THE AMERICAN ROBOT

A Cultural History

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Symbolizing the Machine Age

On October 9, 1922, the New York Theater Guild performed a play unlike any previously seen on American stages. The play's author, a Czechoslovakian named Karel Čapek, was virtually unknown in the United States. The play's title, *R.U.R.*, was indecipherable; the explanation of the acronym, *Rossum's Universal Robots*, did nothing to illuminate the subject. Unlike in Eastern Europe, where the term was a Slavic variant of a word that referred to serfs, most Americans had no idea what a "robot" was prior to that night; by the end of the play, audience members had at least a vague understanding of the term and, within a decade, so did most of their compatriots. While only a small number of people saw *R.U.R.*, the word *robot* percolated through US culture during the decade. Spread by fiction writers, reporters, businesses, filmmakers, and intellectuals, the robot had fully entered the lexicon by the start of the Great Depression as the quintessential symbol of the machine age—and it never left.[1]

R.U.R. and its robots began as the idea of a cosmopolitan Czechoslovakian attempting to comprehend the Great War and the Russian Revolution. Born in a small Bohemian town in 1890, Čapek trained as a philosopher and critic but soon began writing fiction, often with the help of his brother Josef, a cubist painter. Before the war, the broth-

ers lived in the modernist meccas of Paris and Vienna, where they encountered the ideas of men and women like themselves attempting to adjust art to the machine. During the war, Čapek avoided military service due to a spinal injury and instead attended lectures, including some by disciples of John Dewey. For Čapek, the crisis started by World War I seemed like the final stage of the same disease: the decay of the soul in the name of mechanical efficiency. The combination of the war and the Russian Revolution seemed to herald the fate of all societies if the disease were not cured. Eschewing both capitalism and socialism in favor of pragmatism and the ascetic spirituality of Leo Tolstoy, Čapek was skeptical of utopian goals, whether promoted by religious figures, business leaders, scientists, or radicals. He looked to human tolerance and labor to improve the world, not technology, luxury, or revolution.[2]

In *R.U.R.*, the titular company mass-produces and sells artificial, biological laborers that their inventors engineered for maximum efficiency. Echoing modern optimism for science and invention, Rossum's scientists, managers, and engineers proclaim that the robot heralds a new post-scarcity world in which, as the company manager, Harry Domin, argues, "there'll be no more poverty. . . . Everything will be done by living machines. People will do only what they enjoy. They will only live to perfect themselves."[3] Though predictions of abundance and self-improvement come true, they yield dangerous consequences. After robots take over the economy, the birth rate drops so precipitously that virtually no children are born. Governments replace soldiers with robots; wars, now with minimal human costs, grow common. Yet, as robots become essential for production and armed with weapons, they develop consciousness once Helena Glory, a social reformer determined to give them rights, has a scientist manufacture a soul for them. This proves disastrous when the robots—now conscious of their enslavement—rebel. The ensuing war unfolds offstage but concludes on Rossum's island headquarters with its human inhabitants surrounded by a mob of faceless robots. The rebellious slaves kill all but the one resident with whom they identify, a manual laborer named Alquist who preaches that the toil of labor forms the basis of the soul. But before the robots' victory, Helena, feeling guilty for the consequences of her antislavery rhetoric, burns the only copy of their formula. As the epilogue begins, the robots, lacking sexual

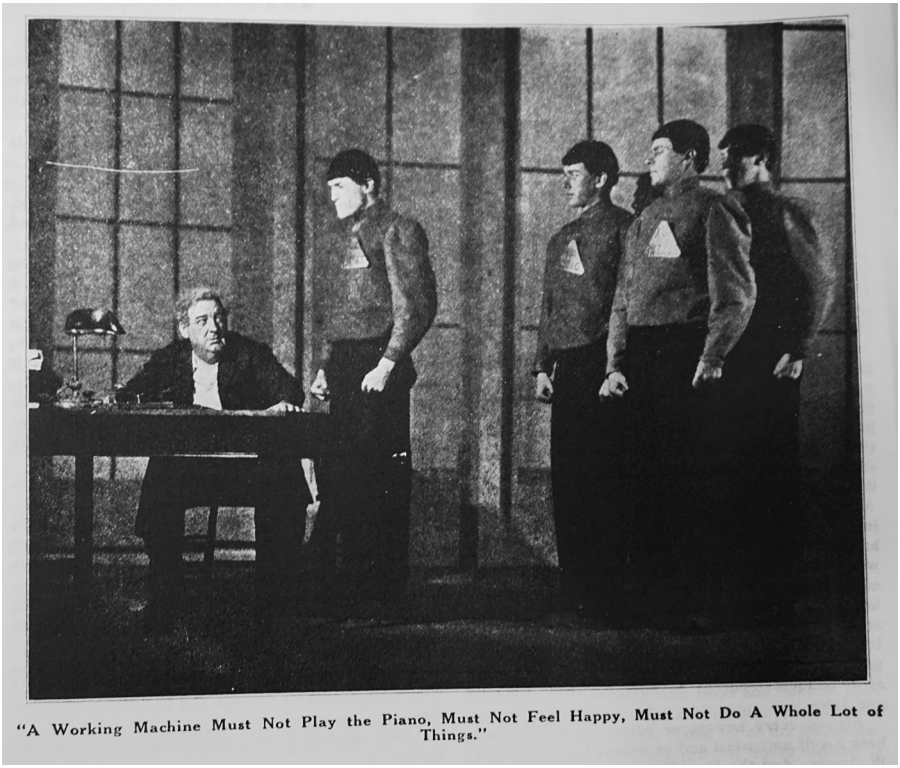

Fig. 4.1. Photograph of the original Theater Guild production of *R.U.R.* included in *Labor Age*'s positive review. Note both the appearance of the robots in the typical worker uniform and the way that the chosen caption—a quote from Domin—frames the story as about a manager's conception of robots: "A working machine must not play the piano, must not feel happy, must not do a whole lot of things."

organs, appear doomed to extinction. While Alquist vainly attempts to recreate the formula, Providence steps in. Two robots miraculously learn to love and overcome their biological deficiency to become the new Adam and Eve. Though humanity is extinct, the new children of God inherit the Earth.

Part satire, part monster, part revolutionary, and part slave, Čapek's robot was an industrial horror appropriate for the aftermath of World War I and the Russian Revolution. But not all Americans accepted the play's pessimism. Far more distant than their European counterparts from the previous decade's slaughter, Americans of the 1920s appropriated the robot to fight their own battles and tell their own stories. Drawing on ambiguities from the play, some Americans

saw the robot as a symbol for the inherently degraded nature of the working class; others more sympathetic to workers saw the robot as a satire of the way that managers and engineers stereotyped and objectified unskilled laborers; still others rejected the robot as a symbol of workers and adopted it as a symbol of technology. As commentators debated the robot's meaning, they transformed it into the central symbol of the dangers and possibilities of an era self-conscious about the growing might of automatic machinery, and both frightened and enchanted by the emergence of a society dedicated to mass production and leisure.[4]

Americans already had symbols that could have filled such a role. Numerous writers invoked Frankenstein's monster to address the seemingly suicidal nature of modern life, especially when describing the Great War and its aftermath. Indeed, the organic nature of Čapek's robots seemed to suggest that the playwright had merely updated Shelley's tale for an age of mass production and consumption. Yet, the robot was not solely a Frankenstein monster. American adaptors, critics, commentators, fiction writers, and even corporations preferred to imagine and depict it as a metal machine closer to the mechanical men of late nineteenth- and early twentieth-century culture than an organic being. But even that antecedent seemed inadequate. For many, the robot was not a mechanical man but a mechanized one, a person turned into a mindless, emotionless machine by the degrading effects of assembly line labor. Both meanings—the robot as machine and the robot as worker—tapped into long-standing debates previously synthesized by the automaton. But though some used the terms interchangeably, the robot was not exactly an automaton either. Real automatons were orderly and predictable in ways that an emerging Jazz Age celebrating spontaneity and accepting of uncertainty was not. Powered by an internal source and occasionally displaying intelligence, robots could move seemingly at will. As halting and jerking as their movements could be, their random rhythms conveyed autonomy much better than the regular loops of automatons.[5]

