Pathways to the Present
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Writing in 1967 about the Seattle area, Philip Herrera, a journalist for *Fortune Magazine*, observed that the region was “a lovely land blessed with a mild, moist climate” and “tall, rugged mountains.” The area was, however, “in the grip of a tremendous boom” about which the “two million presumed beneficiaries seem to have decidedly ambivalent feelings.” The reason for doubt was not far to seek, Herrera thought. Economic growth was creating “a monster city actually known by the monstrous name Pugetopolis.” That awkward-sounding name came from Puget Sound, the inlet of the Pacific Ocean on which Seattle fronted. “With roads, housing subdivisions, and strip developments encroaching on the landscape,” Herrera concluded, “the region’s residents are naturally beginning to see further development as a threat to the unique charm that has made their way of life so attractive.”¹ By 2004, the Seattle region covered an area a hundred miles long and sixty miles wide and was home to more than 3 million residents.²

Much the same transition from rural to urban and suburban occurred around other Pacific Coast cities.³ Benefiting from military spending for World War II and the Cold War, the cities boomed. Here, as in other Pacific possessions of the United States, the federal government was of great importance. Nowhere was population growth and expansive development more apparent than in parts of the San Francisco Bay region, especially the southern section known as Silicon Valley. For decades, fruit growing and processing had, in the words of a publication of the California state government in 1928, led many to think of the region as “‘The Valley of Heart’s Delight’ because of its scenic attractions, mild climate, and diversified agriculture.”⁴ The situation dramatically changed during the 1950s and 1960s and later, as high-technology firms, supporting businesses, new highways, and housing
blanketed the area. The white blossoms of plum and apple trees became rare as orchards were uprooted. Writing in 2001, journalist Cathy Newman aptly described Silicon Valley as “an extended suburb of flat monotony . . . a terrain made visible by the grace of fluorescent and halogen light, connected by concrete tentacles of freeway.”

This chapter examines the development of Silicon Valley and the Seattle region as high-technology and industrial districts after World War II and looks at what those developments meant for people living in the areas. High-technology firms created tens of thousands of jobs, as those companies kept Americans on the cutting edge of technological advances in their industries worldwide. However, exuberant growth created problems. The rearrangement of the physical landscape was a major part of the story, and reactions against those alterations led to the birth of grassroots environmentalism. Economic development was uneven, as some sections of Pugetopolis and Silicon Valley benefited more from growth than others. Moreover, the burden of health hazards in making computer chips fell on production-line workers, many of whom were immigrant Asian women—part of the Pacific-wide migration—who were paid low wages. Then, too, Native Americans were displaced. Environmental justice was at stake, in some ways similar to what was taking place on Kaho‘olawe.

The Development of Silicon Valley

The name “Silicon Valley” originated with a reporter for Electronic News who wrote a journalistic history of the San Francisco Bay area’s semiconductor industry in 1971. The name stuck, because the region was home to building computer hardware, which used silicon in great quantities. The geographic area came to include about 1,500 square miles running from the outskirts of San Francisco south along the San Francisco Peninsula through Santa Clara County, with the city of San Jose at its center. Silicon was (and is) a primary raw material used in making semiconductors and integrated circuits. Silicon transmits electricity well, and is thus a semiconductor, and so could be used in making transistors, which are in effect very small switches to control the flow of electricity. In 1947, William Shockley and others at Bell Laboratories in New York invented the transistor. Seven years later, Shockley moved to Silicon Valley, where he started Shockley Transistor Laboratories. Soon, leaders of firms in Silicon Valley and Texas combined transistors with other devices on silicon wafers to make integrated circuits. Integrated circuits were (and
are) capable of sending complex electrical signals from miniaturized components. Transistors and integrated circuits quickly replaced bulky and less reliable vacuum tubes in such tasks. By the early 1970s, Silicon Valley firms were assembling not just integrated circuits but also microprocessors, the hearts of personal computers.⁸ Resulting environmental problems—heavy metal pollution of water supplies and the emission of poisonous fumes—were not addressed for nearly a generation.

Small and medium-size firms were the lifeblood of California’s Silicon Valley. Nimble, ever-changing, and amorphous, they made the region the foremost high-technology center in the world after World War II. As scholar Annalee Saxenian has explained, these companies formed “a regional network-based industrial system that promotes collective learning and flexible adjustment among specialist producers of a complex of related technologies.”⁹ There was, however, more to the development of Silicon Valley than a collection of small firms. A wide variety of developments came together in what might be called a “hot mix” to create the high-technology region. The work of people at nearby universities, the labors of business entrepreneurs, and the availability of federal government spending for military purposes were all central in the initial development of the Valley.¹⁰

Silicon Valley did not spring up overnight. Although sometimes overlooked, high-technology developments in the San Francisco Bay area predated the emergence of Silicon Valley. In the early 1900s, engineers, businessmen from Sacramento, and the president of Stanford University formed the Federal Telegraph Company (FTC) in Palo Alto. FTC employees developed new ways to send radio messages for the U.S. Navy. World War I brought in orders from the navy and army, but orders declined after the conflict. Patent disputes with the very aggressive Radio Corporation of America (RCA) also pummeled the FTC, leading the firm to move in new directions and to spin off new ventures: Magnavox in 1910, Fischer Research Laboratories in 1936, and Litton Industries in 1932. Such spin-offs would become a hallmark of the Valley in later years. The FTC itself moved from the San Francisco Bay area to New Jersey in 1931. The FTC had been purchased by another company, which decided to consolidate its research work in Newark. Many other engineers and high-technology companies were active in the San Francisco Bay area, demonstrating the first all-electronic transmission of a television image in 1927 and developing the gammatron tube a bit later.¹¹

Particular individuals were important. “If anyone deserved to be called the ‘father of Silicon Valley,’” historians Stuart Leslie and Robert Kargon have written, “it was Frederick Terman.” As a faculty member in engineering, later
as the dean of engineering, and finally as the provost of Stanford University, Terman pioneered in the establishment of connections between academia and industry, trained students in high-technology fields, and helped those students get started in business. Two of his best-known graduate students, William Hewlett and David Packard, formed Hewlett-Packard in 1937, using a loan of $538 from Terman to begin the business. Other start-ups, often formed by Terman’s students, were also important. Charles Litton established Litton Industries in 1932, and Sigurd and Russell Varian started Varian Associates a few years later.¹²

Prodded by Terman, Stanford University established the Stanford Industrial Park in the early 1950s. Renamed the Stanford Research Park (SRP) in 1961, this land became the nation’s first high-technology park. Its development, historian Margaret Pugh O’Mara has explained, benefited from being on the “right side” of important demographic and economic trends in the United States. First was the growing importance of research universities in higher education. Located in Palo Alto, a close-in suburb of San Francisco, Stanford evolved as a regional educational facility before World War II, but federal spending transformed it into a national powerhouse in electronics and engineering during the Cold War. Second, Stanford was suburban at a time when more and more Americans, including engineers and scientists, wanted to live in suburbs. Its suburban location also meant that Stanford had the land upon which a research park could be built. Third, Stanford’s location fit in with the decentralization and dispersal tactics begun by the Department of Defense during World War II, an effort to move plants out of the Northeast where, it was feared, they might be vulnerable to enemy attack.¹³

The SRP soon bustled with activity. In a bucolic, campus-like setting, where buildings seemed to blend into the rolling hills of the countryside, the SRP accepted Varian Associates as its first tenant, a move that successfully brought together academic researchers and businesspeople. By 1963, the SRP housed forty-two companies employing 12,000 workers. Six years later, the SRP boasted sixty firms with almost 18,000 employees.¹⁴ As some of the high-technology firms in the SRP and nearby areas developed, they “hived off” many new, smaller companies. A case in point was Fairchild Semiconductor, founded in 1957 by Robert Noyce and other scientists who broke away from Shockley Transistor Laboratories. During the 1960s, employees who left Fairchild to capitalize on their specialized knowledge founded over two dozen semiconductor-related companies. Called “Fairchildren,” these small firms added greatly to the vibrancy of Silicon Valley. Noyce himself left Fairchild to help start the firm that became Intel in 1968.¹⁵
Military spending linked different eras in the development of the SRP and, more generally, of Silicon Valley. As historian Stuart W. Leslie has pointed out, “it may not be too much of an exaggeration to say that the Department of Defense was the original ‘angel’ of Silicon Valley—a relationship that . . . goes back to before World War I.” From the early radio days, the military was a significant purchaser of electronics products, but it was World War II that gave the “infant West Coast industry a chance to show what it could do.”¹⁶ Hewlett-Packard, which had been founded near San Jose a few years earlier, saw the number of its employees jump from nine in 1940 to one hundred in 1943 and its annual sales mushroom from $37,000 to $1 million in the same years. The Cold War and the very hot Korean War further benefited California’s high-technology companies. Between 1951 and 1953, California firms received $13 billion in prime defense contracts, allowing the state to displace New York as the nation’s leading recipient of defense contracts. Aerospace ventures in Southern California received much of the funding, but those in Silicon Valley, Leslie has noted, “won their share.” By the late 1950s, the Valley trailed only Los Angeles (and surpassed San Diego) as a recipient of defense funding in the Golden State. Sensing opportunities, eastern high-technology firms moved west. Lockheed Missiles and Aerospace opened a major manufacturing facility in Sunnyvale, near Stanford University, in 1956. Soon employing 28,000 workers there and at a research facility in Palo Alto, Lockheed served as “a crucial catalyst for further high-technology growth.”¹⁷

