Introduction

The Technological Imaginary of Imperial Japan

Japan as Techno-Superpower

In December 1990, Japan's Science and Technology Agency and the National Institute of Science and Technology Policy published a report titled *Historical Review of Japanese Science and Technology Policy*—a "post-war comprehensive history of Japan's science and technology policies." The report's purpose was ambitious: to educate the world about how Japan's science and technology policy had played an essential role in its economic and social development and to reflect on how Japan could adopt policies "aimed at not only creating a wealthy nation but a wealthy world as well."[1] The report was written during the 1980s "economic bubble" era, when Japan was viewed as the global leader in technology and technical innovation in such areas as consumer electronics, automobiles, semiconductors, manufacturing technology, and robotics. Numerous books with such sensational titles as *The Technopolis Strategy: Japan, High Technology, and the Control of the Twenty-First Century* and *Japan as a Scientific and Technological Superpower* detailing Japan's unique approach to economic development appeared during this time.[2] Kodama Fumio, dean and professor of engineering management at the Shibaura Institute of Technology, described Japan's model of promoting technological innovation as one that represented a global "techno-paradigm shift" and went so far as to credit the Japanese cassette tape recorder, videocassette recorder, and fax machine for making possible the Iranian and Philippine revolutions and the Tiananmen uprising.[3] Thus, in the 1980s and early 1990s, Japanese

technology and technology policy were widely seen as a progressive force for social development and economic prosperity—and in some cases, even democratic values.[4]

Japan became the world's largest foreign aid donor by 1989 and kept that position for the first decade of the post–Cold War era. In 1995, Japan's overseas development assistance spending reached $14.5 billion, almost double the U.S. figure for that year.[5] Much of this aid consisted of technical assistance not only in the form of goods but also in technical knowledge and personnel. These technical assistance programs began soon after the U.S. occupation ended in 1952 and first took the form of wartime reparations agreements with formerly occupied Southeast Asian countries. Typically, the Japanese government subsidized large-scale hydropower, transportation, or industrial projects, which in turn provided lucrative contracts to domestic construction and manufacturing firms, thereby providing a boost to the Japanese economy. In the 1960s, Japanese scholars even developed and publicized a stage theory of economic development based on the promotion of technology—the "flying geese model"—which governed Japan's foreign policy in Asia through the 1990s. According to this model, in the first stage an underdeveloped country imports manufactured goods from a more advanced nation (i.e., Japan), which promotes industrial development. Import substitution constitutes the second stage, and when that country begins to produce manufactured goods for export in surplus, it enters the third and final stage. The history of Asia's development seemed to prove this theory of industrial growth through technology transfer and import substitution. Longtime receivers of Japanese technical assistance South Korea, Taiwan, Hong Kong, and Singapore became known as the "Four Tigers," followed by "secondary emerging markets," such as the Philippines, India, Indonesia, Thailand, and China.[6] Thus, the aggressive promotion of technology not only was essential to Japan domestically but also has played a prominent role in its foreign policy.

For the Japanese government and its admirers, technology and technology policy represented a modernizing, progressive force that was essential to Japan's national development and security throughout its modern history, as well as Asia's recent economic success. Technology was something to be instrumentally used and promoted to achieve national prosperity, innovation, and productivity. This familiar narrative of Japan's farsighted development of technology and a new "techno-nationalist"

paradigm constituted a pillar of Japan's modernization narrative built up by Japanese and Western scholars alike.[7]

Reconceptualizing Technology in Modern Japan

Constructing East Asia critiques this conventional narrative of postwar technological modernization by tracing its origins in the "technological imaginary" of wartime Japan in order to draw attention to some of the many ways that technology has operated as an ideology and a system of power throughout much of the twentieth century. By "technological imaginary," I mean the ways that different groups invested the term "technology" (*gijutsu*) with ideological meaning and vision. Rather than offering an overarching model or definition of technology, I examine how the discourse surrounding technology in wartime Japan developed and changed according to who was discussing it or what political objective that person or group had. This book expands the conventional modernization narrative of technology as an abstract, universal force for progress and prosperity by analyzing how a technological imaginary was formulated not only in relation to domestic capitalist development and wartime mobilization but also in close relation to colonial expansion and rule—an arena that has often been viewed as separate from the "main" trajectory of Japan's historical development.[8] The emergence of a discourse on technology among Japan's elites was also a process of "imagineering," a blending of creative imagination and technical expertise in the formulation of wartime and colonial policies, as well as the construction of numerous large-scale infrastructure projects designed to incorporate the hopes and desires of various peoples.[9] This book's main premise is that technology's employment as a mobilizing force during the wartime period through various policies and projects of imagineering continued as Japan transformed itself into a global technological superpower and an influential nation in international development circles after 1945. At the popular level, these continuities have been repressed by the conventional narrative of postwar Japan's economic miracle and rise into a major force for peace on the global stage.

