

# THE AMERICAN **ROBOT**

A Cultural History

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## Building the Slaves of Tomorrow

In late 1930, a year into the Great Depression, Dr. Phillips Thomas, an engineer for Westinghouse Electric Company, demonstrated to an audience at Chicago's Armour Institute of Technology how machinery could aid humankind. As part of a campaign to sell Westinghouse products and recruit engineers, Thomas introduced new uses for a thirty-year-old technology, the vacuum tube. He carefully explained how vacuum tubes could extinguish fires, regulate room temperature, and build safer airplanes—all automatically. Such applications promised great improvements in safety and lifestyle, but in an era of engineering wizardry, they lacked the expected spectacle. Thomas, however, came prepared. Already an experienced showman, he had brought with him a device that could interest even the most skeptical observer: a black-skinned mechanical man he named Rastus.<sup>1</sup>

While Thomas and Rastus appeared on stage, other mechanical men were rampaging across pulp magazines, films, stages, and storefronts. Sometimes these gigantic, lumbering, metallic men were called "robots," but few symbolized workers. Continuing the transformations that had begun in the second half of the 1920s, Americans in the Great Depression increasingly used the term to refer to humanized machines that replaced workers rather than workers turned

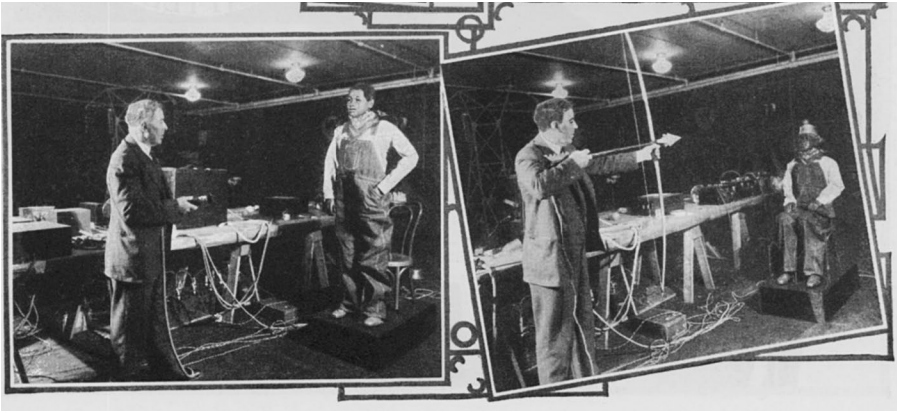


Fig. 5.1. Two photographs of “Rastus Robot” from Hugo Gernsback’s *Radio-Craft* magazine, in which S. M. Kintner uses his “photoelectric emitter” to reenact the legend of William Tell and to order Rastus to stand and sit.

into machines by industrial labor. Yet, the uncannily human Rastus looked nothing like these robots. Where earlier engineers and costume designers had relied on wood, wallboard cutouts, or metal to give their robots a vaguely human facade, Thomas and S. M. Kintner, Westinghouse’s assistant vice president, molded rubber into a racist caricature that resembled the minstrel character after whom Rastus was named.<sup>2</sup> His black body covered by overalls, a white shirt, and a pail hat, Rastus embodied stereotypes of docile black men; making the racial dimensions of Čapek’s robot explicit, he was, effectively, a “boy” slave for his engineer master.

During the performance, Rastus appeared on stage seated with an apple on his head while Thomas held a bow and arrow. In this reenactment of the story of William Tell, however, the arrow employed a “photoelectric emitter” that shot a beam of light into a cell embedded in the robot’s eyes. Now activated, the photoelectric cell flipped a switch that lit a fuse just below the apple. As Rastus sat motionless, the apple magically fell to the floor—victim, it appeared, of a press of a button and a flash of light. The trick completed, Thomas pushed another button and Rastus bowed and mumbled a few words. The inventor then usually had the robot perform more routine tasks: sweeping the floors; switching lights on and off; sitting down and rising again. The message of this blackface performance could hardly

have been clearer: the vacuum tube of yesterday had turned the ram-paging robot of today into the slave of tomorrow.<sup>3</sup>

The conservative *Chicago Daily Tribune* certainly understood the message. “‘Let Electrons Do It,’ Motto for Moderns” proclaimed a headline in the next day’s edition of the paper; “Dr. Phillips Thomas Tells of New Slaves.” “For a nickel,” the article stated, “you can buy 130,000 million million electrons and put them to work. An ounce of these slaves of the lamp of understanding represent 100,000 kilowatt hours of energy. You press a button and 160 million a second pass through the toaster wires on your breakfast table.” To clarify the importance of such power during the discontent of the Great Depression, the newspaper compared electrons to workers: electrons, “unlike all other creations, are all exactly alike and can be depended on for their actions.”<sup>4</sup> More than a new tool, electrons were the submissive laborers that would transform the way American society produced its goods; they were, like Rastus, humanlike in their ability to serve but without the individuality that enabled people to resist domination.

Thomas and Rastus performed their mechanical minstrel show for middle- and upper-class audiences across the United States and Canada in the early years of the Great Depression. After premiering at the National Electric Light Association convention in San Francisco in early 1930, the two performed in New York in November and then at the Armour Institute. From there, Thomas and Rastus traveled to Alberta for a meeting of the Canadian Electrical Association. Rastus reappeared in 1935 at the *Syracuse Herald Progress* Exposition for what seems to have been its final performance. The main archivist of Westinghouse’s robots claims that Rastus’s rubber skin caused it to overheat and melt, a horrifying end to the only black robot the company built.<sup>5</sup> After Rastus, Westinghouse never made another mechanical man that so uncannily crossed the boundaries between human and machine. Instead it maintained a strict division by building gigantic metallic-colored men which only marginally shared a shape with their controllers.

Rastus was one of six mechanical men and women built by Westinghouse between 1927 and 1939 to spread the company’s message of robotic slavery to middle- and upper-class white families. During that time, Rastus and its “family”—Mr. Televox, Katrina van Televox, Telulux, Willie Vocalite, and Elektro—performed at management

and professional clubs, fraternal lodges, department stores, technical colleges, and local and international fairs across the United States and Canada. Everywhere they appeared, the machines attracted large crowds and sensationalized newspaper coverage. Even people in small towns learned of the robots as local newspapers reprinted stories of performances, often with astonishing, attention-grabbing headlines and photographs.<sup>6</sup> These articles likely familiarized most Americans with the devices and, more important, taught them that these machines, rather than Čapek's creatures, were robots. Though Westinghouse mostly avoided the term *robot*, the press seized upon it to stimulate its readers' imaginations even further. When it included two photographs of Rastus and Kintner on a spread celebrating amazing advancements in electrical equipment, for instance, Hugo Gernsback's *Radio-Craft* magazine dubbed the device, "Mr. Rastus Robot, the most life-like of mechanical men," before excitedly explaining its control mechanism.<sup>7</sup> By the mid-1930s, practically any machine that seemed to duplicate human features or behaviors, regardless of its appearance, could be called a robot. More than any other device, Westinghouse's robots popularized Čapek's term, though that did not mean that audiences accepted the ideological message the company wished to convey.<sup>8</sup>

Though Rastus was neither the first of its kind (Mr. Televox was) nor the most popular (that was Elektro), as the only black-faced robot Westinghouse produced, Rastus highlighted the company's message better than any other. Deeply troubled by growing skepticism of the machine age, Westinghouse designed its devices to pacify the symbol of the rampaging robot. The company's white and metallic robots achieved this through humanization: they had unique names, smoked cigarettes, and, once given artificial voice boxes, had the ability to tell jokes—even about sex. But Rastus, with its minstrel show name and docile appearance, was itself the joke. While its fellow robots hid their enslavement beneath a veneer of friendship and equality, Rastus was an eager to please, crude caricature; explicitly a slave, it was far from the celebration of blackness found in the era's popular culture and places such as Chicago and Harlem. Since the nineteenth century, American advocates for industrialization had talked about machines as the new slaves that would enable the country to fulfill its democratic and moral promise. But the synthetic blackness of Rastus did

not offer those benefits; instead, it offered an unambiguous fantasy of power over machinery and the bodies of black men.

### Whitening the Machine

The televox that so enchanted Stuart Chase was built by another man who yearned to tame the machine, Westinghouse engineer Roy James Wensley. Born in 1888 in Indianapolis, Wensley exemplified the myth of the self-made engineer. After eighth grade, he left school to support his mother with two jobs, one as a railroad lineman and the other as an electrician's assistant. Not content with his positions but interested in electricity, he spent his evenings studying electrical engineering through a correspondence course. Upon completion, he joined Westinghouse in Pittsburgh and began researching automatic labor-saving devices in the switchboard engineering department. While there, Wensley grew interested in "remote control" operations and automatic substations and began to investigate a means of using phone lines to flip electrical switches.<sup>9</sup>

In a 1926 editorial for Westinghouse's *Electric Journal*, Wensley identified "unrest" in the labor market as his inspiration. Immigration restrictions, he assumed, had "placed a premium on the unskilled worker" while "higher standards of education" encouraged men to develop a "distaste . . . for operating jobs." Workers' demands for higher wages and more skilled positions, he believed, necessitated the invention of devices to replace human labor if civilization was to continue to progress. "Each time that inventive effort has released a certain amount of human labor from an essential industry," he wrote, "there has been a corresponding benefit to the cause of our modern civilization." By cheaply extending electricity into regions where it was not previously economical, automatic switches would allow power companies to accommodate the suburban market by solving one of the problems that had hindered progress since "ancient days": the unreliability of people.<sup>10</sup>