By the early 1970s, what had been a small cluster of companies had expanded into a full-fledged high-technology district. At first, executives located their operations near Stanford University, but they soon spread them southward down the San Francisco peninsula. Confined by natural boundaries of mountains and ocean, the companies formed a very dense network of enterprises. As Silicon Valley matured, individual entrepreneurs and small firms remained at its core, and their work helps explain the Valley’s success as a high-technology district.¹⁸ Most of the makers of computer hardware and software, producers of communications equipment, and manufacturers of defense products were smaller firms that consciously avoided vertical integration. (Vertically integrated companies embrace all or most of the stages of production and sales within one corporate entity.) Instead of trying to internalize all facets of their companies’ work in single firms, Silicon Valley entrepreneurs got ahead by forming a large, informal, flexible network of linked but independent companies. Located in one region, this agglomeration of many small businesses allowed producers to benefit from economies of scale without forming big businesses. Proximity encouraged
communications among the firms and stimulated growth. Bars and restaurants, along with institutions such as professional and business associations, where scientists and entrepreneurs could meet informally, encouraged the spread of information among the firms. Then, too, workers moving from job to job—for job-hopping was very common—spread information across firm boundaries. By the late 1970s, Silicon Valley possessed nearly three thousand electronics firms, 70 percent of which had fewer than ten employees and 85 percent of which had fewer than 100.¹⁹

Not all Silicon Valley firms were small, however. As early as 1959, Lockheed Missiles and Aerospace employed 19,000 workers at its Sunnyvale establishments and soon gave jobs to thousands more. Hewlett-Packard employed tens of thousands of workers in the 1970s and 1980s. Some of the larger firms were branches of foreign companies, which wanted to have “eyes and ears” in the Valley. Korean and Japanese companies established sizeable operations during the 1980s. Many of the big businesses tended, at least in the 1960s and 1970s, to act in ways typical of smaller ventures. Hewlett-Packard was long known, for example, for its informal management style and paternalistic work practices, popularized as the “HP Way.”²⁰

Companies of all sizes benefited from continued federal government spending for defense. In 1989, San Jose, the capital of Silicon Valley, was the leading community in the United States in terms of the value of prime defense contracts per employed worker—at $4,590, more than four times the average for workers in American cities. Washington, DC, was a distant second at $3,863, and Los Angeles–Long Beach trailed in ninth place at $2,234. Seattle-Everett was eleventh at 2,127.²¹ The relative significance of military spending to the economic development of Silicon Valley declined in the 1990s, as defense spending plummeted early in that decade.²² A sign of the changing times was that Lockheed employed only about six thousand workers in Silicon Valley by 2000.²³ Nonetheless, defense contracts remain important to the Valley to the present day.

Specialized service firms aided the maturation of the Valley as a high-technology region. Adopting the informal style of their high-technology clients, law firms proliferated with the Valley’s development. The number of Palo Alto law firms rose from thirty-five in the mid-1970s to sixty-nine in 1988. Moreover, they increased in size. In the mid-1970s, the largest Palo Alto firms had only 12 lawyers apiece, but by 1988 they boasted as many as 150 attorneys each. The firms specialized in patent, copyright, and intellectual property law, but their members did much more than simply handle legal cases for their clients; they acted as business counselors and deal makers of
all sorts. Similarly, venture-capital firms performed many functions for the high-technology enterprises. Their members provided much of the financing for the expansion of high-technology companies. Between 1968 and 1975, thirty venture-capital firms located in Silicon Valley, many of them on Sand Hill Road in Palo Alto. Their members assumed a “hands-on” relationship with their clients, just as did members of the law firms. Taking substantial equity positions in their client firms, they sat on their boards of directors, offered business advice of all types, and often helped spread information from firm to firm.

The flexibility of the many small firms, and of Silicon Valley as a whole, spelled success for decades. The suburban nature of the Valley and the small, decentralized character of the thousands of companies reinforced each other to create a high-technology juggernaut. Between 1959 and 1976, forty-five semiconductor firms began business in the United States, and forty of these were in the Santa Clara Valley, at the south end of the Silicon Valley. During the same period, about 210,000 new jobs were added to the region. Many of these were high-technology jobs. (Not all were, for some were in companies servicing the high-technology firms.) Silicon Valley firms employed about 115,000 high-technology workers in 1975. By 1990, that number had jumped to 265,000.

Even so, Silicon Valley companies faced a major crisis in the mid-1980s and early 1990s, when they lost the market for semiconductors to fierce competition from Japanese companies. In 1980, American companies were making about 57 percent of the world’s semiconductors, but by 1989 their share had dropped to only 36 percent. Semiconductors had shifted from being a custom to a commodity product, in which low-cost production had become the watchword. Between 1985 and 1986, about 20 percent of the semiconductor employees in the Valley lost their jobs.

Silicon Valley partially recovered in the 1990s. It boomed with the advent of commercial applications for the Internet for most of the 1990s, only to partially collapse in a “dot-com” bust as the decade closed. As late as 1999, the market for high-technology stocks remained hot. Soon, however, the respected British business magazine The Economist expressed growing doubts about there being “a new era” in business in which “the economy would grow by 5.5 percent a year forever” and in which “inflation and the business cycle were dead.” It was all, the journal feared, “a bubble.” Stock prices plummeted in the spring of 2000. By May, reporters for the Wall Street Journal wrote about “a pileup of corpses in the land of dot-coms,” and in July journalists for the Economist discussed high-technology firms as going
“from dot.com to dot.bomb.”³¹ The Wall Street Journal reported in mid-2001 that losses incurred by high-technology firms in the previous year had wiped out all the profits they had earned since 1995. Looking at the earnings of the 4,200 companies that listed their stocks on the Nasdaq, the paper concluded that recent losses were so great that it was as if the boom of the mid- and late 1990s had never occurred.³²

Still other problems assailed Silicon Valley. Even as some firms generated new jobs there, others outsourced jobs abroad, especially by setting up silicon-chip-fabrication and computer-assembly operations in Southeast Asia. Fairchild put up a plant in Hong Kong as early as 1963, and in the 1990s many other firms followed suit. Many production firms relied on “temporary” workers who received few benefits. Those companies followed additional strategies to cut their costs, as was happening in a broad range of companies across America.³³

Silicon Valley’s overall success in job generation led to efforts to replicate the high-technology district elsewhere. As early as the 1950s and 1960s, Terman was involved in these actions. In New Jersey he worked with Bell Labs, high-technology firms, and university leaders to try to establish a “Silicon Valley East.” The venture failed when the companies and the educational facilities proved unable to cooperate. New Jersey’s high-technology firms developed, as a consequence, more as individual companies than as part of an industrial district. In the Dallas–Fort Worth area, Terman’s work with high-technology companies and Southern Methodist University was cut short by a recession that dried up funding.³⁴

Leaders in other regions sought with mixed results to emulate the development of Silicon Valley. Despite efforts by the president of Renasselaer Polytechnic Institute and leaders of nearby businesses, it proved impossible to develop a full-fledged high-technology district around Troy, New York, in the 1980s. The lack of a strong regional industrial base thwarted such efforts.³⁵ Similarly, attempts to build a high-technology district around the Georgia Institute of Technology, in conscious emulation of Terman’s work in the San Francisco Bay area, only partially succeeded. State legislators proved fickle in financing Georgia Tech. Similarly, lacking massive federal spending and an adequate land base, the University of Pennsylvania experienced only partial success in trying to create a high-technology district in the 1960s and 1970s.³⁶ There were some successes. Working with university leaders, North Carolina Governor Luther Hodges used the research and development capabilities of the University of North Carolina and two other state universities to attract high-technology companies. In the mid-1960s, he succeeded
in creating the Research Triangle Park, which became the chief southern challenger to Silicon Valley. Another high-technology district emerged in Austin, Texas, with the University of Texas at its center.³⁷ In the Boston area, large high-technology firms clustered along Route 128. Lacking the flexibility of Silicon Valley, however, the Boston region declined, in relative terms, as a high-technology district after the 1960s.³⁸

A pattern of mixed successes and failures characterized attempts to bolster economies in the United States’ Pacific possessions. Among the many regions to embrace high-technology business as its economic savior were the Hawaiian Islands, especially the island of Maui. Hard-hit by declines in the plantation-agriculture crops of sugarcane and pineapple, Maui’s residents turned to other avenues of economic advance. Some sought economic growth through the development of tourism, but that industry experienced ups and downs with fluctuations in the global economy. And, of course, not all Hawaiian residents, certainly not all native Hawaiians, favored touristic developments. Well into the 1990s, high-technology businesses seemed to offer solutions to Maui’s economic difficulties without harming the island’s environment. However, problems arose in trying to turn high-technology dreams into realities.