The robot's debut during the waning of Victorianism and the waxing of modernism enabled critics from multiple perspectives to embrace it as the central symbol of the problems and possibilities of a new era.[6] Though the play is dystopian, the robot itself could also be utopian; it could stereotype workers or satirize those stereotypes; it

could critique mass production for destroying workers' humanity or support it for bringing them leisure. Nearly human, the robot could address class, race, or both; it could be gendered and sexualized in ways that no other machine could. It could be dumb or intelligent; emotionless or driven by emotion. It could be evoked in popular culture or by intellectuals writing in scientific journals and speaking at conferences. Though people disagreed on its precise meanings, the robot quickly became an icon that most Americans could understand. Amid great anxiety about destruction and uncertainty and hope for leisure and the cultural revival it might inspire, the robot synthesized the divergent strands of a machine age culture that people desperately longed to comprehend.[7]

The Uncanny Machine Age

If any man inspired consciousness of the machine age, it was Thomas Edison, the celebrated inventor of the electric light bulb and power generation, recorded sound, and motion pictures.[8] As he sat with a reporter in 1910 to tell of his plans for an "automatic clerkless shop," Edison articulated the ethos that had driven his adult life and that would soon echo through the obsession with robots: "This is the machine age. . . . Wherever man's power or horsepower can be eliminated, speed, accuracy, and economy are the result. . . . Eventually, nearly everything in this world will be got down to a mechanical basis. That will mean that we can live easier and cheaper." His new shop would fulfill that vision, for it would contain "no shopkeepers, no clerks, no boy to wrap-up packages." Without human workers, Edison prophecized, "there will be no wasting of time in talk, no pricing of articles nor any sampling. Shopping will be an exact, speedy, and business-like proposition." Such a shop could reduce prices for every good and enable the poor to enjoy a purchasing power equivalent to his, a hugely successful businessman. The problem of class divisions would be solved by removing merchants and making the efficient machine the only element between producer and consumer. This "Samaritan Market," he concluded, was a "sure thing" to help the poor because it would "help a man to help himself. He puts his nickel in the slot and has no one to thank." Shorn of their dependence upon unnecessary people, Edison argued, people would finally be free to help themselves.[9]

Stated baldly, Edison's ethos of efficiency sounded ridiculous, but it echoed real and imaginative efforts to rationalize consumption. In the late nineteenth century, farmers' movements sought to remove the middleman between producer and consumer who charged producers more for factory-made goods and gave them less than they could receive for the products they sold.[10] In Edward Bellamy's contemporaneous *Looking Backward*, future Americans shopped at stores that replaced the shopkeeper with machinery.[11] Real life mimicked such visions. Early twentieth-century Philadelphians and New Yorkers could purchase food at automats, a German invention that relied on machinery rather than cooks and waiters to distribute food and drink. By the 1920s, an emerging vending machine industry preached of its ability to offer "automatic retailing" in which automatons would offer pleasure at the drop of a coin.[12] Amid mass advertising and opulent department stores, a simple device that could distribute goods without "waste" was appealing to those who continued to believe in the simplicity and frugality of republican life.

Though dreams of automatic retailing persisted, such stores never dominated the landscape. Automats remained confined to the largest of cities, while the vending machine industry concentrated on small items and mechanical arcade games.[13] Despite numerous attempts to create automatic stores, the luxury and opulence of conventional retailing remained attractive. Indeed, America in the machine age seemed more dominated than ever by advertising, luxury, excess, and the wasting of time in frivolous pursuits.[14] Edison's specific vision failed, but the tension between his ethos of mechanical efficiency and the excesses of mass consumption and leisure would inspire much of the debate over robots and the cultural transformations they might cause.

In the machine age, practically every realm of human life seemed mechanized in the pursuit of efficiency. Since the late nineteenth century, work in mines, on farms, in factories, and in offices had centralized and accelerated. Despite labor union efforts to provide workers with power on the shop floor, the pursuit of lower costs and larger markets encouraged the electrification of machinery and new organization techniques—including the assembly line—that rapidly increased productivity.[15] The home, once seen as a refuge from the mechanical world of work, was transformed as electrification enabled

middle-class families to add washing machines, refrigerators, vacuum cleaners, electric irons, toasters, radios, and alarm clocks. The number of Americans who owned such machines was limited—in 1930, only an estimated 25 percent owned a washing machine, 30 percent a vacuum cleaner, and 40 percent a radio—but an advertising industry that grew from an estimated $682 million in sales in 1914 to nearly $3 billion in 1929 extended technology's influence with messages of efficiency and the liberation from labor.[16]

Efforts to increase productivity combined with workers' movements to reduce the number of hours of work per week while raising wages. Average work hours dropped from 48.3 hours per week in 1900 to 44.8 in 1915 in the unionized building trades, and from 59 hours to 55 in manufacturing. Across the entire economy, work hours fell from about 60 hours per week in 1900 to below 50 by 1920. By the end of the decade the eight-hour workday—long desired by workers and their unions—had become standard, and many salaried workers gained annual vacation time. Despite the lower hours, manufacturing employees saw their wages rise from an average of $435 a year to $568 across the same period. Much as advocates had predicted, machinery had ended the age-old choice between increased leisure or increased wages. In the machine age, men and women could have both.[17]

The man most associated with the new ways of organizing work was Henry Ford. In 1913, Ford opened the first full-fledged assembly line at his Highland Park, Michigan, plant to produce the Model T. Synthesizing elements of production found in other industries, Ford and his engineers connected a highly subdivided labor force, interchangeable parts, electrical drive shafts to ensure a continuous supply of power, the sequential ordering of tasks, and the ultimate symbol of the line: the belts and slides that moved tasks to the worker. The line could produce an automobile in an astonishing 93 minutes (down from twelve hours when the cars were assembled by traditional methods in 1909) that could then be sold for as low as $300 in the 1920s—cheap enough that Ford's workers could purchase one. Recognizing the potential of mass consumption far better than earlier businessmen, Ford famously paid his workers $5 a day, double their prevailing wage before the advent of the assembly line. But efficiency also meant product standardization; until 1925, consumers could purchase one model in only one color, dark blue, or, later, black. By

standardizing both process and product while paying workers more, Ford offered a simple solution to the problem of degrading industrial labor: compensate workers through leisure and consumption.[18]

Leisure became commercialized and mechanized as well. In cities, the spread of dance halls, movie theaters, professional sports teams, and amusement parks accompanied the growing centralization, standardization, and regimentation of labor as workers welcomed the liberating potential of amusement. In riding the first roller coasters at Coney Island or dancing the cakewalk, grizzly bear, or fox-trot to the syncopated rhythms of ragtime and improvisation of jazz, young Americans' bodies mimicked the acceleration they experienced in the workplace. The mechanization and individualization of transport with first bicycles and later automobiles gave men and women a sense of empowerment, speed, and pleasure. In attending films that intercut time and space and shifted perspectives, they saw a reality of motion projected on a screen in ways that seemed vaguely unreal.[19]