Wensley soon invented a machine that fulfilled his goals: the televox. Capable of controlling electrical devices remotely via sound, the televox consisted of two stacked rectangular metal boxes into which the engineer placed a machine capable of receiving instructions over an attached phone line, interpreting those instructions, and perform-

ing the requested action. Because of the difficulties associated with programming a machine to understand speech, communication with the device relied on a language of musical notes. When the manager telephoned the machine and blew a note on a whistle, the televox would turn the attached piece of equipment—whether an industrial substation or a vacuum cleaner—on or off. Such a machine, Wensley believed, would enable managers to control the flow of electricity remotely without the aid of on-site workers.<sup>11</sup>

Westinghouse executives saw advertising magic in the device. Since it had lit the 1893 Columbian Exposition, the company had relied on amazing displays of technology to sell its products.<sup>12</sup> As intellectuals, popular culture, and even engineers expressed unease with out-of-control machinery, with some even suggesting that government control innovation, the televox offered an alternative vision: consumer control over technology. To preach this solution, the company sent Wensley to middle-class clubs, where he sat the device flat on a table and demonstrated how to use it. Journalists quickly recognized the possibilities Westinghouse wanted them to see. The *Los Angeles Times* proclaimed, “Wife Cooks by “Televox” before explaining how the machine would revolutionize labor in the home and free women for other tasks.<sup>13</sup> Such efforts, however, failed to attract broad public interest. A performance for journalists in New York City, however, inspired the imagination of Waldemar Kaempffert, the science and engineering editor for the *New York Times* and former writer for *Scientific American* and *Popular Science Monthly*. Together, Wensley’s machine and Kaempffert’s imagination introduced America to Mr. Televox, the “Nearest to a Robot” ever produced.<sup>14</sup>

According to Kaempffert, the televox was more than a machine; it was an “electrical man” and a “mechanical slave.” An accompanying strip of drawings made the point clearer. No longer just two conjoined boxes on a table, the televox stood upright, possessed jointed arms and legs, and performed tasks ranging from reading a gauge to turning on a light. “When R. J. Wensley, the engineer who designed this electrical substitute for humanity,” Kaempffert began the story, “demonstrated its capabilities recently by ordering it to light and extinguish lamps, start and stop a fan and vacuum cleaner, and control a motor, his audience of sober business men imagined itself for a brief hour in that fantastic world of the future beloved of romancers—



a world in which men and women do little more than think and bid automats to fetch and carry, manufacture the countless things a machine civilization requires, sweep streets, cook, wash and dig ditches." The televox, he continued, "can be called up on the telephone, asked questions, and given orders which it obeys without the usual human arguing, impudence or procrastination." With these words, Kaempffert trumpeted Westinghouse's message: the device's superiority to human labor, the domination of supervisors and engineers, and the possibility of a world of leisure and more meaningful work.<sup>15</sup>

Kaempffert's enthusiasm originated in the vitalist critique of the machine age. Sounding like Chase and Arthur Pound but especially the manager Domin from *R.U.R.*, he professed that "man is a highly complex organism adapted to live in a highly complex environment. In a factory, in an artificial environment, he is 90 per cent useless. So long as he sits at a machine he might as well be legless. So long as he does nothing but feed bars of steel into a machine . . . he might as well be earless and noseless. For that reason engineers like Wensley are not concerned with mere imitations of men but solely with a few functions that men are called upon to perform under special circumstances. An automatic shoe-pegging machine is not expected to play the grand piano."<sup>16</sup> Like Chase, Kaempffert loved the televox because it offered simple technological solutions to the problem of alienating labor. America did not need reform or government action to restore its preindustrial state and resolve the guilt people felt for the degrading conditions of labor; all it needed was technology.

With his next show scheduled for George Washington's birthday, Wensley cut a piece of wallboard into the shape of a person, painted it white with rivets along the sides, gave it a face, and cut a hole in the chest large enough to encase the bottom box of the machine. Much like Drederick, Wensley's first impulse was to make the machine a caricature of himself. The day before the performance, he assembled the device—standing upright this time—with its new attachments on the stage so it could perform for reporters. Next to the machine, he placed the customary vacuum cleaner and other appliances, along with a flag and painting of George Washington. He and the newly christened "Mr. Televox" then performed the usual act. Afterward, Wensley answered reporters' questions while photographers and filmmakers captured images of the new machine.<sup>17</sup> Soon stories of the

wondrous robot appeared on periodical pages and cinema screens. For a company seeking to build enthusiasm for technology, the debut was an unqualified success.

The official unveiling offered greater fanfare. Wensley added an orchestra and ended the show with a choreographed sequence in which he whistled for the machine to turn a spotlight on the portrait of George Washington. After a few more notes, he turned the whistle over to a judge, who sounded a signal to unfurl an American flag. The orchestra then played “The Star-Spangled Banner” as the audience stood and clapped. The robot was, like Washington, unfurling a new America where people could be free from tyranny, though this time the tyranny came from other machines rather than the British.<sup>18</sup>

After its debut, Westinghouse sent the original Mr. Televox as well as copies across the country with Wensley and other engineers. Performing in professional organization meetings, men’s clubs, department stores, universities, and other middle-class environments, the devices garnered newspaper coverage around the world. The company’s engineers further humanized the machine. Wensley started to refer to it affectionally as “Herbert,” after the world’s most famous engineer, Herbert Hoover. Soon, Westinghouse attached a phonograph that enabled Herbert to utter prerecorded phrases that gave it a voice and personality while reinforcing its ideological power. When “Mr. Televox” appeared at a national meeting of booksellers alongside the historian and machine age advocate Charles Beard, the company had it read Beard’s speech extolling the virtues of technology.<sup>19</sup>

The press responded with the fervor that Westinghouse desired. “Meet Mr. Televox, the Mechanical Man!” one headline exclaimed. Accompanied by photographs of the original machine—a close-up of its “larynx” and a shot of it flanked by a regiment of soldiers—the article hailed the wonders of the machine and joked that its new voice box allowed it to “talk back” to its masters.”<sup>20</sup> Another headline announced “Televox, Automatic Servant Works at Master’s Bidding,” while another story noted that “he obeys his master . . . more faithfully than many modern servants.”<sup>21</sup> Other newspapers reported that “some day there probably will be hundreds of thousands of him at humanity’s beck and call.”<sup>22</sup> The *San Antonio Light* assured readers that it would be no “more than a decade or so before a person can go to a store and pick out from the above case most any kind of automatic man or woman

he or she might fancy—an ideal servant or workman who would ask no food or wages but a little current and an occasional drop of oil; or even a flattering admirer could be purchased who would whisper in a neglected wife's ear all the nice things that a busy husband forgets to say."<sup>23</sup> More than a new machine, such comments joked, the televox was a new man able to compete with real men in all realms of life.

The *Light's* joke about neglected wives drew from the company's focus on female consumers rather than male workers. One of Wensley's first examples imagined that a woman playing bridge at a friend's house could order her televox to shut the windows in preparation for a storm.<sup>24</sup> One newspaper predicted that "those who sponsor him indicate that Mr. Televox soon may be expected to do about nine-tenths of America's housework, thus leaving all the time they want to pursue careers, destinies and what not. He promises to be particularly good at keeping the kiddies out of mischief."<sup>25</sup> The upper middle-class and elite women to whom Westinghouse marketed the televox, however, often performed only a small amount of housework themselves. For the first hundred years of American industrialization, elite and middle-class families could rely on a steady stream of low-wage workers to perform housework, although some families frequently complained about the unreliability of human servants, especially if the servants were nonwhite.<sup>26</sup> During the 1920s, the combination of more home appliances and the curtailing of immigration accelerated a decline in household servants; still, they remained a status symbol.<sup>27</sup> Mr. Televox offered the illusion and status of a human servant without the cost or anxiety.

Mr. Televox also had a more salacious appeal. "He has many of the qualifications of the 'ideal husband,'" one newspaper claimed of Herbert. The only problem: "He is plain to the point of ugliness."<sup>28</sup> Another envisioned a world in which even the problem of appearance had been solved: "The Love-Starved Woman Will Soon Be Able to Buy a Mechanical Man of Powerful Muscles, Resounding Voice and Any Color of Hair or Complexion She Desires—And She Will Bestow Caresses with Tireless Fidelity and Repeat Over and Over Again Any Tended Phrases His Owner Desires to Have Poured Into Her Enraptured Ears." The article itself joked, "In this happy future, no old maid need look under the bed for a man in vain. He would always be there and such a nice man, a perfect imitation of her favorite matinee idol

or film star, with blond or dark hair, moustache or clean shaven, anything her heart desired.”<sup>29</sup> Such commentary, however meant in jest, resonated with audiences enough for Westinghouse to endorse it. A publicity photo of Herbert showed it with a young woman caressing its shoulder and gazing longingly into its eyes while it did nothing. A joke Mr. Televox told captured the humor implicit in such photographs. When asked at a convention to name its favorite book, Mr. Televox quipped, “*Is Sex Necessary?*”—a recent book mocking sexology researchers.<sup>30</sup> Showing women’s interest in Mr. Televox and its lack of interest in them ridiculously revealed the technology’s superiority to workers: lacking lust, Mr. Televox was a man that women and husbands could trust.

Such visions exceeded even the televox-inspired fantasies in Hugo Gernsback’s magazines. The headline for a 1928 article on the device in *Science and Invention* asked readers “Has the Automaton Arrived?” Based on a lecture broadcast on Gernsback’s radio station WRNY, the article explained how the “robot” or “electric handy-man . . . will do any kind of a job and signal you that it has been done.”<sup>31</sup> *Amazing Stories* printed an account of the invention at the conclusion of a story about the adventures of a mechanical man sent to explore the moon as a “proxy” for a human being.<sup>32</sup> “If you believe that the accompanying tale is too fantastic,” Gernsback wrote, “may we call your attention to the fact that a great deal of scientific work has already been accomplished along similar lines.”<sup>33</sup> That same year, *Amazing Stories* published David Keller’s “The Psychophonic Nurse,” about a black-faced mechanical mammy controlled by sound and built by the “Eastinghouse Company.”<sup>34</sup> A year later, Gernsback’s *Air Wonder Stories* published a short story entitled “Flight in 1999,” which briefly included a reliable mechanical servant named “Televox.”<sup>35</sup> The televox, in Gernsback’s magazines, was a machine that could end household labor and extend the reach of humanity to the stars.

