



Silicon Politics, from Puritan Soil to California Dreaming

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“ON Puritan Soil the Computers Grow,” proclaimed a headline in the *New York Times* in 1964, the midpoint of a four-decade period when greater Boston was the most important hub of high technology in America. Harvard and MIT were research powerhouses without rival, their leaders shaping national science policy, their laboratories spinning startup companies at a rapid clip. Corporate campuses gleamed along “America’s Technology Highway” of Route 128, their balance sheets fattened by Cold War defense contracts. Earlier that year, the Maynard-based MIT spinoff called Digital Equipment Corporation, or DEC, had introduced its market-defining mini-computer, the PDP-8. Within a decade, DEC was the third-largest computer company in the world.¹

New England’s high-tech dominance continued into the 1980s. Journalists and boosters hailed the “Yankee ingenuity” of firm founders and celebrated Governor Michael Dukakis and US Senator Paul Tsongas for fighting off Rustbelt malaise with a tech-driven “Massachusetts Miracle.”² In 1982, the Massachusetts technology sector had close to \$20 billion in sales—twice the volume of its closest rival, Northern California’s

¹John Philips, “On Puritan Soil the Computers Grow,” Review of *CAMBRIDGE U.S.A., Hub of a New World*, by Christopher Rand, *The New York Times Book Review*, November 29, 1964, 3; Henry R. Leiber, “Technology: Alchemist of Route 128,” *The New York Times*, January 8, 1968, 139; Lily Geismer, *Don’t Blame Us: Suburban Liberals and the Transformation of the Democratic Party* (Princeton: Princeton University Press, 2014), 23.

²Geismer, *Don’t Blame Us* 19–42, 251–80.

Silicon Valley. Regions across the United States scrambled to replicate Boston's high-tech alchemy. "We're the Brooke Shields of the economy," crowed the chief lobbyist for the Massachusetts High Technology Council in 1983.³

The supermodel era did not last. The minicomputer market cratered, the Cold War ended, and layoffs came by the thousands. Having chipped into Boston's lead in the 1980s, Silicon Valley blew past it during the dot-com boom. The biggest technology company of the 1990s was Seattle-based Microsoft, cofounded by Harvard dropout Bill Gates. One of the biggest of the 2000s, Silicon Valley-based Facebook, was founded by another Harvard dropout, Mark Zuckerberg. Even by his sophomore year, he had concluded that living the high-tech dream required getting out of Cambridge.

Today, Silicon Valley is no longer merely a place in Northern California but shorthand for an entire industry. The firms started by Gates and Zuckerberg are two of the five largest technology companies in the world, known collectively by the rather ominous handle of "Big Tech." Their reach is global, their customers in the billions, and their combined market capitalization exceeds the GDP of Japan. All are headquartered on the West Coast.⁴ In 2023, San Francisco teemed with startup ventures focusing on the presumed next big thing in technology, generative artificial intelligence (AI). This led one Bay Area investor to declare that the region was like "Rome or Athens in antiquity"—a hub of world-altering ideas, technological marvels, and political and social power.⁵

³Fox Butterfield, "Two Areas Show Way to Success in High Technology Industry," *The New York Times*, August 8, 1982, A1; William D. Marbach, et al., "High Hopes for High Tech; Can the New Glamour Industries Lead the Way out of the Economic Slump?" *Newsweek*, February 14, 1983, 61.

⁴The five companies are Amazon, Apple, Google, Meta (formerly Facebook), and Microsoft. Margaret O'Mara, "Change is Looming for Big Tech," *The New York Times*, May 1, 2020, A27; O'Mara, "The World Tech Made," *Foreign Affairs*, November 1, 2022.

⁵Garry Tan, quoted in Anne Sraders, "3 Takeaways from Y Combinator's Latest Class of Startups," *Fortune*, September 8, 2023, <https://fortune.com/2023/09/08/takeaways-y-combinators-summer-startup-class/>.

