the idea of all economic activity as process, whereby the motions of the whole business are analogous to the harmoniously in-tune behaviors of the assembly line. And third is the principle of "self-regulating control," meaning that automation requires systems of self-control and feedback, which also help to set in advance and maintain standards of

what constitutes acceptable performance. Profit, Drucker suggests, is one crude example of such feedback systems in business. In Drucker's argument, the entire operation of a business is seen as a continuous process, not just on the fully automated factory floor, but as a cohesive and holistic entity in the economy at large, where there is no end to the reaches of the logic of automation.

Other authors in the period similarly sought to articulate automation as a "logic" rather than a discrete technology or specific process. In the trade magazine *Automation*, British correspondent Frank G. Woollard discussed the state of the automation discourse. While he emphasized the role of the transfer machine in automation, he did this in his contention that "the root idea behind all automation is continuity of process."[54] This, he stressed, is a philosophical observation about the flow of processes, and the "logic of automation" may be summarized by one phrase: "continuous operation" or, quite simply, "the single word 'continuum.' "[55] As Drucker provocatively suggested, "Even if there are no automatic machines, no electronic controls or computers, no 'mechanical brains,' " if his three principles of automation are present, then there is "genuine Automation."[56] While automation was often articulated through the figure of the transfer machine, the pushbutton, or the servomechanism, authors keenly articulate a "logic of automation" as a continuum of flow, serving as a conceptual iteration of movement across the production line and beyond, subjected to the "closed-loop" feedback of automatic control.

In this book, we will look at how the rise of Disneyland was shaped by this logic of automation that dominated the period and reworked the ways in which society and corporations organized, managed, and articulated themselves in the postwar era. This book traces the societal and technological changes that occurred in this moment with a particular interest in how new conceptualizations of research, innovation, and labor were appropriated by the various corporate groups responsible for the planning and design of the Disneyland Park.

Chapter Summaries

This book is organized by the principles and technologies that served as the building blocks of Disneyland's attractions.[57] This calls to mind the phrase "a plurality of means," used in patents to indicate any undefined technology intended to enact a particular aim. At Disneyland, a plurality of means was responsible for taking guests on their magical rides through imagined realms. These means included relays, sensors, tracks, pacers, programmable logic controllers, magnetic tape, and countless

other elements. Throughout each chapter, we will dive into these technologies, exploring not only their history within the amusement park, but teasing out their broader cultural significance. As we shall see, these technologies constituted the logic of automation, both within the theme park and beyond its gates.

To this end, the book is organized into five sections: Automation, Systems of Control, Feedback, Computerization, and Animation. While each of these may be thought of (and read) as a chapter in their own right, I have opted to divide each of these into several short chapters. To better orient readers and ease the weight of technological descriptions, the chapters often localize their contribution around a specific time, site, or Disneyland attraction.

Readers are introduced to the fraught place of automation in the American consciousness throughout the 1950s in part 1, Automation. As the opening section of the book, these chapters explore how the Disneyland theme park emerged within the context of these discussions, molded by the period's technologies and its anxieties. Surveying news broadcasts, magazine stories, advertisements, trade films, and congressional hearings, the section stages the deep fears that gripped Americans about the detrimental impact that automation would have on their daily lives and livelihood. Tracing the way in which these technologies were also championed as wartime marvels and spaces for creative endeavor, these chapters similarly look at how automation was popularized on a broader public scale.

In part 2, Systems of Control, the book turns to the various technological elements that govern the operation of Disneyland rides drawn from automation technologies of the period. Here, we focus largely on the defining feature of any theme park ride: the track. Unlike walk-through attractions like funhouses, it is the track that optimizes visitors' movements through space and controls their viewpoints and behaviors. As guests move along the track, limit switches, optical sensors, and changes in the track's current monitor the movement of the ride vehicle, triggering the appropriate audio and effects for each given scene and facilitating the loading and unloading of passengers in the station. Drawing from the railroad system, the segmentation of the ride's track into "block zones" enabled for a safety system that ensured that two vehicles could never collide with each other, while also monitoring the progression and flow of vehicles through the attraction.