Well aware of their island’s economic difficulties, Maui’s political and business leaders formed the Maui Economic Development Board (MEDB) in 1982 to diversify their island’s economy, especially by nurturing high-technology ventures through the creation of the Maui Research and Technology Park (MRTP). Those forming the MEDB, and its child the MRTP, believed that high-technology businesses could become a “third leg” of Maui’s economy, along with agriculture and tourism.³⁹ The MEDB entered into agreements with the state of Hawai‘i, the University of Hawai‘i, Maui County, and the federal government to try to make the MRTP a reality.⁴⁰

State and federal funding helped. State Senator Mamoru Yamasaki persuaded the state government to finance the first major building to serve as an incubator for newly formed high-technology companies. The state’s agreement to participate in the MRTP broke an impasse. Private firms constructed a second building, a state-of-the-art commercial office complex. Next came the Maui High Performance Computing Center, complete with a very powerful supercomputer, made possible by funding from the federal government secured by Senator Daniel Inouye. Other installations followed in the 1990s. Still, it proved difficult to attract tenants. A major challenge lay in a dearth of scientists and technicians on Maui. MEDB members hoped to upgrade scientific education in the island’s public schools and labored
to improve higher education as well. They wanted especially to turn Maui Community College into a major four-year research institution. They failed in this unrealistic goal, for state funding to do so was not available. The lack of a four-year university on Maui hurt badly.⁴¹

Only in the late 1990s did the MRTP begin to fulfill its promise. By the winter of 1998, about twenty companies, mainly small businesses, and organizations there employed about 350 people. High-technology companies had not, however, yet become a third leg of Maui’s economy.⁴² Nor, despite considerable government support, had that occurred elsewhere in the Hawaiian Islands, which lacked many of the factors needed to attract high-technology businesses—elements ranging from the possession of a first-class scientific research university to the existence of government policies favorable toward businesses. High tax rates hurt business development in Hawai‘i, for example. In 1999, Forbes Magazine ranked Honolulu 160th out of 162 regions—third from the bottom of the list—in the United States as a desirable place in which to conduct high-technology businesses.⁴³

There was more success in another Pacific region influenced by the United States, South Korea. Here Terman was important. Korean leaders had long stressed technical education and research as important parts of its development strategy, and Chung Hee Park continued this policy after he took power in 1961. The United States government was also very important, its cooperation part of its efforts to build up allies in the Pacific. In 1965, Park secured $150 million in development loans from the United States, including some for the Korean Institute of Science and Technology (KIST). American officials selected Terman to head a committee to assess the feasibility of KIST’s proposals and projects, and Terman, along with two of his protégés, who were also on that committee, toured Korea in 1970, meeting with government officials and business executives.⁴⁴

From those meetings, and earlier conferences, came the idea for the Korean Advanced Institute of Science and Technology (KAIST), situated in the Korean government’s Ministry of Science and Technology. KAIST was originally envisioned as a graduate-only institution, to have 200 masters-level and 200 doctoral-level students in such fields as electronics, polymers, and pharmaceuticals. The institute would have close ties with industry, just like those binding Stanford to the many firms in Silicon Valley. Backed partly by American funding, the KAIST succeeded. By the mid-1980s, it had 1,200 students, two-thirds of whom were at the masters level. Its graduates contributed in important ways to South Korea’s advances in high-technology fields, for example in the making of D-RAM chips. In 1987, KAIST moved from
Seoul to the Taedok Science Town, about sixty miles to the south, and South Korean planners transformed that city into a technopolis. A combination of American aid and advice and South Korean know-how had worked over a decade and a half of consistent effort.⁴⁵

As developments across the United States and its Pacific territories demonstrated, it was not a simple matter to replicate Silicon Valley. Many factors had to come together for high-technology districts to succeed. Having flexible, entrepreneurial firms seemed necessary, but they were not by themselves a guarantee of success. Governmental spending, such as the defense spending so important for Silicon Valley firms, helped. So did the presence of a nearby research university, such as Stanford, especially if researchers from that institution interacted with high-technology entrepreneurs and service businesses such as specialized venture-capital firms and law firms. Even though success was difficult, many areas hoped to become new Silicon Valleys in the early twenty-first century. In their aspirations, people in these regions tended to overlook the many downsides of Silicon Valley’s development.⁴⁶

Environmental Problems in Silicon Valley

The problems in Silicon Valley constituted a dark side to the region’s growth. In their recent wide-ranging historical account, David Pellow and Lisa Park have observed, “‘The Valley of the Heart’s Delight’ is often referred to as the ‘Valley of the Toxic Fright’ by environmentalists and occupational health advocates.” They have noted that the “Valley holds many dubious distinctions, including hosting the highest density of federally designated toxic Superfund sites anywhere in the nation.”⁴⁷ Looking at the status of women workers in the Valley, Glenna Matthews has written that the development of Silicon Valley was achieved only at considerable human cost. The “biggest cost,” she has concluded, “has been paid by the assembly workers: exposed to toxic chemicals, poorly compensated.”⁴⁸ In his account of Mexican Americans, the largest minority group in Silicon Valley, the historian Stephen Pitti has also decried the costs to workers of the district’s development. While stressing that they were not simply victims, Pitti has pointed out that “few ethnic Mexicans enjoyed runaway economic success in the Gold-Rush atmosphere of the late-twentieth-century information age.”⁴⁹ Many lived in poverty.

Far from being clean and offering opportunities to all, Silicon Valley’s high-technology industries created a host of environmental problems, which raised serious quality-of-life questions. Crowding, congestion, and air and
water pollution affected nearly everyone in the region by the 1970s and 1980s. Health issues, however, most affected production-line workers. As late as 1999, making an eight-inch silicon wafer required 3,023 gallons of deionized water (in addition to gallons of regular water), 4,267 cubic feet of bulk gasses, 29 cubic feet of hazardous gasses, and 27 pounds of chemicals. Production processes created 3,787 gallons of waste water and 9 pounds of hazardous waste.⁵⁰

Unless handled carefully, these substances harmed the health of workers. Too often, few safeguards were in place, especially in the early days. Chemical fumes, corrosive acids, and other toxic substances assailed production-line workers, who were usually not warned of the dangerous circumstances under which they labored as they fabricated wafers and assembled electronics products. According to a 1980 report by the state of California, workers in semiconductor plants suffered from illnesses at a rate three times greater than that of workers in general manufacturing. A year later, another state report, this one about forty-two California semiconductor firms, revealed that nearly half of elevated illness rates their workers incurred came from systemic poisoning or toxic exposure.⁵¹

A pioneering investigation in 1984 summarized many of the dangers. Prepared by the director of the Labor Occupational Health Program at the University of California, Berkeley, and the safety coordinator in the Santa Clara County Office of Education, the report was damning. It found that “electronics is not a sterile, clean industry;” but rather one using “hundreds of potentially dangerous substances.” Organic solvents used in cleaning operations caused “a range of health problems, including dermatitis; central nervous system effects, such as nausea, dizziness, and headaches; liver and kidney damage; and even cancer.” Corrosive acids caused “serious burns” and “lungs damage.” Moreover, “other toxic substances, including gasses such as arsine and phosphine, metals such as lead and other solders, and epoxies, pose[d] additional risks.” Finally, “reproductive hazards” included “radiation and various chemicals.”⁵²