As technology's center of gravity shifted westward, innovation once attributed to Yankee tinkering became closely associated with an iconoclastic "Left Coast" sensibility, forged in the 1849 Gold Rush, reinvented by the 1960s counterculture, and monetized in an age of online disruption. In the mid-1990s, the media theorists Richard Barbrook and Andy Cameron acerbically named this mix of hippiedom and yuppiedom "the Californian Ideology," calling it a "bizarre hybrid . . . only made possible through a nearly universal belief in technological determinism."⁶ The language and iconography of the frontier West loomed large; companies were "pioneering," entrepreneurs were "cowboys" and "mavericks." In 2021, Amazon founder Jeff Bezos made that subtext into text by donning a cowboy hat and boots along with his blue flight suit as he made his first voyage into space, spurring a flurry of online fashion commentary.⁷

Popular dissections of Silicon Valley culture often portray it as a place apart, a land of oddballs, outsiders, and contrarians—the anti-Boston. Silicon Valley entrepreneurs and investors have leaned into this corporate branding. "Here's to the crazy ones," began the copy in an advertising campaign that initiated Apple's turnaround under returning chief executive Steve Jobs in 1997. "The misfits. The rebels. The troublemakers. . . . Because the people who are crazy enough to think they can change the world, are the ones who do." As an early Apple employee once put it to me, "all the losers came here, and somehow they pulled it off."⁸

⁶Richard Barbrook and Andy Cameron, "The Californian Ideology," *Science as Culture* 6:1 (1996), 44–72.

⁷Jacob Bernstein, "Are you a Bezos?" *The New York Times*, July 25, 2021, ST9.

⁸Rob Siltanen, "The Real Story Behind Apple's 'Think Different' Campaign," *Forbes*, December 14, 2011, <https://www.forbes.com/sites/onmarketing/2011/12/14/the-real-story-behind-apples-think-different-campaign/?sh=34eaea3662ab>; Guy Kawasaki, interview with Margaret O'Mara, Menlo Park, Calif., January 26, 2015. For dissections of this "renegade" positioning, from the friendly to the critical, see Steven Levy, *In the Plex: How Google Thinks, Works, and Shapes our Lives* (New York: Simon & Schuster, 2011); Fred Turner, *From Counterculture to Cyberculture: Stewart Brand and the Rise of Digital Utopianism* (Chicago: University of Chicago Press, 2006); and Paulina Borsook, *Cyberselfish: A Critical Romp through the Terribly Libertarian Culture of High Tech* (New York: PublicAffairs, 2000).

The scholarly literature has taken a more tempered approach, while still underscoring consequential cultural contrasts. In her now-classic comparative study of the two regions, AnnaLee Saxenian argued that regional differences in organizational culture informed “fundamentally distinct industrial systems.” Especially during the economic storms of the 1980s, the tight social and professional networks and routine job-hopping in Northern California gave it an advantage over New England’s large, integrated firms.⁹

Other scholars, myself included, have further emphasized the Valley’s suburban location, state laws and tax policies, and the presence of Stanford University, whose unusual institutional assets included nearly nine thousand acres of land, part of which was developed into a research park for high-tech tenants. In Silicon Valley, Cambridge and Route 128 were one.¹⁰

Smaller in size, a continent removed from the American capitals of finance and politics, and far more industrially homogeneous, postwar Silicon Valley evolved into an entrepreneurial Galapagos of niche service firms—law offices, venture capital partnerships, advertising and marketing agencies—catering to the distinctive needs of advanced-electronics startups run by young, inexperienced founders. Robust domestic migration

⁹Annalee Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Cambridge, MA: Harvard University Press, 1996), 2.

¹⁰On suburbs and Stanford: John Findlay, *Magic Lands: Western Cityscapes and American Culture* (Oakland: University of California, 1992); Rebecca S. Lowen, *Creating the Cold War University: The Transformation of Stanford* (Oakland: University of California, 1997); and Margaret Pugh O’Mara, *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley* (Princeton: Princeton University Press, 2004). On California state law: Ronald J. Gilson, “The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not to Compete,” *New York University Law Review* 74:3 (1999), 575–629. On what I term the “entrepreneurial Galapagos” of service firms see Margaret O’Mara, *The Code: Silicon Valley and the Remaking of America* (New York: Penguin Press, 2019) as well as Martin Kenney, ed., *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region* (Stanford: Stanford University Press, 2000). The two regions also differed in industrial sub-specialization. Boston was the land of mainframes and minicomputers, while Silicon Valley concentrated from the start in miniaturized electronics and communication networks—the building blocks of the post-1980 personal-technology revolution. See Christophe Lecuyer, *Making Silicon Valley: Innovation and the Growth of High Tech, 1930–1970* (Cambridge, MA: MIT Press, 2007) and Leslie Berlin, *The Man Behind the Microchip: Robert Noyce and the Invention of Silicon Valley* (Oxford: Oxford University Press, 2005).

