Stewart Brand

Born 1938.
Life story compiled by Alex Reid.
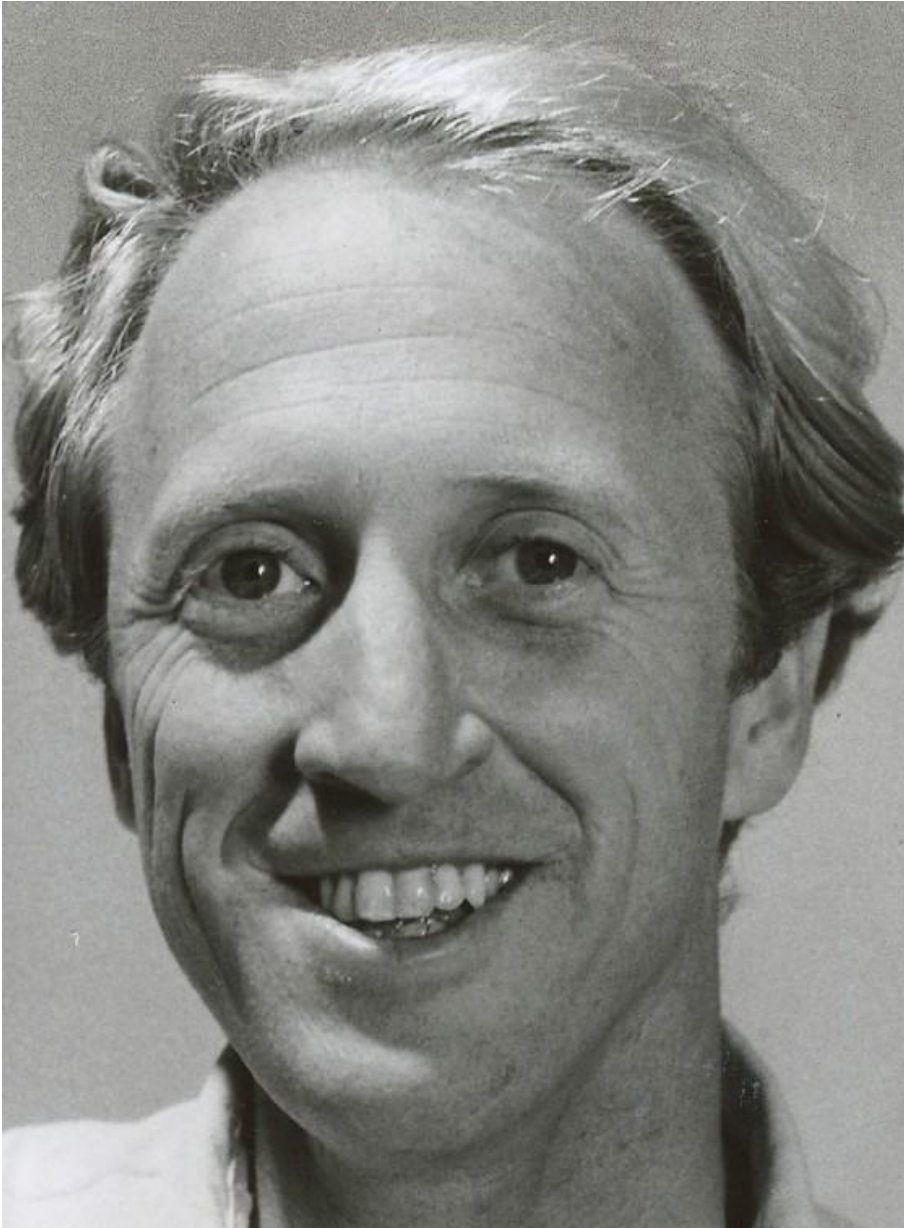Available online at www.livesretold.co.uk

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1. Introduction

Stewart Brand in 1973. He says of himself: I design stuff; I start stuff; I found stuff. On the passport I put "writer."

Stewart Brand was born in Rockford, Illinois and attended Phillips Exeter Academy in New Hampshire. He studied biology at Stanford University, graduating in 1960. As a soldier in the U.S. Army, he was a parachutist and taught infantry skills; he later expressed the view that his experience in the military had fostered his competence in organizing. A civilian again in 1962, he studied design at San Francisco Art Institute, photography at San Francisco State College, and participated in a legitimate scientific study of then-legal LSD, in Menlo Park, California. In 1966, he married mathematician Lois Jennings, an Ottawa Native American.

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2. Stanford University

In the spring of 1957, at the height of the cold war, Stewart Brand was a nineteen-year-old freshman at Stanford University, and he was deeply worried. Even though Europe lay more than six thousand miles to the east, Brand had begun to write at length in his diary about his fear that the Soviet Union would soon attack the United States. If the Soviets invaded, he wrote, he could expect

That my life would necessarily become small, a gear
   with its place on a certain axle of the Communist
   machine. Perhaps only a tooth on the gear. . . .
That my mind would no longer be my own, but a tool carefully shaped by the
descendants of Pavlov.
That I would lose my identity.
That I would lose my will.
These last are the worst.

Some fifty years later, and more than a decade after the collapse of the Soviet Union, Brand's fears might appear overwrought. But for Brand and other members of his generation in the late 1950s, the possibility of a Soviet attack felt very real. Brand was born in 1938 in Rockford, Illinois, a town not far south of Milwaukee, which specialized in making machine tools. His father was an advertising copywriter and a ham radio operator; his mother, a Vassar-educated homemaker and "space fanatic." In the Brand household, technologies of communication and travel presented vistas of individual and national progress. Both radio sets and rocket ships connected the Brand family to a universe beyond midsized, middle-class, midwestern Rockford.

Thanks primarily to his mother, Brand became a space buff himself. He still keeps a well-worn copy of his childhood favorite, Chesley Bonestell's New Frontier primer The Conquest of Space, in his Sausalito, California, office. Even so, Brand suffered from a deep fear of technological Armageddon. "In [the] early '50s somebody compiled a list of prime targets for Soviet nuclear attack," he later remembered, "and we [Rockford] were [number] 7, because of the machine tools." For the young Stewart Brand, as for many other American children in the era, the possibility that the world might come to an end at any moment hung steadily in the air. As a child, he recalled, "I had a nightmare — one of those horrible, vivid, never forget

nightmares—there was chaos and then I looked around and I was the only person left alive in Rockford . . . a knee-high creature. So I had an early allergy to nukes.'

By the time Brand reached college, alongside the dread of nuclear holocaust, another fear lurked as well: the fear of growing up to become the kind of adult who lived and worked in a hyperrationalized world. While he wrote extensively about the Soviets in his journals, Brand dwelled very little on the risks an invasion might pose to America as a nation. Instead, he focused on the ways that such an invasion might prevent his achieving personal independence and on how it would force him to become a member of a gray, uninspired, Orwellian mass.

The Soviets of Brand's imagination were mechanical creatures who would stomp out every trace of individuality if given half a chance. In one sense, as symbols, they pointed backward, calling up the lockstep Nazis of American propaganda some fifteen years before. Yet they also looked forward, to an adulthood in which Brand himself might be compelled to give up his individuality. Both of these senses of invasion came to the fore in Brand's diary of 1957, when he wrote: "If there's a fight, then, I will fight. And fight with a purpose. I will not fight for America, nor for home, nor for President Eisenhower, nor for capitalism, nor even for democracy. I will fight for individualism and personal liberty. If I must be a fool, I want to be my own particular brand of fool—utterly unlike other fools. I will fight to avoid becoming a number—to others and to myself.'

For Stewart Brand, the national struggle to save America and the world from Soviet assault and nuclear holocaust was intimately entwined with his individual adolescent struggle to become his own person. And Brand was not unique in this respect. For college students of his time, the imagined gray mass of the Soviet Army was a mirror image of the army of gray flannel men who marched off to work every morning in the concrete towers of American industry. The soldier in his uniform was simply another form of what sociologist William Whyte called the "Organization Man." Cut off from his emotions, trained to follow a chain of command, the Soviet soldier and the American middle manager alike seemed to many to be little more than worker bees inside ever-growing hives of military-industrial bureaucracy.