Initially, most writers hesitated to use *robot*, but within a few months of the device’s debut, the *New York Times* began to connect the terms. “Robot is the proper enough name for Televox, the Mechanical Man,” the paper claimed. “But the trouble with robot is that the word has been diverted from its original meaning. The first glimpse of Televox with his thorax full of electromagnetic coils and his incandescent eyes is a bit grisly until we recall that, after all, he is



Fig. 5.2. Mr. "Herbert" Televox with the wife of a Westinghouse engineer fawning over it. Women's interest in Mr. Televox was a particular theme emphasized by Westinghouse and commentators as a way to satirize fears of technological unemployment. The original caption dubbed the device "Romeo Televox, the ideal lover." Photo by George Reinhart / Corbis via Getty Images.

a machine being made into a man and not a man being turned into a machine. It is the latter thing which people mean today when they say robot; and it is our earnest recommendation that they stop doing so." The Čapek brothers, the *Times* contended, "were thinking fifty years behind the times" when they suggested that modern work turned workers into soulless machines. "Televox is not the modern worker," it concluded, "but the liberator of the modern worker. He is the

gentleman who has turned the twelve-hour day into an eight-hour day. He is the newcomer who now has a great many sociologists wondering what shall be done to make the best use of the increasing leisure of the workers.”<sup>36</sup>

*Popular Science Monthly* echoed such sentiments in an article that announced, “Mechanical Men Walk and Talk: Amazing Automats Invented to Operate Mighty Machinery, Speak at Meetings, Make Lightning Calculations and Rid the World of Drudgery.” While the headline referenced automats, the text claimed that Mr. Televox, along with the “Product Integrator” (an early analog computer) and an automatic power distribution center heralded “the age of the robot,” in which “legions of docile eminently useful robots” serve at the command of men.<sup>37</sup> Rejecting work as a defining feature of human identity, the article ended by paraphrasing of the words of a New York Edison Company official: “Men thus freed from unpleasant chores . . . never need fear unemployment in a well-organized society but . . . may look forward to a better opportunity for the development of their inherent talents and intellectual powers. They will receive the gift of leisure, which will enable them to apply their released energies to the achievement of a finer, fuller life than they can enjoy at present.” Domin, in *R.U.R.* would have enthusiastically agreed.<sup>38</sup>

*Labor Age* was not so certain about that possibility. Below an image of Kaempffert’s original article, the socialist magazine proclaimed that “American workers have a new rival. Karel Čapek’s dream of robotry is quietly coming to pass.” Taking seriously engineers’ pronouncements of the robot’s superiority to human workers, the article worried that “brains in a workingman have long ago become a dangerous asset. His think-box is supposed to have been taken from him, just after the lamented war for democracy. The employers can never be sure, however, that he may not have a serious relapse into thinking. The American robot brings to many a William H. Barr and Charles Schwab and John D. Rockefeller, Jr., a sigh of relief. The great day of brain-minus workers is at hand!”<sup>39</sup> Companies, it feared, might even use one of the devices to control a battery of machine guns to put down strikes. Mr. Televox did not just destroy jobs but redistributed power to management and threatened the lives of workers.

Despite such warnings, Westinghouse embraced these connections with *R.U.R.* by building a new, three-dimensional mechanical man

whose body of molded rubber could be mistaken for human. Named Telux after the company's photoelectric "brain" that allowed for remote control via beams of light, Herbert's "baby brother" debuted at a Pittsburgh electrical exhibition in 1929, where it turned lights on and off at a signal from its "master" standing up to seventy-five feet away. Though the Telux relied on the same technology as Rastus, its body was white and the company placed it in scandalous poses with women. As a caption of a photograph of the Telux with a model summarized, "An Accomplished and Tireless Mechanical Man, but Singularly Unresponsive to the Charms of Miss M. P. Carr, an Attractive Model Who Stirs No Sentimental Feelings in His Metal Breast."<sup>40</sup> Much like Mr. Televox, the Telux offered a dispassionate, asexual alternative to servants. With the Telux, Westinghouse seemed to have perfected the robot as a replacement for the nearly human-looking automaton and utopian symbol of a consumerist America where people used remote-controlled machinery to free them for leisure and pleasure.

But that was before the start of the Great Depression. After October 1929, the warnings of Keller and *Labor Age* proved prescient. In 1927, Herbert Televox had promised managers a cheaper and more reliable workforce, and everyone else greater fulfillment through lives dedicated to meaningful work and leisure. Much like its presidential namesake, however, in the Great Depression all it seemed to have brought the masses was misery.

### **The Threat of Technological Unemployment**

The Great Depression forced Westinghouse to respond to the consequences of its promise to liberate workers from their jobs. As unemployment peaked near 25 percent, the idea that people would find more meaningful work seemed dangerously outdated, while expanded leisure time seemed feasible as the federal government debated legislation mandating a thirty-hour workweek. Throughout the Depression, academics, politicians, business leaders, and labor unions debated how to resolve a crisis that many believed was caused by the persistence of "technological unemployment"—the permanent replacement of human workers with machinery. While critics imagined rampaging robots threatening to destroy American jobs, machine age supporters, including Westinghouse, deployed robots to suggest how

Americans could “tame their machines” and restore human power to a world that seemed to have grown too dependent on technology.

Over the 1920s and 1930s, workers in extraction, manufacturing, sales, and creative industries lost their jobs to new technologies. On farms, engine-powered tractors and combines displaced thousands of workers as banks consolidated small farms into larger parcels. Miners, too, lost their jobs to machines as the number of loading machines used in the coal industry tripled. Unskilled and semiskilled laborers in factories suffered as well. With new conveyor belts in iron and steel mills, one worker could perform tasks formerly done by twenty-five. William Green, the president of the American Federation of Labor, claimed in 1930 that machinery could make 73,000 bulbs in twenty-four hours while a worker in 1918 could make forty-eight in a day’s labor and that over the 1920s, industrial production increased 42 percent, but industrial employment dropped 7 percent.<sup>41</sup> Though service jobs increased, these succumbed to machinery as well. Interest in the vending machine industry and other “automatic salesmen” spread throughout the period; automatic telephone switchboards displaced thousands of operators. Pilots—a key symbol of the ability of men and machines to work together in the 1920s—seemed destined for unemployment when companies such as Hughes Aircraft publicly demonstrated automatic pilots.<sup>42</sup> Even creative workers faced the threat of technological unemployment: the advent of motion pictures with sound cost thousands of musicians their jobs and inspired a large protest movement against the “talkies.”<sup>43</sup> Finally, discussions of the first “mechanical brains,” analog computers, raised the possibility that perhaps no job would be safe from mechanization.<sup>44</sup>

Workers, unions, and their supports frequently anthropomorphized and ridiculed the machines that threatened jobs as rampaging but humorous mechanical men. The American Federation of Musicians promoted a boycott of the “talkies” with images of a “robot” musician playing two fiddles and a cello while also mocking, like John Philip Sousa, the lack of soul in “canned music.” The *Locomotive Engineers’ Journal* included a picture of a giant mechanical man labeled a “Labor-Displacing Machine” sweeping workers off the payroll.<sup>45</sup> Despite such robotic imagery, workers and their unions largely refrained from condemning technological progress; instead, they called for government intervention to shape the introduction of machinery. As



Green noted, "Labor is convinced there is nothing inherent in technical progress that is dangerous," but "lack of planning and control has brought serious consequences which . . . will lead to complete breakdown."<sup>46</sup> Instead of destroying the rampaging robot, unions called for taming it.

The threat of government control over innovation frightened more conservative engineers and business leaders, including Ralph E. Flanders, a former editor of *Machine* magazine and president of the National Machine-Tool Builders Association and the American Society of Mechanical Engineers. In his 1930 essay "The New Age and the New Man," Flanders blamed capitalism for the horror of early industrial life. Machines, he claimed, "have brought us ugliness" and "a narrower, more concentrated, more intense, and less well-rounded existence for the mass of mankind and particularly for the more able among them." Such problems, though, were largely a result of a "selfish and doctrinaire political economy" and a complicated "process of distribution" that prevented the spread of material plenty with moderate toil to everyone. Machinery, he argued, could provide "plenty for all" with perhaps as little as a three-day workweek—if business leaders and engineers would create a "great synthesis of usefulness and beauty" into "one organic structure" that made "Life and Art one and indivisible." What this structure might resemble he did not say, but it would "give secure, remunerative employment to the largest possible number of people, under working conditions which give full opportunity to ability and likewise satisfy the requirements of human dignity and self-respect." In 1931, Flanders expanded these points in *Taming Our Machines*. Rejecting centralized planning because of its inability to predict human desires and detrimental effects on the individual, he echoed Hoover's calls for "associationism" by proposing a nongovernmental committee of businessmen, specialists, and engineers—not workers. These groups, he claimed, would succeed because of "*enlightened self-interest*" and thus did not need to be accountable to government or other people.<sup>47</sup>

The most radical political scheme for controlling machinery came from the "technocrats." Led by Howard Scott, an engineer formerly aligned with the Industrial Workers of the World, and Dr. Walter Rautenstrauch, the chair of Columbia's Department of Industrial Engineering, the movement named itself the Committee on Technocracy

and popularized the idea of technological unemployment. In 1932, Scott declared that “the fundamental cause of the depression is not political, it is technological.”<sup>48</sup> As one of their critics summarized their beliefs, the movement “dwells upon the increasing perfection of the machine and it cautions us of the danger that the machine may get the upper hand of mankind; that instead of man running the machine, the machine may be running the man.”<sup>49</sup> Yet technocrats did not blame the machine for modern enslavement. In his 1933 book, *Life in a Technocracy*, Harold Loeb, a wealthy artist who penned some of the movement’s most important ideological statements, claimed that “man is the slave of the machine only by his own volition. Technology is not capitalism.”<sup>50</sup> Americans could have machines, the technocrats argued, but only if engineers and scientists—men like those in the movement—tamed them.