and foreign immigration gave the region a population-level tendency toward technological and personal reinvention as well as a high rate of new-firm creation.¹¹

Yet in emphasizing the differences between the two places, scholars who write about the modern technology industry may have underplayed a core regional advantage that early Silicon Valley possessed: its close relationships with the people and institutions of high-tech New England.

Faculty and students were continually moving back and forth between the two regions' major universities. Entrepreneurs set up shop in Boston, moved to California, then sometimes moved back. New England capital funded California startups, and Silicon Valley's microchips powered East Coast mainframes. Both coasts had computer wizards and academic entrepreneurs, hackers and hippies, free-market capitalists and technolibertarians. As a result, quite a bit of New England DNA still courses through Silicon Valley, shaping business practices and political attitudes now considered to be quintessentially and quixotically Californian. Tracing some of these similarities and symbioses leads us toward an understanding of high-tech culture and politics that is less binary, more dynamic, and shaped not as much by regional geography than by *time*.



In the early Cold War decades, Silicon Valley and Route 128 had remarkably similar economies and business cultures,

¹¹On the “entrepreneurial Galapagos,” Margaret O’Mara, *The Code: Silicon Valley and the Remaking of America* (New York: Penguin Press, 2019), especially ch. 3, as well as Martin Kenney, ed., *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region* (Stanford: Stanford University Press, 2000); Chong-Moon Lee, William Miller, Marguerite Gong Hancock, and Henry Rowen, eds., *The Silicon Valley Edge: A Habitat for Innovation and Entrepreneurship* (Stanford: Stanford Business Books, 2000). On immigration and entrepreneurship, see Annalee Saxenian, “Silicon Valley’s New Immigrant Entrepreneurs,” Center for Comparative Immigration Studies, University of California, San Diego, May 2000. As of 2019, foreign-born workers made up 64 percent of all tech industry employees in Silicon Valley; see Silicon Valley Institute for Regional Studies, “Silicon Valley Indicators,” accessed September 12, 2023, <https://siliconvalleyindicators.org/data/people/talent-flows-diversity/foreign-born/foreign-born-share-of-employed-residents-over-age-16-by-occupational-category-table/>. On the Valley’s natural environment and climate, see Jason Heppler, *The Nature of the Valley* (Norman: University of Oklahoma Press, 2024).

distinguished chiefly by the fact that greater Boston was far larger, more prosperous, and more powerful. Both were overwhelmingly defense-dependent, dominated by large, vertically integrated military contractors specializing in aerospace, communications, and transistorized computing. (Southern California-based Lockheed was Silicon Valley's largest employer through the late 1980s, its impact largely unheralded because nearly all of the activities of its Northern California-based Missiles & Space Division were highly classified.) Few outsiders really understood the technologies these high-tech regions made. No national newspaper had a dedicated "technology reporter." Working in these firms could ensure solid middle-class prosperity, but few technologists presumed they would get rich.¹²

Another shared characteristic was the outsized economic and cultural role played by two unusually technical and entrepreneurial universities: MIT and Stanford. Though far from the only preeminent and technically significant institutions in their respective regions, MIT and Stanford stood apart for their engineering prowess, their unapologetically close partnerships with government and industry, and the entrepreneurial exploits of their faculty, students, and alumni. Both stood at the apex of what Stuart W. Leslie calls "'the golden triangle' of military agencies, the high technology industry, and research universities" that were established during the early Cold War period.¹³

Stanford's similarities to MIT were the result of the luck of economic geography as well as by administrative design. Frederick Emmons Terman, who served as Stanford's Dean of Engineering and Provost in years after the war, had in the 1920s been the first MIT doctoral student of Vannevar Bush—New Englander, engineer, entrepreneur, and Franklin Roosevelt's wartime "General of Physics." As director of the Office of

¹²I discuss this early period, including the significant role of Lockheed's Missiles and Space Division, in *The Code*, 30–83. Also see Lecuyer, *Making Silicon Valley* and Stephen B. Adams, "From Orchards to Chips: Silicon Valley's Evolving Entrepreneurial Ecosystem," *Entrepreneurship and Regional Development* 33: 1–2 (2021), 15–35.

