

## **California inspired: from flower power to Silicon Valley**

**How 1960s Bay Area radicalism helped shape the technological powerhouse of northern California.**

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Success has many parents. The east-coast dominated military-industrial complex and international capitalism could vie with Bay Area hippie counterculture and collectivist ideals of the University of California at Berkeley for custody. All have good claims for laying foundations for today's Silicon Valley. It's little wonder that Silicon Valley ideology seems so confused.

At one end we have the libertarian ideals espoused by Paypal co-founder Peter Thiel, born in the year of the Summer of Love in Germany and educated at Stanford University in Mountain View, who argues democracy is at odds with the freedom to be an individual. He wants the freedom to be able to drive technology to the point that we could cheat death.

“The fate of our world may depend on the effort of a single person who builds or propagates the machinery of freedom that makes the world safe for capitalism,” Thiel concluded in a 2009 essay for the Cato Institute in which he set out his libertarian agenda.

“I stand against confiscatory taxes, totalitarian collectives and the ideology of the inevitability of the death of every individual. For all these reasons, I still call myself ‘libertarian’.”

At the other end of the spectrum, Sun Microsystems co-founder Bill Joy, born 13 years earlier than Thiel, worries that untrammelled technological development could doom the human race unless access to some information is restricted. “The price of retaining the rule of law is to limit the access to great and unbridled power,” Joy argued in a TED Talk just over a decade ago in 2006.

There is one link though: they are people who believe the power to reinvent civilisation is achievable and they have access to tools to do it. That is arguably why, if anyone, Stewart Brand is the ideological father to Silicon Valley, and why the Flower Power revolution seems to loom so large in the Bay Area's 50-year period of technological supremacy and its inhabitants' belief that they are creating a better world.

In his 2005 commencement address at Stanford University, Apple co-founder Steve Jobs pointed to Brand's influence on him and the wider Silicon Valley community: “When I was young, there

was an amazing publication called the ‘Whole Earth Catalog’, which was one of the bibles of my generation. It was created by a fellow named Stewart Brand not far from here in Menlo Park, and he brought it to life with his poetic touch. This was in the late 60s, before personal computers and desktop publishing, so it was all made with typewriters, scissors and Polaroid cameras. It was sort of like Google in paperback form 35 years before Google came along: it was idealistic, and overflowing with neat tools and great notions.”

In the mid-1960s, Brand believed that technology provided society with a way out of its troubles and could form part of the hippie movement that he had joined. In 1966, he campaigned for Nasa to release an image of the Earth as seen from orbit after a trip on LSD on a San Francisco rooftop overlooking the Pacific Ocean. “LSD’s not a mind expander; it’s a mind concentrator,” he claimed in a video interview for the Victoria & Albert Museum’s retrospective on the 1960s social revolutions, giving the example: “Have you ever really looked at your hand?”

Brand recalled: “I thought that if we ever got a photograph of Earth from space it would change everyone’s perspective.”

That image wound up on the cover of the ‘Whole Earth Catalog’ several years later. Brand’s hope was to bring some direction back to the hippie movement. “I had seen the hippie thing was going severely romantic but there were two technical guys that people were listening to: Buckminster Fuller and Marshall McLuhan,” he said.

Among his other ideas, Fuller’s geodesic-dome concept had become the template for many of the temporary buildings members of the movement adopted in communes such as Drop City in Colorado and around Marin County north of San Francisco and Big Sur to the south.

Brand explained: “The ‘Whole Earth Catalog’ came out of Buckminster Fuller’s perspective that tools are the most fundamental thing that humans do. I had been part of the founding of a couple of communes. The communes were trying to reinvent civilisation and were doing it poorly because they were liberal-arts majors who dropped out of everything. They had no idea how to do anything. My perspective because I had been trained as a scientist – as a biologist – was to bring to that movement a respect for science and technology and making things. The ‘Whole Earth Catalog’ was about access to tools that would enable the skills needed to reinvent civilisation.”

The tools Brand identified in the catalogue included a Hewlett-Packard desktop calculator, although it would take more than a decade for him to become heavily involved in the world of electronic computing. Indirectly, he helped the personal-computer revolution get off the ground. Armed with an inheritance of \$20,000, Brand hit on the idea of getting the hippie community to come up with ways to use the money for good. At a ‘wake’ for ‘The Last Whole Earth Catalog’ at the Exploratorium in San Francisco, people would come to the stage, hold the money in \$100 bills and announce their plan. Brand had hoped the format would bring forth great ideas. Yet they were, according to him, almost uniformly “terrible ideas”.

The eventual recipient of the cash the next morning was Fred Moore after burning a dollar bill as a demonstration. “He put the money in a jar and buried it,” Brand recalled, lending parts of it out

for small projects. Later, in the 1970s, Moore helped set up, with Gordon French, the Homebrew Computer Club. At the first meeting in French's garage in Menlo Park in 1975, members got their first look at the Intel 8080-based MITS Altair kit. Apple co-founder Steve Wozniak points to that meeting as inspiring him to design the Apple I.

The 8080 microprocessor inside the Altair marked a radical change in the design of computers – one that would for enthusiasts like Wozniak liberate computing from the air-conditioned cathedrals needed to house IBM's enormous mainframes or the cabinet-sized minicomputers of Digital Equipment. However, it was largely the product of chance. Its 1971 forerunner, the 4-bit 4004, was little more than an improvised collection of parts, intended to cut the cost of developing the chips for a desktop calculator project that Intel had taken on to help keep money flowing in while it built up its core business of making memory chips for the defence and aerospace industry, as well as DEC and IBM.