Modernization theorists have typically depicted the wartime 1930s and 1940s as a "dark valley" of irrationality, spiritualism, and reactionary politics in Japan's modern history.[10] Postwar Japanese democratization, they have argued, rested largely on the gains of the U.S. occupation period

(1945–52). Since the 1980s, however, a number of works have demonstrated how the postwar Japanese democratic system in fact rested on many statist components developed during the wartime era. Some works have also shown how wartime authoritarianism and militarism were not simply ultraconservative reactions to liberal democracy but contained many modern and progressive characteristics as well. For example, Chalmers Johnson traces the origins of Japan's postwar "economic miracle" to the various techniques of industrial policy and planning formulated by economic bureaucrats in the prewar and wartime eras. John Dower provocatively calls the Asia-Pacific War a "useful war" in its development of key postwar institutions for high-speed growth, such as the economic bureaucracy, semi-monopolistic business combinations, and the Japanese system of management and "cooperative" labor relations. Sheldon Garon argues that values of modernization, such as "progress, science, and rationality," allowed the state to develop techniques of "moral suasion" in the prewar era to mobilize civil society into a more authoritarian, managed social system during and after the war. *Constructing East Asia* focuses these earlier analyses of the relationship between "modernization" and authoritarianism by examining how modernization's most visible product—technology—operated as an ideology for wartime mobilization and colonial rule, which in turn shaped the course of postwar democratic Japan's history.[11]

To illuminate the relationship between technology and power, and thereby question the conventional, instrumentalist view of technology, this book borrows from the Frankfurt School's rich body of work on technology's political nature. Max Weber, for example, argued that the emergence of a Protestant ethic of discipline, calculation, and rationality in modern capitalism created a disenchanted order whereby people were "bound to the technical and economic conditions of machine production which to-day determine the lives of all the individuals who are born into this mechanism . . . with irresistible force."[12] Purposive and instrumental forms of activity, organization, and technology became embodied in large bureaucracies and administrations, building an "iron cage" of reason whereby people were transformed into "specialists without spirit, sensualists without heart." Formal systems of rationality that optimize calculability and control and were concerned with "efficiency of means" rather than "choice of ends" dominated people's everyday lives.[13] Thus, for Weber the formation of a technological society was not so much a linear march of progress as modernization theorists have argued but a dehumanizing and

inescapable process of rationalization. *Constructing East Asia* incorporates Weber's argument by examining how technology constituted a widespread force of rationalization that in turn shaped the nature of power in war-time Japan.

Technology in wartime Japan did not simply represent an oppressive force of rationalization but actively mobilized the people for state goals as well. The work of Herbert Marcuse and Jürgen Habermas is important to this book's argument that technology is a system of power, as they have suggested certain ways that technology has dynamically incorporated people's hopes and desires into mechanisms of social control. Marcuse, for example, linked the spread of technical rationality to the naturalization of capitalist relations of domination. For him, technology "provides the great rationalization of the unfreedom of man and demonstrates the 'technical' impossibility of being autonomous, of determining one's own life." Whereas Weber emphasized an oppressive "iron cage of reason," Marcuse described capitalist domination as "submission to the technical apparatus which enlarges the comforts of life and increases the productivity of labor."[14] Habermas elaborated on Marcuse's formulations by noting how a perva-sive "technocratic consciousness" or logic of "purposive-rational action" expands outside the realm of economic activity and reproduces itself at the level of social systems into which people are functionally integrated.[15] "[Politics] is oriented toward the elimination of dysfunctions and the avoidance of risks that threaten the system: not . . . toward the *realization of practical goals* but toward the *solution of technical problems*," he argued.[16] As a result, the public sphere had become depoliticized and concerned more with the system's proper functioning than with any practical vision of the "good life."[17] Technology for Habermas and Marcuse represented more than physical technology; it represented specific techniques of power and mobilization. Their theoretical conclusions are significant because they help capture an important political dynamic at work in wartime Ja-pan when new definitions of technology emerged and became predomi-nant in the public discourse.

Constructing East Asia demonstrates this political dynamic through an analysis of the influential groups and actors who shaped Japan's technological imaginary—intellectuals, technology bureaucrats, engi-neers, and state planners. Such Marxists as Aikawa Haruki articulated a notion of a technologized system society whereby the people's economic, political, social, and cultural lives were mobilized for radical social

transformation—including those in Japan's expanding empire. Technology bureaucrats like Miyamoto Takenosuke insisted on the importance of "social engineers" who incorporated technical expertise into national policy making, and put forth the notion of "technologies for Asian development" (*kōa gijutsu*) as a guiding vision for engineers to modernize and therefore "liberate" Asia from Western imperialism. Such engineers as Naoki Rintarō, Haraguchi Chūjirō, and Kubota Yutaka traveled to Japan's empire to escape bureaucratic red tape in Japan and developed concepts of "comprehensive technology" (*sōgō gijutsu*) and "national land planning" (*kokudo keikaku*)—coordinating and integrating such technical projects as urban planning, dam construction, flood control, and industrial development to bring about mutually sustaining relationships and benefits. Reform bureaucrats (*kakushin kanryō*—literally, "renovationist bureaucrats") like Mōri Hideoto formulated such notions as "economic technology" (*keizai gijutsu*) or policies designed by bold "economic technicians" to integrate Japan and its empire into an organic mechanism based on voluntarist "life organizations." As "technology" became a prominent word in Japanese public discourse during the 1930s, influential elites appropriated the term and expanded its conventional meaning as physical artifacts to include techniques of social organization and transformation.