The unreal nature of much of the modern amusements encouraged critics to draw stronger lines between human and machine that centered on authenticity. Responding to the emergence of Edison's phonograph, the "March King" John Philip Sousa wrote in 1906 that "talking and playing machines . . . reduce the expression of music to a mathematical system of megaphones, wheels, cogs, disks, cylinders, and all manner of revolving things, which are as like real art as the marble statue of Eve is like her beautiful, living, breathing daughters." Contrasting "the mathematical and mechanical" with "the emotional and the soulful," the band leader suggested that no machine could play the nationalistic and romantic music that he favored with the depth found in the soul. Eighteenth- and early nineteenth-century listeners had frequently praised the precision of automaton music performances, but precision was not enough for Sousa; music needed soul.[20]

The need for soul in an age of efficiency further encouraged the growth of mass amusements and a celebration of leisure as the defining feature of identity.[21] In the early twentieth century, reformers placed play at the center of human life and identity, especially for children. Far more than the subdivided and deskilled workplace, play allowed children the freedom to develop themselves while socializing them for an urban society. Yet, the kinds of play that re-

formers recommended differed substantially from commercialized amusements. Advocating playgrounds, sports such as basketball that could teach teamwork, hobbies, nature trips, and traditional dances, reformers sought to maintain Victorian links between leisure and self-improvement. By the 1920s, interest in children's leisure had extended into the adult realm as corporations such as the National Cash Register Company provided workers with recreational outlets as compensation for the monotony of work, and as a means of preventing unionization through the building of a community in the seemingly more equitable pursuit of fun.[22]

Yet, to critics, the growth of commercialized amusements threatened the possibility of using leisure to improve self and society. Throughout the era, intellectuals and social critics spoke of the "leisure problem," the sense that people devoted too much time to mindless, individualistic pursuits rather than more productive forms of leisure that could reinvigorate the self and community.[23] This was part of the anxiety that shaped David Keller's "The Threat of the Robot," as he was horrified that people might watch football alone in their homes rather than in a stadium with their fellow citizens. Magnifying this anxiety was that many of the most popular trends—including dances, jazz, and film—originated in the cultural expressions of African Americans and immigrants and were frequently most enjoyed by the young, regardless of race, class, or gender. To be sure, older, white, and male cultural authorities exercised general control and censorship, but in the dance halls, cinemas, and amusement parks, they could not contain everything.[24]

The growing cultural authority of disadvantaged groups was part of a much larger blurring of the lines and categories that had dominated Victorian life. By the twentieth century, science had shattered predictable laws of the universe and suggested a world that was less deterministic and purposeful, less Sousa-esque and more improvisational like jazz. In biology, Darwinism merged with the science of hereditary to transform evolution from a study of the development of higher forms of life into a study of inheritance, a transformation that gave scientific credence to arguments for biological and racial determinism. In physics, quantum mechanics and Einstein's "special theory of relativity" meant the world was both more complex, random, and indecipherable than previous generations had assumed. In

mathematics, philosopher and scientist Charles Sanders Peirce advocated replacing the search for absolute proof with statistical probabilities that acknowledged a degree of uncertainty, a transformation that echoed through the philosophy of pragmatism he shared with William James and John Dewey that emphasized adjusting idealisms, preconceptions, and beliefs to real-world results. By the time the German physicist Werner Heisenberg codified his uncertainty principle in 1927, uncertainty had been a dominant element of intellectual life for three decades.[25]

The growth of uncertainty and sharper distinctions between the real and the artificial inspired feelings of the uncanny, especially from automatons. Coined in the nineteenth century, the term *uncanny* was theorized in the early twentieth by psychologists Ernst Jentsch and Sigmund Freud who each associated it with German author E. T. A. Hoffmann's 1816 short story "The Sand-man," in which a man falls in love with a harpsichord-playing, singing-and-dancing female automaton only to be driven mad when he realizes her mechanical nature. Locating its origins in the tension between the human need for "intellectual mastery" over the environment, Jentsch described the uncanny as "a dark feeling of uncertainty" that arises in moments of "doubt as to whether an apparently living being is animate and, conversely, doubt as to whether a lifeless object may not in face be animate."[26] Focusing on the automaton, he observed that such a "feeling of unease" grew worse as the mechanism improved and the device appeared "truer to nature."[27] Freud extended this analysis by arguing that the "uncanny effect is often and easily produced by the effacing the distinction between imagination and reality, such as when something that we have hitherto regarded as imaginary appears before us in reality, or when a symbol takes over the full functions and significance of the thing it symbolized."[28] Despite their differences, both Freud and Jentsch associated the uncanny with a tension between the scientific ethos to master nature and the persistence of the unexplainable—particularly, the animation of material objects that should not, according to reason, move. Unifying anxieties about the uncertain and the unreal, the uncanny captured a sense that modernity was turning the fake real and the real fake.[29]

Americans rarely associated uncanny feelings with automatons prior to the late nineteenth century. In Julian Hawthorne's 1868 story

of a dancing automaton, the audience responded enthusiastically, not horrifically, to its lifelike nature. Yet, early twentieth-century Americans frequently invoked the uncanny to describe the feelings inspired by both the automaton and people who acted like automatons. One reporter noted that a shoe-salesman automaton's "eyes are remarkably strong, and looking intently at his expressionless orbs gives one an uncanny feeling."[30] When storefront dress models threatened to strike, newspapers reported on French automatons that might take their jobs. "Naturally it is uncanny to see these figures move or even to see them lounging in such extraordinary life-like positions," one article stated. "Everybody who sees them has the same sensation at first—and it is a sensation with a twinge or something startling and awkward in it." Yet, they continued, the uncanny feelings created by the appearance of life in matter were not permanent: "One gets the joke, and especially one gets the final comfortableness of having wax, rubber and machinery do the work."[31] Uncanny feelings could arise around people who seemed inert. In the syndicated "Confessions of a Bride" column from World War I, a wife described the situation with her husband who had recently returned from the war in France. "He is no nearer recognizing me as his wife, or any of the family associates of the months before the war," she wrote, "than he was the first day he returned from France. It is as uncanny to his physicians as to the rest of us. Like a rational, flesh-and-blood automaton he moves among us. . . . Sentiment is dead within him."[32] In America at least, the uncanny was a feeling tied directly to the way that modern life—including both commercialism and war—seemed to empower the machine and destroy the individual soul.

The fear that the machine age had destroyed the soul led American writers to call for a reinvigoration of the nation's culture. Drawing on nineteenth-century intellectual traditions, critics such as Randolph Bourne, Van Wyck Brooks, Waldo Frank, and, later, Lewis Mumford worried that industrial life destroyed both the individual and community. As Bourne noted in 1914, "The clerk dulled and depressed by the long day, and the factory worker—his brain a-whirl with the roar of the machines—must seek elation and the climax which the work should have given them, in the crude and exciting pleasures of the street and the dance and the show."[33] Frank made the connection even clearer. The machine, he argued, was "the god of the American world,"

while industrialization had destroyed "the American soul and made it poor"; this "sagging, uncreative world," he concluded, "bore witness to the fate of human spirit in a civilization which could persist alone by the denial of experience, by the mechanization of Desire."[34] Only cultural reinvigoration through a synthesis of the spiritual and material, such intellectuals argued, could reinvigorate America's "beloved community."