¹³Leslie, *The Cold War and American Science: The Military-Industrial-Academic Complex at MIT and Stanford* (New York: Columbia University Press, 1993), 2.

Scientific Research and Development, Bush had marshalled thousands of America's scientists into an "army of brains," oversaw development of the atomic bomb, and landed on the cover of *Time* magazine. His advocacy for a permanent regime of government-funded science led to the creation of the National Science Foundation, and his visionary 1945 essay "As We May Think" became a founding document of the information age.¹⁴

Recruited back to Cambridge by Bush during the war, Terman had a front-row seat for observing his *doktorvater's* wartime operations and his vision of a postwar scientific infrastructure. The Stanford engineer returned to Palo Alto determined to tap into the coming federal bounty and raise his university's profile and research power, using Boston's higher education institutions as his blueprint. In the years that followed, Terman and his fellow administrators remade the university's academic structure, building up what he termed "steeples of excellence" in the hard sciences and engineering. Terman long had encouraged his students to forego the corporate rat race and start their own companies nearby; he had successfully persuaded two of his advisees, Bill Hewlett and David Packard, to do so in 1939. As the region's postwar industrial base grew, more graduates joined them.¹⁵

Along with ideas about how to run a university and encourage engineers to move from academic laboratories to high-tech startups, the Boston-to-California relay of the early Cold War decades transmitted a shared sensibility about the role of government in academic and private-sector innovation. Both regions were filled with engineer-tinkerers in white shirtsleeves and thin ties, more comfortable in the laboratory than within

¹⁴On Bush, see G. Pascal Zachary's biography, *Endless Frontier: Vannevar Bush, Engineer of the American Century* (New York: Free Press, 2018) as well as Zachary's edited collection of Bush's own work, *The Essential Writings of Vannevar Bush* (New York: Columbia University Press, 2022), which includes "As We May Think," published in *The Atlantic* in July 1945.

¹⁵In her incisive study of Stanford's Cold War transformation, Rebecca Lowen notes that Terman had initially been drawn to Harvard's reformist administrators—this was the midpoint of the two-decade rule of President James P. Conant—but then became increasingly admiring of his alma mater. See Lowen, *Creating the Cold War University* (Oakland: University of California Press, 1997), 105.

the corporate hierarchies of midcentury managerial capitalism, impatient with government bureaucracy but patriotically acquiescent to working in an electronics industry that had the Pentagon as its largest customer.

Another thread of influence was the emergence of high-tech venture capital. As business historian Tom Nicholas has observed, “a long-running orientation toward risk capital and entrepreneurship . . . can be seen in the earliest expressions of economic growth and development.”¹⁶ New England was a critical incubator of the model, from the joint-stock investment vehicle that funded Francis Lowell’s first Waltham mill at the start of the nineteenth century, to the formation of what is considered to be the first true high-tech venture firm, American Research and Development (ARD), in the 1940s. Financed by a consortium of academic administrators and Boston bankers, ARD is most closely associated with its longtime leader Georges S. Doriot, the French military man turned Harvard Business School professor.¹⁷

From an investment perspective, Doriot and ARD were a one-hit wonder, but what a hit it was: a seed investment in DEC that turned into a multimillion-dollar payday after the company went public in 1966. In terms of a bicoastal culture of high-tech investing, Doriot’s legacy was profound, as he taught and trained many men who went onto become significant players and shapers of Silicon Valley’s high-tech venture-capital scene. In some cases, the apprentices learned what *not* to do from Doriot, an old-school manager who ran his firm in the hierarchical way typical of the time. “From the beginning,

¹⁶Tom Nicholas, *VC: An American History* (Cambridge, MA: Harvard University Press, 2019), 320.