Technology and Japanese Fascism

Technology in wartime Japan meant much more than simply advanced machinery and infrastructure; it included a subjective, ethical, and visionary dimension. As in Europe and elsewhere, from the early twentieth century, technology in Japan began to represent certain forms of creative thinking, acting, or being, as well as values of rationality, cooperation, and efficiency. Technology also lent itself easily to utopian visions of an egalitarian society without ethnic or class conflict. Particularly during the 1930s, as Japan was shifting from a light to a heavy industrial wartime economy, elites developed a more subjective view of technology as increasingly permeating and altering every aspect of life. This more subjective, practical, and mobilizing view of technology—the "technological imaginary"—guided a whole range of social actors (or "imagineers") from bureaucrats designing Japan's wartime managed economy to engineers planning and constructing massive colonial infrastructure projects, from Marxists struggling to make sense of Japanese capitalist development and

the possibility of revolution to cultural critics advocating the cultivation of a "neorealist" technological aesthetic in film and mass media.

Wartime Japan's technological imaginary represented a form of fascist ideology that employed familiar tropes of modernity and rationality rather than relying primarily on cultural appeals to spiritualism or ultranationalism. The technological imaginary left a particularly strong legacy on postwar Japanese society and foreign policy. Several scholars have examined the connections between technology and fascism in other contexts. Most notably, Jeffrey Herf has analyzed how such German "reactionary modernists" as Oswald Spengler, Ernst Jünger, Martin Heidegger, and Werner Sombart appropriated technical reason to pathological, irrational, and romantic ends of "community, blood, will, self, form, productivity, and finally race."[18] But Japanese elites did not merely "pervert" technology's inherent rationality by infusing it with irrationality and romanticism. Rather, in varying ways, they articulated a practical, a political, and an inventive notion of technology whereby different areas of life were rationally planned and mobilized to exhibit their maximum potential and creativity.

Instead of searching for some particular notion of "Japanese" technology, *Constructing East Asia* examines how Japanese elites actively incorporated utopian notions of technology from other contexts into their fascist ideologies. Charles Maier has made the connection between technology and fascism in the West by tracing how Taylorism in the early twentieth century spread beyond rationalizing factory work techniques to become a powerful political ideology of industrial management and social reorganization. "Scientific management" lent itself to visions of overcoming class conflict on both the left and the right in the early twentieth-century United States and Europe. According to these visions, society would be reorganized along the lines of a "coherent system" of "efficiency, optimality, enhanced productivity and expanded output." For example, in the United States during the Progressive Era, Charles Ferguson and Thorstein Veblen put forth the engineer as the ideal person to "impose optimality upon society" and end capitalist waste and class conflict. In France, "Saint Simonianism embodied a proto-technocratic ideology that rejected traditional class divisions in favor of the unity of all 'productive' and 'industrious' elements, bourgeois, peasant, and proletarian." In Italy, the Futurists envisioned the fascist state as a "dynamo," and therefore "more than a state." In the Soviet Union, communists celebrated technology's potential

to facilitate social revolution. Finally, in Germany, industrialist-engineers, such as Walther Rathenau and Wichard von Moellendorf, employed technological paradigms in pushing for a "planned economy" (*Planwirtschaft*) that would eliminate competition and transform capitalists into public employees. Thus, technology became a powerful signifier of social harmony, innovation, and efficiency all over the industrialized world, especially in the face of the crisis of capitalism and growing labor unrest during the Great Depression. Japanese elites did not reject these notions of technology and social management but incorporated them into their own fascist ideological programs.[19]

This book defines fascism as an ideology and mode of power translated globally into various national contexts that combined antimodern and modern elements for the revolutionary transformation and mobilization of society.[20] Although "fascism" has been a contentious term for English-language scholars writing on wartime Japan, those who have used it have often borrowed from Maruyama Masao's conception of "fascism from above." Maruyama believed that Japanese fascism in the end was spread not by a mass movement "from below" like in many European cases but by the state's various organs. Furthermore, Japanese fascism was "particular" in its emphasis on emperor-centered familialism, antimodern agrarianism, and emancipatory pan-Asianism.[21] Although English-language scholars have reformulated various points of Maruyama's thesis or have refused to use the term altogether, many have continued to emphasize the antimodern, authoritarian, and spiritualist or communitarian elements of Japanese fascism more than its rational, modernizing components.[22] In their frameworks, Europe constitutes fascism's original model according to which Japan always appears particular. For example, the lack of a charismatic leader or a mass fascist-style party or the continuity between Meiji institutions and those of the 1930s was seen as providing enough evidence to "prove" that Japan was not fascist.[23] Instead of deriving a standard model from the German or Italian experience, *Constructing East Asia* views fascism as a common set of ideas and programs that were translated into different national contexts.[24] Focusing solely on the particularities and minutia of a so-called pure model of fascism ignores fascism's importance as a broader historical force that developed simultaneously in different places. More important, a focus on fascist particularity in Japan overlooks common processes of modernization within fascism, such as rationalization, social reorganization, and the construction of a

technological imaginary as a form of power and mobilization that continued to have important effects after the war.