In part 3, Feedback, we turn to focus on Disneyland's adaptation and development of automation's defining principle of feedback. Largely, this section focuses on the introduction of the Matterhorn Bobsleds in 1959, Disneyland's first roller coaster. These chapters provide readers with an introductory survey of the technical language and concepts that defined theme park automation. From there,

we trace the development of other attractions, such as Ford's Magic Skyway for the 1964/65 New York World's Fair and the Goodyear PeopleMover at Disneyland from 1967. In these later projects, I argue that Disneyland returned to its roots in the assembly line to produce new ride systems that took inspiration from the technology they witnessed at the River Rouge plant. With these innovations came a desire to rethink mass transportation systems in light of the theme park's contributions. The history of these ride systems paints a detailed picture of the way in which the amusement park allowed people to imagine a future metropolis built anew on the building blocks of automation.

In part 4, Computerization, we turn to the rise of the computer and the ways in which it better enabled the dream of the "fully automated pushbutton factory" for the theme park. The introduction of programmable logic controllers (PLCs) in the early 1970s marked a watershed in the history of industrial automation. PLCs are industrial computers developed for automotive manufacturing that are tasked with assessing the data provided to them by sensors and various other inputs in order to control all aspects of production. Unlike hardwired relays, PLCs allowed for the construction of malleable scions of control. Popularized by the Allen-Bradley company in the mid 1970s, PLCs were first imported into the theme park for Space Mountain in 1977, added to the Matterhorn Bobsleds in 1978, and to the new Big Thunder Mountain in 1979. Today, however, PLCs can be found on just about every track-based amusement park ride, no matter how simple.

In part 5, Animation, the book returns to Walt Disney Productions' roots in animation to consider how automation brought the studio's efforts back full circle to questions of animacy and the "animation of the inanimate" in the Space Age. Looking at the long history of sound as a system for control, these chapters focus on Disney's major innovation in the first half of the 1960s with the introduction of Audio-Animatronics in Walt Disney's Enchanted Tiki Room in 1963 and Great Moments with Mr. Lincoln, originally developed for the 1964/65 World's Fair in New York City. Audio-Animatronics were made possible by the postwar development of magnetic tape recording. During this period, a series of applications for this technology were in use, ranging from the testing of ballistic missiles to the control of automatic machines in the factory, replacing the motions of human technicians. If the Abraham Lincoln animatronic appeared lifelike, it was this same lifelikeness that allowed for magnetic tape to supplant the human worker in the factory—just as the Audio-Animatronics replaced the need for an actor to play Lincoln. In this return to form, I argue that the animation of Disneyland's Audio-Animatronics effectively aestheticized the replacement of the human with automation technologies, both on the stage and on the assembly line.

The book will conclude by taking a step away from Disneyland itself to consider the place that automation holds in our world today. On the one hand, I will demonstrate how the theme park has continuously relied on automation technologies to provide audiences with new types of attractions and sensory experiences. On the other hand, we will consider how the rise of artificial intelligence has revitalized many of the concerns articulated around automation in the 1950s. Indubitably, the impact of automation in American life continues to have massive effects on labor, economic stability, and daily life. From Tesla's Gigafactories to Amazon's fulfillment centers, this conclusion underscores the personification of automation technologies, including robotic manufacturing arms and autonomous warehouse robots. The animacy of this technology continues to serve as a rhetorical foil in the crucial debates about the sustainability of automation and the socioeconomic inequalities it generates. By carefully scrutinizing the continued aestheticization of automation today, I encourage the reader to deploy the lessons learned from this book to critically revisit the automated world around them. From automatic doors to traffic lights, airport baggage carousels and grocery store checkout conveyors, the building blocks of automation are everywhere around us, hiding in plain sight. This book is an invitation to see the factory in Disneyland and Disneyland in the daily world around us, this is an invitation to contemplate our daily Automationland.

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Illustrations are indicated by page numbers in italics.