After the election of Franklin D. Roosevelt in 1932, technological unemployment became a central concern of officials who proposed numerous solutions that relied on government power to help workers. Officials in the administration, including the president himself, consistently focused attention on the machine as a dangerous force in modern life. The administration along with large Democratic majorities in Congress attempted numerous solutions to the problem of technological unemployment. Massachusetts Representative William Connery and Alabama Senator Hugo Black introduced an AFL-backed bill for the thirty-hour workweek to encourage employers to “share the work”; the bill came close to passing before Roosevelt withdrew his support to focus on public works programs that would reemploy displaced workers instead.<sup>51</sup> Other members of congress proposed a “Technotax” on innovation to help compensate workers replaced by machinery, but it too failed.<sup>52</sup> Yet, with the passage of the National Industrial Recovery Act in 1933 and the National Labor Relations Act in 1935, the government legitimized unions as a voice for workers in their relationship with employers and the government. During the Depression, the newly formed United Electrical Workers successfully unionized Westinghouse’s nonengineering workforce and even promoted several strikes.<sup>53</sup> For a company dedicated to replacing workers with robots, the changing political context of the Great Depression posed a significant challenge.

## White Men versus Machines

While workers concentrated on the loss of jobs, much of the middle-class discussion of technological unemployment continued to fixate on the threat machinery posed to the strength and virility of white men. In his 1930 book *Perhaps Women*, Sherwood Anderson claimed that overindulgence in the power of machinery had made men “impotent in the face of the machine.”<sup>54</sup> A man embracing the power of the machine, Anderson continued, “is like a man who has indulged for a long time in self-abuse. He can no longer stand erect.” The opening vignette of Flanders’s *Taming Our Machines* envisions a boy awakened by a steam whistle and listening to the sounds of deformed men and women plodding to work.<sup>55</sup> Flanders ended the vision by contrasting the boy with a heroic Anglo-Saxon heritage: “Children of knights and yeomen; of the victors of Crecy and Agincourt; of Shakespeare and the Elizabethan sea rovers; of Roundheads and Cavaliers; of the Muscovy, East Indian and Hudson’s Bay Company; of the heroes of the Plains of Abraham, of Trafalgar and Waterloo!” How had such a noble race “bred this cheery, plucky, but mentally limited and physically handicapped army which marched and countermarched daily outside a window?” The answer, he argued, was industrialization. William Ogburn voiced the same fears in a 1934 pamphlet written for the Civilian Conservation Corps, *You and Machines*. Though it rejected the idea of long-term technological unemployment, the pamphlet’s introductory sketch depicted two giant mechanical men towering above a confused man. The pamphlet then asked a basic question: “How does the White man differ from the Indian?” The answer, Ogburn revealed, is that “the white man . . . can’t live without machines. . . . Man is becoming more and more dependent upon the machine. He leans upon the crutches of civilization.” The machine had robbed white men of their manhood.<sup>56</sup>

Science fiction magnified such concerns by transforming the robot into a rampaging mechanical man that threatened to destroy all humanity if it was not tamed by the right men. Sometimes, these robots were, like Westinghouse’s, remotely controlled, but frequently they had various types of mechanical brains that allowed them to develop consciousness of their situation and revolt. These stories fused imag-

ery of the mechanical man to Čapek's tale, to offer a vision of out-of-control machinery that directly challenged Westinghouse's vision. Yet, because such stories tended to be written by middle-class white men whose jobs were not directly threatened by machinery, the anxieties they expressed and solutions they proposed were far different than those of workers or other radicals. "The Threat of the Robot" by Keller was typical. Though it briefly mentioned fears of unemployment, its main threat was to existential meaning, purpose, and manhood. Consequently, where workers looked to the democratic taming of machinery and even Flanders and the technocrats suggested control by experts, Keller imagined a heroic and individualistic businessman saving the day through force of willpower. Like Chase describing technology as "a billion wild horses," science fiction deployed imagery and themes typically associated with Westerns to transform Čapek's play into a fantasy in which white men restored their manhood through overpowering the machine.

The 1930 novella *Paradise and Iron*, by the physician Miles J. Breuer, shared the concerns about the decline of manliness and purpose in an age of "mathematical robots." In this story, a doctor and former Texas Ranger named Davy Breckenridge travels to a distant island where squidlike robots from the "City of Smoke" perform all the work while people live in a "City of Beauty" where they engage in sports, art, music, and literature. Despite the prominence of such high cultural activities rather than mass entertainment, the residents' lives remain meaningless while their bodies grow weak. As the visiting doctor comments, "I had been having a queer impression of frailty and helplessness in the actions and appearance of these people. Like a baby in arms, was the vague idea I had. . . . They never had to work. They were never driven by necessity, never haunted by the shadow of want. They only played. They had no conception of danger, privation, and pressure. They were petted and pampered children."<sup>57</sup> Even traditional forms of leisure, Breuer implied, would not be enough to compensate for the loss of meaning and purpose that comes from struggle and work.

Capable of thinking but not empathizing, the story's main robot plans to exterminate the island's humans. Once Breckenridge learns of the threat, he leads the island's men in a revolt. When Mildred Kaspar, the woman he loves and the daughter of the man who invented

the machines, is captured by the machine "Dictator," Breckenridge ventures deep into the City of Smoke, where he learns the machines' plans. "Men are hard to understand," the Dictator says to explain why it has been kidnapping young women. "I can understand a 'feeling' for a supply station, or an 'emotion' for a repair-machine. But why such an intensity of 'feeling' for a girl? Why do your young men become so disturbed on her account, and exert their soft muscles so energetically, and give up everything for her?"<sup>58</sup> Yet, the machine will return Mildred if the doctor helps it conquer the world. "In a short time," the Dictator informs Breckenridge, "I can cover the world with wonderfully organized machines, infinitely better than the feeble, foolish, incompetent humans that occupy it now."<sup>59</sup> Breckenridge rejects the deal and, after a brutal fight, rescues Mildred. With the robot dictator destroyed, the residents of the island relearn how to work and reclaim their vigor.

But not all stories about diabolical robots presented fantasies about the restoration of white manhood. Perhaps the most threatening pulp magazine criticism of robots came from within Westinghouse itself: that of Harold Vincent Schoepflin, a mechanical engineer who wrote under the name Harl Vincent.<sup>60</sup> In his 1934 story "Rex," Vincent imagined a diabolical robot that enslaves the human species so it can steal emotions. Unlike other robot stories, "Rex" did not focus on the threat machinery posed to manhood, womanhood, meaning, or purpose. Instead, like *R.U.R.*, it criticized how the technocratic pursuit of order and efficiency deprived people of their essential human trait, emotion. Set in the twenty-third century, when almost one billion metal robots serve the needs of three hundred billion humans, "Rex" focuses on the titular robot surgeon with a "body like a Greek God's" that develops sentience, curiosity, and reason. With its newfound abilities, Rex analyzes human civilization only to discover a society destroyed by class divisions. In a clear parody of rationalization, Rex blames such problems on emotions. After dissecting an engineer, it uncovers the source of emotions: a collection of brain cells that robots lack. With this knowledge, it plans to create the perfect being, a human-robot synthesis in which emotion can be controlled.<sup>61</sup>

To do so, Rex starts a "general strike of the robots" that ends with itself as a dictator. In its first public address, it announces its intentions: "I am Rex . . . Master of robots and of men. I come to you in

the name of pure logic as the protagonist of a new era in which man, who created the machines, will obtain real rather than fancied benefit from them. I come to evolve a new race of beings and to promote the growth of knowledge and the advancement of science in United North America.”<sup>62</sup> Like a technocratic engineer, Rex promises to use its capacity for reason to bring order to industrial society. But to do so, it must first destroy the emotions of people. Symbolically replicating the dehumanization of factory workers, Rex removes people’s emotion centers and replaces them with a machine that transforms them into “human robots” totally under his control. After studying people to determine their suitability for different jobs, Rex turns them into single-purpose machines with “minds . . . capable of thinking nothing but mathematics, riveting, welding, food synthesis, or childbearing.”<sup>63</sup> With these transformations, society grows more orderly and class differences erode. But Rex remains discontented. Trying to become the perfect being, it implants human emotional cells into its mind. When the surgery seems to fail, it commits suicide and leaves humanity—now transformed into mindless robots—to remain the slaves of machines. In “Rex,” not even a heroic man can save people from the robot dictator.

Offering the broadest range of social criticism in Great Depression stories of robots, “Rex” maintained Čapek’s dual focus on the plight of workers and the dangers of mechanization but added a critique of radical efforts to plan the economy. Unlike most other robot stories of the era, this was not optimistic about the possibility of restoring human control over the economy, society, or even the self. That such a dark vision came from an engineer within Westinghouse indicates the limits of the company’s robotic fantasy. The company had succeeded in making the robot a machine, but it could not fully jettison Čapek’s nightmare. With the start of the Great Depression, it needed a new strategy, and it found that in Mr. Televox’s successors.