These dangers fell heavily on a largely immigrant workforce. Liberalization of America’s immigration laws in 1965, combined with the lure of jobs in California, pulled new workers into the San Francisco Bay area. Many ended up in Silicon Valley. Hispanics and Asians, especially, took part in the new immigration into the United States. The movement of Asians into the San Francisco Bay area was an important element in the Pacific Diaspora. In the two decades after 1965, for example, 622,000 Filipinos came to the United States, with nearly 70 percent settling in western America. Filipino women were a very important component of Silicon Valley’s workforce.⁵³
Relatively few of the immigrants to the San Francisco area found managerial positions. In 1970, Latinos held a scant 7 percent and Asians only 17 percent of Santa Clara Valley’s high-technology managerial white-collar jobs. Another 17 percent of the craft jobs were held by Latino employees, 14 percent by Asian workers. By way of contrast, Latinos filled 57 percent of the jobs classified as belonging to “operatives” or “laborers,” and Asians held an additional 36 percent of them. In the early 1980s, about 75 percent of the electronics workers were women, and at least 40 percent of them were minorities, mainly Hispanic and Asian. By way of contrast, white males comprised 90 percent of the managers. Fifteen years later, the situation remained about the same. In 1997, Hispanics held only 7 percent of the white-collar jobs in Silicon Valley’s high-technology industries, but 23 percent of the blue-collar ones in original manufacturing firms and 14 percent of those in contract companies. Asians had 31 percent of all white-collar positions, but 59 percent of the blue-collar jobs in original manufacturers and 77 percent of those in contract firms.

Environmental challenges caused by high-technology manufacturing extended beyond the workplace. Nowhere were problems worse than in the pollution of groundwater supplies. Silicon Valley drew mainly on groundwater in aquifers for its industrial and drinking water. By the early 1980s, it was becoming apparent that toxic-waste water from high-technology manufacturing was contaminating the aquifers. The discovery of toxic chemicals, which were used to clean microchips and computer boards, in the soil and water near a Fairchild plant and an IBM plant in the early 1980s turned out to be just the tip of the iceberg. Testing by governmental authorities soon revealed that 65 of 79 companies examined had released toxic chemicals into the ground beneath them. Some 104 wells providing drinking water had been contaminated, and 66 plots of land were too toxic for humans to walk on. Making the problem worse than it might have otherwise been was the fact that some 10,000 old wells, uncased and uncapped, once used to provide water for the irrigation of orchards allowed chemicals easy access to Silicon Valley’s groundwater. By the late 1990s, the Environmental Protection Agency had designated twenty-nine Superfund sites in the Valley, more than in any other county in America. Twenty-four of the sites resulted from pollution by electronics firms.

Among those districts hit hardest by the water pollution was east San Jose, home to the barrio in which many Chicanos lived. Long neglected by San Jose’s city officials, east San Jose had historically lacked services found throughout the rest of the city. As late as the 1950s, children played in gulches containing raw sewage. Many streets remained unpaved and without side-
walks or public lighting. After 1960, San Jose’s “Latino community boomed in size” until it came to “comprise more than 25 percent of the city by 1990, but its recent history only highlighted the Valley’s greatest constant, the power of race for structuring local political and cultural developments,” Pitti has observed. Not surprisingly, perhaps, it was the water supply for the Los Paseos neighborhood that was among those found to be most contaminated—by seepage from tanks on Fairchild’s property. An investigation revealed “an apparent clustering of birth defects, miscarriages, stillbirths” over a three-year period.

Complaints from women in the area, together with the efforts of activist lawyers, led to the formation of a grassroots environmental movement. Traditional national environmental groups held back, perhaps because many of their members were managers in high-technology firms. Two local organizations were of most importance. Having held community workshops about chemical solvents even before the discovery of the first release, the one at the Fairchild plant, the Santa Clara Center for Occupational Safety and Health (SCCOSH) greatly expanded its operations after it. Formed in response to the Fairchild spill, the Silicon Valley Toxics Coalition (SVTC) also soon increased the scope of its work. That work soon brought results. Fairchild closed its plant in south San Jose in 1983 and spent $30 million on remediation work. In contrast, many other companies persisted in denying any responsibility for damages to the environment or to the health of their workers. In fact, many executives initially blamed their workers for the health problems, accusing women employees who complained about illnesses as suffering from “hysteria.”

They changed their stances in the 1990s as a result of continuing pressure from local environmental groups and the federal government. In her discussion of workers’ health issues in Silicon Valley, Matthews observed that by the opening years of the twenty-first century there had been “real and important progress,” but she has also noted that “the problem is still serious.” Similarly, Pellow and Park conclude their account of quests for labor and environmental justice in the Valley with the observation that “labor and environmental justice organizations have made their mark on Silicon Valley’s political and economic terrain.” Still, they question “whether they can continue to reform an industry that is growing more rapidly around the globe than any other.”

Although environmental concerns involving toxic substances were of the most immediate concern to production-line workers in Silicon Valley, planning matters, especially urban planning issues, were not far behind. Just
as the development of high-technology businesses brought many more benefits to white-collar than blue-collar workers, it also brought greater benefits to some sections of the San Francisco Bay area than to others. The development of Silicon Valley exacerbated earlier uneven patterns of growth in the region, as did high-technology developments in the Seattle region slightly later. Private market forces, not government planning, with the important exception of military spending, dictated the early economic development of Silicon Valley. Land-use planning and planning for water resources were minimal, setting the stage for later problems such as traffic congestion and groundwater pollution.

Unplanned growth in California replicated a general lack of planning elsewhere in the nation. This situation might be expected, for the San Francisco Bay area had long developed in a chaotic way. Efforts to rebuild San Francisco after its horrific 1906 fire and earthquake in a designed manner proved largely abortive, despite the fact that a city plan had been drafted in 1905. Then, too, regional planning efforts for the development of transportation, though much discussed, won scant approval and were not implemented in the years before World War II. None of these facts should be surprising; America's Pacific Coast cities developed in mainly unplanned ways in these decades. They simply contained too many different groups of people with many diverse ideas and were growing too quickly, at least into the 1920s, to embrace urban planning.⁶²

Increased planning efforts, especially regional planning, accompanied World War II and continued after that conflict. In 1943, federal officials established a Metropolitan Defense Council (MDC) composed of local businessmen and politicians to try to improve the San Francisco Bay area's infrastructure for the war effort. The MDC in turn led to the creation of the Bay Area Council a year later. Led by prominent businessmen, the council was dedicated, in its officers' words, "to the proposition that the San Francisco Bay Area is an integrated economic unit." Over time, council members became pro-suburban in their mind-sets and tried to attract new industries whose employees would be won over by "a good climate, beautiful landscape, and cultural amenities." What had begun as regional planning became decentralized boosterism.⁶³

A major result of decentralist thinking was to widen differences among localities in the San Francisco Bay area. Not all communities, and certainly not all people, benefited equally from the high-technology boom. Richmond and Oakland, which had gained in job creation from World War II, were largely bypassed as Silicon Valley expanded to the south. San Francisco ini-
ially found few benefits. Not until the 1990s and later did the city profit much from high-technology developments. Most of the growth and the bulk of the new jobs were concentrated on the west and south sides of San Francisco Bay.

One of the first signs that uneven development might cause environmental problems occurred in the “Battle of the Hills” in Palo Alto during the early 1960s. Seeking to expand the SRP, Stanford University officials faced opposition from some of the local residents. Locals wanted to keep the foothills into which an expanded SRP would intrude free of commercialization. Moreover, the expansion proposal acted as a lightning rod for those who had come over the previous decade to dislike noise and fumes from some of the businesses in the supposedly “green” SRP. In the end, Stanford officials carried the day and expanded the SRP, but only in a scaled-back fashion, as grassroots environmentalism had an impact on development.⁶⁴

A more dramatic event highlighting inequalities was the seizure in late 1969 of federally owned Alcatraz Island by seventy-eight Native Americans calling themselves “Indians of All Tribes.” At issue was the matter of sovereignty, just as it would later be on Kaho'olawe. Responding to demands that they leave the island, Native Americans exclaimed that it “is the hope of Indian People to advance themselves culturally and spiritually. . . . We will no longer be museum pieces, tourist attractions, and politicians’ playthings.” Those seizing Alcatraz declared it to be Indian land and vowed to build a cultural and educational center there. However, they were soon divided by leadership struggles and harmed by a lack of adequate food, water, housing, and electricity on Alcatraz. Those few Indians still remaining on Alcatraz were removed by federal officials in June 1971.⁶⁵

The development of Silicon Valley’s high-technology industries led to rapid population growth, which gobbled up land for urban use and led to further environmental problems. San Jose’s population mushroomed from 95,000 in 1950 to 920,000 in 2000. This population explosion outpaced that for the state of California as a whole, which increased from 10.5 million to 33.9 million in the same decades, and that of the San Francisco Bay area, which rose from 2.6 million to 6.5 million. Uneven development continued. As one urban historian has explained with understatement, San Jose’s expansion “consumed considerable adjacent farmland, including some of California’s finest vineyards and numerous orchards.” California being the most urbanized state in America in 2000, some 93 percent of Californians lived in metropolitan areas. Quality-of-life issues caused by urban sprawl, the disap-
The Pacific Coast

pearance of green space, and a lack of affordable housing were epidemic. They were nowhere more pressing than in Silicon Valley.