In the 1940s and 1950s, that bureaucracy had brought forth nuclear weapons; in the 1960s it would lead Americans into the Vietnam War. As they came of age, Stewart Brand and others of his generation faced two questions: How could they keep the world from being destroyed by nuclear weapons or by the large-scale, hierarchical governmental and industrial bureaucracies that had built and used them? And how could they assert and preserve their own holistic individuality in the face of such a world?

As he sought to answer those questions, Brand turned first to the study of ecology and a systems-oriented view of the natural world.

Brand first encountered systems-oriented ways of thinking at Stanford in a biology class taught by Paul Ehrlich. By the end of the decade, Ehrlich was famous for predicting in his book The Population Bomb (1968) that population growth would soon lead to ecological disaster. In the late 1950s, however, he was concentrating on

the fundamentals of butterfly ecology and systems-oriented approaches to evolutionary biology.

These preoccupations reflected the extraordinary influence of cybernetics and information theory on American biology following World War II. At the level of microbiology, information theory provided a new language with which to understand heredity. Under its influence, genes and sequences of DNA became information systems, bits of text to be read and decoded. In the 1950s, as Lily Kay has pointed out, microbiology became "a communication science, allied to cybernetics, information theory, and computers."

Information theory also exerted a tremendous pull on biological studies of organisms and their interaction. Before World War II, biologists often focused on the study of individual organisms, hierarchical taxonomies of species, and the sexual division of labor. Afterward, many shifted toward the study of populations and the principles of natural selection in terms modeled on cybernetic theories of command and control.

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2. The US Army

Soon after graduating from Stanford, Brand was drafted into the army, where he spent the next two years, first as an infantryman and later as a photographer. At the beginning, Brand took to military life and decided to become a Ranger. Midway through Ranger school, though, he decided to quit. "I wrote out every argument on both sides, knowing the conclusion was foregone, but comforted by the list," he told his diary at the time. "My vision widened, the Rangers looked admirable but wrongly zealous. And they wanting to be soldiers and I not." Although he liked the Rangers" parachute training and their camaraderie, Brand gradually come to loathe military regimentation.

Brand is shown, right, with his army haircut in 1961, and leading his platoon.

After leaving the Rangers, he became an army photographer at Fort Benning, Georgia; at Fort Dix, New Jersey; and briefly at the Pentagon. While stationed in Washington, he began to feel restless in his off-duty hours. "I was looking for the wrong thing," he wrote in his diary. "I was looking for San Francisco beauty, San Francisco people, San Francisco happiness—the bohemian style. . . . Therefore, Resolved—to go posh. To frequent the theaters, music halls, galleries, and homes not as an interloper taking all he can learn, but as a learning participant.'

Brand remained somewhat isolated in Washington, but when he returned to Fort Dix, he found his way into a swirling New York art scene. In the summer of 1960, Brand had met a young San Francisco painter named Steve Durkee; by 1961 Durkee had moved into a lower-Manhattan loft, where Brand began to visit him on weekends from Fort Dix. As he did, he began to explore a social landscape at once deeply in synch with the systems perspectives he had encountered at Stanford and entirely out of synch with the relatively ordered, hierarchical world of cold war college and military life.

Lower Manhattan in the late 1950s and early 1960s played host to a community of artists preoccupied with finding new relationships to their materials and audiences. When Brand arrived, the most influential members of the scene included musician John Cage, painter Robert Rauschenberg, and performance artist Allan Kaprow. These artists had inherited an essentially Romantic tradition, especially in painting, within which the artist struck a heroic pose.

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3. USCO

For the artists of those New York communities into which Brand had gravitated, as for Brand's professors at Stanford, cybernetics offered a new way to model the world. Even at the height of the cold war, many of the most important artists of this period, figures such as John Cage and Robert Rauschenberg, embraced the systems orientation and even the engineers of the military-industrial research establishment. Together they read Norbert Wiener and, later, Marshall McLuhan and Buckminster Fuller; across the late 1950s and well into the 1960s, they made those writings models for their work.

At the same time, both the artists he met and the authors they read presented the young Stewart Brand with a series of role models. If the army and the cold war corporate world of Brand's imagination moved according to clear lines of authority and rigid organizational structures, the art worlds of the early 1960s, like the research worlds of the 1940s, lived by networking, entrepreneurship, and collaboration. As he moved among them, Brand came to appreciate cybernetics as an intellectual framework and as a social practice; he associated both with alternative forms of communal organization.

The Garnerville Methodist Church, New York.

Among the first communities into which Brand found his way was the influential art tribe USCO. Around 1962 Steve Durkee met up with a San Francisco–based poet named Gerd Stern. Within a year, Stern began collaborating on a series of multimedia performances with a young technician from the San Francisco Tape Music Center named Michael Callahan. By 1964 Durkee, Stern, and Callahan, together with a floating circus of friends and family, had taken up residence in an old Methodist church in Garnerville, New York, about an hour north of Manhattan. They christened their art troupe USCO—short for "The US Company." Over the next four years, they transformed the "happening" into a psychedelic celebration of technology and mystical community that found its way into the burgeoning LSD scene in San Francisco and the pages of Life magazine.

Brand worked off and on with USCO as a photographer and a technician between 1963 and 1966, living at the Garnerville church for short periods between his travels. Within USCO, he encountered the first stirrings of the New Communalist movement. Like Cage and Rauschenberg, the members of USCO created art intended to transform the audience's consciousness.

They also drew on many diverse electronic technologies to achieve their effects. Strobe lights, light projectors, tape decks, stereo speakers, slide sorters—for USCO, the products of technocratic industry served as handy tools for transforming their viewers" collective mind-set. So did psychedelic drugs. Marijuana and peyote and, later, LSD, offered members of USCO, including Brand, a chance to engage in a mystical experience of togetherness.

And USCO's work did not stop at the end of each performance. Gathering at their church in Garnerville and then again at performance sites around the country, the members of USCO lived and worked together steadily for a period of years. Like a cross between a touring rock entourage and a commune, USCO was more than a performance team. It was a social system unto itself. Through it, Brand encountered the works of Norbert Wiener, Marshall McLuhan, and Buckminster Fuller—all of whom would become key influences on the Whole Earth community—and began to imagine a new synthesis of cybernetic theory and countercultural politics.

USCO was founded on a fusion of Eastern mysticism and ecological, systems thinking. Its members chose the name USCO in accordance with the teachings of Ananda K. Coomeraswamy, an early-twentieth-century scholar of Indian art then popular among Manhattan bohemians. Coomeraswamy had asserted that artists in traditional societies were as anonymous as tradesmen. The members of USCO saw themselves returning to a more traditional mode of tribal living and collective craftsmanship.

The tribe would be bound together through various rituals involving drugs, mystical forces, and electrical technologies. As art critic Naomi Feigelson put it in 1968, "Collectively and individually USCO is hung up on light and its symbolic meanings, on the Kaballah and mysticism, on the divine geometry of living things and electrical phenomena."

But USCO's founders were also steeped in the literature of cybernetics. Gerd Stern, a European Jew and a World War II– era refugee, saw Norbert Wiener as a child of European transplants like himself and was thoroughly versed in his writings. In large part for this reason, light, electricity, and mystical "energy" generally played a role in USCO's work very much like the one "information" plays in Wienerian cybernetics: they became universal forces that, functioning as the sources and content of all "systems" (biological, social, and mechanical), made it possible for individual people, groups, and artifacts to be seen as mirrors of one another. A promotional brochure for a 1968 USCO presentation at New York's Whitney Museum of Art described the group this way: USCO "unites the cults of mysticism and technology as a basis for introspection and communication.'