¹⁷On early venture capital in Boston and elsewhere, see Nicholas, *VC*; Spencer Ante, *Creative Capital: Georges Doriot and the Birth of Venture Capital* (Boston: Harvard Business Press, 2008); and Caroline Fohlin, “Creating Modern Venture Capital: Institutional Design and Performance in the Early Years,” January 8, 2013, SSRN, <http://dx.doi.org/10.2139/ssrn.2197840>; Sebastian Mallaby, *The Power Law: Venture Capital and the Making of a New Future* (New York: Penguin Press, 2022). On East Coast influences on early Silicon Valley venture capital, see Mallaby as well as Leslie Berlin, “The First Venture Capital Firm in Silicon Valley,” in *Making the American Century: Essays on the Political Culture of Twentieth Century America*, ed. Bruce J. Schulman (Oxford: Oxford University Press, 2014), 155–170.

I believed in collegiality,” said one former Doriot disciple, Bill Elfers, who went on to found Silicon Valley-based Greylock Partners. “That would be a crucial element in selecting and developing the general partners and creating the framework for the firm’s culture.”¹⁸



While the blossoming of the counterculture in the 1960s Bay Area has been a presumed catalyst for the growth of the personal computer industry in the 1970s, the trajectory is not quite as linear nor as exclusively Californian. The Vietnam War era marked a cultural turning point in high-tech regions both East and West. College students rebelled against the mainframe-and-punch-card-powered Establishment, while at the same time, declining federal spending on defense and aerospace research and development precipitated mass layoffs in each region’s economy. Young technical people no longer wanted to work in the defense industry, and amid defense cutbacks, they probably could not have found a job with a military contractor if they tried.

By the middle of the 1970s, personal-computing hobbyist groups were springing up all over the country, bringing together like-minded enthusiasts who had been soldering motherboards in their basements to swap ideas, technical specs, and software code. The most famous of these was the Homebrew Computer Club in Silicon Valley—its brief history burnished into legend chiefly because Steve Jobs and Steve Wozniak were early members of the group—but there were plenty in other regions as well. In the greater Boston area, academic institutions as well the booming 1970s minicomputing industry were incubators of talent and ideas that contributed mightily to personal computing becoming more than a tech-geek hobby.

Dan Bricklin worked at DEC in the mid-1970s and continued on to Harvard Business School, where he developed a

¹⁸“Bill Elfers, Founding Partner,” Greylock Partners firm website, <https://greylock.com/team/bill-elfers/>, accessed November 20, 2023, archived at <https://perma.cc/Q2VU-UJ7U>.

spreadsheet software application that turned the Apple II from an expensive plaything into a usable business machine. Ray Ozzie came to Data General, then the number-two minicomputer maker, in 1979, then went on to create the wildly popular personal-computer software Lotus Notes. The Boston area then “was kind of what you picture the Bay Area being like today,” Ozzie later remembered, “with a lot of young people, single, coming from major colleges all over the United States. . . . Work and play were very blurred, and everyone felt like they were in the center of the universe.”¹⁹

Once again, the two regions were evolving in sync, economically and politically. Venture capitalists from the Bay Area, Boston, and all points in between led a sustained lobbying effort to successfully persuade federal lawmakers to cut the capital gains tax in 1978. Soon after California voters passed the property-tax-capping Proposition 13 that same year, the Massachusetts High Technology Council led the charge to reduce taxes there as well, arguing that high taxes and regulations made “Taxachusetts” high-tech firms unable to compete with their Sunbelt cousins.

The growth of a commercial technology industry in both places—from minicomputers and microchips to personal computing hardware and software—had shifted the collective mood. Many technologists, particularly the younger ones, had little connection to nor affection for the military-industrial complex and the federal government that spawned it. The apolitical stance of an earlier generation of engineers hardened into political diffidence. “I’ve never voted for a presidential candidate,” Apple cofounder Steve Jobs breezily told a reporter in 1984. “I’ve never voted in my whole life.”²⁰



¹⁹James Temple, “Tech’s Lost Chapter: An Oral History of Boston’s Rise and Fall, Part One,” *Vox*, December 9, 2014, <https://www.vox.com/2014/12/9/11633606/techs-lost-chapter-an-oral-history-of-bostons-rise-and-fall-part-one>.