Pushed by a progrowth city government, San Jose expanded rapidly through the 1960s. Using control over their city’s sewer treatment facilities as a club, San Jose’s political leaders convinced people in many contiguous areas to agree to annexation, until by 1970 the city covered 132 square miles. San Jose’s rampant growth, which sparked fears about increased costs for city services and, at the same time, generated concerns that bucolic lifestyles were in danger, led to the formation of an antigrowth coalition. Women were in the forefront of this campaign. As early as 1962, the conservative Virginia Shaffer had won election to the city council on the strength of promises to reduce city taxes. By 1969, she and others had succeeded in removing San Jose’s progrowth city manager from office. Still more women won election to the city council in the 1970s. In 1974, San Jose voters chose Janet Gray Hayes, one of the councilwomen, as their city’s mayor, making her the nation’s first woman to be mayor of a city of five hundred thousand or more people. Hayes campaigned on the promise to “make San Jose better before we make it bigger” and was an advocate of parks and green areas.

State legislation framed local actions, but local measures often had greater impacts. Already in the 1950s, farmers and slow-growth advocates secured state legislation limiting the power of municipalities to annex farmland and guaranteeing that farmland would be assessed for taxation on the basis of its value as agricultural land, not on the basis of its market value as real estate. This legislation, however, had little effect in Silicon Valley, where many farm owners were small landowners eager to sell at hefty profits to developers. Closer to home, San Jose’s voters approved Measure B in 1973, an ordinance limiting new zoning for homes wherever schools were over-crowded. Measures like that one did reduce the pace of growth within San Jose’s city limits, but urbanization continued outside of them. San Jose, after all, was far from the entirety of Silicon Valley. Then, too, ways to continue annexation were found, leading to an overall tenfold increase in the size of San Jose between 1950 and 2000.

Affordable housing became rare in the Valley, in part because of the movement of so many new people into the area and in part because of limitations on building such as Measure B. In 2001, only 16 percent of the region’s residents could afford the $540,000 median house price. The problem was that house prices had more than doubled since 1990, while per capita income had risen by a much smaller 36 percent (and for the bottom quartile of wage
earners’ real incomes had actually fallen). Even renting an apartment was
difficult, with a median apartment rental price of $1,600 per month. All-
too-typical was the family of John Singh. Singh worked on a contract basis
for Hewlett Packard, and his wife had employment as a registered nurse.
Together, they earned $105,000 annually. However, with three children they
could not afford to buy a house and lived, instead, in the Boccardo Reception
Center, a shelter for the homeless in San Jose. They were not alone; 40 percent
of the shelter’s residents had jobs.⁷⁰ High-technology workers were not the
only ones hit hard by high housing prices. Service workers such as teachers,
firemen, and policemen found it increasingly difficult to live in the Valley.⁷¹

Even for those who could afford Valley homes, life was far from easy. A
study of some forty communities across the United States in the late 1990s
revealed that, “although Silicon Valley ranked high in interracial trust and di-
versity of friendships, it landed near the bottom in civic engagement, chari-
table giving, volunteering, and civic leadership—and in sense of community
as well.”⁷² In a region where vacations had come to be derided as “downtime,”
even some successful high-technology entrepreneurs questioned what they
were doing with their lives as the twenty-first century opened. In such an
environment, growing traffic congestion was, not surprisingly, particularly
resented as a waste of time.⁷³

Thus, Silicon Valley, and more generally the San Francisco Bay area, ex-
perienced exuberant growth in the twentieth century, especially after World
War II. Buoyed by entrepreneurial ambitions and defense spending, the re-
gion boomed as a high-technology region, well known and imitated around
the globe. Areas throughout the Pacific, from would-be high-technology dis-
tricts in the Hawaiian Islands and Japan to a more successful one in South
Korea, sought to become new Silicon Valleys. In trying to emulate the Val-
ley’s apparent success, residents in other regions overlooked the negative as-
pects of such expansion. For instance, many of the same issues emanating
from industrial and high-technology growth arose in an expansive Seattle
after World War II.

Economic Growth and Environmental Problems
in Seattle and Pugetopolis

Traffic tie-ups were even worse in the Seattle area than in Silicon Valley. As
a scholar of urban planning observed in 2002, “traffic congestion in Greater
Seattle is arguably the worst in the nation.” Every nook and cranny from
Everett in the north to Tacoma in the south was being filled with urban and suburban developments, and Pugetopolis was quickly coming to resemble the linked cities of Boston, New York City, and Washington, DC. From an overgrown town of 368,000 people in 1940, Seattle became a major metropolis of 2.6 million residents fifty years later.⁷⁴

The Seattle region suffered from some of the same growth problems as Silicon Valley, but there were differences as well. Beyond transportation congestion loomed runaway housing prices, land-use questions, and water-quality problems. Seattle boomed in the 1980s and later, in part, from the expansion of high-technology firms such as Microsoft. However, because these companies engaged more in software production than in the fabrication of computer chips and hardware, there was less contamination of the region’s water supply by toxic chemicals. True, Seattleites and people in nearby suburbs polluted Lake Washington with their sewage, but in a rare show of regional cooperation they succeeded in cleaning up that body of water.⁷⁵

Seattle’s first period of rapid development started with the acquisition of rail connections to the Midwest and East in the 1880s and 1890s. Seattle’s business leaders were well situated to take advantage of new economic developments. With much of the Great Lakes cut over, the United States came to depend more heavily than before on the Pacific Northwest for its timber. Seattle-area mills helped supply that demand. Even more explosive, though short-lived, was the impact of the Klondike Gold Rush to Alaska in the mid- and late 1890s. Possessing a fine natural harbor and ambitious merchants, Seattle benefited greatly as the leading outfitting point for the north. Slightly later, Seattle fishermen and corporations came to control most of Alaska’s salmon industry. Local railroads also opened up areas near Seattle to coal mining and farming. Seattle thus developed as a commercial city more than as a manufacturing center. Still, as the city grew in size and population, it became a large enough market to spur the development of local industries such as shipbuilding and ironworking. Between 1890 and 1920, the city’s population rose more than fivefold, from 43,000 to nearly 240,000, growth that made Seattle a large regional center on America’s Pacific Coast.⁷⁶

Faced with the rapid expansion of their city, some Seattleites turned to planning to channel the forces of change. In some matters, largely engineering ones aimed at the commercial expansion of their city, they succeeded. Seattle’s chief engineer, R. H. Thomson, oversaw a major regrading effort that lowered the heights of Seattle’s hills by using hydraulic monitors (apparatus similar to large fire hoses) to wash them away. He then utilized the resulting dirt and gravel to fill in parts of Seattle’s waterfront. This action both re-
moved a significant barrier to Seattle’s commercial and residential expansion and created new sites for industrial development. Seattle’s officials also seized new water supplies for their growing metropolis, especially by securing a watershed area off-limits to most types of development around the Cedar River. At about the same time, the federal government built a major set of locks on a waterway connecting Lake Washington to Puget Sound, a project that further enhanced the city’s commercial potential.⁷⁷

There were environmental downsides to these actions, however—problems only dimly perceived and rarely acknowledged by Seattleites in their scramble for wealth. Entire ecosystems were greatly altered. The building of the locks, for example, sent Lake Washington’s water out to sea by a new route. Doing so lowered the lake’s level considerably and completely eliminated the Black River, which had earlier been its outlet. Environmental justice issues were involved, as public works especially hurt Native Americans. Once again, benefits from growth were unevenly distributed. For instance, the industrial development of newly created areas on Seattle’s waterfront and the banks of nearby rivers, especially the Duwamish, impinged on the livelihood of Native Americans in the area. They found it impossible to maintain a subsistence lifestyle based on hunting, fishing, and gathering, and had to move away. Only in the 1990s and later did small groups return.⁷⁸