Like Wiener's cybernetics, USCO's techno-mystical ideology emerged out of and supported multidisciplinary collaboration in a workshop setting. The group's

productions ranged from three-dimensional poems, with flashing lights and bold-faced words, to multimedia slide, light, and sound shows and psychedelic posters. Each production required input by artists with a variety of technical skills, and the collaboration in turn required both a contact language in which the artists could speak to one another and a rationale to drive their production.

Techno-mysticism filled both bills. "They have an artistic point of view," wrote Naomi Feigelson in 1968, "a critical, philosophical approach to life, and a goal beyond today. They are a group of individual artists, each disciplined in his own craft, and all together they are on a work trip." For the artists of USCO, technical work on multimedia projects offered a way to plug in to mystical currents that flowed among the group's members and within each of them. Like the anti-aircraft gunner operating Wiener's theoretical predictor, they could see themselves as parts of a techno-social system, serving new machines and being served by them.

Such a vision did not mean that the members of USCO entirely escaped the questions of leadership and issues of gender politics that they ascribed to mainstream society. On the contrary: former members recall that Durkee and Stern served as alpha males to the group and frequently, if indirectly, struggled to control its direction. Although women (notably Durkee's wife, Barbara), played important roles in the group, leadership fell to men. Nevertheless, with their mystical conviction of collective unity, the members of USCO could confront the hard-bodied, bifurcated universe of cold war politics and its potentially world-ending nuclear weapons with a vision of transpersonal and potentially transnational harmony.


An event at the USCO church, Garnerville.

To bring that vision to life in performance, USCO operated on organizational principles that would have been quite familiar to Brand from his studies with Paul Ehrlich. Rather than work with a transmission model of communication, in which performers or others attempt to send a message to their audience, USCO events tried to take advantage of what Gerd Stern called "the environmental circumstance." That is, USCO constructed all-encompassing technological environments, theatrical

ecologies in which the audience was simply one species of being among many, and waited to observe their effects.

As Steve Durkee put it, they built artistic worlds just like "God created the universe." Early projects were relatively simple. In 1963, for instance, Stern developed a project called "Verbal American Landscape," in which three slide projectors showed, in random sequence, photographs— many taken by Stewart Brand—of individual words found on road signs and billboards. Viewers were left to piece the words together into meanings of their own. Gradually "Verbal American Landscape" was absorbed into more complex shows.

In a 1963 performance entitled "Who R U?" at the San Francisco Museum of Art, Stern and Callahan added highway sounds to the mix, moving them from speaker to speaker in the showroom. They also had individuals placed in booths around a central auditorium, miked their conversations, and replayed them simultaneously in an eighteen channel remix. By 1965 this show had morphed into a program called "We R All One," in which USCO deployed slide and film projections, oscilloscopes, music, strobes, and live dancers to create a sensory cacophony.
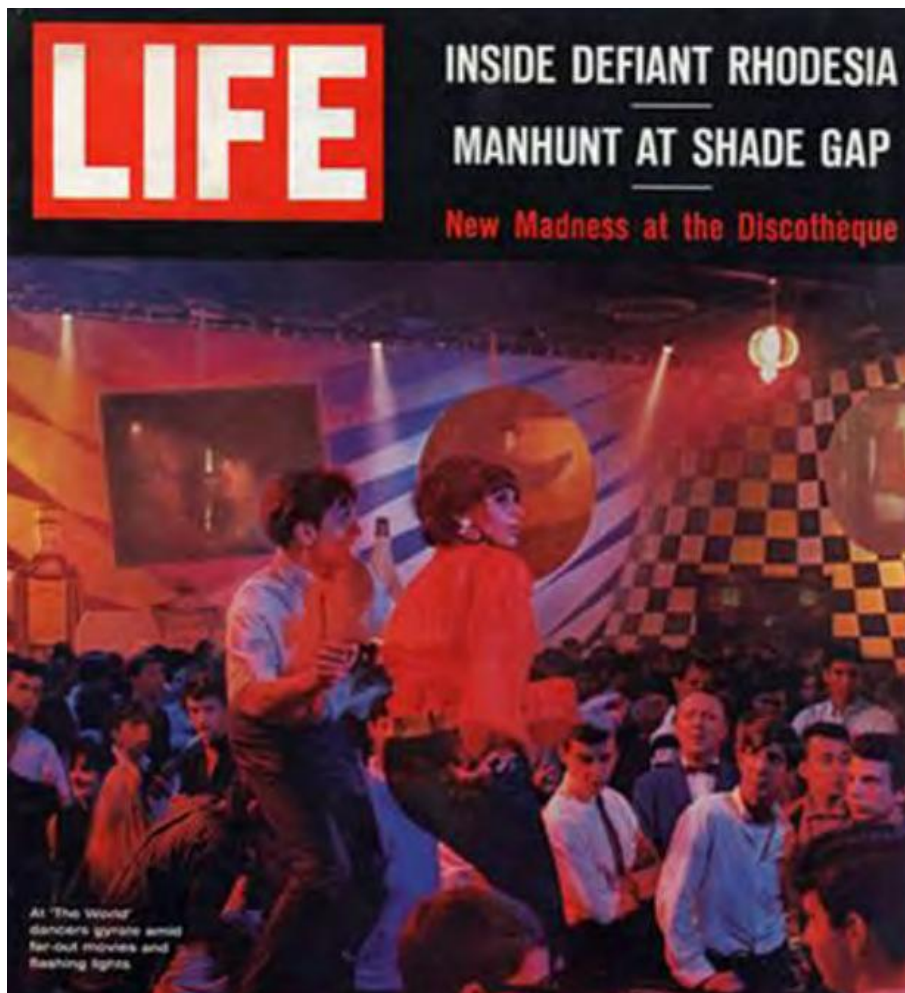
Life Magazine features on its cover in May 1966 the USCO installation at The World Discotheque, Garden City, New York.

At the end of the performance, the lights would go down, and for ten minutes the audience would hear multiple "Om's" from the speakers. According to Stern, the show was designed to lead viewers from "overload to spiritual meditation." In the

final moments, the audience was to experience the mystical unity that ostensibly bound together USCO's members.

By the mid-1960s, USCO's performances marked the cutting edge of countercultural art. USCO had built multimedia backdrops for talks by Timothy Leary (whose Millbrook, New York, mansion received regular visits from USCO members) and Marshall McLuhan. In 1966 they supplied multimedia designs for Murray the K's World—a huge discotheque created within an abandoned airplane hangar—that appeared on the cover of Life magazine.

In May of that year, they built an installation they called "Shrine" at New York's Riverside Museum. Audience members sat on the floor around a large aluminum column. Around them, a nine-foot-high hexagon featured Steve Durkee's paintings of Shiva and the Buddha, as well as flashing lights and other psychedelic imagery. They inhaled burning incense and listened to a sound collage and stayed as long as they liked. USCO called the installation a "be-in" because of the ways audience members were supposed to inhabit and not simply observe the work. On September 9, 1966, Life featured USCO's "Shrine" in a cover story on psychedelic art and introduced the notion of a "be-in" to a national readership for what was almost certainly the first time.