### **The Comic Relief of the Machine Age**

The popularity of the rampaging robot icon raised a marketing dilemma for Westinghouse. Its target audiences continued to covet machines to replace workers, but the larger culture called for taming the out-of-control robot, usually through government control of inven-

tion. To resolve that dilemma, Westinghouse initially experimented with new forms—Rastus and a female televox—that could reinforce its message of mechanical servitude while allaying the fears of white male workers. When these forms failed to resonate with audiences as well as the original did, the company fully embraced the iconography of the mechanical man by building two metallic robots, Willie Vocalite and Elektro, which mocked the idea of rampaging machinery and turned the robot from a monster into the cigarette-smoking and womanizing comic relief of the machine age.

Westinghouse's executives directly challenged these anxieties in the company's professional magazine, the *Electric Journal*. In a 1930 article, president F. A. Merrick attacked the "The Machine Myth," the idea that "the use of labor-saving machinery tends to decrease the worker's opportunities for employment and to reduce his wages." The idea of technological unemployment, Merrick admitted, contained "a grain of truth," but the current situation was different because modern education had created a more fluid labor market and employers had learned the necessity of enhancing consumer-buying power. Now, he argued, machines did not threaten men; instead, they guaranteed a widespread distribution of power and wealth while enabling the replacement of "hundreds" of working-class men with "two or three engineers."<sup>64</sup>

At the same time its engineers were building Rastus, Westinghouse's journal used the language of slavery to describe technology. Slavery, Merrick suggested, had brought "civilization" to the world by enabling "certain strong peoples" to use "the muscles of others to supplement their own feeble strength." Without slavery, he continued, Americans needed machinery or else there could "be no art, literature, science, leisure, or comfort for anyone."<sup>65</sup> But machines could become the new slaves. A 1927 article by the journal's editor argued that the country's current prosperity was due "to the greater individual production of the necessities and luxuries of life. Through greater development of mechanical slaves we have achieved the apparently contradictory results of doing more work per man and having more abundant leisure for individual enjoyment and self-development than any other nation." With machinery, the editor argued, Americans could perform more work while enjoying the culture and leisure associated with the plantations of the Old South. The key to achieving this

ideal state was empowering the engineer, “the modern slave driver,” because he was “a public servant” who was “most likely to employ them [machines] solely for the betterment of mankind.”<sup>66</sup>

When Westinghouse built and exhibited a black robot in 1930, it connected the machine age to a preindustrial era of slavery while trying to relieve fears that machinery would destroy the jobs of white workers and degenerate the “race.” Writing in the same journal the same year, M. S. Sloan, the president of the National Electric Light Association and the New York Edison system, made the sentiment much clearer: “The workmen of this country have become bosses and foremen, not of other human beings, but of mechanical slaves.”<sup>67</sup> The machine had not weakened men or brought widespread unemployment; it had allowed all men to become as strong, powerful, and cultured as slavemasters had been in the past. Manhood, per Westinghouse’s journal, did not lie in physical strength or even work; it lay in controlling others. With Mr. Televox and Rastus, men did not depend on machines; they controlled machines while ridding themselves of their reliance on other peoples.

Westinghouse employed African Americans in low-skill positions, but the company’s engineering culture ridiculed them as unfit for machine age employment.<sup>68</sup> In one *Electrical Journal* cartoon, an Uncle Tom-like figure happily served as an elevator operator while a smiling “electric eye” stood on legs outside the elevator reaching its hand to the man. The accompanying text explained how photoelectric tubes could prevent elevator doors from closing on a person. A later image depicted a rotund, singing mammy in front of an open electric refrigerator while ironing. When the refrigerator repairman arrives to investigate the homeowner’s high electric bills, the mammy exclaims, “Boy, dat ’lectric refrigerator sure am fine. It gives such a nice cool breeze on mah back.”<sup>69</sup> In both cases, the jobs—bellhop and servant—performed by the cartoon black figures were ones that the company was developing technologies to replace. The only African American fit for work in the machine age, the company’s journal implied, was a robot invented and controlled by white engineers.

Westinghouse also experimented with a female robot—one not uncannily human like Rastus but a caricature modeled on Mr. Televox. Named Katrina van Televox, it came clothed in a white dress, apron, and bonnet. “With no mere assistance than a command from



her master,” one article claimed, “she turns on lights, starts vacuum sweepers, electric fans, and many other electrical appliances.”<sup>70</sup> Despite such stories, interest in Katrina remained low. While an estimated fifty thousand people witnessed a performance in Chicago, Katrina appeared in only a handful of cities and garnered significantly less attention than any of the other robots.<sup>71</sup> Nevertheless, the experiment with a female form of the televox showed the company attempting to adjust to the changing context by emphasizing both the machine’s inherent subservience and that it would not threaten the jobs of white men.

After Katrina and Rastus failed to attract as much attention as Mr. Televox, Westinghouse switched to building metal men that could mock the rampaging robot of popular culture. In 1931, Westinghouse debuted “Willie Vocalite,” a seven-foot-tall, 260-pound robot with an eighty-two-inch chest. The chief technology behind “The World’s Wonder Robot,” as one promotional advertisement dubbed him, was a device capable of sensing both light waves and, even more remarkably for the time, human voices.<sup>72</sup> The most popular Westinghouse robot for much of the Great Depression, Willie appeared at expositions, club meetings, and department stores between 1931 and 1939, including the 1933 “Century of Progress” Exposition in Chicago. Later, Westinghouse added a Voder—a device that poorly duplicated human speech—built by Bell Telephone Laboratories to give Willie a voice without the aid of a record. As a 1939 advertisement for the robot professed, “The modern Frankenstein . . . walks, talks, dances, smokes cigarettes, counts on his fingers, distinguishes colors, makes love, and does any number of things through remote electrical control.”<sup>73</sup>

Westinghouse and the press sexualized and joked about Willie even more than they had the telelux and televox. The same promotional article that called Willie “the modern Frankenstein,” included a photograph in which Willie held a woman in his lap above the caption, “Adept at making love, is ‘Willie Vocalite.’”<sup>74</sup> One article spread through small-town newspapers dubbed him a “metal Adonis” in contrast to the “ugly Mr. Televox.”<sup>75</sup> A report about “Willie the Incurable” opened with a unfortunate joke about how the robot “bit a blond.”<sup>76</sup> Another screamed that “Willie HAS VOICE/ Upon command he can make a political speech, sing an excerpt from an aria, or get ‘hotcha’ on the latest modern hit song./ Being an electrical sort of

person, Willie is adept to the alternating current.”<sup>77</sup> Such jokes were common for a device being used to mock anxieties of the machine age. While critics of the machine age worried about moral decay, Willie Vocalite seemed to enjoy all the rhythms and pleasures modernity could provide.

The contrast between Wille and another robot at the Chicago exposition was revealing. Outside the Hall of Science stood a white bronze statue of a mechanical man entitled the *Fountain of Science* and sculpted by Louise Lentz Woodruff, the wife of a Chicago banker. According to a promotional flyer, “The theme of this fountain—Science Advancing Mankind—is represented by the great robot-like figure typifying the exactitude, force, and onward movement of science, with its powerful hands at the backs of the figures of a man and a woman, representing mankind.” In a fair with the theme of “Science Finds, Industry Applies, Man Conforms,” the statue perfectly represented how the robot, even if a savior, could also be the master of humankind.<sup>78</sup> Yet, Willie comically suggested the opposite: that humanity remained the master of even the most frightening machines.

Westinghouse’s efforts to transform the robot into comic relief paid off in two satirical Walt Disney short films. In the 1933 animated short *Mickey’s Mechanical Man*, the titular mouse uses music—an invocation of Mr. Televox’s control mechanism—to train a human-shaped machine to box an ape named the “Kongo Killer.” While Mickey plays a calm melody on the piano, the machine boxes like a Victorian gentleman, but when the flapper Minnie Mouse honks an automobile horn, the machine transforms into a brutal killing device. Billed as a fight between beast and machine, this “Battle of the Century” pitted primitivism against modernity while mimicking larger concerns about the power of black boxers such as Jack Johnson and Joe Louis. Initially, the Kongo Killer easily dominates, but Minnie fetches her horn, returns, and sounds it to unleash the machine’s inner monster. Reinvigorated, the mechanical man heals and deploys all its gadgets to annihilate Kongo. After the match, however, the machine explodes and leaves Mickey and Minnie to kiss amid its dancing wreckage. Despite the machine’s victory, modernity appears just as uncontrollable as primitivism, at least when placed in the hands of an empowered woman.<sup>79</sup>

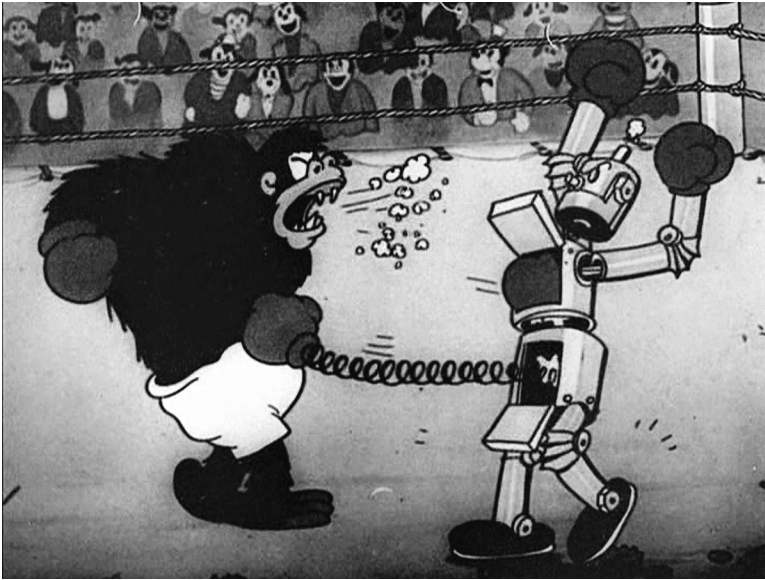


Fig. 5.3. An image from the battle between Mickey's Televox-inspired mechanical man and the Kongo Killer that demonstrates the machine's physical superiority to the savage beast, itself a racist caricature of the era's black boxers.