In her recent book on notions of "the scientific" among wartime Japanese elites, Hiromi Mizuno avoids the term "fascism" in favor of "scientific nationalism"—an ideology whereby "science and technology are the most urgent and important assets for the integrity, survival, and progress of the nation."[25] In her work on Japan's wartime reform bureaucrats, Janis Mimura aptly describes their ideologies as "techno-fascism"—a fusion of technical rationality, comprehensive planning, and modern values of productivity and efficiency with ethnic nationalism and right-wing ideologies of organicism. In various ways, she shows how techno-fascism aimed to transcend traditional Japanese political divisions and incorporate them within a larger politics of technocratic planning, which she briefly describes as a new "mode of power."[26] *Constructing East Asia* expands on Mizuno's notion of "scientific nationalism" and Mimura's suggestion about techno-fascism by arguing that the technological imaginary represented something more than a politics of nationalism and technocratic planning. In their techno-fascist or scientific nationalist ideologies, we also see the contours of another mode of power, one that was based more on harnessing the creativity and vitality of human subjects than solely on repression and violence. Within the ideas and policies of Japan's elites, power was not simply something that organized society from above, but dynamically shaped it from within through the productive practices of a whole array of institutions and people. Fascism was more than the existence of a totalitarian state; it also created a form of "molecular or micropolitical power" throughout everyday life that sought to preserve capitalism "without all of its consequences for class conflict, its alienating effects, instability, and cultural and economic unevenness," as Harry Harootunian argues.[27] *Constructing East Asia* examines how the technological imaginary articulated such a fascist mode of power.

Japan's Technological Imaginary

The figures and groups discussed in this book were at the vanguard of a wide range of Japanese elites who began to articulate a more subjective, utopian notion of technology from the 1920s. For example, American scientific management ideology was translated into the Japanese context and developed into the world-famous modern Japanese management

system after 1945. A number of engineers, managers, and bureaucrats in the prewar and wartime eras promoted the state-sponsored efficiency movement and the industrial rationalization movement (*sangyō gōrika undō*).[28] The notion of technocracy—rule by technical experts—also became popular during the early twentieth century. Technocracy's proponents included such heavy chemical industrial combine (*zaibatsu*) leaders as Nissan's Ayukawa Yoshisuke, who promoted the idea of multilateral "public holding companies" over private corporations, and Ōkochi Masatoshi of the Physical and Chemical Research Institute (*rikagaku kenkyūjo*; hereafter Riken), proponent of the philosophy of "scientific industry," and such reform bureaucrats as Mōri Hideoto, Okumura Kiwao, and Kishi Nobusuke, who developed a conception of technology as the efficient management of the economy and society. Engineers organized themselves into the Japan Engineers' Club (*Nihon kōjin kurabu*; hereafter, Kōjin Club) in 1920—becoming the Japan Technology Association (*Nihon gijutsu kyōkai*) in 1935—and began asserting that technology formed the basis of national culture and ethics. Heavily influenced by the New Deal in the United States and Nazi economic policies in Germany, they pushed an agenda of encouraging cooperation between labor and management, improving administrative and bureaucratic efficiency, increasing engineers' involvement in national policy-making positions, and intensifying East Asia's colonization. Their leader, Miyamoto Takenosuke, who became assistant director of the powerful Cabinet Planning Board, played a key role in drafting such important plans as the 1941 Outline for a New Order of Science and Technology.[29]

After World War I and the advent of total war, the military became a locus for new notions of technology and society. "Control officers" called for the establishment of a "national defense economy" that efficiently utilized natural resources and optimized industrial production for war. In alliance with reform bureaucrats and engineers, they proposed policies to organize society based on such principles of technology as rationalization and efficiency.[30] For example, Tada Reikichi, an officer who headed the Army Science Laboratory and later the Army Technology Bureau in the 1930s, viewed science and technology as essential components of the organic Japanese "national body" that the state had to actively develop to achieve victory in the current stage of evolutionary struggle among nations. He even envisioned Japan as an organic "electronic fortress" equipped

with advanced radar technologies (the state's eyes) as well as remote control and guidance systems (the state's limbs) that reacted promptly to any foreign military threat. To attain this advanced state, the government's technology bureaucracy had to be centralized and the nation's research apparatus integrated to rapidly develop the necessary technological innovations.[31]