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5. Marshall McLuhan & Buckminster Fuller
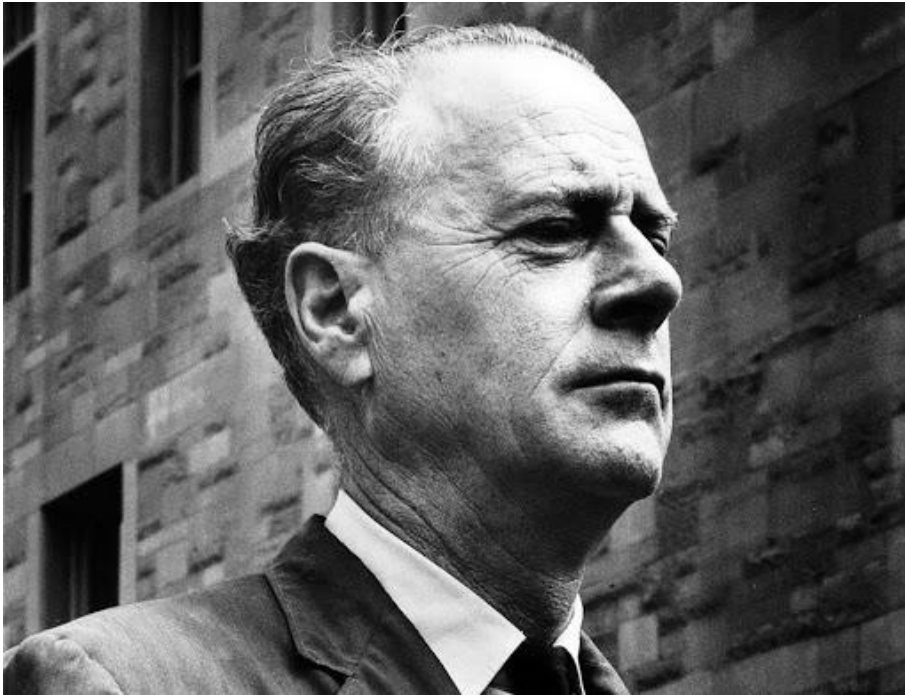
Marshall McLuhan.

USCO's performances brought with them two important transformations of the earliest artistic happenings. First, they aimed not only to help their audiences become more aware of their surroundings but also to help them imagine themselves as members of a mystical community. Second, to bring about that understanding, USCO turned to the materials of everyday life and to new electronic communication technologies.

These turns grew in large part out of USCO's engagement with the technocentric visions of Marshall McLuhan and Buckminster Fuller. Each of these theorists depicted technology as a tool for social transformation. At the same time, both turned their backs on the bureaucratic world of mainstream technocratic production. In their writings and their speeches, each cultivated a style of orphic collage. To readers raised on the declarative sentences of Ernest Hemingway, McLuhan and Fuller offered a kaleidoscopic alternative. Words and ideas collided with one another across their texts, sparking insights, creating flashpoints, energizing their readers.

What is more, McLuhan and Fuller seemed to live lives in synch with their prose. Even though McLuhan held a teaching post in Canada, both he and Fuller traveled constantly in the mid-1960s. For the young people who flocked to their lectures, their peregrinations offered a model of an entrepreneurial, individualistic mode of being that was far from the world of the organization man—and yet a mode in which they still didn't need to give up the stereos and automobiles and radios that industrial society had created. Ultimately, McLuhan, and especially Fuller, would offer Stewart Brand both ways of imagining technology as a source of social transformation and living models of how to become a cultural entrepreneur.

By the time Marshall McLuhan came to the attention of the artists in USCO, he had been a professor of English literature, primarily at the University of Toronto, for nearly twenty years. He had edited a volume of Tennyson's poetry, converted to Catholicism, and spent most of his working life in Canada. Little in this work suggested that he would become the most popular media theorist of the 1960s. Yet, alongside his teaching and his work on poetry, McLuhan developed a fascination with technology and its role in psychological and cultural change.

Most critics trace this interest to his reading of the Canadian economic historian Harold Innis. But McLuhan also drew extensively on the work of Norbert Wiener. As McLuhan's first PhD student, Donald Theall, has pointed out, McLuhan encountered Norbert Wiener's Cybernetics in the summer of 1950. According to Theall, who was studying with McLuhan at the time, McLuhan rejected the mathematical theory of communication that Wiener laid out in Cybernetics but was deeply influenced by the vision of the social role of communication outlined in Wiener's 1950 volume The Human Use of Human Beings. McLuhan began reading the work of other cyberneticians, and in 1951 he took up Jürgen Ruesch and Gregory Bateson's Communication: The Social Matrix of Psychiatry. According to Ruesch and Bateson, the self that was the subject of psychiatry was enmeshed in and largely shaped by a complex web of information exchange. In keeping with Wiener's cybernetics, they viewed social life as a system of communication and the individual as both a key element within that system and a system in his or her own right. When McLuhan was engaging with cybernetics, he was also exploring tribalism and art with his colleague Edmund Carpenter, an authority on the Inuit. In 1953 Carpenter and McLuhan established a series of weekly seminars on communication and media and a journal entitled Explorations. Together, journal and seminar served as a forum for McLuhan to brew up many of the insights for which he became famous.

The twin interests in cybernetic approaches to communication media and tribal forms of social organization that McLuhan developed in the early 1950s became key elements of his media theories in the early 1960s and important influences on the art worlds of that period. In 1962 and 1964 McLuhan published The Gutenberg Galaxy and Understanding Media, which, together, argued that transformations in communication technology were bringing about the retribalization of society. The Gutenberg Galaxy asserted that mankind was leaving a typographic age and entering an electronic one. With its sequential orientation, its segmented letters and words, McLuhan claimed, the technology of type had tended to create a world of "lineal specialism and separation of functions." That is, he held type responsible in large part for the development of rationalization, bureaucracy, and industrial life.

By contrast, he said, electronic technologies had begun to break down the barriers of bureaucracy, as well as those of time and space, and so had brought human beings to the brink of a new age. In The Gutenberg Galaxy McLuhan described the new age in tribal terms: electronic media had linked all of humanity into a single "global village." In Understanding Media, McLuhan linked both the new tribalism and its promise of a return to a prebureaucratic humanism to a more cybernetic rhetoric of human machine entanglement as well. "Today," he wrote, "we have extended our central nervous system itself in a global embrace, abolishing both

space and time as far as our planet is concerned." In McLuhan's view, the individual human body and the species as a whole were linked by a single nervous system, an array of electronic signals fired across neurons in the human body and circulating from television set to television set, radio to radio, computer to computer, across the globe.

This worldwide web of electronic signals carried a mystical charge for many. In McLuhan's work, the charge tended to invoke a vision of mystical Christian unity, but for the young bohemians of the 1960s, it did not need to refer to anything more dogmatic than the felt sense of generational togetherness. At one level, USCO's motto—"We Are All One'—echoed McLuhan's Catholic striving toward a universal humanism. When the members of USCO built their multimedia environments, they hoped their audiences would feel their own, individual senses meld into the global nerve system of electronic media. At a more local level, though, the "we" of USCO's motto referred primarily to the members of USCO itself, the vanguard techno-tribesmen who recognized the power of McLuhan's vision. Even as they labored to introduce their audiences to the notion that all humans were one, the members of USCO created a workaday world in which the members of USCO were themselves brought into a state of collaborative unity through their work with electronic media. In that sense, the "we" of USCO's motto reflected a turning away from the global humanism of McLuhan's vision and back toward a more traditional notion of a visionary avant-garde. Early on, the members of USCO painted two words over the doors to the Garnerville church that captured this mix of anti-authoritarian humanism and tribal elitism well: "Just Us."

The same tension between global humanist ideals and local elite practice would haunt much of the New Communalist movement over the next decade, and the Whole Earth network for years after that. But in the early 1960s, the linking of the global and the local helped account for much of Marshall McLuhan's appeal within the emerging counterculture. McLuhan's simultaneous celebration of new media and tribal social forms allowed people like Stewart Brand to imagine technology itself as a tool with which to resolve the twin cold war dilemmas of humanity's fate and their own trajectory into adulthood. That is, McLuhan offered a vision in which young people who had been raised on rock and roll, television, and the associated pleasures of consumption need not give those pleasures up even if they rejected the adult society that had created them.

Even if the social order of technocracy threatened the species with nuclear annihilation and the individual young person with psychic fragmentation, the media technologies produced by that order offered the possibility of individual and collective transformation. McLuhan's dual emphases also allowed young people to imagine the local communities they built around these media not simply as communities built around consumption of industrial products, but as model communities for a new society. In McLuhan's writing, and in the artistic practice of groups like USCO and, later, the psychedelic practices of groups like San Francisco's Merry Pranksters, technologies produced by mass, industrial society offered the keys to transforming and thus to saving the adult world.