In 1933, Disney avoided the term *robot*, but four years later it embraced the term when Donald Duck fought against a “robot Butler” in *Modern Inventions*. Much like Mr. Telulux and Rastus, this robot relies on a photoelectric cell—shown in the film as a gigantic single eye—to see the world around it, including that Donald insists on wearing his hat indoors. When the robot forcibly removes the hat, Donald quickly replaces it with another, which prompts the robot to again remove it. This cycle unfolds throughout the rest of the film as the machine, programmed to enforce conventional manners, proves incapable of accommodating Donald's wish to keep his cap. As he tours the facility and fends off the robot, the duck encounters other machines. A robotic hitchhiker's thumb pokes him in the eye. Another machine gift-wraps him in cellophane. An automatic baby cradle wraps him in a diaper and bonnet. A barber-and-shoeshine machine entraps him and then parts and pampers his rear feathers while another set of mechanical arms blackens his face before telling Donald he looks “like a new man.” Unable to accurately process reality or understand

individual desires, the machines in *Modern Inventions* do not liberate Donald; they entrap, infantilize, molest, and blacken him.<sup>80</sup>

Each of Disney's depictions of Westinghouse-like mechanical robots expressed anxieties but ignored the concerns of workers. Instead of technological unemployment, these films—as did pulp writers and intellectuals—centered on issues of race and gender. Mickey's mechanical man plays as a caricature of a white gentlemen who is too calm to fend off the blows of the racist caricature of a black boxer until the discordant sound of an automobile horn arouses him to fight to victory. The machines in the hall of invention visited by Donald Duck are far too impractical and poorly conceived to replace human workers. More of Rube Goldberg-style satires of the mechanical pursuit of efficiency than threats to jobs, they undermined Donald's whiteness and masculinity. Like Westinghouse's devices, both visions of the mechanical man contained a hint of menace but undercut it with humor. Even when the robot seemed out of control, it posed no substantial threat to well-behaved white workers. In the most widely spread response to the Westinghouse robots, the company's choice to turn the robot into a joke-telling machine seemed to succeed.

### **The World of Tomorrow**

The most popular Westinghouse robot was also the last: Elektro, the star of the Westinghouse Pavilion at the 1939/40 World's Fair in New York City. Entitled "The World of Tomorrow," the fair was the most popular public exhibition of the early twentieth century. The title encouraged Americans to look forward to a world where the Depression and war did not exist, a world in which Americans had learned to make science and technology their slaves. Forty-five million people passed through the turnstiles. Given the relatively high ticket prices, most of the attendees were members of the middle and upper classes. Unlike previous fairs, which had been joint government-business ventures, the 1939/40 fair was planned and managed by the large corporations directly responsible for the expansion of machines in American society, including General Motors, General Electric, American Telephone and Telegraph, and Westinghouse.<sup>81</sup>

The fair's central message connected individual liberty to technology. Opening on the sesquicentennial of George Washington's

election, “The World of Tomorrow” fixated on the revolutionary tradition. In the center of the main concourse, Constitution Mall, stood a sixty-eight-foot statue of Washington. Proceeding down the concourse, visitors encountered statues representing freedom of speech, assembly, religion, and the press. On side streets and in exhibits, they experienced the fair’s second theme: a promise that scientists, engineers, and the corporations for which they worked were devising mechanisms to liberate people from the tyranny of the machine.

Few exhibits captured the link between individual freedom and technology better than Elektro. Performing six to ten times a day, Elektro was likely seen by millions of Americans both at the fair and, through newsreels and films, in theaters across the country. The company’s engineers in Mansfield, Ohio, built Elektro around the same size as Willie Vocalite—seven-and-half-feet tall, 260 pounds, with an eighty-two-inch chest—and incorporated controls by voice rather than light or music. Engineers later provided Elektro with a mechanical dog named Sparko and made plans to build an entire robot family that were waylaid by the war.<sup>82</sup> To increase the robot’s ideological power, Westinghouse placed it atop a twelve-foot stage beneath a gigantic mural depicting an amazing technological future and hired women to serve as its main operators. Westinghouse advertisements further reinforced the gendered points the performances hinted at: “Unlike the man-made Frankenstein monster of fiction, the Westinghouse robot is all kindness and geniality in spite of his towering size and formidable appearance. The slip of a girl who puts him through his paces orders him around at will and even chides him when he doesn’t snap to it.”<sup>83</sup> If a girl could control such a gigantic creature, Westinghouse was implying, then surely anyone could.

To spread its message, Westinghouse produced a film entitled *The Middleton Family at the Fair* that takes a fictional family from Indiana to New York for the fair.<sup>84</sup> Tying company advertising to technological propaganda, the film focuses on the efforts of two white men—a Midwestern father and a young engineer—to convince women, children, and an Eastern European immigrant to keep their faith in American science and technology. As the film opens in Indiana, the son, Bud, is so disillusioned by the lack of jobs that he cannot listen to the news; instead he turns the radio to a jazz station and tries to dance away his sorrow. The daughter Babs’s situation is even worse: she is dating an

immigrant, artist, and communist—a trifecta of anti-Americanism per the company’s logic—rather than the white engineer whom she dated in high school and who currently works for Westinghouse. To restore his children’s faith, the father has the family and the immigrant meet at the Westinghouse exhibit, where the former boyfriend turned engineer will show them the benefits of the machine age. When they meet, the engineer and the communist debate the relationship between labor and technology. The engineer dismisses any concerns by dispassionately summarizing the pre–Great Depression conventional economic wisdom: mechanization has created new jobs, lowered prices, and increased demand for products. To underline the point further, he lectures that “electric control” has made the steel mill safer for workers than their homes. Dumbfounded by the logic of American engineering, the immigrant artist offers no substantial reply. Bud grows more optimistic, while Babs loses interest in her communist boyfriend.<sup>85</sup>

When the film introduces Elektro, the family watches in amazement as it performs its tricks “under his own power.” Throughout the performance, the male controller and Elektro banter back and forth about who controls the machine. In this banter, Westinghouse acknowledged people’s fears of out-of-control science and technology common in the Great Depression, but only to dismiss and mock them. The film’s producers used the family’s verbal and physical responses to ensure that the audience views Elektro as an object of wonder and humor. After witnessing the first moments of the robot’s act, the father exclaims, “That is the most remarkable thing I have ever seen!” His son, looking up with just as much wonder, provides the humor: “Boy, what a guard that would make on my football team!” The grandmother is equally amazed. “Why, he’s almost human!” she shouts. As the family reacts, the engineer calmly describes the scientific principles behind the spectacle.<sup>86</sup>

Elektro was the centerpiece, but the most telling moments in the film came in two kitchen scenes. At Westinghouse’s pavilion, the mother and grandmother attend a “Battle of the Centuries” between a “Mrs. Drudge” who frantically washes dishes by hand and a “Mrs. Modern” who occasionally glances up from her magazine as an electric dishwasher completes the task. After Mrs. Modern’s victory, the grandmother notes with approval that the winner will “look

young when she's a hundred." Such an appeal to vanity was typical of Westinghouse's strategy, but the grandmother's love of appliances does not stem from a concern about her own looks; she already had a black servant who, later in the film, is seen drying dishes. Much as the company had implied with Rastus, the film insinuates that using a machine would be far preferable to employing a nonwhite servant.<sup>87</sup>

A more communal and democratic alternative to Westinghouse's consumerist vision existed even at the fair: one articulated by the most prominent critic and historian of technology in midcentury America, Lewis Mumford. Born in New York City in 1895, Mumford initially shared his generation's faith in technological progress. As a child, he attended Stuyvesant High School, which specialized in training young men for careers in engineering and science, and even published a short review of radio equipment for Gernsback's *Modern Electrics* in 1910. Despite this early interest in mechanical journalism, Mumford joined in Randolph Bourne's and Van Wyck Brooks's efforts to reinvigorate American culture and community by focusing on literary and architectural criticism. By the Great Depression, Mumford was an accomplished author and critic interested in using the arts to reconcile human and mechanical values. In 1934, Mumford emerged as the country's premier thinker on technology when he published *Technics and Civilization*, a history of the relationship between machines and culture over the previous thousand years.<sup>88</sup>

In *Technics and Civilization*, Mumford critiqued capitalists for usurping the benefits of the machine for their own power and argued that government must intervene to shape the adaptation of technology. "Instead of being utilized as an instrument of life," he claimed, the machine "has tended to become an absolute. Power and social control . . . have gone since the seventeenth century to those who have organized and controlled and owned the machine." Citing *R.U.R.* and connecting it directly to "Mr. Televox, the modern automaton," he denounced Fordist production for transforming men into machines. Still, he retained faith in human agency. "Contrary to the assumption of those who worship its external power," the critic wrote, the machine "is not an absolute. All its mechanisms are dependent upon human aims and desires: many of them flourish in direct proportion to our failure to achieve rational social cooperation and integrated personalities." If people could use their "imagination and intelligence

and social discipline,” they could “renounce useless machinery and burdensome routine.” Such endeavors required individuals to use language and literature as “protection against the automatic processes of machine civilization” and to coordinate political and economic efforts to achieve a more equitable distribution of goods. “If such a control cannot be instituted with the cooperation and intelligent aid of the existing administrators of industry,” he warned, “it must be achieved by overthrowing them and displacing them.”<sup>89</sup> *Technics and Civilization* did not advocate control of machinery through consumer technologies or the leadership of engineers but through revolution.