Broader utopian conceptions of technology permeated the social sciences as well. In sociology, Matsumoto Junichirō and Hayase Toshio introduced to Japan the ideas of the technocracy movement and their importance for the New Deal in the United States, socialism in the Soviet Union, and fascism in Germany.[32] In economics, Ōkuma Nobuo emphasized the study of techniques related to the reproduction of human labor as well as material production, and Ōkochi Kazuo argued for the introduction of policies to promote private consumption as well as production. These studies crystallized into a wider discipline of the "life sciences," which helped increase the scope of state technocratic control for wartime mobilization.[33] In political science, Rōyama Masamichi defined technology as the "tactics of managing human life" and applied technology to administrative reform. Rōyama argued that through the adoption of rational management techniques in administration, technological consciousness and method would begin to hold sway in administrative conduct and eventually spread to local government and the numerous organizations governing daily life.[34]

Philosophers conceptualized technology as praxis, imagination, and creation ("subjective technology") in order to articulate new potentialities of sensation and subjectivity within modern life. From the 1920s, the philosopher Nishida Kitarō used the term "technology" as a synonym for *poiesis* or what he called "acting intuition" (*kōiteki chokkan*), which concerned the simultaneous self-formation of the subject and the formation of the world.[35] Along these lines, the philosopher Miki Kiyoshi wrote in a 1938 essay, "Technology is the act of making things. The common essence of technology is to make things, whatever they may be, whether they are tools, machines, mental and bodily forms, social systems or ideas."[36] Thus, he equated technology with the production of all areas of life. The philosopher of science Shimomura Toratarō viewed the human body as "an organism that in some fashion uses machines as its own organs" and criticized other Japanist philosophers involved in the famous 1942 Overcoming

Modernity symposium who simplistically dismissed science and technology as "Western" and therefore "inauthentically Japanese."[37] The Marxist philosopher Tosaka Jun defined technology as a dynamic "mass intelligence," comprising the innumerable skills, techniques, and practices that were not confined to the factory but emerged within modern everyday life.[38] The aesthetics philosopher Nakai Masakazu incorporated the language of cinema into his analyses of media technology's effects on subjectivity. He viewed the modern human body as "similar to a palace filled with mirrors that infinitely reflect and project various things such as light, sound and words off of each other" and articulated a notion of "technological time" of mass invention and creativity.[39] Japanese society's increasing permeation by various technologies undermined contemporary attempts by other prominent philosophers, such as Watsuji Tetsurō and Kuki Shūzō, to posit an "authentic" Japanese subjectivity supposedly untouched by "Western" modernity.

From the 1920s, technology in the form of radio, film, mass-circulating magazines, journals, and newspapers also radically transformed cultural expression and people's subjective experience. The spread of mass media technologies signified the formation of a technological culture full of new aesthetic sensations and possibilities. For many, modernity's most visible product—the machine—infused all areas of life, yet not in an alienating manner as labor unions or right-wing ideologues often proclaimed. Cultural commentators celebrated the new experiences of "speed, shock, sensation, and spectacle" that new mass media technologies embodied. The Marxist critic Hirabayashi Hatsunosuke explored the specific ways that cinema, radio, and mass detective novels brought art and culture closer to the masses, and generated possibilities for the emergence of a "people's culture" imbued with a scientific, critical attitude.[40] The film critic Imamura Shōhei wrote that the emerging documentary film aesthetic of the 1930s ("culture films") possessed "a fresh, original perception of the life of the machine, a poetic originality with regard to the machine, a new yearning for the machine."[41] The avant-garde artist Murayama Tomoyoshi argued for the necessity of "loving the beauty of the bluntly courageous machine," and his MAVO movement consciously employed the technically manufactured materials of modern industrial society in their artistic work to break down barriers between art and everyday life.[42] Miriam Silverberg examines how the emergence of mass-mediated culture in the

1920s facilitated the creation of a range of "consumer subjects," such as the café waitress, housewife, modern girl and boy, salaryman, and lumpen proletarian, who employed shifting strategies of "erotic grotesque nonsense" to challenge statist discourses of rationalization until the late 1930s.[43] Thus, the technological imaginary emerged out of a society that was already very much familiar with and even saturated by industrial and media technologies.

Although scholars have emphasized the importance of technocratic management from above in their studies on technology or "techno-fascism" during the wartime era, another aspect of technology frequently has been overlooked: the ability of technology to mobilize, create, innovate, and organize something new.[44] As Silverberg notes, the newly empowered "consumer subjects" of the 1920s and 1930s developed a culture characterized by "enormous energy, the urge to create, and acerbic challenges to the status quo," such as the state's rationalization and morality campaigns.[45] This mass culture of "erotic grotesque nonsense," she argues, largely died by the end of the 1930s as Japan fully turned toward militarism and totalitarianism. *Constructing East Asia* addresses the question of how statist elites attempted to control this dynamic mass culture of innovation and experimentation by explicitly appealing to technology. The "technological imaginary" signified much more than an instrumental deployment by technocrats of rational means-ends technology for social management. It also represented the formation of a new mode of power that sought to operate at the level of people's hopes and desires and direct them toward national objectives. Broadly speaking, the technological imaginary envisioned society as an organic system constituted by a whole series of economic, scientific, cultural, intellectual, and administrative technologies. According to many of these emerging visions, every member of society had a productive role in the operation of the social system, which was dedicated to constructing a "New Order in East Asia." Technology began to take on the meaning of a vast technical system similar to what Yamanouchi Yasushi has described as the "autopoiesis characteristic of organic life."[46] The incorporation and systematization of all areas of life through the technological imaginary during Japan's wartime era serves as a compelling paradigm to analyze certain fascist tendencies that have continued well into postwar Japan, and might be somewhat inherent to the process of technological modernization itself.

