



BOOKS *et al.*

HISTORY OF SCIENCE

When science was groovy

Counterculture-inspired research flourished in the Age of Aquarius

By **W. Patrick McCray¹** and **David Kaiser²**

In the days leading up to Woodstock, posters and advertisements pronounced the music festival—held 50 years ago on 15 to 18 August 1969—as an “Aquarian exposition.” The watery descriptor, derived from astrology, was popularized 2 years earlier by the hit musical *Hair*. As the American pop music group The 5th Dimension sang in “Aquarius/Let the Sunshine In,” in the new era, “Peace will guide the planets/And love will steer the stars.” Many people, especially those associated with the counterculture, welcomed the dawning of a New Age that would be guided more by “mystic crystal revelation” than traditional science.

But the Age of Aquarius was also the Age of Apollo. And in the summer of 1969, just a month before the Woodstock festival, hundreds of millions of people watched American astronauts walk on the surface of the Moon and return safely to their home planet. Science and technology—from new

materials to digital computers to precision navigation—had made this feat possible, not hippie mysticism. NASA administrator Thomas Paine proclaimed the success of the Apollo program as the “triumph of the squares—the guys with computers and slide rules.”

A half-century later, the confluence of the Ages of Aquarius and Apollo presents historians of science with a challenge. How do we reconcile one of the 20th century’s most impressive technoscientific achievements with bucolic images of young Americans frolicking in Woodstock’s muddy fields?

The notion that there must be an opposition between hard-nosed science and freewheeling New Age enthusiasms was articulated with particular force by Theodore Roszak in his 1969 book *The Making of a Counter Culture*. Roszak, a left-leaning professor at a California State University campus, described how the youth of his day were fleeing science “as if from a place inhabited by plague.”

In Roszak’s telling, members of the counterculture were more likely to embrace astrology, Eastern religions, and chemically enhanced spirituality than astrophysics, engineering, or molecular biology. Other

Revelers at Woodstock may have embraced the non-traditional, but they didn’t necessarily reject science.

observers at the time were quick to agree. Surveying the trajectory of science in the United States since 1945, physicist Edward Teller concluded that the “lack of interest” in science among America’s youth was “the surest sign of decadence” (1, 2).

The belief that young people in the United States during this period were anti-science has persisted to the present day. Many historians have repeated Roszak and Teller’s simple dichotomy, pitting countercultural ideals against science.

Yet the dichotomy obscures at least as much as it clarifies about the era. The 1970s—a much-maligned decade in popular culture, to be sure—was a period of substantial change in American science and technology. A growing literature by historians of science and technology has begun to reveal the colorful and unexpected ways in which various strands of the counterculture embraced particular forms of science and technology—an amalgam that we have dubbed “groovy science” (3).

Many young people who self-identified as part of the American counterculture grew wary of the conformity and consumerism that they considered to pervade middle-class life. Along with their disquiet about cultural mores often came a critique of certain types of science and technology. Yet their rejection of hulking Cold War projects that were closely associated with military contractors or faceless corporations—room-filling electronic computers, repurposed

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rockets—hardly meant that they rejected science and technology tout court. After all, hallucinogens and hi-fi stereo systems had just as strong a connection to scientific research as missiles and mainframes.

Some “tuned in” scientists aimed to convert their studies, which had previously been closely linked to Cold War institutions and priorities, to new ends. For example, John C. Lilly switched from military-sponsored work on psychology to controversial studies involving dolphins, LSD, and sensory deprivation (4). Meanwhile, at the University of California, Santa Barbara, physicists adapted to the dawning realities of the 1970s by crafting a new curriculum centered around “socially relevant” topics such as environmental and biomedical applications—and further aimed to entice potential students with hands-on projects that might help elucidate purported mind-reading and related telepathic phenomena (5).

Groovy-science gurus emerged, their reach and appeal aided by clever uses of mass media. Some, such as former Harvard professor and psychedelics enthusiast Timothy Leary, adapted quickly to the new media environment, exploiting a preternatural ability to turn impromptu events into well-covered “happenings.” When Leary championed the latest ideas about human consciousness, quantum physics, and space colonization, he helped spread scientific ideas well beyond the slide-rule set (6).

Others, who lacked Leary’s telegenic charm, nonetheless managed to attract the enthusiasm of restless college students. Unhip elders such as Immanuel Velikovsky became bestselling authors and inspired campus clubs with their unusual ideas about ancient history and celestial

mechanics. Although Velikovsky’s ideas clashed with conventional astronomy, they inspired many young people to pick up their pencils and calculate (7).

Since 1969, meanwhile, many once-radical ideas have filtered into the mainstream, their groovy roots forgotten. For example, many of today’s trends toward sustainability and “green design” emerged out of countercultural experiments in communal living (8). “Artisanal” and “organic” foods, which clutter shelves these days everywhere from nationwide grocery store chains to tiny neighborhood co-ops, likewise stem from concerted efforts back in the 1970s to evade conventional consumerism and pursue a novel blend of countercultural aspirations and entrepreneurship (9, 10).

Even at the cutting edge of today’s research efforts in quantum optics and quantum encryption, one can find distinctly tie-died threads. Key ideas about quantum entanglement—and the subtle ways in which what Einstein had famously dubbed “spooky action at a distance” might nonetheless remain consistent with relativity—emerged from a spirited back and forth. Underemployed physicists in the San Francisco Bay Area—some of them dabbling with mind-reading experiments and exploring quantum wholeness while immersed in hot tubs at Esalen—traded ideas with a handful of more conventional colleagues, while most academic physicists dismissed topics such as entanglement as mere “philosophy.” The concerted efforts by the Bay Area group, including a series of increasingly clever thought experiments, catalyzed important new insights into quantum theory that are central to today’s flourishing field of quantum information science (11).

Groovy science burgeoned for a time. Whereas Roszak warned of an “anti-rational” tide among the American counterculture, with its “radical rejection of science and technological values”—he imagined hordes of “Theosophists and fundamentalists, spiritualists and flat-earthers, occultists and satanists”—with a half-century of hindsight, we can identify rather different trends (1).

Many countercultural aspirants embraced a “small is beautiful” approach to what they called “appropriate technology.” Others eagerly sought the big-picture worldviews of quantum physics and cosmology, hoping to find hints of a cosmic togetherness in the pages of bestselling books such as Fritjof Capra’s *The Tao of Physics*—a book that reflected Capra’s own training in high-energy physics as much as his earnest explorations of various Eastern spiritual traditions (12).

Many of those groovy efforts didn’t vanish so much as seep, unseen, into the mainstream. Think of the banality of personal practices such as yoga and vegetarianism throughout American culture today, which were once the province of counterculture enthusiasts on the margins. Traces of groovy science—with its hands-on, tinkering impulse—survive in today’s do-it-yourself culture, while the resurgence of interest in everything from medical uses of psychedelics to midwifery and home-birth options for childbirth hearkens back to countercultural mainstays.

As we mark the twin anniversaries of Woodstock and the first Apollo Moon landing, let us appreciate the groovy overlaps—sympathetic vibrations as much as head-on collisions—that have threaded knowledge production and innovation throughout the American experience. ■

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Psychologist Timothy Leary (left) was an early advocate for exploring the clinical potential of psychedelic drugs.

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