Programmability of the 4004 made it more than a one-off device. The designers of the Pioneer 10 space probe seriously considered using the 4004 but considered it too new and risky to use. They used the kind of custom circuit that had been rejected for the Busicom calculator. Almost a decade later, the Nasa Space Shuttle blasted off with help of the 8086 that became the core of IBM's PC product line in the early 1980s – and when personal computing was brought out of the counterculture into the corporate fold.

By then, personal-computing users had embraced digital communication through the medium of telephone modem, while academics and the military had access to the significantly faster national network of the Arpanet. It was a combination of government money and ideals of the technological counterculture that would form the next phase in the evolution of Silicon Valley. John Gage was among the people who put them together.

Gage first arrived at UC Berkeley as a maths student in 1960, becoming involved in the Free Speech Movement and towards the end of the decade in George McGovern's presidential campaign against Richard Nixon. It wasn't until 1975 that he completed his bachelor's degree at Berkeley. At the university he became friends with Joy.

Joy embraced the ideas behind the Arpanet and the Unix operating system developed on the opposite side of the country at AT&T's Bell Labs, which spawned a workalike at Berkeley. The US Department of Defense Advanced Research Projects Agency (Darpa) paid the Berkeley team to port their operating system from the DEC PDP-11 on which it had been developed, much like the original Bell Labs Unix, to the relatively new Vax and to let it network with other Arpanet machines over TCP/IP. Joy wrote his own version of the TCP/IP stack for the project as well as playing a key role in the development of UC Berkeley's own version of Unix. In keeping with communal ideals of the East Bay university, both would be published using an early form of open-source software licence: the Berkeley Software Distribution (BSD).

Joy went on to join a workstation maker, Sun Microsystems, founded in Mountain View by Stanford University alumni Andy Bechtolsheim, Vinod Khosla and Scott McNealy. The company took its name from the Stanford University Network and not long after came up with

the tagline “the network is the computer”. Its machines ran a version of BSD Unix titled SunOS. Gage soon joined too, becoming the company’s chief researcher after a stint in marketing.

Independently, Brand, influenced by what he saw of the early online bulletin board system Electronic Information Exchange System (EIES), decided to create one that would restart the idea of the technological commune. The Whole Earth ‘Lectronic Link (WELL) got under way in 1985, becoming a prototype for the many forums and social media sites that now permeate the internet. Doubleday Books gave the Point Foundation formed by Brand and Dick Raymond a \$1.3m advance to put together the ‘Whole Earth Software Catalog’. Not long after, at the first Hacker’s Conference, Brand declared “information wants to be free”.

Ten years later it started to happen. Gage co-founded the organisation NetDay, which used crowdsourcing to bring US schools on to the internet, which had opened up to the public only a few years previously. On 9 March 1995, President Bill Clinton and vice president Al Gore turned up at a high school in Concord, central California, to help pull networking cables through ceiling conduits along with 100,000 volunteers across the country. NetDay activities spread to France, Korea and the UK among other countries over the following two years.

As schools came online, students used browsers running software funded by the US NSF. Marc Andreessen, a member of the Mosaic development team at the National Center for Supercomputing Applications (NCSA) in Illinois moved to the Bay Area to set up Mosaic Communications with Jim Clark, the former head of Sun competitor Silicon Graphics. His former employer objected to the use of the Mosaic name. A year later, the company floated on the stock market as Netscape Communications and saw its share price bid up to astronomic levels in a matter of hours. The initial public offering (IPO) became the model for every Silicon Valley internet start-up to this day: technology and finance became joined at the hip. Many suffered an ignoble swan dive, but the success of Netscape and some of its successors led to money pouring into the area through venture capitalist firms that mostly lay along the side of Sand Hill Road in Mountain View, opposite Stanford.

Are communal ideals of the Homebrewers of Menlo Park at odds with the bread-heads of Sand Hill Road? Not exactly. In his book on Brand and his involvement with the WELL and his ideas of using technology to reshape society, ‘From Counterculture to Cyberculture’, Stanford professor Fred Turner points out that Brand’s interest in the communes of the 1960s was very far from communism. In the late 1950s, while studying at the university in Mountain View, Brand wrote of his worries about the Soviet Union and what would happen if the Russian Bear attacked: “...my mind would no longer be my own, but a tool carefully shaped by the descendants of Pavlov”.

Turner says that before he started his book he thought the US counterculture was in opposition to American culture. As he worked on it, he changed his mind. The counterculture, if anything, was closely linked to the culture of the country and the image of the pioneering homesteader. If there is one thing that unifies the denizens of Silicon Valley, it is individualism, Turner argues. A better world went hand-in-hand with personal liberation.

Joy, who drew criticism as a 'statist' for his argument in favour of some level of government control, is more of an outlier than the self-avowed libertarian Thiel.

However, those libertarian views have not deterred Thiel from creating Palantir Technologies, named after the seeing stones used by Sauron and Saruman in 'The Lord of the Rings', which monitors the online activities of his fellow citizens. Fifty years earlier, Gage and his compatriots in the Free Speech Movement marched wearing punched cards hung around their necks in protest against having their details stored in centralised computer systems.

Brand argued in his essay 'We Owe It All to the Hippies': "The counterculture's scorn for centralised authority provided the philosophical foundations of not only the leaderless internet, but also the entire personal-computer revolution."

In practice, Silicon Valley fully embraced the Fuller philosophy that tools provide the key to building the future: it's how the tools get used that determines the outcome, and that may turn out somewhat different from Brand's original hopes.