When *R.U.R.* premiered, the tensions between empowered machinery and the seemingly disempowered individual had been growing in importance for decades, but it was World War I and the Russian Revolution that underlined their potential danger. As commentators searched for meaning, they frequently turned to Mary Shelley's *Frankenstein* as a symbol of the out-of-control nature of modernity.[35] But the preindustrial *Frankenstein* was not quite the right symbol. It was materialistic but not consumerist; ugly and monstrous, it was not quite uncanny like the dolls and automatons Jentsch and Freud discussed; an individual rather than part of a mass crowd, it threatened its master, not all of humanity. In *R.U.R.*, audiences found their modern *Frankenstein*. As John Corbin caustically wrote in his negative *New York Times* review, "Having been worn threadbare in the country of its origin, the Frankenstein metaphor has reached Czechoslovakia and has there achieved a social consciousness—has become, in fact, class conscious."[36] Shelley's tale had been an intimate affair between father and son, but Čapek offered a grand melodrama with a conclusion perfect for a world confronting not just war and revolution but an entire culture transformed by mass production and consumption: mass extinction.

Class, Race, and the American Robots

The year 1922 was an inauspicious one for a radical Czechoslovakian play to open in America. Suspicion of foreigners had only increased after the Great War arising from a series of bombings that suggested immigrants were intent on transporting the Russian Revolution to the United States. In the South and the Midwest, the revived Ku Klux Klan had won supporters by proclaiming "one hundred percent Americanism" and attacking African Americans, Catholics, Jews, and other "un-American" groups. In the 1924 Johnson-Reed Act, the federal

government implemented a system of quotas to limit immigration of Eastern Europeans, among other groups. Though the nativist heat would dissipate, its energy empowered a broader conservative ascension that repudiated earlier reforms and decimated labor unions and other groups that threatened the interests of capital.[37]

Despite, or perhaps because of, the political environment, *R.U.R.* was a hit that spread from New York to other cities, including Los Angeles, Chicago, and Berkeley. The *New York Sun* called it a "magnificent melodrama, superbly portrayed and directed." The *Oakland Tribune* dubbed it "the best melodrama to be presented on any stage this decade" and "the strongest piece of writing that has graced the American stage in ages." Favorable reviews appeared in the literary magazines *Colliers Weekly* and *Harper's Bazaar*. Worker organizations such as the Industrial Workers of the World (IWW) praised the play. The League for Industrial Democracy's *Labor Age* claimed that "for anyone interested in the questions of the present day, the play is thoroughly worth while." American author and socialist Carl Sandburg called it "significant, important, teasing, quizzical, funny, terrible, paradoxical," and compared it to "the strongest plays of Henrik Ibsen."[38] In a syndicated review originally written for *Vanity Fair*, radical journalist Heywood Broun praised the play's combination of melodrama and ideas, even though he found the ending "self-consciously sweet."[39] Religious magazines—particularly those outside of evangelical Protestantism, such as the *Christian Century*, *Jewish Forum*, *Catholic World*, and *Universalist Leader*—echoed this enthusiasm. Just a year later, Doubleday published the play to similarly rave reviews. Within a year, the Goldwyn Company acquired the movie rights, though the play would not find its way to the silver screen.[40] Revived throughout the 1920s and 1930s and periodically thereafter, *R.U.R.* was one of the most successful radical plays of the era.

But what its robot symbolized was unclear. Physically and thematically, Čapek's robot resembles artificial humans such as Frankenstein's monster more than the mechanical men of American culture. Even so, *R.U.R.* merged the two types. The original inventor, "old Rossum," used chemistry to create an artificial human; but his engineer son, young Rossum, streamlined the design to make the robot more fit for work. "A man," Domin later quotes young Rossum, "is something that feels happy, plays the piano, likes going for a walk, and in fact, wants

to do a whole lot of things that are really unnecessary. . . . When he wants . . . to weave or count." Removing such capabilities, according to the factory managers, turned the robot from an artificial person into a machine. "Robots are not people," Domin insists. "Mechanically they are more perfect than we are, they have an enormously developed intelligence, but they have no soul."[41] Unlike the inventor, his son and the later executives believe in a soul, but associating that soul with culture and leisure rather than work enables them to dismiss concerns about worker well-being. In the satire of the play, they, like Frederick Winslow Taylor, see workers as material objects to control rather than autonomous individuals capable of their own creativity. In its original production, the Theater Guild reinforced that viewpoint by costuming the actors as uncannily uniform men with identical haircuts, black pants, and gray shirts with a triangle-shaped logo.[42] While Domin and his coworkers might think the robot is a machine, the performance stressed the devices' similarities to human workers.

Most writers initially understood the robot a symbol of potentially revolutionary workers, but they disagreed on the nature of the problem and its solution. *Colliers* framed Charles W. Wood's review under the headline "Workmen Made to Order" because he spent much of it lamenting how "practical education" merely fits workers "scientifically to their jobs" rather than teaching the whole person.[43] In such a reading, the problem of rebellious workers was caused by their lack of culture, a deficiency that education, not workplace reforms, could cure. Others, however, saw a need for a more significant restructuring of society. In 1926, a manager at the Philadelphia Rapid Transit Company, which was experimenting with worker ownership of the company, pointed to a copy of *R.U.R.* and said, "This is what we are coming to—Robotism—if we continue to let men produce like machines, with no more incentive than to increase their speed and to get higher pay. . . . Make this vast army of workers the owners of the machinery of production and they will become more sturdy of character. Then we can rest assured that they will never do as Russians did."[44] America, the manager suggested, did not need to merely improve the education of workers; it needed to empower them by giving them control over the workplace.

The organization to see the greatest revolutionary potential in the play and its central symbol was the IWW, the era's most radical and

inclusive of unions.[45] Writing in the organization's *Industrial Pioneer* magazine, Rosa Knuuti described the play as a "lurid and . . . ironical melodrama around the theme of the class struggle—the degradation of the present-day industrial worker into a veritable mechanical working machine."[46] Čapek, she judged, had "rendered a great service to mankind by so dramatically calling the attention of all who have eyes to see and brains to understand, to this aspect of the class struggle."[47] Later that year, another writer for the magazine identified the workers in Ford's plants as "robots," not because they were dehumanized, but because Ford wanted labor that was "Robotized," made more efficient through the removal of components not necessary for production.[48] The next year, the publication used the term to describe the "contempt" the press held "workers in" by printing ridiculous beauty and health advice as well as literary and philosophical "bunk."[49] In a later issue dominated by stories about technological unemployment, the publication reprinted a speech by its editor in front of a branch of the IWW. "Labor," he argued, "is regarded as a Robot, a mechanically adjusted creature, devoid of understanding and emotion, whose only mission in life is to produce wealth and die in warfare when necessary for those whose profit it is waged, namely, the capitalist class."[50] The robot's ideological power, IWW writers argued, came from its ability to satirize how employers and their supporters dehumanized and objectified workers.

But middle-class radical publications rejected the play for engaging in the same type of stereotyping that IWW writers thought it ridiculed. In the *Nation*, Ludwig Lewisohn praised the Theater Guild's production but found the play's logic to be a "complete absurdity" because "on the one hand we have the assumption that men can be reduced to the level of mere machines which, in the nature of things, would not revolt at all; on the other hand we are told that these helots will revolt against slavery, oppression, their own soulless estate, which at once reinvests them with all the passions, powers, and thoughts from which the triumphs of civilization . . . draw their origin."[51] The *Single Tax Review* similarly found the play "sophomoric" and asked, "Are we to understand that Mr. Čapek would have the R.U.R. represent the workingmen of the world rising in rebellion against their masters? If so why should he suggest that their victory will be speedily followed by their own extinction? That doesn't seem plausible." The only expla-

nation the reviewer could imagine was that "even the progressive Theater Guild would not have stood" for a complete victory by the workers.[52] Unlike Knuuti, such critics found nothing humorous or ironic in the play. Taking it seriously, they saw the robot as a misguided symbol of the proletariat, not as an absurdist satire.