Seattleites proved less successful in redesigning the spatial layout of their city. Like the residents of other Pacific Coast cities, they considered a comprehensive city plan for their metropolis. Called the Bogue Plan after Virgil Bogue, the engineer who drew it up, the scheme envisioned the coordinated construction of new harbor facilities, streets, parks and boulevards, and a civic center. Presented to voters by the city council in 1912, the plan embraced an area of 150 square miles and sought to prepare Seattle for a population of one million people, roughly four times its population then. The Bogue Plan failed to win approval. Like the Progressive-era city plan for San Francisco, it initially attracted a lot of favorable comment, as many business and professional groups came out for it. Yet, those organizations soon split on particular aspects of the scheme. Many Seattleites also feared that approval of the plan would raise their taxes. Feeling themselves already heavily burdened to pay for engineering works such as the regrading of their hills, they opposed any measure that might hike their taxes still more. While some parts of the Bogue Plan were put in place over the following decades, the idea of comprehensive city planning was relegated to the back burner for many years to come.⁷⁹ A major reason for this turn of events was a slowdown in the rate of Seattle’s growth. Like most Pacific Coast cities, with the notable exception of
Los Angeles, Seattle grew more slowly in the 1920s and 1930s. Consequently, the urgency for comprehensive planning dissipated.⁸⁰

Seattle's population resumed its upward trajectory during and after World War II, as its shipbuilding firms, and especially the Boeing Company, boomed.⁸¹ Into the 1970s, Seattle's fate was tied directly to that of Boeing. While Boeing's expansion brought economic growth to the Seattle region in the form of tens of thousands of jobs, challenges also trailed in the wake of the rapid development of the firm. People lived ever farther from Seattle's downtown, as suburbs proliferated. Downtown businessmen tried to arrest this trend, with only partial success. A climax to their actions came in the late 1960s, when they sought through regional planning to address district-wide infrastructural issues, nearly all of which impinged upon the physical environment of the Seattle area.

Describing Seattle after World War II, urban historian Carl Abbott has accurately observed, “The engine that was obviously driving the new Seattle was Boeing.”⁸² It was during and right after the conflict that Boeing became central to Seattle's economy, and it was really only then that Seattleites from many walks of life—business leaders, many labor leaders, and politicians—united, for a time, in pushing for Boeing's agenda at the national level. In the importance of Boeing to the Seattle region can be glimpsed, once again, the significance of the American military, World War II, and the Cold War in the Pacific. While many of Boeing's sales were commercial, many others were military, especially in the 1940s and 1950s.⁸³

Founded shortly before World War I, the Boeing Company expanded during the conflict, only to contract after it. Established on the banks of the Duwamish River close to Seattle's waterfront, the company was one of the manufacturing ventures that displaced Native Americans there. Boeing had become Seattle's largest industrial venture by 1928, with 900 employees. Hurt by the Great Depression, Boeing boomed from the 1940s into the late 1960s, as the firm developed military aircraft and, after World War II, civilian airplanes as well. It delivered its 707, the first American commercial jetliner, to airlines beginning in 1958. Boeing's employment in the Seattle region jumped from about 4,000 in 1940 to roughly 50,000 four years later. Employment slumped to 9,000 in 1946, but climbed to 58,000 in 1958 and reached about 100,000 by 1967. By the mid-1960s, about 20 percent of all of the jobs in King County were with the Boeing Company.⁸⁴ The company's expansion also spurred population growth in the Seattle area. In 1950, about 468,000 residents made Seattle their home, up from 368,000 a decade before. In 1970, some 530,000 people lived in the city of Seattle, with many more in
its suburbs. By that time, 1.4 million people were living in Seattle's standard metropolitan area.\textsuperscript{85}

Although Seattle's leaders backed Boeing's efforts to win Defense Department contracts, some came to harbor doubts about the impacts the firm was having on their region's economy and development. By the early 1960s, they voiced two major critiques: they thought that Boeing's dominance was precluding the development of a diversified economy (some even came to see Seattle as being simply a "colony" of Boeing); and they believed that too much of the economic growth and spatial development was occurring outside of Seattle in its suburbs, thus endangering downtown businesses. There was considerable truth to these perceptions, especially the second one. Needing space for runways, large assembly plants, and research facilities, Boeing located most of its facilities beyond Seattle's city limits, eroding the city's tax base. Then, too, as Boeing attracted workers to the region, an increasing proportion lived outside of Seattle. In the decade of the 1950s, the outlying parts of Seattle increased in population by 46 percent, but within the city limits the rise was less than 1 percent. The first regional shopping center, Northgate, opened in 1950, just north of Seattle's city limits. The trend toward suburbanization, aided by the construction of interstate highways, continued in the 1960s, until by 1970 about 63 percent of Seattle-area residents lived in suburbs.\textsuperscript{86} These decades were, one disgruntled Seattleite observed, "the era of the bulldozer, the ranch-style house, the shopping center, and long runs of commerce on arterials."\textsuperscript{87}

Seattle's business and political leaders responded in several ways. Like San Jose's leaders, they embraced annexation, sometimes using their control over water and sewers to persuade outlying regions to agree to become part of the city of Seattle. The sixty-block area in which Northgate was located was annexed in 1955, bringing revenues from taxes on the shopping center into the city's coffers. In 1962, they also mounted a world's fair in a section of Seattle not far from the city's downtown. Seattle's leaders hoped that the exposition would both attract new businesses to their region and showcase the downtown as the center of the Seattle area. The exposition drew nearly 10 million people. However, it proved to be too isolated from the downtown to help the downtown area much. Its emphasis on aerospace and science, as in the construction of the landmark Space Needle, did more to boost Boeing than other firms in the public's imagination.\textsuperscript{88}

Nonetheless, Seattle's downtown did not stagnate. At the hands of political and business leaders, it developed as an international center for finance and trade, complete with a host of shimmering skyscrapers soaring above
its hills. During the 1950s and 1960s, choices made by Seattle's elite moved their city ahead of other regional rivals such as Portland to become a globally “networked” city. Historian Abbott credits civic initiatives undertaken in these decades—the world's fair, the building of a downtown sports complex, including a domed stadium (the Kingdome, since torn down to make way for a newer stadium), harbor improvements designed to handle containerships, and the construction of a new park system—with helping Seattle to attain international standing.⁸⁹

Still, Seattle's downtown never regained the dominance it had once exerted over its surrounding area. Despite some success at annexation, new areas continued to spring up beyond the city limits, as suburbs marched ever deeper into the countryside. Increasingly, those suburbs sought independence from Seattle; more and more people in the new suburbs refused annexation, as they came to realize that it did not automatically bring sidewalks, streetlights, and other amenities. As a result, Seattle's city boundaries were basically fixed by about 1960.

In terms of suburban expansion, the greatest growth, and the most worrisome for Seattle's downtown leaders, occurred to the east of Seattle. As environmental historian Matthew Klingle has observed, “the most dramatic gains were in the smaller towns that ringed Lake Washington, especially in the Eastside region across the lake.” About thirty miles long and one to three miles wide, Lake Washington runs north–south along Seattle's eastern boundary. Two bridges, one opened in 1940 the other in 1963, connect Seattle to the metropolis' Eastside. Only four incorporated towns, including Seattle, touched Lake Washington in 1942, but twenty years later nine new towns bordered the lake on the Eastside alone. The Eastside's population more than doubled in the 1950s.⁹⁰

Of the rapidly growing Eastside communities, Bellevue attracted the most attention. Incorporated in 1953, Bellevue's expansion was chaotic. “There was nothing orderly about it,” noted George Bell, the Eastside's prime housing developer. In the mid-1960s, Bellevue was, as one Seattle magazine exclaimed, “the fastest-growing chunk of Washington” and “one of the fastest-growing areas in all of America.” Rapidly becoming an independent city, Bellevue nonetheless was home to many residents who had moved there hoping to enjoy a country existence. It was a place that “proudly proclaims its own unique, non-metropolitan identity,” the Seattle journal noted. However, its character was changing. “Already the Bellevue landscape is a kaleidoscope of contrasting scenes,” the journal mused, with “the most obvious contrast” being “between the remaining belts of rusticity and the highly developed
sections of town.” By 1972, 62,300 people were living in Bellevue, up from just 7,700 in 1954.91

As in the San Francisco Bay area, economic growth was very uneven in Pugetopolis. Generally speaking, Seattle and the Eastside suburbs benefited at the expense of southern Puget Sound and Indian reservations throughout King and Pierce Counties. For instance, the Duwamish–Green River corridor became poorer and more polluted, while Lake Washington and the Seattle suburbs grew wealthier and cleaner.92

Political contests over two groups of economic development and environmental protection issues laid bare divisions between Seattle and its suburbs and demonstrated the limits of power wielded by the metropole. In the late 1950s, Seattleites and their suburban neighbors cleaned up Lake Washington, which had become polluted by sewage from surrounding towns. Such cooperation proved difficult to achieve and had partially hidden environmental costs, however. About a decade later, voters in the Seattle region considered a package of issues designed to improve both their economic and physical environments, but approved only some of them.