²⁰Tom Zito, “Jobs: 1984 Access Magazine Interview,” *Newsweek Access*, Fall 1984, reprinted in *The Daily Beast*, October 6, 2011, <https://www.thedailybeast.com/steve-jobs-1984-access-magazine-interview>, archived at <http://perma.cc/A3W8-T4Q9>.

The internet era not only moved Silicon Valley past Boston to become the largest American technology cluster by jobs, sales, firms, and venture capital deals. It also built wealth on a scale far beyond anything previously experienced in the Valley or Route 128. Both regions had minted millionaires through the 1980s but never quite as many, nor quite so quickly. One venture capitalist called the boom of the late 1990s “the largest single legal creation of wealth we’ve witnessed on the planet.”²¹

The entrepreneurs and evangelists of the early internet economy took the anti-government impulses of the personal computer era further, and now had a prominent online soapbox on which to proclaim their values. Never mind that the internet itself had originated as a Pentagon project and only recently become commercialized through an act of Congress. The further the public sector stayed away from the technology business, these technologists declared, the better. “Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind,” rang out the opening lines of John Perry Barlow’s 1996 *Declaration of the Independence of Cyberspace*, a foundational document of the internet era. “On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us.” Speaking to an international gathering of online enthusiasts the year before, Barlow warned, “we will spread ourselves across the planet so that no one can arrest our thoughts.”²²

Even more tempered voices urged political leaders to give the internet economy the lightest of regulatory touches, allowing individualism and free speech to thrive. Mitch Kapor, a founder of Boston-based Lotus Software who had worked closely with lawmakers like Massachusetts Congressman Ed Markey in the internet’s commercialization, called it “a

²¹John Doerr, “The Coach,” Interview by John Brockman, 1996, Edge.org, <https://edge.org/digerati/doerr>, archived at <https://perma.cc/9KWX-GLWK>.

²²John Perry Barlow, “A Declaration of the Independence of Cyberspace,” Electronic Frontier Foundation, February 1996, <https://www.eff.org/cyberspace-independence>; Trudi McIntosh, “Libertarian Stands up for the Wired Frontier,” *The Australian*, February 20, 1996, N1.

Jeffersonian information policy.”²³ Amid the partisan strife of the 1990s, the value of this largely deregulated and privatized approach was one of the few things on which both Democrats and Republicans could agree. The regulatory frameworks that emerged in the 1990s, notably the Telecommunications Act of 1996, may not have been as hands-off as Barlow wanted but were Jeffersonian enough to give internet companies a smooth and wide runway for astounding growth.



During the 1990s boom, Silicon Valley became the new Wall Street, drawing in young people who might have otherwise gone into investment banking as well as pulling in Boston-area graduates that in an earlier era would have stayed East. The dot-com bust at the turn of the millennium sent some of these migrants scurrying back across the continent, but the downturn ultimately proved to be a prelude to a supersizing of the industry in the 2000s and 2010s that took it to unimagined heights.

With this emerged a new strain of high-tech politics, a regionally undifferentiated mélange of social liberalism, libertarianism, and techno-optimism that alternatively sought to reinvent government or sidestep it altogether. Silicon Valley had gone for Ronald Reagan by a landslide in both 1980 and 1984, but now voted overwhelmingly Democratic, as did greater Boston. The Obama Administration drew enthusiastically from Silicon Valley's ranks and hailed its transformative technologies, a mutual admiration society that reached its apex at a 2011 town hall meeting at Facebook, where the president dressed down by taking off suit jacket and rolling up his sleeves, and chief executive Mark Zuckerberg traded in his trademark hoodie for a similar shirt-and-tie getup. (Reflecting the largely untroubled politics of that moment in social media's evolution, the clothing choices were the biggest news item emerging from

²³Mitchell Kapor, "Where is the Digital Highway Really Heading?," *Wired*, March 1, 1993.

the event.)²⁴ The chummy relations between Silicon Valley and Washington, DC during most of the Obama era underscored how politically influential West Coast technology leaders had become, possessing power to shape federal policy and spending priorities that matched if not exceeded that once held by the midcentury high-tech Brahmins who advised presidents and secured multimillion-dollar federal contracts.