The problem with imagining the robot as a worker was that if viewers did not understand the joke, the play risked implying that nothing could fix the problems of industrial society. This was the crux of Corbin's critique of the play in the *New York Times*. Five days after his initial review, Corbin contrasted *R.U.R.* with the, in his view, superior anti-machine satire of New Zealand writer Samuel Butler's 1872 novel *Erewhon* that had become an increasing part of the conversation about machinery over the preceding decade. While Butler had critiqued the importance of the machine in human life, Corbin claimed that Čapek made "the great enemy of mankind . . . the human beings that civilization has doomed to an eternity of feeding it—the so-called proletariat." Citing the example of the Russian revolution as evidence, he argued that "the true enemy of civilization is not the machine, but the mechanized human being—dwarfed in intelligence, stunted in sympathy, swayed by the only idea one can ever derive from the seamy side of the industrial fabric, the idea of soulless mastery, sheer physical power." Though he assumed that Čapek was a socialist, Corbin called him "constructively a Nihilist" and questioned whether he really meant "to tell the Workers of the World that better men than they can be made out of salt, sand, and the white of an egg?"[53] Later, in response to reader criticisms that he dismissed the play too quickly, Corbin reiterated that the play's logic suggested that "all effort to improve the lives of factory workers" will lead to "the annihilation of civilization."[54] By constructing a monstrous icon that symbolized workers rather than machinery, Čapek implied that nothing except extinction could resolve the issues of industrialization—and Corbin was far too optimistic to accept that fate.

What Corbin grasped that few other reviewers appreciated was that in America, race was essential to understanding the robot. *R.U.R.* did not explicitly address race but as biologically distinct laborers, robots could easily encourage viewers to adopt a racial view of the creatures. This was especially true in a diverse country such as the US, where employers frequently segregated jobs by race and justified

harsh treatments of workers with claims of their innate inferiority.[55] American industrial advocates had long associated labor they found degrading with those whom they deemed racially inferior, just as they had long applied machine metaphors to those same workers. One of the era's most frequent defenses of Fordism, even among liberals, was that only people biologically suited to mindless work would end up working on assembly lines. As one engineer wrote in *American Machinist*, "Most people do not want to 'express themselves,' and are much happier with somebody else taking the responsibility. The stolid look is a generic one. Such men are built stolid; they would be stolid on a farm."[56] After *R.U.R.*, people had a new term with which they could dehumanize entire groups of people based on a presumption of inferiority: robot. "If 'R.U.R.' is an indictment against the stupidity of our capitalistic class," a Broadway producer wrote, "it is equally an indictment against the crass ignorance of our working class."[57] Or, as both a critic and a supporter of industrialization later explained, the industrial laborer is a "natural robot."[58]

Corbin recognized the centrality of race to the robot in America by entitling his essay "The Revolt against Civilization," a reference to a recent book by the eugenicist, biological-determinist, and anti-immigration activist Lothrop Stoddard. Corbin, or his editor, chose that title because he thought that the robot "concretely symbolized and dramatically focused" Stoddard's arguments.[59] *The Revolt against Civilization* expanded claims Stoddard made in his more famous 1920 book *The Rising Tide of Color against White World-Supremacy*, which explained how Chinese and Japanese industrialization as well as nonwhite population growth would imperil the global supremacy of white nations. Stoddard also worried, however, that materialism had created a "profound *malaise*" that led, in a direct parallel to *R.U.R.*, to a declining birth rate "which affected nearly all white nations."[60] In *Revolt against Civilization*, he looked within industrial societies themselves, especially Russia, to explore how a biologically inferior underclass threatened the core of white civilization. Stoddard's arguments were deeply controversial, but they reflected a much larger racial anxiety felt by white Americans of the time, including, at least partially, Corbin.[61] In that context, the robot could easily merge stereotypes of race and class in a way that confirmed assumptions of the inherent biological inferiority of others. A potentially revolutionary icon sanc-

tioned by some of the most radical writers in America, Čapek's robot could have deeply challenged the central ideology and class divisions of industrial capitalism. But it ultimately did not; instead, it foundered on the same shoal that had wrecked many American radical and labor movements: race.[62]

Culture and the Autonomous Machine

But the robot also faltered as a radical symbol because people quickly associated it with the amazing power of technology. Even before *R.U.R.*'s premier, American writers invoked the mechanical man to symbolize the autonomous power of machinery. In 1922, after observing Ford's assembly line, journalist Arthur Pound announced, "This is the century of the automatic machine. The social problem is to accommodate the use of automatic machinery to the well-being of the masses; our political problem is to avert class and state wars growing out of quarrels over the profits, powers, and privileges accruing through the production and marketing of goods." He then explained his chosen symbol and the title of his book: "Much of our modern heart-searching leads down to the Iron Man at the base of the industrial structure. He claims the twentieth century as his; the social and economic forces that he releases are those most likely to carry on into the future the reality of our day." Anthropomorphizing the automatic machine, Pound gave it agency, power, and manhood. It—not the people who tended it or even who owned or managed it—determined the course of material and moral development.[63]

The stakes Pound established were high. Because automatic machinery would make everyone efficient, it could level wages to give everyone a similar level of consumption. Echoing the optimism of Tench Coxe and later advocates of industrialization, he argued that America could achieve equality by letting the iron man work its mechanical magic. But, he warned, the iron man could also destroy democracy, especially if government did not direct its development. "America's high duty," he professed, "is to guide the continuing evolution of the Iron Man intelligently. . . . Governments now stake their existences upon controlling men: in the dawning age, the acid test of sovereignty may be control of machines. Through such control, the leveling tendency, inherent in automatic production and reinforced

by popular education, may be directed toward the goal of true democracy; whereas, undirected, it may push the human race into a new slavery, or stampede it into a new anarchy."[64] The choice for Pound was clear: government had to exercise "moral control" over the iron man if democracy was to survive.[65]

Yet the specter haunting Pound's analysis was not machinery, but alienated workers. Observing men feeding materials into an automatic machine, he reiterated earlier warnings: "There is a stirring within him [the worker] which informs him, even before the voice of the agitator reinforces the conviction, that this is no life for a real man. He gets, literally, no fun out of his labors." By removing joy and creativity from work, Pound argued, repetitive movements "starved" men "in their souls," which led them to seek "sedatives" in the form of mass amusements. But because those sedatives did not teach thrift or self-restraint, people were growing selfish and destructive. Viewing modern work as unfulfilling and leisure as destructive, Pound joined numerous other intellectuals in embracing "education for leisure" as a way of promoting self improvement. "Unless our American gentlemen and gentlewomen appear in due time and in sufficient numbers," he concluded in words that would reverberate through *R.U.R.*, "civilization will be wrecked by machine-made barbarians, unable . . . to replace what they have destroyed."[66] For Pound, the only possible response to the danger of the alienated worker was cultural reinvigoration.

Published shortly before *R.U.R.* debuted in October, *The Iron Man in Industry* raised many of the issues that would dominate the play as well as later interpretations of the robot, including the way it drew attention to technology rather than capitalism as the problem of modern life. Pound did recognize the power of capitalists to shape the introduction of machinery, but his symbol and title transformed the machine into the central character. The contrast with the Progressive Era's most influential economist, Thorstein Veblen, was telling. The titles of the works that framed Veblen's life employed the terms *leisure class* and *price system* that directed attention to class and capitalism. In the 1920s and early 1930s, works such as Stuart Chase's *Men and Machines*, Floyd Dell's *Love in the Machine Age*, and Ralph E. Flanders's *Taming Our Machines*, joined Pound's *The Iron Man* in directing attention to technology.[67] Much like Pound's, such works cri-

tiqued other elements of American life—including capitalism—but embraced the machine as the dominant source of change and, frequently, cultural transformation as a solution.[68] In doing so, they shifted popular conversation away from capitalism to a topic that was far safer—for both businesses and the writers—in the aftermath of the Russian Revolution and the Red Scare: the relationship between technology and culture.