Pollution problems in Lake Washington worsened dramatically after World War II.93 Seattle’s sewers dumped into Puget Sound for the most part, but the sewers of Eastside communities had their outlets in the lake. By 1955, ten new sewer systems discharged treated and untreated sewage into Lake

Just east of Seattle, Bellevue sported its own downtown skyscrapers. (Courtesy of Elizabeth Lawrence)
Washing t, and leaking septic tanks added to the problem. Even Seattle's sewage, which coursed through the same pipes as rain runoff, spilled into Lake Washington in times of heavy rainfall. Combined sewage overflows lay at the heart of the problem. In a wake-up call to Seattleites, a University of Washington professor of zoology proclaimed the lake “dead” in 1956. For months over the next three summers, large sections of the lake were closed to swimming and recreational activities, further alarming Seattleites.

Worried that the deteriorating condition of Lake Washington might hurt the growth and image of their city, Seattle's leaders, beginning to dream of a world's fair, joined forces with younger professionals and educators to change matters. Doing so would be difficult, they realized; for, like many regions, Seattle was characterized by fragmented government. There were about 180 separate local governments in King County, including 21 sewer districts representing 40 communities around Lake Washington. Nonetheless, led by James Ellis, a young Seattle attorney active in civic affairs, they sought to build consensus for change. They initially failed. In March 1958, voters turned down a plan for a comprehensive sewer system. Two factors led to the defeat. First, it was presented to voters as part of a package that also included a regional mass transit system and plans for regional zoning. Even many who wanted to clean up Lake Washington hesitated to vote for that expansive package. Then too, Seattleites and the residents of Bellevue approved the plan, but it lost heavily in South King County, whose residents in many suburbs viewed it as a power grab by Seattleites.⁹⁴

Sewer advocates quickly reworked their proposition. They stripped it of any connections to mass transit and regional zoning and limited the vote to residents of communities directly bordering on the lake. Approved by a wide majority in September 1958, the measure provided for the construction of huge interceptor sewers around Lake Washington, soon making the lake a “textbook example on how ‘bioremediation’ can pull aquatic ecosystems back from the brink of collapse.”⁹⁵

There was a dark side to even such a dramatic environmental victory, however. The new sewers dumped into Puget Sound, increasing pollution there, and into the Duwamish River, where what little remained of aquatic life was almost snuffed out. These actions occurred just as Native Americans in the state of Washington were beginning to reassert their historic fishing rights. Only in later decades were some remediation efforts taken to improve the quality of water in the Duwamish River, allowing a few Native Americans to fish there again. More broadly, the rehabilitation of Lake Washington helped draw more people to the Seattle region, thus ironically increasing
some forms of pollution and congestion. With only slight hyperbole, historian Klingle has observed that a “rising tide of concrete and asphalt began to flow up the Sammamish River [which drains into Lake Washington] and onto the Issaquah Plateau, engulfing more and more acreage with every year.”

As growth continued, Seattle-area residents sought to control sprawl through “Forward Thrust” proposals. Extensive bond issues to fund the proposals were voted on separately, not as single entities; proponents had learned from the defeat of the initial Lake Washington sewer measure. With Ellis again playing a leading role, some proposals won relatively easy acceptance in 1968: area-wide parks and recreation centers, the Kingdome, additional sewers, flood-control measures, and various neighborhood improvements.

Transportation measures, on the other hand, mainly failed at the polls. Voters were asked to approve the building of new arterial streets (streets just short of being freeways) through Seattle. These propositions drew immediate fire. One street, named R. H. Thomson after Seattle’s early-twentieth-century engineer, would have sliced through Seattle’s world-famous arboretum, an oasis of nature in the city. Another would have destroyed much of Seattle’s black community. Yet another would have crossed Lake Washington on a third bridge. There was more to Forward Thrust’s transportation plans, however. A mass transit scheme was also part of Forward Thrust: four coordinated rapid-rail lines serving major travel corridors into Seattle from the suburbs. The results at the polls were mixed. Some of the proposed arterials were built, but not all. Even those that were constructed were greatly modified in light of public concerns. No arterial bisected the arboretum (instead, half-built on-ramps today provide diving platforms for swimmers enjoying Lake Washington), and a third Lake Washington bridge was not built. The street extending through part of the black neighborhood was greatly modified to do much less damage than the one originally proposed.

The opposition to freeways in Seattle was part of a nationwide antifreeway movement that had begun in San Francisco in 1959 and spread throughout much of the United States in the 1960s and 1970s. Urban historian Raymond Mohl has identified a number of commonalities in successful freeway revolts: “persistent neighborhood activism” and “interracial alliances,” strong journalistic and political support, a tradition of planning in the affected localities, and ways for proponents to take their concerns into court systems. In Seattle, many of these characteristics were present. Very strong local neighborhood organizations coalesced into a large citywide umbrella orga-
nization, Citizens Against Freeways, well able to flex its political muscles. Its leaders were well-positioned professionals similar to those in Forward Thrust, and they could not easily be brushed aside. The journal *Seattle Magazine* and Seattle’s major newspapers initially provided support for many of Forward Thrust’s plans, but in time questioned its freeway ideas, as did local and statewide politicians. While never as important as in some other areas, court cases sometimes were used to slow construction plans. Most important in Seattle, however, were the votes on bond measures.⁹⁹

No mass transit system was approved. The mass transit plan included in Forward Thrust, and backed as well by many members of Citizens Against Freeways, won a bare majority of the vote, 51 percent, but not the needed 60 percent. The major reason the issue failed was that the proposed routes aimed simply at moving people into and out of the downtown area, not between the rapidly developing suburban communities, what some observers of urban developments were beginning to call “edge cities.” Even the editor of the progressive *Seattle Magazine* had doubts about this plan.¹⁰⁰ The failure of the mass transit proposals and the inability to construct some of the arterials set the stage for the clogging of Seattle-area roads, which has resulted in a high degree of congestion to the present day.¹⁰¹ Saving the arboretum and Seattle’s black area from highways and protecting Lake Washington from a third bridge entailed environmental costs. Choices on economic development and environmental protection matters, the example of Seattle’s Forward Thrust shows, are rarely easy.

At about the same time that Seattleites addressed problems of urban growth and congestion, residents throughout Pugetopolis began changing their attitudes toward the region’s defense industries. By the late 1960s, and especially in the 1970s and 1980s, inhabitants of the Puget Sound region began to oppose defense developments on environmental and antiwar grounds. Historian Brian Casserly has cogently written, “Puget Sound communities traditionally welcomed the local military presence for the economic benefits that it brought but . . . this changed in the 1960s and 1970s . . . as groups of citizens challenged the traditional cozy relationship between local civic and business leaders and the military.” That alteration, he has concluded, resulted from “the development of environmental concerns about the impact of military related growth, such as the destruction of natural areas like Hood Canal, increased urban sprawl, etc.” “In addition,” Casserly observed, “new, more critical approaches to the military were also influenced by the growth of peace activism in the 1970s.”¹⁰²

A case in point lay in efforts to stop the building of a Trident nuclear
submarine base at the Bangor Ammunition Depot near Bremerton on Hood Canal just across Puget Sound from Seattle. In the 1970s, a loose coalition of local property owners worried about the costs of infrastructure improvements and higher taxes, environmentalists who were concerned about changes that an increase in population might bring to the landscape and quality of life in their region, and peace activists sought to shut down the project. Like those challenging the navy’s use of Kaho’olawe at about the same time, they relied on demonstrations to dramatize their opposition. One group invaded the base illegally to plant a garden “to symbolize the conflict between issues of world hunger and ‘the tremendous amount of money being spent on a nuclear first strike offense.’” Again like the navy’s opponents in Hawai‘i, they went to court to challenge the navy’s environmental impact statements to try to halt the construction of the base. They lost, and the Trident base opened in 1982. However, the widespread opposition heralded, Casserly has explained, “the emergence of a new phase in western relations with the military, especially regarding facilities associated with nuclear weapons.”¹⁰³