Technology and Japanese Imperialism

The technological imaginary was not limited to Japan proper but extended to its empire as well. When Japan acquired Taiwan as its first colony in 1895, Gotō Shinpei, Taiwan's head of civilian affairs and its governor from 1898, developed the concept of "scientific colonialism." Largely influenced by German thought on colonial administration, scientific colonialism meant a "systematic and research-oriented approach" to development, whereby Taiwan became a laboratory for a wide range of such policies as urban planning, hygiene improvement, infrastructure construction, and the introduction of civil institutions. Similar to a biological organism, the colonies had their own particular laws and practices that required systematic study by Japanese experts as the basis for "modernizing" and "civilizing" them.[47] Gotō became the first director of the South Manchurian Railway (*minami Manshū tetsudō gaisha*; hereafter, Mantetsu) in 1906 and rose to become Japan's home minister—the ministry responsible for infrastructure development—in 1916 and 1923. Scientific colonialism inspired the first wave of technical bureaucrats, scientists, doctors, and engineers sent to Japan's formal and informal empire in Korea, Taiwan, the Guandong Leased Territories, and Mantetsu's railway zones. There they built the roads, railways, ports, and cities for Japan's commercial empire, which was then largely rooted in agricultural commodities. Although scientific colonialism led to a wide range of technological achievements, it referred more to the "useful application of knowledge, most of which was derived from Western science" as a means to justify Japanese imperial rule rather than to any kind of systematic conceptualization of technology's relationship to empire.[48] It was not until the establishment of Manchukuo in 1932 and the shift toward a militarized bloc economy that a new wave of bureaucrats and engineers emerged to articulate conceptions of an integrated technological empire.

Under the banner of "constructing East Asia" (*tōa kensetsu*), several thousand idealistic engineers flocked to Korea, Taiwan, Manchukuo, and China primarily during the 1930s to construct roads, canals, ports, dams, cities, irrigation, sewage and water works, and electrical and communications networks. Under their direction, those colonies developed the technological imaginary, or a new mode of power that envisioned society as an organic system of productive processes and mobilized citizens in close relationship to colonial planning and management. Bureaucrats and engi-

neers were able to formulate and realize many of their grand visions in urban planning, industrial development, and comprehensive river basin management in the colonies because of the stronger centralized institutions, lack of red tape, and decreased factionalism there.[49]

The technological imaginary was not simply an intellectual construct among Japanese elites but was formulated in close relation to actual technical projects. Bureaucrats and engineers also formed their conceptions on technology by getting their hands dirty on the ground. As Daqing Yang notes, "the material means of either building Japan's empire or holding it together are still largely taken for granted rather than being thoroughly investigated."[50] Through an analysis of several specific wartime projects—river basin planning in Manchuria on the Liao River, urban planning in Beijing, regional planning on the border between Korea and Manchuria, and the construction of the Fengman (Hōman) and Sup'ung (Suihō) Dams in Manchuria and Korea—this book demonstrates how the technological imaginary also developed in constant negotiation with a variety of institutions, people, and forces in the colonies. Existing work on technology in the Japanese empire has largely affirmed the political scientist James Scott's influential discussion of massive, state-sponsored public works projects during the mid-twentieth century as examples of an authoritarian "high-modernist" ideology—a strong "self-confidence about scientific and technical progress, the expansion of production, the growing satisfaction of human needs, the mastery of nature . . . , and, above all, the rational design of social order commensurate with the scientific understanding of natural laws."[51] Whereas Scott has claimed that "monotonic schemes of centralized rationality," such as large, multipurpose dams, simplified or "straitjacketed" the human and natural worlds, and thereby suppressed the full range of variation and complexity of local interests, knowledge, and conditions to conform to its uniform visions, I argue that conflict and negotiations with such variation lay at the very heart of the formation of technocratic ideology and the engineering process.[52] As Martin Reuss has noted, "successful engineering requires more than the application of scientific rationalization" in accordance with the dictates of high-modernist ideology but also necessitates various "social inputs" from different groups and difficult interactions with unfamiliar environments.[53] Rather than eliminating social complexity and reiterating the high-modernist intellectual constructs of wartime technocratic elites, I analyze how war campaigns, state mobilization plans, environmental forces,

business interests, bureaucratic conflict, resistance by local residents, and technical limitations all played a role in shaping these particular projects and larger visions of technology. More broadly, instead of focusing on Japanese imperialism's particularities—for example, its policy of assimilation in Korea and Taiwan or the ideology of emperor worship as the basis for empire—this study examines how colonial ideology and power operated through more universal tropes of comprehensive technical planning and development prevalent throughout the world at the time. By understanding how the technological imaginary operated in the colonial context, we are then also able to see important continuities with postwar Japan's influential overseas development policy and technical assistance projects in Asia.[54]