The first American film about an automaton was typical of this rhetorical shift. In 1919, Rolfe Photoplays released a fifteen-part serial entitled *The Master Mystery* that starred escape artist Harry Houdini as Quentin Locke, a Department of Justice agent investigating International Patents, Inc., for antitrust violations.[69] The company's executives made their vast fortunes by accumulating patents from independent inventors, promising to manufacture and market the devices, and then simply letting the inventions rot in a basement. In the first episode, the film introduces an automaton in which a human brain can be transplanted to give the machine consciousness and the human a more powerful body. Upon seeing a prototype, the company president tells the inventor that the device is "ridiculous, and even if possible, it would be of no use except as a terrible engine of destruction." Yet, after another executive and the automaton's inventor attempt to cooperate with Locke's investigation, viewers see a life-size version of the automaton trudging up the stairs to murder the two men. Locke spends the entire serial building his antitrust case while escaping from various traps set by henchmen and the automaton. When Locke finally defeats the device and unmasks it, he reveals that rather than a full automaton or even a human brain implanted into a machine body, it is merely a disguise: Houdini's most frightening enemy is not a machine but a wealthy monopolist so committed to destroying the potential of machines that he dressed up as one.

The plot and characterization of *The Master Mystery* indicted monopolistic corporations and capitalists, but its iconography indicted the machine. The very definition of the "idle rich" that Veblen critiqued in his *Theory of the Leisure Class*, the villainous executives of the series luxuriate in opulent mansions while depending on the hard labor of others and preventing the manufacture of technologies that could aid the public.[70] The celebration of Houdini's Locke as a bureaucrat nobly performing the public's work to break up a monopoly

Fig. 4.2. Promotional image for *The Master Mystery* that shows the fake automaton, or "Iron Terror," directing its henchmen as they capture Harry Houdini's investigator and his love interest (played by Marguerite Marsh). Image captured by Robert Zinck, Widener Library, Harvard University.

similarly drew on Progressive Era endorsements of neutral experts as protectors of the public interest. Yet, Rolfe's advertisements and most of the film identified the automaton as the agent of horror. Numerous posters and published stills showed Houdini and his love interest menaced by the monstrous "Iron Terror."[71] Though the final episode revealed the truth, the bulk of the film's materials focused on the machine.

While *The Master Mystery* continued to indict the leisure class, others suggested that the primary solution to the problem of the machine age had to be cultural.[72] In his 1922 book *Social Change with Respect to Culture and Original Nature*, Columbia University sociologist William F. Ogburn coined the phrase *cultural lag* to refer to the tendency of cultural values and institutions to adjust slowly to changes in material conditions. For Ogburn, "the rapidity of change in mod-

ern times" caused by the "increase in inventions" created "maladjustments" between cultural values and social institutions, and perhaps even between human nature and modern life. "Where one part of a culture changes first, through some discovery or invention, and occasions changes in some part of culture dependent upon it," he noted, "there frequently is a delay in the changes occasioned in the dependent part of a culture."[73]

Ogburn relied on an emerging anthropological definition of culture that was far more inclusive than Pound's definition. Whereas Pound wanted individuals to acquire culture, Ogburn quoted the anthropologist Edward B. Tylor's definition of culture as "that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society." Ogburn included "material culture" in this definition, but cultural lag depended on distinguishing it from other forms. Changes in material culture, he argued, "force changes in other parts of culture such as social organization and customs, but these latter parts of culture do not change as quickly. They lag behind the material-culture changes."[74] In making such a distinction, Ogburn adopted a social form of mind/body dualism in which material culture provided a society's body and immaterial culture provided its mind and soul. What was needed to solve the problems of modernity was not revolution but a gradual reconciliation between the two.

German modernist Fritz Lang's 1927 film *Metropolis* similarly called for a cultural solution to the problem of the machine. Inspired by Lang's view of the New York skyline, *Metropolis* depicts a mechanized society divided into a white ruling class that plays in the skies above the earth and a darker working class that toils underground.[75] Fully dehumanized, workers shuffle as a faceless army with their heads bowed in servitude to the clock until their bodies are sacrificed to a fiery mechanical god the film names after the Old Testament's Moloch. The workers are known by numbers rather than names and lack all individuality and independence. Even this mechanization is not efficient enough for the wealthy. When the workers, influenced by the rhetoric of a saintly woman named Mary, begin to plot a revolution, the Henry Ford–like leader John Masterman hires the scientist Rotwang to mass-produce a "machine man" to replace his workers.[76] To thwart the revolution and rid the world of workers, the two kidnap

Mary, transfer her form and visage onto the machine man, and then use the doppelgänger to inspire the workers to attack the machines and unleash a flood that will destroy the entire underground city and its inhabitants. His workforce exterminated, Masterman can replace it with Rotwang's machine men and the ruling class can enjoy even greater levels of pleasure.

While Masterman and Rotwang hatch their plan, Masterman's son Eric ventures into the underground city in search of Mary, whom he has envisioned in a dream. Once there, he discovers that his pleasure depends on the harsh lives of the workers and begins to try to ameliorate their situation. Before he can convince his father, however, Rotwang kidnaps Mary, transforms the machine man into a highly sexualized duplicate of her, and unleashes it.[77] It then incites the workers to attack the machines and unleash floodwaters upon their homes and children.[78] Eric, however, saves the real Mary, the workers, and the children before killing Rotwang. Upon discovering the reality of machine Mary, the crazed workers burn it at the stake and remove any threat to their jobs. As Masterman, Eric, and a nameless worker clasp hands to make peace, Lang's concluding message appears on the screen: "There can be no understanding between the hands and the brains unless the heart is the mediator."[79] Only a religiously inspired sentimentality, Lang proposed, could solve the problems of the industrial age.

When framed in the socialism/capitalism debate, *Metropolis*'s message was muddled, especially after American censors cut lurid scenes of opulence. Reviewers found the film's technical achievements noteworthy but consistently complained about its "unimaginative" and "perplexing" story.[80] The film's depiction of the lives of the rich and poor pointed to a class analysis, while its focus on machinery—from the opening images of pistons, to clocks, the machine Moloch, and its mechanical woman—seemed to indict technology. Its sentimental ending endorsed stereotypes of managers as "heads" and workers as "hands" while the failure to include Mary alongside Eric as the "heart" suggested that only men's sentiment mattered. Yet, the film's repeated emphasis on spirituality and feeling drew from the broad critique of materialism and the call for new values that could bring a divided community together. Once again, culture became the solution to the problems of industrial capitalism.

But reviewers also thought that the machine man Lang indicted could be the solution to the plight of workers. The American version of *Metropolis* never uses the term *robot*; however, many of its reviewers did—to describe the mechanical Mary. In his *New York Times* review, Mordaunt Hall identified the fake Mary as a "Robot woman."[81] *Popular Mechanics*, which had never used the term previously, printed photographs of Mary in both human and robot form next to a blurb that read: "A new German Film, Based on the Old Robot Story, in Which a Mechanical Person, Created by an Inventor, Becomes a Frankenstein Monster, Has Been Produced in Germany."[82] In his review that newspapers reprinted across the country, H. G. Wells sardonically remarked that "Rotwang the inventor is making a Robot, apparently without any license from Čapek."[83] By identifying the machine Mary as a "robot," such publications shifted the meaning of the term from a worker to a technology. "Mechanical civilization has no use for mere drudges," Wells wrote. "The more efficient the machinery the less need there is for the quasi-mechanical minder. . . . The whole aim of mechanical civilization is to eliminate the drudge and the drudge soul." The film, he observed, failed to acknowledge that technology had brought wealth to the masses: "Unless the masses of the population have spending power, there is no possibility of wealth in a mechanical civilization. A vast, penniless, slave population may be necessary for wealth where there are no mass production machines, but it is preposterous with mass production machines."[84] In Wells's review, the robot is not a dehumanized worker but the technological savior of the worker. Domin in *R.U.R.* could not have said it much better.