No one promoted this doctrine more fervently than the technocratic polymath Buckminster Fuller. Architect, designer, and traveling speechmaker, Fuller became

an inspiration to Stewart Brand, the Whole Earth network, and the New Communalist movement as a whole across the 1960s. The geodesic domes Fuller patented soon after World War II came to be favored housing on communes throughout the Southwest. Fragments of his idiosyncratic conceptual vocabulary, such as "tensegrity," "synergy" and "Spaceship Earth," bubbled up steadily in discussions of how and why alternative communities should be built.
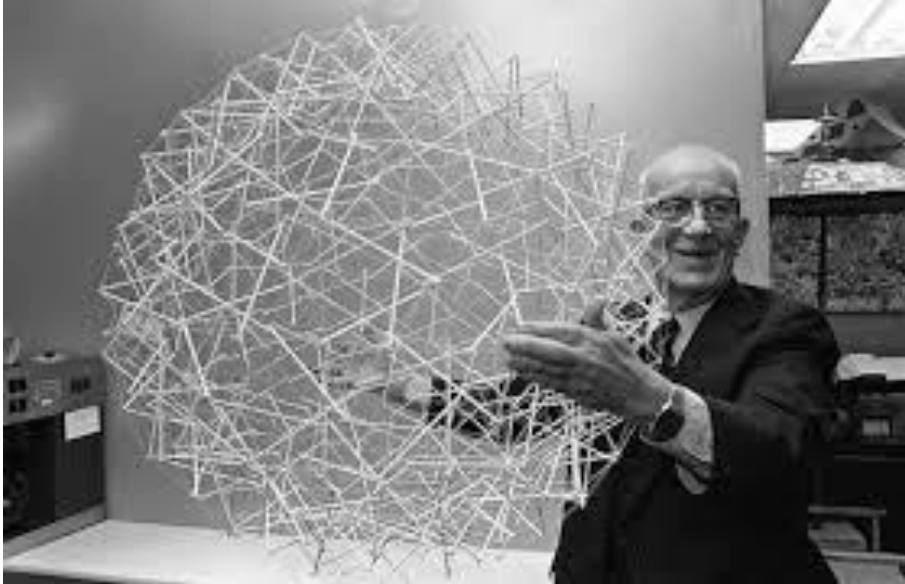
Buckinster Fuller with a geodesic structure.

And Fuller himself—seventy years old in 1965, short, plump, bespectacled, and, when he spoke in public, often clad in a three-piece suit with an honorary Phi Beta Kappa key dangling at the waist— seemed to model a kind of childlike innocence that many New Communalists sought to bring into their own adulthoods. If the politicians and CEOs of mainstream America were distant and emotionally reserved, Fuller was playful and engaged. And like his young audiences, he displayed a highly individualistic turn of mind and a deep concern with the fate of the species. Fuller made his name designing futuristic technologies such as the three wheeled Dymaxion car and, most famously, the geodesic dome, but the roots of his interests reached deep into America's pre-industrial past. Born in 1895, Fuller was the latest in a long line of Unitarian ministers, lawyers, and writers. His great-aunt, Margaret Fuller, had joined Ralph Waldo Emerson to co found the Dial, the preeminent literary journal of American Transcendentalism and the first magazine to publish Henry David Thoreau. Margaret served as an intellectual model for the young Buckminster. "When I heard that Aunt Margaret said, 'I must start with the universe and work down to the parts, I must have an understanding of it," that became a great drive for me," he recalled. For the Transcendentalists, as later for Fuller himself, the material world could be imagined as a series of corresponding forms, each linked to every other according to invisible but omnipresent principles.

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6. The Warm Springs Indians

Even as Brand was participating in the technocentric rituals of USCO, he was continuing to search for new, flexible modes of living in other realms as well. Soon after Brand left the army, an old family friend, Dick Raymond, commissioned him to take photographs of the Warm Springs Indian Reservation in central Oregon for a brochure. Over the next three years, when he was not working with USCO, Brand visited the Warm Springs Reservation and Blackfoot, Navajo, Hopi, and Papago reservations as well. When he began this project, he saw Native Americans in terms long set by Anglo-American myth. They were the custodians of the American landscape and, as such, guides to the preservation of the American wilderness. Over time, however, Brand began to reimagine Native Americans in light of his readings of McLuhan and Fuller. In his journals of 1964, he wrote that a new era was dawning.

The old era had been dominated by a "Protestant consciousness" ; under it, "mystery subsided into number, uniform and linear. Specialization gradually pervaded Western society, became malignant, and then suddenly, with the acceleration of electricity and computer automation, it passed its own breakpoint into an era of tribal endeavor and cosmic consciousness still un-named. Americans dwelling in the wilderness of changing eras are re-learning to be natives from the most native Americans, The Indians, studying with the new clarity the ancient harmony of a shared land-heritage." For Brand, as for many counterculturalists in the decade to follow, Native Americans became symbolic figures of authenticity and alternative community.

Stewart Brand with Navaho peyote roadman Hola Tso and obligatory Volkswagen van.

If the white-collar man of the 1950s had become detached from the land and from his own emotions, the Native American could show him how to be at home again, physically and psychologically. If the large corporations and governments of the twentieth century were organized in psychologically and socially divisive hierarchies, the world of the Native American was organized into tribes. Polis, family, community: within Brand's heavily idealized vision of Native Americans, all three exist harmoniously as elements of a single unity, the tribe. And if technology had finally begun to draw Americans toward a "cosmic consciousness," well, the Indians had been there all along.

Not long after he started working with the Warm Springs Indians, Brand read a book that seemed to confirm his inkling that Indians might hold the key to a nonhierarchical world, Ken Kesey's 1962 novel One Flew Over the Cuckoo's Nest. There Kesey (right) told the story of McMurphy, an individualistic con man imprisoned in a mental hospital, and his struggle against his rigid, unfeeling floor manager, Nurse Ratched (also known as "Big Nurse").
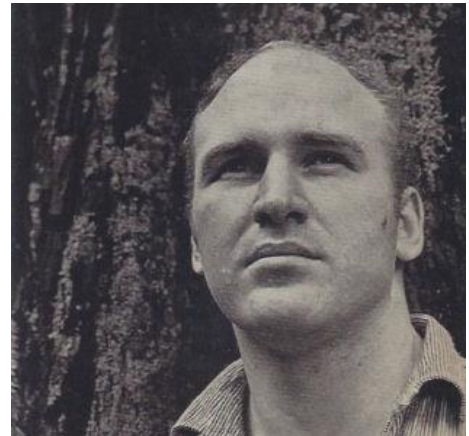
His narrator was another patient, the Native American Chief Bromden. McMurphy's struggle with Ratched and Chief Bromden's ultimate escape from the ward served, in Brand's view, as emblems of his own struggle to establish an independent identity. The novel, he wrote in his journal, gave him "the answer to my dilemma between revolution against the Combine and preservation of things like old Indian ways. No dilemma. They're identical.

Brand in his desert period, with fellow hippies Jack and Jean Loeffler.

As Kesey writes it, the battle of McMurphy versus Big Nurse is identical with [Warm Springs] Indians versus Dalles Dam [on Oregon's Columbia River] or me versus the Army."

For Brand, the hierarchical institutions of the hospital in Kesey's book and the government on the reservation mirrored each other. McMurphy's struggle for independence was Brand's own, and Chief Bromden's escape from the hospital at novel's end neatly described Brand's own desire for de-institutionalized freedom. As he read One Flew Over the Cuckoo's Nest and as he traveled from reservation to reservation, Brand, like Kesey, began to link his own struggle against hierarchy and his generation's struggle against technocracy to a mythic American past.

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7. The Merry Pranksters

In 1963 Brand wrote a low-key letter introducing himself to Ken Kesey and soon after met him face-to-face. By that time, Kesey was not only an increasingly famous author, but the host of a burgeoning psychedelic scene on the San Francisco peninsula as well. In 1958 Kesey had come to Palo Alto as a graduate student in Stanford's creative writing program. Over the next few years, the program admitted a stellar roster, including future novelists Larry McMurtry, Ed McClanahan, Robert Stone, and Gurney Norman. While there, Kesey wrote much of One Flew Over the Cuckoo's Nest. He also began to develop an affection for psychedelic drugs.