The political earthquake of the 2016 election was a shock to a tech industry that voted overwhelmingly for Hillary Clinton, however, and in the Trump and Biden eras that followed, a sharper-edged varietal of Silicon Valley techno-libertarianism seized the spotlight. With it came a new kind of political engagement, one that went beyond giving money or spending short stints in the executive branch, but was defined by forcefully, unapologetically, and confidently proclaiming one's opinions on the state of policy and society, often with a right-wing bent.

A leader of this new class was Peter Thiel, a founder of PayPal and early Facebook investor, who broke with the Silicon Valley consensus of 2016 by endorsing Donald Trump and speaking in support of his candidate at that year's Republican National Convention. A champion of cryptocurrency and other schemes to escape the thumb of state control, Thiel was often described as a Libertarian, but his politics were more complex than that. He didn't hate government, but he hated what government had become. If anything, he was a Cold Warrior. "Most of our political leaders are not engineers or scientists and do not listen to engineers or scientists," he despaired in a 2011 essay. "Today a letter from Einstein would get lost in the White House mail room, and the Manhattan Project would not even get started; it certainly could never be completed in three years."²⁵ It was as if Thiel was channeling the ghost of Vannevar Bush.

²⁴"Facebook Town Hall with President Obama," The Obama White House, April 20, 2011. YouTube video, 1:04:14, <https://www.youtube.com/watch?v=3ypVArkbsn8>.

²⁵Peter Thiel, "The End of the Future," *National Review*, October 3, 2011, <https://www.nationalreview.com/2011/10/end-future-peter-thiel/>.

But the two men were quite different, each emblematic of the high-tech politics of their time, each demonstrating how far high-tech culture had traveled—not merely East to West, but from an era that venerated public service to one that celebrated capitalist disruption. Thiel had never held public office nor aspired to it, but had a megaphone and political influence because of his immense wealth. Van Bush might have called someone like Thiel or Thiel’s PayPal cofounder Elon Musk a “tyro,” which he defined as “the freewheeler in an organization, who gums up the works because of his arrogant ignorance, often because he filches authority which does not belong to him.”²⁶

Thiel, Musk and other contrarian billionaires like them were utterly unlike any other technologists that came before, and they had no interest in the kind of technocratic institution-building that Bush, Terman, and others had done at midcentury. They had little in common with the left-leaning internet evangelists like Barlow and Kapor either. One thing these modern tech titans had in common with the leaders of the bicoastal Cold War technology economy, however, is that governments relied heavily on the products that their companies built. Law enforcement and national security agencies used the databases and surveillance software built by Thiel’s company, Palantir. Starlink satellites produced by Musk’s SpaceX were providing internet service in war-ravaged Ukraine after Russia’s 2022 invasion. Decades of eroding faith in government, deregulation, and privatization left military and civilian leaders with fewer public resources available to direct high-tech wars. The techno-libertarian billionaires of Silicon Valley have stepped in.

“The applications of science have built man a well-supplied house, and are teaching him to live healthily therein,” Vannevar Bush wrote at the end of “As We May Think,” sending these words out into a world ravaged by war and days away from the dropping of the first atomic bomb. Bush continued:

They have enabled him to throw masses of people against one another with cruel weapons. They may yet allow him truly to encompass the

²⁶Vannevar Bush, *Pieces of the Action* (New York: Morrow, 1970), 121.

great record and to grow in the wisdom of race experience. He may perish in conflict before he learns to wield that record for his true good. Yet, in the application of science to the needs and desires of man, it would seem to be a singularly unfortunate stage at which to terminate the process, or to lose hope as to the outcome.²⁷

Bush would marvel at all that American science and technology has accomplished since he wrote these words, although—as one who oversaw the Manhattan Project—perhaps not too surprised by the extent of its political and societal disruptions. Bush knew the fearsome power technology contained, especially when controlled by ill-prepared people, but he still urged his readers not to give up hope. Let us stay hopeful, too.

²⁷Bush, “As We May Think,” *The Atlantic Monthly*, July 1945, 108.

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