Men and Machines

Few men captured the emerging hopes and anxieties for the humanized machine as well as the radical journalist Stuart Chase. Born in New Hampshire in 1888, Chase attended MIT and Harvard, where he acquired both technical expertise and a liberal arts education.[85] After graduation, he worked as an accountant in Boston but soon joined the Federal Trade Commission and later the Labor Bureau. Service in such institutions regulating the American economy fit well with Chase's political leanings. Before the war, he dabbled in Henry George's single-tax plan and socialism, and afterward embraced Veblen's sug-

gestion that engineers, as experts on production, should have political power in the machine age. In 1925 he began a series on waste for the *New Republic* in which he found that America wasted 50 percent of its manpower in advertising, sales, and idleness. Concentrating on efficient production rather than wasteful advertising and selling, Chase argued, would ensure a higher standing of living for all Americans.[86] Praised by liberal writers across the country, the series transformed Chase from an obscure bureaucrat into a chief advocate of centralized planning.

In 1929 Chase published *Men and Machines*, a collection of essays that explored the question of whether the machine liberated or enslaved men.[87] Chase could not hide his obvious esteem for machinery, but he identified a litany of accusations that he considered valid, including the mechanization of warfare; worship of money; and increases in technological unemployment, advertising, mental diseases, accidents, and class divisions. His most vigorous critique, however, focused on the transformation of workers into "robots." Chase devoted an entire chapter to "the mechanism of flesh and blood first heard of in a Czechoslovak play, toward which, it is alleged, all men are moving." Connecting the robot to Ford's assembly line, he agreed that such work was degrading, unhealthy, and dangerous, but used statistics to show that only a small number of American workers encountered such toil. Of those small number, he continued, many were biologically suited for the toil because they lacked the physical capabilities to perform other jobs. Paraphrasing a French investigator of American factories, he argued that "many [workers] have the gorilla appearance, but on tabulating their nationalities, he [the investigator] finds them to be stolid peasants from Russia, Poland, Roumania. Many of the immigrants who are tending our machines were born with a dumb look."[88] American factories, Chase argued, transformed few men into robots, and most of those were so racially or physically inferior that they appreciated it.

Though Chase believed that industrialization had improved American life, he still depicted machines as "a billion wild horses" that threatened to stampede and destroy humanity. "Man is not the slave of his machines," he wrote, "but he has allowed them to run unbridled, and his next great task is, by one method or another, to break them to his service." To explain how to bridle machines, Chase

posed a hypothetical: suppose that "you, dear reader," were an American dictator. Such a dictator should suppress machines where they harm human civilization; threaten the life, limb, and psychology of people; overly tax natural resources by overproduction; waste labor by selling products rather than making them; encourage passive rather than active entertainment; or produce shoddy goods. Furthermore, he concluded, the dictator should establish a central location where engineers, economists, and mechanics could oversee the national economy because "machines, like horses, can be tamed only by men who understand them." After establishing a government by experts, the dictator should seize resources and redirect scientific inquiry to researching "serious" devices that would free workers from drudgery. Chase admitted such centralization might hamper progress, but he was fine with that possibility. As he glibly remarked, "I am willing to put off that promised trip to Mars for a few years in exchange for a city planned for comfortable and civilized living."[89]

Chase was no fascist like Keller's fictional Ed Ball or the real dictators of Europe, but it is revealing that centralization was the only solution he could even imagine. Chase was fundamentally uncertain about what direction to pursue. In the machine age, it seemed, every person operated, as on the Western frontier, for his or her own self; but in the machine age it also seemed as though individualism and thus male identity had been destroyed. Something was needed to restore both the individual and the community and to reconcile machinery and soul, but Chase could not imagine how this could be done without greater centralization. Unlike cultural critics, he saw no possibility of creating a new culture that could fuse the material and the spiritual and give men the purpose and meaning they had supposedly experienced prior to industrialization.

Chase did, however, offer a solution that men such as Edison, Ford, and the fictional Domin would have appreciated—a device that people, without any sense of danger, had already started to call a robot. As the end of his history of the machine, Chase introduced "Mr. Televox," a white mechanical man produced by the Westinghouse Electric & Manufacturing Company that could flip electrical switches on or off by hearing orders over the telephone. "The ghost of James Watt must have shuddered down the years—for he was a kindly

man—as the bodies of women, men, and little children were broken in the dismal caverns where his engines pounded," Chase stated, "but for Mr. Televox his back must straighten and his hand go gladly to the salute."[90] What America needed, Chase suggested, was not revolution or even cultural reinvigoration; all it needed was robots. And Westinghouse would provide them.

4. David H. Keller, *The Kellers of Hamilton Township: A Study in Democracy* (Alexandria, LA: Wall Printing, 1922).

5. John Cheng, *Astounding Wonder: Imagining Science and Science Fiction in Interwar America* (Philadelphia: University of Pennsylvania Press, 2012), 17–50, 85.

6. See David H. Keller, "Revolt of the Pedestrians," *Amazing Stories*, February 1928, 1048–59; David H. Keller, "The Psychophonic Nurse," *Amazing Stories*, November 1928, 710–17; David H. Keller, "The Female Metamorphosis, *Science Wonder Stories*, August 1929, 246–63, 274.

7. On the romance of the dictator in the era, see Benjamin Alpers, *Dictators, Democracy, and American Public Culture: Envisioning the Totalitarian Enemy, 1920s–1950s* (Chapel Hill: University of North Carolina Press, 2003), 15–58.

8. On the history of the word *technology*, see Ruth Oldenziel, *Making Technology Masculine; Men, Women, and Modern Machines in America, 1870-1945* (Amsterdam: Amsterdam University Press, 1999), 19–50; Eric Schatberg, "'Technik' Comes to America: Changing Meanings of 'Technology' before 1930," *Technology and Culture* (July 2006): 486-512; and Leo Marx, "The Idea of 'Technology' and Postmodern Pessimism," in *Does Technology Drive History: The Dilemma of Technological Determinism by Merritt Roe Smith and Leo Marx* (Cambridge, MA: MIT Press, 1994).

9. Keller, "The Threat of the Robot," 97.

10. Ralph E. Flanders, *Taming Our Machines: The Attainment of Human Values in a Mechanized Society* (New York: R. R. Smith, 1931).

Chapter 4

1. For an account of opening night, see Gilbert Seldes, "The New York Letter," *Washington Post*, October 15, 1922, 66.

2. Biographical details taken from Iwan Klíma, introduction to *R.U.R. (Rossum's Universal Robots)*, by Karel Čapek (New York: Penguin Books, 2004), vii–xxv.

3. Summary and direct quotations from the play are taken from the original translation used by the Theater Guild: Karel Čapek, *R.U.R. (Rossum's Universal Robots)*, trans. Paul Selver (Garden City, NJ: Doubleday, 1923), 51.

4. Tobias Higbie, "Why Do Robots Rebel? The Labor History of a Cultural Icon," *Labor: Studies in Working-Class History* 10, no. 1 (Spring 2013): 99–121. Much of this chapter is in conversation with Higbie's fascinating argument for the transformation of the meaning of the term *robot* from "worker" to "machine." I agree with much of Higbie's analysis but concentrate more on larger debates regarding leisure and culture as the solution to the problem of the robot.