Scope of the Book

Constructing East Asia is about the relationship between technology and power within Japanese fascism and imperialism and covers some of the technological imaginary's range and depth through the examination of different social actors who had major roles in shaping wartime discourse and national policy: intellectuals, technology bureaucrats, engineers, and state planners. The analysis of several large-scale urban and regional planning, river basin control, and dam construction projects in the Japanese empire demonstrates how the technological imaginary was not merely an intellectual construct but developed extensively on the ground as well. Chapter 1, "Revolutionary Technologies of Life," introduces some of the main issues involved in theorizing technology's meaning in Japanese society as leftist intellectuals first developed its meaning from the early 1930s. Through a study of Aikawa Haruki, one of the most prominent theorists of technology, this chapter demonstrates how a view of technology as representing broader values of rationality, efficiency, and creativity not only fell within the purview of government officials and engineers who mobilized the country for war but also was enthusiastically embraced and elaborated upon by leftist intellectuals exploring technology's role in society's revolutionary transformation. Contrary to the postwar myth of leftist resistance to or unwilling complicity with the wartime state, it was Marxist social scientists who in fact shaped some of the most radical notions of mobilizing society through technology and even imagined ways to make the state's wartime mobilization programs more efficient and

effective—all of which foreshadowed techniques that were later adopted in postwar Japanese society.

Chapter 2, "Technologies of Asian Development," examines the discourse around technology among state engineers who became a strong force in the 1930s. An analysis of the writings and policies of the high-level technology bureaucrat and spokesperson for the engineers' movement, Miyamoto Takenosuke, reveals how state engineers shaped technology's meanings. While leftist intellectuals outlined a view of technology as infusing all areas of life with a spirit of creativity and revolutionary transformation, technology bureaucrats asserted a more technocratic notion of technology as comprehensive social planning through such concepts as "comprehensive technology" (*sōgō gijutsu*) and "technologies for constructing Asia" (*kōa gijutsu*). Chapter 2 thus illuminates how wartime ideology worked through tropes of modernization and technical development—as opposed to backward-looking, spiritualist discourses of emperor worship or Japanese racial superiority, as conventional narratives hold.

Chapter 3, "Constructing the Continent," shifts the scene to civil engineers and urban planners in the colonial context, where they planned and constructed a wide range of infrastructure projects. Whereas the earlier chapters focus primarily on conceptions of technology among actors in Japan, this chapter examines the manifestation of those conceptions in the form of the emerging trope of "comprehensive technology" projects in Japan's wartime empire. Using the various conceptions of comprehensiveness among project engineers as its point of departure, it illustrates how three prominent technology projects were planned and implemented in relation to various competing interests, institutions, and forces in the colonies: the Liao River Improvement Project in southern Manchuria, Beijing urban planning in China, and the Dadong port coastal industrial zone along the Yalu River in eastern Manchuria on the border with Korea. Predominant conceptions of technology are analyzed in terms of their attempted embodiment in large-scale colonial projects.

Chapter 4, "Damming the Empire," examines the most prominent examples of Japanese colonial infrastructure: the construction of two of the world's largest dams, Fengman and Sup'ung. This chapter focuses on the various power relations involved in producing the technical knowledge that transformed the Songhua River region in northern Manchuria and harnessed hydropower from the Yalu River on the border between Korea and Manchukuo, as well as their effects on the colonies. In sum, I

argue that it was the overlapping forms of political, legal, scientific, managerial, police, and military power in the colonies that made Japanese expertise and the discourse of modernizing East Asia through Japanese technology possible.

Chapter 5, "Designing the Social Mechanism," analyzes the thought and actions of an influential group of wartime policymakers who actively patronized the idealistic technology bureaucrats and engineers. The "reform bureaucrats" were the experts who designed Japan's managed economy policies for wartime mobilization both in the colonies and at home. By analyzing the wartime concepts and policies of Mōri Hideoto, their chief ideologue, this chapter explores how discourses of technology lent themselves to the formation of a new mode of fascist power—one that situated technology as a productive and creative rather than coercive and repressive force within people's everyday lives. An analysis of the reform bureaucrats' discourse complicates common understandings of Japanese fascism as something either dominated by a "deliberate irrationality" or as "corrupting" technology's otherwise rational and progressive nature.[55] It also reveals that wartime technocratic ideology signified something more than a rule by experts—a form of power that combined spiritualist and rational techniques to mobilize the population for total war.