In 1959 Kesey became a subject in a series of experimental protocols at the Veterans Hospital in Menlo Park, sponsored by the CIA's MK-ULTRA program. Doctors in these experiments gave volunteer subjects various psychedelic drugs and observed their behavior. In return they offered the subjects small amounts of cash. Between 1959 and 1960, Kesey tried LSD, psilocybin mushrooms, mescaline, and the amphetamine IT-290. The CIA believed that these drugs had the potential to become weapons in the cold war, breaking down the psyches of spies, for instance, and making them more amenable to questioning. Kesey saw quite a different effect:

The first drug trips were, for most of us, shell-shattering ordeals that left us blinking knee deep in the cracked crusts of our pie-in-sky personalities. Suddenly people were stripped before one another and behold! As we looked, and were looked on, we all made a great discovery: we were beautiful. Naked and helpless and sensitive as a snake after skinning, but far more human than that shining knightmare that had stood creaking in previous parade rest. We were alive and life was us. We joined hands and danced barefoot amongst the rubble. We had been cleansed, liberated! We would never don the old armors again.

For Kesey, LSD served as a weapon in the same generational struggle that occupied Stewart Brand. Symbolically, Kesey's "knightmare" echoes Brand's undergraduate fear of growing up to don psychic armor on behalf of a militarized corporate state. In this context, LSD was a benevolent wake-up call, one that allowed Kesey to step out of the regimented ranks of adulthood and become childlike, flexible, barefoot and dancing.

Stewart Brand's first experience taught him a somewhat different lesson. Brand was first given LSD in December of 1962 at the International Federation for Advanced Study (IFAS), an organization founded a year earlier by Myron Stolaroff, an engineer from the Ampex Corporation, and Willis Harman, a professor of engineering at Stanford and later a futurist at the Stanford Research Institute. Stolaroff and Harman had built the institute in order to explore the psychological effects of LSD; by 1962 they were charging subjects like Brand five hundred dollars for a daylong trip guided by one of several local psychologists.

The man in charge of Brand's procedure was Jim Fadiman, who later served for several months at Stanford Research Institute's Augmentation Research Center—the division that in 1963 sponsored Douglas Engelbart's research on networked computing. According to Brand's journals, he received two doses of LSD, one in a "goblet" and the other, an hour later, by injection. Fadiman and others then had

Brand look at a mural, a yin-yang mandala, and a series of other images, including pictures of his family. They played classical music. They asked Brand how he felt ("very thing" he replied). Eventually, the session ended and Brand wandered off to dinner at Fadiman's house, still high.

Brand was put off by the highly structured, pseudoscientific trappings of the IFAS procedure, but the notion that psychedelic drugs could alter one's perceptions took. Brand soon began to hang out with a group devoted to "tripping" in every sense: the Merry Pranksters. The Pranksters had first come together around Kesey's house on Perry Lane on the edge of the Stanford campus. Not long after he began visiting the Veterans Hospital in Menlo Park, Kesey began bringing drugs home. A scene began to emerge: some of the writers from Stanford, the artist Roy Seburn, psychologist Richard Alpert (later known as Baba Ram Dass), guitarist Jerry Garcia, Page Browning—all had begun to appear for various parties.

Within a year, Kesey had put together a new scene, with Page Browning and Gurney Norman remaining from the original Perry Lane crew, and in the fall of 1964 he and the Pranksters painted up an old school bus and drove east on the first leg of the legendary tour chronicled in Tom Wolfe's The Electric Kool-Aid Acid Test. Brand did not go with them. As Wolfe put it, Brand represented "the restrained, reflective wing of the Merry Pranksters".

The Merry Pranksters' Furthur bus.
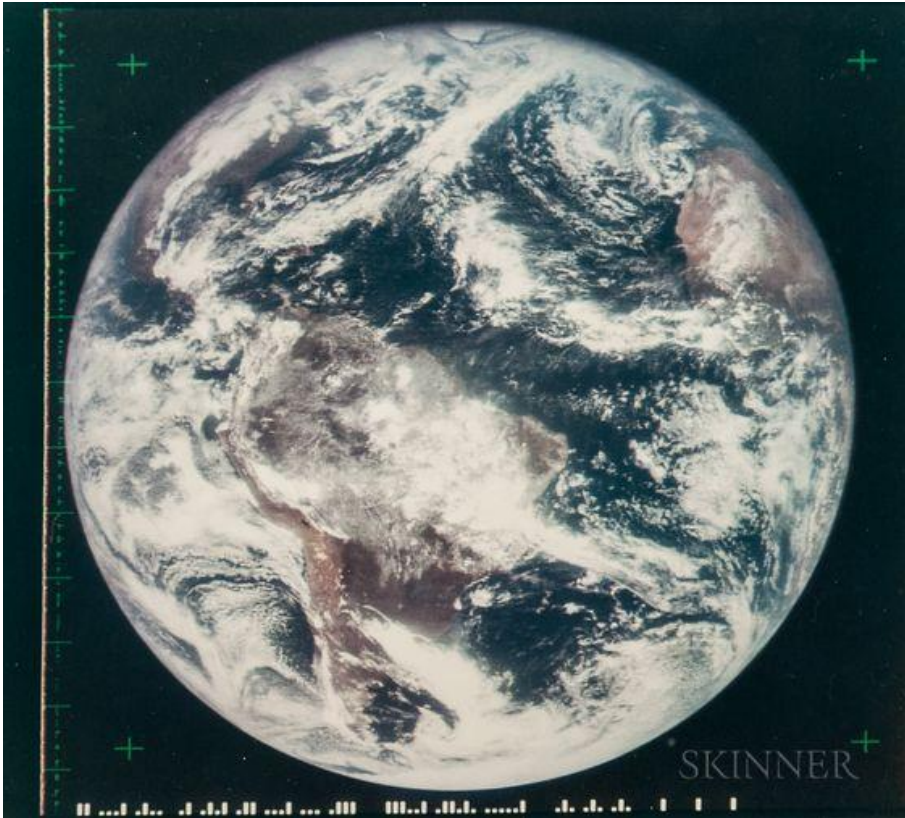
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8. NASA Images of Earth

Photo of Earth from ATS-3 satellite. 1967.

In 1966, while on an LSD trip on the roof of his house in North Beach, San Francisco, Brand became convinced that seeing an image of the whole Earth would change how we think about the planet and ourselves.


Earthrise photo by Bill Anders, 1968.

He then campaigned to have NASA release the then-rumored satellite image of the entire Earth as seen from space. He sold and distributed buttons for 25 cents each asking, "Why haven't we seen a photograph of the whole Earth yet?". During this campaign, Brand met Richard Buckminster Fuller, who offered to help Brand with his projects. In 1967, a satellite, ATS-3, took the photo. Brand thought the image of our planet would be a powerful symbol. It adorned the first (Fall 1968) edition of the Whole Earth Catalog.

Later in 1968, NASA astronaut Bill Anders took an Earth photo, Earthrise, from Moon orbit, which became the front image of the spring 1969 edition of the Catalog. 1970 saw the first celebration of Earth Day. During a 2003 interview, Brand explained that the image "gave the sense that Earth's an island, surrounded by a lot of inhospitable space. And it's so graphic, this little blue, white, green and brown jewel-like icon amongst a quite featureless black vacuum."