A second instance of local opposition to the military, this time successful, occurred with regard to Fort Lawton right in Seattle. Seattle’s civic and business leaders had lobbied hard for the creation of Fort Lawton during the early 1900s, but once established, the base never generated the anticipated economic growth. When military officials proposed using part of its grounds as an Anti-Ballistic Missile facility in 1968, local leaders mounted spirited opposition, arguing that the base’s grounds could better be used as a park to enhance the quality of life for Seattleites.¹⁰⁴ They were joined by Native American leaders. Inspired by the 1969 Indian occupation of Alcatraz Island, Seattle-area Indians took over some of Fort Lawton’s grounds in early March, 1970. Jane Fonda joined them in their protests several weeks later. In the end, the base’s lands were transferred to Seattle for use as a park, which included an Indian cultural center.¹⁰⁵

High-Technology Developments in Seattle

The only-partial success at regional planning by Forward Thrust advocates combined with an economic downturn in the early 1970s to usher in a new period in Seattle’s history. Boeing was hit hard by the national recession and laid off 60,000 workers between 1969 and 1971.¹⁰⁶ As unemployment in Seattle climbed to 14 percent, a billboard on Interstate Highway 90 asked, “Will the Last Person Leaving Please Turn Out the Lights?” Boeing even-
tually recovered from this downturn, but never again dominated Seattle’s economy the way it had in the 1950s and 1960s. The city developed a more diversified economy, based in part on high-technology industries.¹⁰⁷ This change did not, however, halt environmental alterations, as suburbanization continued apace. In fact, the choices made by Seattle-area residents in rejecting many of the plans proposed by Forward Thrust continued to affect them as the twenty-first century began.

While less important to Seattle’s economy than before, Boeing remained significant. Consequently, Seattleites continued to benefit and suffer as the company endured cyclical ups and downs in its production and sales. Buoyed by both commercial and military orders, the firm’s employment in the Seattle region recovered to 93,000 by 1989. Another recession and cutbacks in military spending led to layoffs in the mid-1990s, but employment rose again later in the decade. Surprises came in the opening years of the twenty-first century. In 2001, Boeing moved its headquarters, although no factories, to Chicago, and a few years later ethics scandals rocked Boeing, costing the firm several large federal government orders.¹⁰⁸

However, Boeing was no longer the only game in town. Lumber and fishing remained significant industries; ocean-borne trade through new harbor facilities was important; and a research-oriented University of Washington and new research institutions, such as a major branch of the Columbus-headquartered Battelle Memorial Institute, added a fillip to the region’s development. Tourism boomed. Recognizing these alterations and the development of a significant high-technology component to the Seattle-area economy, *Fortune Magazine* named Seattle America’s number-one city for business in 1992.¹⁰⁹

Seattle’s high-technology segment differed from that in Silicon Valley. It was not an agglomeration of many independent, tightly linked firms. Instead, Seattle’s high-technology development took more of a “hub-and-spoke” design. Boeing acted as a hub for aerospace developments. It both subcontracted work to other companies in the region and spun off start-up aerospace firms, although not to the extent that high-technology firms such as Fairchild did in Silicon Valley. In 1989, there were eighty-six companies making aircraft and aircraft parts and another five producing guided missiles and space vehicles in the Seattle area. Microsoft formed part of a hub for software companies. Some six hundred software firms made the state of Washington their home by 1992, with the great majority of them located in the Seattle region. Often less well recognized was Boeing’s role in the development of software enterprises. Founded in 1970, Boeing Computer Services
(BCS) employed 6,000 people by 1989. Established to serve Boeing’s internal needs, BCS ventured into commercial markets and spun off independent companies. There were already over a hundred software companies in the Seattle region by the time Microsoft was incorporated in 1981. Finally, the University of Washington and its Fred Hutchinson Cancer Research Center served as the hub for a fledgling group of biotechnology firms. By the mid-1990s, some sixty such enterprises employed 5,000 workers. The various types of high-technology businesses provided about 10 percent of the jobs, and a higher percentage of the payroll, in the Seattle region by 1989.¹¹⁰

Renewed economic growth led to further expansion in Seattle’s suburbs, until by 1990 the Seattle region contained 2.6 million residents. The Eastside especially boomed. Bellevue soon boasted its own downtown, complete with skyscrapers rivaling those in Seattle. Bellevue had become a classic edge city, largely independent of Seattle. By 2002, Bellevue boasted 117,000 residents.

Rapid population growth and spatial expansion resulted in renewed calls for planning and controls. As in California, some localities in Pugetopolis sought to limit development though the adoption of “no-growth” or “slow-growth” ordinances. When these generally proved only partially effective, Washingtonians turned to their state legislature for help.¹¹¹ In 1990, the Washington State Legislature passed the Growth Management Act (GMA). This legislation required that local governments make plans channeling growth in specific areas by designating areas as either growth or nongrowth corridors. The GMA also required that infrastructure improvements—schools, water and sewer facilities, roads, and the like—be put in place before residential or commercial development could occur. Moreover, the state’s twelve most populous counties had to submit comprehensive land-use plans.¹¹² The GMA proved less effective in controlling growth than many of its advocates had hoped. One scholar of urban development observed, the “result has been even more rivalry among entities,” as little cooperation to curb growth occurred. Continuing, he noted, “Although expansion of built-up areas into exurban areas has been reduced, each community has vigorously tried to increase its share of the employment and population pie.” Indeed, he has concluded, “within the growth boundaries, traditional zoning regulations have been relaxed in favor of higher densities.”¹¹³

The Seattle region was too popular for its own good. A writer for Newsweek observed in 1996, “Sooner or later, it seems, everyone moves to Seattle, or thinks about it, or at least their kids do.” Seattle, he concluded, had come to “consist entirely of people who were born somewhere else. Rootless youths seeking alienation beneath Seattle’s brooding skies, but with plenty of girls to
keep them company. Middle-aged strivers betting that Microsoft can create one more millionaire.” Seattle’s motto had become, he suggested, “Seattle: if you can make it there, so what?”¹¹４ Growth extended far into the countryside. A reporter for the Seattle Post-Intelligencer observed the trend accelerating in 2004, as many Seattlites lived ever farther from the city’s center. Writing about Issaquah, he described how “3,330 homes are planned to the northeast in Issaquah Highlands . . . where a new Microsoft campus is planned.” “As a result,” he noted with dismay, “the broad greenswards that helped attract settlers to Issaquah Creek’s flood plain more than a century ago have been covered with blacktop and storefronts.”¹¹⁵

Conclusions

Military spending for World War II and the Cold War helped America’s Pacific Coast cities, just as such spending boosted other Pacific regions. The cities experienced rapid economic growth and attained national, even international, stature. Seattle and Silicon Valley created measurably high economic standards of living for their residents. In 1970, and even more so twenty years later, residents in Seattle enjoyed a per capita income quite a bit higher than that of the average Washingtonian. Similarly, Silicon Valley residents had incomes on average considerably higher than those of other Californians.¹¹６ In Silicon Valley and, increasingly, in the Seattle region the rising incomes came from high-technology companies.

However, major environmental costs accompanied economic growth. Some costs were obvious, others hidden. Congestion and high home prices were in plain view. So was water pollution by sewage. In both Silicon Valley and Seattle, urban and suburban development altered physical landscapes in ways similar to those described by environmental historian Adam Rome for communities across America.¹¹⁷ As in the rest of postwar America, suburban growth spawned environmental efforts to control sprawl, with, at least in the cases of Seattle and Silicon Valley, only partial success.¹¹⁸ Ground-water contamination, especially by toxic chemicals, was much less obvious. Even further from public view were questions of environmental injustice, as high-technology development fostered uneven economic growth. The health problems of immigrant women workers in Silicon Valley’s wafer fabrication plants and the loss of fishing grounds on the Duwamish River by Native Americans were two deleterious results.

Environmental justice concerns were, of course, central to policy
making for Kaho‘olawe. Trade-offs between economic development and environmental justice matters also occurred in Alaska, the subject of the next chapter. Those issues became apparent in efforts to create a new international park in cooperation with the Russians. That effort seemed to infringe on the rights of Alaskan Natives and was initially opposed by some of them. Trade-offs between business development and environmental protection in Alaska revolved, however, mainly around the exploitation of fishery and oil resources.