5. Joel Dinerstein, *Swinging the Machine: Modernity, Technology, and African*

American Culture between the World Wars (Amherst: University of Massachusetts Press, 2003), 29–62.

6. For overviews of American modernism, see Lynn Dumenil, *The Modern Temper: American Culture and Society in the 1920s* (New York: Hill and Wang, 1995); Paul Murphy, *The New Era: American Thought and Culture in the 1920s* (New York: Rowan & Littlefield, 2012); Richard Pells, *Modernist America: Art, Music, Movies, & the Globalization of American Culture* (New Haven, CT: Yale University Press, 2011); and David Shi, *Facing Facts: Realism in American Thought and Culture, 1850–1920* (New York: Oxford University Press, 1995), 275–302.

7. There is an extensive literature on machine-age anxieties, but in this chapter, I am predominantly drawing on Dinerstein, *Swinging the Machine*; and, for its relationship to politics, Richard Pells, *Radical Visions and American Dreams: Culture and Social Thought in the Depression Years* (Middletown, CT: Wesleyan University Press, 1973), 1–42.

8. For more on Edison, see Maury Klein, *The Power Makers: Steam, Electricity, and the Men Who Invented Modern America*; and Carroll Pursell, *The Machine in America: A Social History of Technology*, 2nd ed. (Baltimore, MD: Johns Hopkins University Press, 2007), 203–28.

9. "An Automatic Clerkless Shop," *Washington Post*, May 22, 1910, MS2. For more on automatic retailing in the period, see Susan Strasser, *Satisfaction Guaranteed: The Making of the American Mass Market* (Washington: Smithsonian Books, 1989), 203.

10. Charles Postel, *The Populist Vision* (New York: Oxford University Press, 2009), 121–30; Michael McGerr, *A Fierce Discontent: The Rise and Fall of the Progressive Movement in America* (New York: Oxford University Press, 2003), 48–49.

11. Edward Bellamy, *Looking Backward*, *2000–1887* (Boston: Houghton Mifflin Company, 1926), 100–109.

12. See, for instance, "Drug Store Installs Automatic Section of 52 Robots," *Automatic Age*, February 1930 53–55.

13. For the larger context on such automatic retailing, see Ann Satterthwaite, *Going Shopping: Consumer Choices and Community Consequences* (New Haven, CT: Yale University Press, 2001), 40.

14. William Leach, *Land of Desire: Merchants, Power, and the Rise of a New American Culture* (New York: Vintage Books, 1993), 298–348. For the most extensive analysis of advertising in the period, see Roland Marchand, *Advertising the American Dream: Making Way for Modernity, 1920–1940* (Berkeley: University of California Press, 1985).

15. David Nye, *America's Assembly Line* (Cambridge, MA: MIT Press, 2013), 13–38.

16. Gary Gerstle, *American Crucible*: *Race and Nation in the Twentieth Cen-*

tury (Princeton, NJ: Princeton University Press, 2001), 125; Dumenil, *Modern Temper*, 88–89. For more on home appliances in the period, see James D. Norris, *Advertising and the Transformation of American Society* (New York: Greenwood Press, 1990), 71–94; and Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York: Basic Books, 1983), 151–91.

17. McGerr, *A Fierce Discontent*, 250–51. On the tradeoff between wages and hours, see Benjamin Kline Hunnicutt, *Work without End: Abandoning Shorter Hours for the Right to Work* (Philadelphia: Temple University Press, 1988), 9–36; and Gary Cross, *Time and Money: The Making of Consumer Culture* (New York: Routledge, 1993), 99–127.

18. Nye, *America's Assembly Line*, 13–38; David A. Hounshell, *From the American System to Mass Production, 1800–1932* (Baltimore, MD: Johns Hopkins University Press, 1984), 217–61. On the five-dollar-day specifically, see Stephen Meyer III, *The Five Dollar Day: Labor Management and Social Control in the Ford Motor Company, 1908–1921* (Albany: State University of New York Press, 1981), 95–122.

19. On the rise of commercialized and technological amusements, see Roy Rosenzweig, *Eight Hours for What We Will: Workers and Leisure in an Industrial City, 1870–1920* (New York: Cambridge University Press, 1985); Kathy Peiss, *Cheap Amusements: Working Women and Leisure in Turn-of-the-Century New York* (Philadelphia: Temple University Press, 1986); David Nasaw, *Going Out: The Rise and Fall of Public Amusements* (Cambridge, MA: Harvard University Press, 1999); McGerr, *A Fierce Discontent*, 248–78; Lary May, *Screening Out the Past: The Birth of Mass Culture and the Motion Picture Industry* (Chicago: University of Chicago Press, 1983); and Sarah Hallenbeck, *Claiming the Bicycle: Women, Rhetoric, and Technology in Nineteenth-Century America* (Carbondale: Southern Illinois University Press, 2016).

20. John Philip Sousa, "The Menace of Mechanical Music," *Appleton's Magazine*, September 1906, 279.

21. On the rise of this "leisure ethic," see William Gleason, *The Leisure Ethic: Work and Play in American Literature, 1840–1940* (Stanford, CA: Stanford University Press, 1999); Gary Cross, *Kids' Stuff: Toys and the Changing World of American Childhood* (Cambridge, MA: Harvard University Press, 1997), 50–81; Hunnicutt, *Work without End*, 109–46; McGerr, *A Fierce Discontent*, 248–78.

22. Sanford Jacoby, *Modern Manors: Welfare Capitalism since the New Deal* (Princeton, NJ: Princeton University Press, 1997), 14–16. For more on the growth of leisure as compensation for labor, see Hunnicutt, *Work without End*, 67–108; and Cross, *Time and Money*, 15–45.

23. Hunnicutt, *Work without End*, 109–46.

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60. Lothrop Stoddard, *The Rising Tide of Color: The Threat against White World-Supremacy* (New York: Scribner's Sons, 1921), 158, 160.

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67. Dinerstein, *Swinging the Machine*, 29–62.

68. Pells, *Radical Visions*, 19–21.

69. See Harry Grossman and Burton L. King, *The Master Mystery* (Rolfe Photoplays, 1920).

70. See Thorstein Veblen, *The Theory of the Leisure Class: An Economic Study of Institutions* (New York: Macmillan, 1912), 35–67.

71. For another advertising photo, see *The Master Mystery*, 1919, McManus-Young Collection, Rare Book and Special Collections Division, Library of Congress, reproduction nos. LC-USZ62-66393, LC-USZ62-64313, http://www.loc.gov/pictures/item/96520687/.

72. Pells, *Radical Visions*, 4–5.

73. William Fielding Ogburn, *Social Change with Respect to Culture and Original Nature* (New York: B. W. Huebsch, 1922), 200–201.

74. Ogburn, *Social Change*, 196. For more on the larger redefinition of culture, see Susan Hegeman, *Patterns for America: Modernism and the Concept of Culture* (Princeton, NJ: Princeton University Press, 1999); Howard Brick, *Transcending Capitalism: Visions of a New Society in Modern America* (Ithaca, NY: Cornell University Press, 2006), 86-120; and Murphy, *The New Era*, 28–37.

75. *Metropolis*, directed by Fritz Lang (Universum Film, 1927). The analysis here is based on the American cut of the film.

76. "Metropolis Film Seen," *New York Times*, January 11, 1927, 36. The names included here come from American reviews of the version of the film shown in America, which had been rewritten by Channing Pollock.

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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.

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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

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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.