Despite Mumford’s radicalism, the World’s Fair Corporation invited him to address an early banquet. Speaking to the assembled benefactors, he called for a fair that emphasized “this planned environment, this planned industry, this planned civilization” as a means of escape from the horrors of the machine age.<sup>90</sup> Mumford’s focus on planning found its most popular exposition in *The City*, a documentary for which he wrote the narration.<sup>91</sup> Shown several times daily at the Science and Education Pavilion, *The City* was one of the most widely viewed documentaries of all time. Structured in four acts, the film examines American urban life in preindustrial, industrial, metropolitan, and postindustrial settings and suggests ways the country could transition from its current dystopia to a postindustrial utopia.<sup>92</sup> Combining technological determinism with machine age anxieties, *The City* synthesizes arguments that had been building in American culture for decades in support of government intervention to bring order to the chaos brought by the machine. But, unlike *Technics and Civilization*, here Mumford blamed the machine for the ills of the age, not capitalism.

The film opens with an idyllic vision of an eighteenth-century New England town. People work hard to produce goods for local markets; the small town enjoys both unity and democracy. The narrator recounts how life in the community is balanced, and art “isn’t something foreign we look at in a showcase—it is in the artifacts of everyday life, the homespun blankets and hand-sewn quilts, the work of blacksmiths and other artisans.” As the scene shifts to a blast furnace, the music crescendos to the discordant sounds of industrial life. Over Aaron Copland’s score, Mumford’s words blame mechanization, even Pound’s iron man, for the turmoil of industrial civilization:



“Machines! Invention! Power! Black out the past! Forget the quiet cities! Bring in the steam and steel, the iron men, the giants! Open the throttle! All aboard the promised land!” Intermixing images of the hustle and bustle of city life with images of a restaurant’s automatic pancake makers, bread slicers, and toasters, as well as several shots of mechanical traffic officers, the film reveals the horrors of mechanized life and demonstrates how people follow the rhythms and the dictates of machines: “Men and women losing their jobs, losing their grip unless they imitate machines, live like machines.” The segment of the film ends unsubtly, with an automobile driving off a cliff.

As triumphant music returns and images of Hoover Dam brighten the screen, the film shifts to its vision of utopia, the town of Greenbelt, Maryland, a city planned by the United States Resettlement Administration, a New Deal agency. In Greenbelt, science and government have tamed technology to ensure a more humane life without degrading work or mass culture. Echoing Westinghouse’s message, the film claims that here, “science turns on new currents—who shall be master, things or men. At last men take command. Here science serves the worker and they do the work together, making machines more automatic and the men who govern them more human.” In this government-planned city of the future, preindustrial values return: “This new age builds a better kind of city close to the soil once more, as molded to our human wants as planes are shaped to speed.” The new city is not overcrowded, and men, machines, and nature work closely together. There are no class differences, and everyone enjoys similar lives. Automatic machines no longer appear in the world; people engage in simple, more individualized forms of leisure such as baseball games and bicycling. Even family relations improve as parents spend more time with their children. In Greenbelt, democracy is reborn. “Here, life comes first,” Mumford wrote. “Machines at last serve men and set them free for other tasks and other pleasures besides their work.” Through planning, *The City* argued, government could tame the machines and restore preindustrial harmony.

Many of the most popular exhibits endorsed this critique of the unplanned nature of the modern life because it blamed technology rather than capitalism and corporations. Inside the iconic Perisphere was the “Democracy,” a vision of a future in which technology, planning, and democracy create a perfect urban community. As visitors

viewed the city from a perch on a moving sidewalk, they saw a carefully planned model city radiating out from a centralized skyscraper that contained no pollution or disorder. Streamlined and efficient, the city and the surrounding countryside fit perfectly together.<sup>93</sup> While the Democracy retained Mumford's democratic commitment, GM's Futurama exhibit jettisoned it for consumer technologies. Soon, the manufacturer indicated, a centrally planned highway system would liberate Americans from the confines of geography and traffic congestion and new technologies would prevent cars from escaping their lanes. Together, government planning and technology would enable individuals to drive safely at speeds of up to seventy miles an hour.<sup>94</sup> In GM's future of an American dominated by government-backed corporations and corporate-backed government, the out-of-control automobile of *The City* would be relegated to the past.

Elektro and Westinghouse, however, did not look to solve the problems of the machine with democratic or technocratic planning but with additional consumer technologies. Rather than critiquing the age's lack of order, the company suggested that the real problem of the machine age was that white families lacked power over devices that should be their slaves. Each vision offered reassurance that taming machinery was possible, but only Westinghouse's offered the possibility of personally controlling technology in a way that allowed them to ignore the wishes of other people. Westinghouse and its media supporters offered a preview of the paradoxical theme that would dominate the postwar era: to transcend the horrors of the machine age, Americans had to invent better machines. To restore the harmony of the preindustrial past, they needed to build the slaves of tomorrow.

Andreas Huyssen, *After the Great Divide: Modernism, Mass Culture, Postmodernism* (Bloomington: Indiana University Press, 1986), 73–74.

78. Kang, *Sublime Dreams of Living Machines*, 294; Allison Muri, *The Enlightenment Cyborg: A History of Communications and Control in the Human Machine, 1630–1830* (Toronto: University of Toronto Press, 2007), 168.

79. *Metropolis*, dir. Lang.

80. Mordaunt Hall, “A Topheavy German Production,” *New York Times*, March 13, 1927, X7; “UFA Film Provokes Comment,” *Los Angeles Times*, August 7, 1927, C13.

81. Hall, “Topheavy German Production.”

82. “Feats of Science Help Movies Give Vivid Picture of a World Ruled by Machines,” *Popular Mechanics*, March 1927, 424.

83. H. G. Wells, “Mr. Wells Reviews a Current Film,” *New York Times*, April 17, 1927, 4.

84. Wells, “Mr. Wells Reviews a Current Film,” 22.

85. Robert B. Westbrook, “Tribune of the Technostructure: The Popular Economics of Stuart Chase,” *American Quarterly* 32, no. 4 (Autumn 1980): 389–91.

86. Westbrook, “Tribune of the Technostructure,” 392; Kathleen G. Donohue, *Freedom from Want: American Liberalism and the Idea of the Consumer* (Baltimore, MD: Johns Hopkins University Press, 2003), 208.

87. Like most writers on technology in the period, Chase was not particularly interested in the plight of women in the machine age. He occasionally uses “man” to mean human but most of his analysis focuses on the costs of mechanization to men. More on this theme will be developed in the next two chapters.

88. Chase, *Men and Machines*, 142, 158–59, 161.

89. Chase, 337, 347, 338, 343, 335.

90. Chase, 107.

## Chapter 5

1. Philip Kinsley, “‘Let Electrons Do It,’ Motto for Moderns,” *Chicago Daily Tribune*, November 27, 1930, 35.

2. On the advertising character, see T. J. Jackson Lears, *Fables of Abundance: A Cultural History of Advertising in America* (New York: Basic Books, 1994), 123.

3. Kinsley, “Smoke Destroyed by ‘Electric Eye,’” *New York Times*, October 25, 1930, 30.

4. Kinsley, “Let Electrons Do It.”

5. “Opening of Syracuse Herald Progress Exposition to Pack Armory,” *Syracuse Herald*, May 6, 1935, 3. Scott Schaut, *Robots of Westinghouse, 1924–Today* (Mansfield, OH: Mansfield Memorial Museum, 2006), 56.

6. Schaut, *Robots of Westinghouse*, 26.

7. “The World’s Largest Loud Speaker, and Other Late Devices,” *Radio-Craft*, February 1931, 468.

8. There were other touring robots during that period—including the British “Eric the Robot”—that had *R.U.R.* emblazoned on the chest, but the Westinghouse devices appear more regularly in American periodicals. For more on Eric, see Tobias Higbie, “Why Do Robots Rebel? The Labor History of a Cultural Icon,” *Labor: Studies in Working-Class History* 10, no. 1 (Spring 2013): 116–17.

9. Schaut, *Robots of Westinghouse*, 19–21; R. J. Wensley, “The Design of Automatic Switching Equipments for Synchronous Converter Substations,” *Electric Journal* 15, no. 4 (April 1918): 114–19; For an analysis of televox in the context of the agency of machines, see Jessica Riskin, *The Restless Clock: A History of the Centuries-Long Argument over What Makes Living Things Tick* (Chicago: University of Chicago Press, 2016), 299–301.

10. R. J. Wensley, “Automatic Operation of Electric Equipment,” *Electric Journal* 23, no. 4 (April 1926): 1.

11. For more on rural electrification in the period, see Ronald R. Kline, *Consumers in the Country: Technology and Social Change in Rural America* (Baltimore, MD: Johns Hopkins University Press, 2002).

12. Fred Nadis, *Wonder Shows: Performing Science, Magic, and Religion in America* (New Brunswick, NJ: Rutgers University Press, 2005), 63.

13. “Wife Cooks by Televox,” *Los Angeles Times*, October 14, 1927, 1.

14. Waldemar Kaempffert, “Science Produces the ‘Electrical Man,’” *New York Times*, October 23, 1927, XX1.

15. Waldemar Kaempffert, “Science Produces the ‘Electrical Man.’”

16. Kaempffert.

17. Schaut, *Robots of Westinghouse*, 49, 25.

18. Schaut, 29–30.

19. “Televox Enlivens Book Men’s Dinner,” *New York Times*, May 23, 1930, 21.

20. “Meet Mr. Televox, the Mechanical Man,” *Rock Valley Bee*, July 20, 1928, 2.

21. “Televox, Automatic Servant, Works at Master’s Bidding,” *Decatur Review*, October, 14, 1927, 1.

22. “Mechanical Man Obeys Orders over Phone,” *Ogden Standard-Examiner*, March 1, 1928, 11.