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9. Whole Earth Catalog
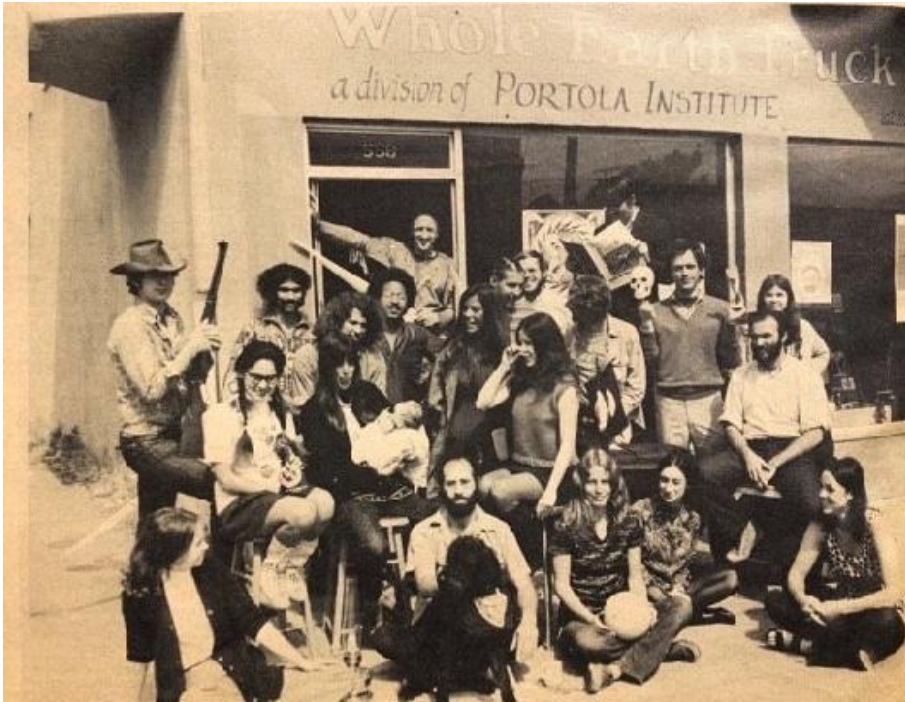
The Whole Earth Catalog team.

During the late 1960s and early 1970s about 10 million Americans were involved in living communally. In 1968, using the most basic approaches to typesetting and page-layout, Brand and his colleagues created issue number one of The Whole Earth Catalog, employing the significant subtitle, "access to tools". Brand and his wife Lois travelled to communes in a 1963 Dodge truck known as the Whole Earth Truck Store, which moved to a storefront in Menlo Park, California. That first oversize Catalog, and its successors in the 1970s and later, reckoned a wide assortment of things could serve as useful "tools": books, maps, garden implements, specialized clothing, carpenters' and masons' tools, forestry gear, tents, welding equipment, professional journals, early synthesizers, and personal computers.

Brand invited "reviews" (written in the form of a letter to a friend) of the best of these items from experts in specific fields. The information also described where these things could be located or purchased. The Catalog's publication coincided with the great wave of social and cultural experimentation, convention-breaking, and "do it yourself" attitude associated with the "counterculture".


The influence of these Whole Earth Catalogs on the rural back-to-the-land movement of the 1970s, and the communities movement within many cities, was widespread throughout the United States, Canada, and Australia. A 1972 edition sold 1.5 million copies, winning the first U.S. National Book Award in category Contemporary Affairs.

To continue this work and also to publish full-length articles on specific topics in the natural sciences and invention, in numerous areas of the arts and the social sciences, and on the contemporary scene in general, Brand founded the CoEvolution Quarterly (CQ) during 1974, aimed primarily at educated laypersons. Brand never better revealed his opinions and reason for hope than when he ran, in CoEvolution Quarterly #4, a transcription of technology historian Lewis Mumford's talk "The Next Transformation of Man", in which he stated that "man has still within him sufficient resources to alter the direction of modern civilization, for we then need no longer regard man as the passive victim of his own irreversible technological development."

The content of CoEvolution Quarterly often included futurism or risqué topics. Besides giving space to unknown writers with something valuable to say, Brand presented articles by many respected authors and thinkers, including Lewis Mumford, Howard T. Odum, Witold Rybczynski, Karl Hess, Orville Schell, Ivan Illich, Wendell Berry, Ursula K. Le Guin, Gregory Bateson, Amory Lovins, Hazel Henderson, Gary Snyder, Lynn Margulis, Eric Drexler, Gerard K. O'Neill, Peter Calthorpe, Sim Van der Ryn, Paul Hawken, John Todd, Kevin Kelly, and Donella Meadows. During ensuing years, Brand authored and edited a number of books on topics as diverse as computer-based media, the life history of buildings, and ideas about space colonies.
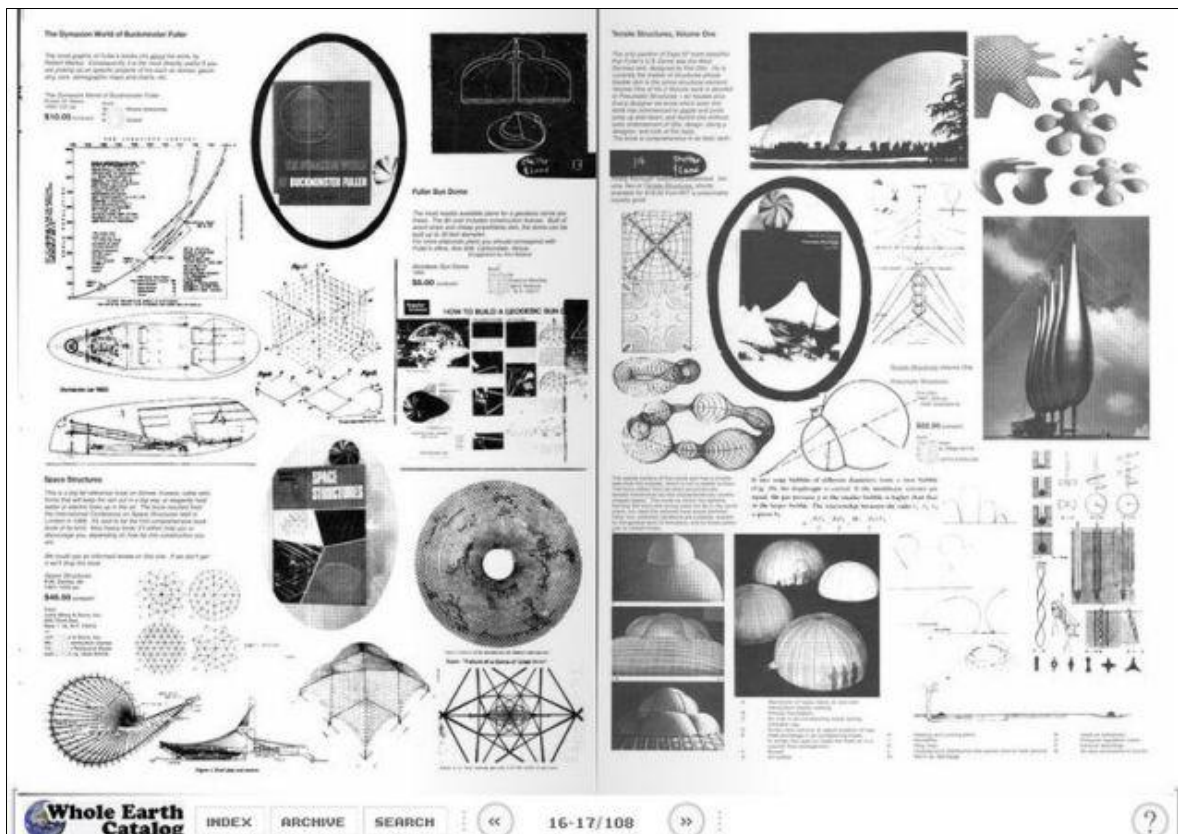
A double page spread from the Whole Earth Catalog.

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10. The WELL and All Species

In 1985, Brand and Larry Brilliant founded The WELL ("Whole Earth 'Lectronic Link"), a prototypical, wide-ranging online community for intelligent, informed participants the world over. The WELL won the 1990 Best Online Publication Award from the Computer Press Association. Almost certainly the ideas behind the WELL were greatly inspired by Douglas Engelbart's work at SRI International; Brand was acknowledged by Engelbart in "The Mother of All Demos" in 1968 when the computer mouse and video conferencing were introduced.