The epilogue discusses some of the continuing effects of notions of technology developed during the wartime era on postwar Japan's transformation into a technological superpower. In the midst of reinventing the Japanese political system and the institutions of high-speed economic growth, "technology" again operated as social, cultural, and political mechanisms designed to incorporate people's hopes and desires both at home and abroad. Thus, the epilogue examines some of the postwar legacies of wartime discourses on technology, particularly their implications for social control and mobilization.

The analysis of the wartime technological imaginary illuminates how ideology and power operated in Japan and its empire by seeking to mobilize people through the trope of technology. Technology was actively defined as practical, transformative, and thoroughly political in working to bring about a utopian New Order in East Asia. Each group of intellectuals, engineers, and bureaucrats defined technology for their own agendas and interests, and thereby sought to radically transform society within the contours of the wartime Japanese state's overarching goals.[56] In articulating the technological imaginary, however, they rationalized a domestic

and colonial fascism that instead created a dystopian order that thoroughly exploited Asia's land, resources, and people. For example, more than ten thousand Chinese and other Asians were processed as "logs" (*maruta*) and subjected to gruesome human experimentation by Unit 731 to develop Japan's biological and chemical weapons program, and hundreds of thousands more were killed in field experiments. Ishii Shirō, the scientist who headed the unit, rationalized this research in terms of the universal scientific "search for truth" and the national importance of developing advanced weapons against the enemy.[57] Several million Chinese were systematically press-ganged, classified, and processed as forced laborers for Japan's mission to "construct East Asia." Furumi Tadayuki, a Manchukuo reform bureaucrat, testified in the 1954 Chinese war crimes trial that their goal was to transform "coolies" into "machinic extensions of the Japanese Imperial Army; nonhuman automatons absolutely obedient." They then often ended up in mass graves or what the Chinese describe as "pits with ten thousand corpses" (*wan ren keng*), which were often located near Japanese industrial and technical projects, such as Fengman and Sup'ung Dams.[58] Furumi also described how reform bureaucrats, military officers, and criminal elements systematically and with a "refined rationality" created a market that plied millions of Chinese with opium, heroin, and morphine to weaken them physically and fund Japan's total war infrastructure.[59] Two hundred thousand or more Korean, Chinese, and other women largely from Asia were pressured, tricked, or forced to become "comfort women" or sexual slaves who were made to service thirty to forty Japanese soldiers a day in the name of nurturing their "fighting spirit," prevent the male's "natural" inclination to rape civilian women, and check the spread of venereal disease within their ranks. These women were often also referred to as "sanitary public toilets."[60] The brutality and exploitation in the colonies and war front fed back into Japan, where all men, women, and children were increasingly asked to sacrifice every aspect of their lives for the war effort as soldiers or factory workers. This culminated in the gruesome 1945 slogan of *ichioku gyokusai* or "the shattering of a hundred million like a beautiful jewel," whereby all Japanese were asked to become like the *kamikaze*—the young men who "volunteered" to smash their airplanes into American naval vessels to defend Japan. Contrary to its promise of empowerment and development, the technological imaginary rationalized wartime forced labor, rape, starvation, death, and resource exploitation, and arguably made them brutally systematic and efficient.

Scholarship on Japanese war crimes often focuses on the pervasive racism or authoritarian culture within the military and the rest of society in accounting for such brutality.[61] Yet we may also partially understand them in relation to the technological imaginary's attempt to completely harness the vital subjectivities and lives of people within Japan and its empire. People ultimately became expendable for the "greater good" of achieving the modern, technological "new order" throughout Asia—their lives "processed" in the various labor camps, factories, laboratories, "comfort stations," and battlefields throughout Asia.[62] We should not therefore simply dismiss the technological imaginary's transformative, participatory messages that appealed to people's hopes and desires for a better life as empty ideology, as it also created powerful modernist development initiatives and an array of institutions that called for innumerable sacrifices to be made in its name while entrenching the interests of the elites who articulated that ideology. It is this new mode of power and mobilization that survived relatively intact after the war, pushed by many of the same bureaucrats, engineers, and intellectuals as the recipe for postwar prosperity and development throughout Asia. Instead of viewing the technological imaginary as a "positive" building block for the postwar Japanese or Asian economic miracles, *Constructing East Asia* examines the wartime and colonial origins of technology as an ideological system of power that continued to have fatal effects in the postwar era.[63] As Japan has continued to invest significant resources in technology to promote postwar economic growth and social development—for example, in the formation of the "Japanese style of management"; in the formation of the "construction state" (*doken kokka*); in Japan's influential overseas development assistance programs; in postindustrial visions of the "information society" (*jōhōka shakai*); and in Japan's strong commitment to nuclear energy—the issues of power, mobilization, and social transformation through "technology" first extensively articulated during the war remain very important today. For example, in the aftermath of the recent Fukushima nuclear disaster, Japanese are questioning the state's strong commitment to nuclear energy since the 1950s, as well as the energy industry's longtime promise of clean, abundant, and safe power—both the results of an uncritical approach to technology and powerful institutions that have continued to emphasize technology's importance to Japan's national progress often without truly incorporating the people's interests.