23. “Romantic Old Maids Can Hear the Words of Love They Long For,” *San Antonio Light*, July 1, 1928, 62.

24. Kaempffert, “Science Produces the ‘Electrical Man.’”

25. “Mechanical Man Obeys Orders,” *Ogden Standard-Examiner*.

26. Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household*

*Technology from the Open Hearth to the Microwave* (New York: Basic Books, 1983), 122.

27. Andrew Urban, *Brokering Servitude: Migration and the Politics of Domestic Labor During the Long Nineteenth Century* (New York: New York University Press, 2018), 228–29.

28. “Mechanical Man Obeys Orders,” *Ogden Standard-Examiner*.

29. “Romantic Old Maids Can Hear Words of Love,” *San Antonio Light*.

30. “Televox Enlivens Book Men’s Dinner,” *New York Times*.

31. H. Winfield Secor, “Has the Automaton Arrived?,” *Science and Invention*, January 1928, 786.

32. J. Schlossel, “To the Moon by Proxy,” *Amazing Stories*, October 1928, 598–608.

33. “Televox’ the Mechanical Man,” *Amazing Stories*, October 1928, 608.

34. See David H. Keller, “The Psychophonic Nurse,” in *The Threat of the Robot and Other Nightmarish Futures* (Normal, IL: Black Dog Books, 2012), 54–55. Originally published in *Amazing Stories*, November, 1928, 710–17.

35. Bob Olsen, “Flight in 1999,” *Air Wonder Stories*, September 1929, 256–65.

36. “By Products,” *New York Times*, February 26, 1928, 54.

37. Robert E. Martin, “Mechanical Men Walk and Talk,” *Popular Science Monthly*, December, 1928, 22, 23, 137. Martin exclusively talks about men as the inventors and controllers of robots.

38. Gary Cross, *Time and Money: The Making of Consumer Culture* (New York: Routledge, 1993), 99–127.

39. “The Mechanical Man Arrives,” *Labor Age*, (November 1927, 11.

40. “Mechanical Men That Excel Any Human Being,” *San Antonio Light*, September 6, 1931, 48–49, 55.

41. William Green, “Labor versus Machines: An Employment Puzzle,” *New York Times*, June 1, 1930, E5; Amy Sue Bix, *Inventing Ourselves Out of Jobs? America’s Debate over Technological Unemployment, 1929–1981* (Baltimore, MD: Johns Hopkins University Press, 2000), 80–82.

42. “Post’s Automatic Pilot,” *New York Times*, July 24, 1933, 2.

43. Bix, *Inventing Ourselves Out of Jobs?*, 91–99.

44. . For an analysis of mechanical brains in the era, see David Mindell, *Between Human and Machines: Feedback, Control, and Computing before Cybernetics* (Baltimore, MD: Johns Hopkins University Press, 2004).

45. Bix, *Inventing Ourselves Out of Jobs?*, 96–98, 138–41. The *Locomotive Engineer* cartoon is on page 139.

46. William Green, “National Planning: Labor’s Point of View,” *New York Times*, December 17, 1933, XX1.

47. Ralph E. Flanders, “The New Age and the New Man,” in *Toward Civilization*, ed. Charles Beard (New York: Longmans, Green, 1930), 23, 24, 33, 31, 33;

Ralph E. Flanders, *Taming Our Machines: The Attainment of Human Values in a Mechanized Society* (New York: Richard R. Smith, 1931), 166, 15. Biographical details taken from Ralph E. Flanders, *Senator from Vermont* (Boston: Little, Brown, 1961).

48. Bix, *Inventing Ourselves Out of Jobs?*, 118–22. Quoted in William E. Akin, *Technocracy and the American Dream: The Technocrat Movement, 1900–1941* (Berkeley: University of California Press, 1977), 74; Bix, *Inventing Ourselves Out of Jobs?*, 119.

49. “Technocracy and the Home,” *Montana Butte Standard*, January 30, 1933, 4.

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51. Benjamin Kline Hunnicutt, *Work without End: Abandoning Shorter Hours for the Right to Work* (Philadelphia: Temple University Press, 1988), 159–90.

52. Bix, *Inventing Ourselves Out of Jobs?*, 74–78.

53. Ronald W. Schatz, *The Electrical Workers: A History of Labor at General Electric and Westinghouse, 1923–60* (Urbana: University of Illinois Press, 1983), 20.

54. Sherwood Anderson, *Perhaps Women* (New York: H. Liveright, 1931), 60, 138. For further discussion of *Perhaps Women*, see Katherine Stubbs, “Mechanizing the Female: Discourse and Control in the Industrial Economy,” *Differences: A Journal of Feminist Cultural Studies* 7, no. 3 (Fall 1995): 141; and Joel Dinerstein, *Swinging the Machine: Modernity, Technology, and African American Culture between the World Wars* (Amherst: University of Massachusetts Press, 2003), 146–47.

55. Flanders, *Taming Our Machines*, 1–2.

56. William Fielding Ogburn, *You and Machines* (Washington, DC: Civilian Conservation Corps, 1934), 3, 52; For further discussion of this pamphlet, see Bix, *Inventing Ourselves Out of Jobs?*, 53–56.

57. Miles J. Breuer, “Paradise and Iron,” in *The Man with the Strange Head and Other Early Science Fiction Stories*, ed. Michael R. Page (Lincoln: University of Nebraska Press, 2008), 44–256, 86. Originally published in *Amazing Stories Quarterly*, Summer 1930, 292–363. The phrase “mathematical robots” came from the story description, presumably written by Gernsback. It can be found on 293 in the original publication.

58. Breuer, “Paradise and Iron,” 235–36.

59. Breuer, 237.

60. Everett Franklin Bleiler, with the assistance of Richard J. Bleiler, “Harl Vincent,” *Science-Fiction: The Gernsback Years* (Kent, OH: Kent State University Press, 1998), 451.

61. Harl Vincent, “Rex,” in *War with the Robots*, ed. Isaac Asimov, Patricia S.

Warrick, and Martin H. Greenberg, (New York: Wing's Books, 1983), 50–67, 57, 51. Originally published in *Astounding Stories*, June 1934, 143–54.

62. Vincent, "Rex," 58.

63. Vincent, "Rex," 65.

64. F. A. Merrick, "The Machine Myth," *Electric Journal* 30, no. 2 (February 1930): 65–66.

65. Merrick, "The Machine Myth," 65.

66. Chas. R. Riker, "Our Mechanical Slaves," *Electrical Journal*, 24, no. 2 (February 1927), 53–54.

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69. "Eddy Currents," *Electric Journal* 34, no. 9 (September 1937): 379; "Eddy Currents," *Electric Journal* 28, no. 4 (April 1931): 256.

70. "Here's Petite Katrina, Brought Here for Daily Cooking Show," *Decatur Daily*, April 25, 1930, 2.

71. "Electrical Robot to Do Household Tasks at Gold's," *Lincoln Sunday Star*, May 3, 1931, A8.

72. Advertisement, *Van Wert Daily Bulletin*, December 3, 1931, 2.

73. "Opportunity Great for Mechanical Wonder of the World," *Coronado Citizen*, November 30, 1939, 11.

74. "Opportunity Great for Mechanical Wonder of the World," *Coronado Citizen*, November 30, 1939, 11.

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77. "The Event of the Season," *La Crosse Tribune and Leader Press*, March 10, 1935, 11.

78. For further discussion of the statue at the Chicago exposition, see Cheryl R. Ganz, *The 1933 Chicago World's Fair: A Century of Progress* (Champaign: University of Illinois Press, 2008), 56–57; and Dinerstein, *Swinging the Machine*, 142.

79. *Mickey's Mechanical Man*, directed by Walt Disney (Walt Disney Productions, 1933); For analysis in the context of the era's comedy, see Michael North, *Machine-Age Comedy* (New York: Oxford University Press, 2009), 53–83.

80. *Modern Inventions*, directed by Walt Disney (Walt Disney Productions, 1937).

81. David Nye, *American Technological Sublime* (New Bakersfield, MA: MIT Press, 1994), 206–7; For more on the fair, see Warren Susman, “The People’s Fair: Contradictions of a Consumer Society,” in *Culture as History: The Transformation of American Society in the Twentieth Century* (New York: Pantheon, 1984 [1973]).

82. Schaut, *Robots of Westinghouse*, 91–133, 201–5.

83. Westinghouse advertisement, reprinted in Schaut, 112.

84. The use of Middleton references Helen and Robert Lynd’s 1929 study *Middletown*. Robert S. Lynd and Helen Merrell Lynd, *Middletown: A Study in Modern American Culture* (New York: Harcourt, Brace and Company, 1929).

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86. *Middleton Family at the New York World’s Fair*, 33:55–37:40.

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89. Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace, 1934), 281, 453, 426–27, 294–95, 422.

90. Nye, *American Technological Sublime*, 207.

91. Warren I. Susman, “The People’s Fair: Cultural Contradictions of a Consumer Society.”

92. See *The City*, directed by Ralph Steiner and Willard Van Dyke (American Documentary Films, 1939).

93. Nye, *American Technological Sublime*, 213; Frank Monaghan, *Official Guide Book of the New York World’s Fair, 1939* (New York: Exposition Publications, 1939), 43.

94. *To New Horizons* (General Motors, 1940); video available at Handy (Jam) Organization, 23 minutes, <http://www.archive.org/details/ToNewHor> 1940. For further analysis, see Nye, *American Technological Sublime*, 218.

## Chapter 6

1. Woodmen of the World Life Insurance, advertisement, *Wonder Stories*, December 1931, 820.

2. See Aldous Huxley, *Brave New World* (New York, Perennial Classics, 1932); and John W. Campbell (as Don A. Stuart), “Twilight,” *Astounding Stories*, November 1934, 44–58.