In 2000, Brand helped to launch the All Species Foundation, which aimed to catalog all species of life on Earth until its closure in 2007.

During 1986, Brand was a visiting scientist at the MIT Media Lab. Soon after, he became a private-conference organizer for such corporations as Royal Dutch/Shell, Volvo, and AT&T Corporation. In 1988, he became a co-founder of the Global Business Network, which explores global futures and business strategies informed by the sorts of values and information which Brand has always found vital. The GBN has become involved with the evolution and application of scenario thinking, planning, and complementary strategic tools. For fourteen years, Brand was on the board of the Santa Fe Institute (founded in 1984), an organization devoted to "fostering a multidisciplinary scientific research community pursuing frontier science." He has also continued to promote the preservation of tracts of wilderness.

The Whole Earth Catalog implied an ideal of human progress that depended on decentralized, personal, and liberating technological development—so-called "soft technology". However, during 2005 he criticized aspects of the international environmental ideology he had helped to develop. He wrote an article called "Environmental Heresies" in the May 2005 issue of the MIT Technology Review, in which he describes what he considers necessary changes to environmentalism. He suggested among other things that environmentalists embrace nuclear power and genetically modified organisms as technologies with more promise than risk.

Brand later developed these ideas into a book and published the Whole Earth Discipline: An Ecopragmatist Manifesto in 2009. The book examines how urbanization, nuclear power, genetic engineering, geoengineering, and wildlife restoration can be used as powerful tools in humanity's ongoing fight against global warming.

In a 2019 interview, Brand described his perspective as "post-libertarian", indicating that at the time when the Whole Earth Catalog was being written, he did not fully understand the significance of the role of government in the development of technology and engineering.

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10. The Long Now Foundation

Brand is co-chair and President of the Board of Directors of The Long Now Foundation. Brand chairs the foundation's Seminars About Long-term Thinking (SALT). This series on long-term thinking has presented a large range of different speakers including: Brian Eno, Neal Stephenson, Vernor Vinge, Philip Rosedale, Jimmy Wales, Kevin Kelly, Clay Shirky, Ray Kurzweil, Bruce Sterling, Cory Doctorow, and many others.

Stewart Brand introduces the Long Now Foundation thus:

Civilization is revving itself into a pathologically short attention span. The trend might be coming from the acceleration of technology, the short-horizon perspective of market-driven economics, the next-election perspective of democracies, or the distractions of personal multi-tasking. All are on the increase. Some sort of balancing corrective to the short-sightedness is needed-some mechanism or myth which encourages the long view and the taking of long-term responsibility, where 'long-term' is measured at least in centuries. Long Now proposes both a mechanism and a myth. It began with an observation and idea by computer scientist Daniel Hillis :

"When I was a child, people used to talk about what would happen by the year 02000. For the next thirty years they kept talking about what would happen by the year 02000, and now no one mentions a future date at all. The future has been shrinking by one year per year for my entire life. I think it is time for us to start a long-term project that gets people thinking past the mental barrier of an ever-shortening future. I would like to propose a large (think Stonehenge) mechanical clock, powered by seasonal temperature changes. It ticks once a year, bongs once a century, and the cuckoo comes out every millennium."

Such a clock, if sufficiently impressive and well-engineered, would embody deep time for people. It should be charismatic to visit, interesting to think about, and famous enough to become iconic in the public discourse. Ideally, it would do for thinking about time what the photographs of Earth from space have done for thinking about the environment. Such icons reframe the way people think.

Hillis, who developed the "massive parallel" architecture of the current generation of supercomputers, devised the mechanical design of the Clock and is now building the monument scale version of the Clock in the Sierra Diablo range of West Texas near the town of Van Horn. The first Clock prototype is currently on display at the London Science Museum and others are at the headquarters of Long Now in San Francisco. The Clock's works consist of a specially designed gear system that has precision equal to one day in 20,000 years, and it self-corrects by "phase-locking" to the noon Sun.

Long Now added a "Library" dimension with the realization of the need for content to go along with the long-term context provided by the Clock - a library of the deep future, for the deep future. In a sense every library is part of the 10,000-year Library, so Long Now is developing tools (such as the Rosetta Disk , The Long Viewer and the Long Server) that may provide inspiration and utility to the whole

community of librarians and archivists. The Long Bets project - whose purpose is improving the quality of long-term thinking by making predictions accountable - is also Library-related.

The point is to explore whatever may be helpful for thinking, understanding, and acting responsibly over long periods of time.

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13. The 10,000 Year Clock

The following description of the 10,000 Year Clock was extracted in October 2020, with acknowledgement and thanks, from the website of the Long Now Foundation.

The full scale 10,000 Year Clock is now under construction. While there is no completion date scheduled, we do plan to open it to the public once it is ready. The following essay by Long Now board member Kevin Kelly discusses what we hope the Clock will be once complete. This is one of several projects by Long Now to foster long-term thinking in the context of the next 10,000 years.

There is a Clock ringing deep inside a mountain. It is a huge Clock, hundreds of feet tall, designed to tick for 10,000 years. Every once in a while the bells of this buried Clock play a melody. Each time the chimes ring, it's a melody the Clock has never played before. The Clock's chimes have been programmed to not repeat themselves for 10,000 years. Most times the Clock rings when a visitor has wound it, but the Clock hoards energy from a different source and occasionally it will ring itself when no one is around to hear it. It's anyone's guess how many beautiful songs will never be heard over the Clock's 10 millennial lifespan

The Clock is real. It is now being built inside a mountain in western Texas. This Clock is the first of many millennial Clocks the designers hope will be built around the world and throughout time. There is a second site for another Clock already purchased at the top of a mountain in eastern Nevada, a site surrounded by a very large grove of 5,000-year-old bristlecone pines. Appropriately, bristlecone pines are among the longest-lived organisms on the planet. The designers of the Clock in Texas expect its chimes will keep ringing twice as long as the oldest 5 millennia-old bristlecone pine. Ten thousand years is about the age of civilization, so a 10K-year Clock would measure out a future of civilization equal to its past. That assumes we are in the middle of whatever journey we are on – an implicit statement of optimism.

The Clock is now being machined and assembled in California and Seattle. Meantime the mountain in Texas is being readied. Why would anyone build a Clock inside a mountain with the hope that it will ring for 10,000 years? Part of the answer: just so people will ask this question, and having asked it, prompt themselves to conjure with notions of generations and millennia. If you have a Clock ticking for 10,000 years what kinds of generational-scale questions and projects will it suggest? If a Clock can keep going for ten millennia, shouldn't we make sure our civilization does as well? If the Clock keeps going after we are personally long dead, why not attempt other projects that require future generations to finish? The larger question is, as virologist Jonas Salk once asked, "Are we being good ancestors?"

Danny Hills, the clock's inventor, writes:

I cannot imagine the future, but I care about it. I know I am a part of a story that starts long before I can remember and continues long beyond when anyone will remember me. I sense that I am alive at a time of important change, and I feel a responsibility to make sure that the change comes out well. I plant my acorns knowing that I will never live to harvest the oaks.

I want to build a clock that ticks once a year. The century hand advances once every 100 years, and the cuckoo comes out on the millennium. I want the cuckoo to come out every millennium for the next 10,000 years.

The first step in this multi-decade project was to construct a working 8-foot-tall prototype. This test version was finished (just in time) on New Year's Eve 1999. At the stroke of midnight, the prototype 10,000-year Clock bonged twice to usher in the new millennia, the year 2000, in front of a small crowd at its temporary home in the Presidio, San Francisco. The Clock now resides in the London Science Museum. Somewhat worrisome, there have been moments when it was not wound.

In contrast to the human-scale of the prototype, the Clock in the mountain will be monumental, almost architectural in scale. It will be roughly 200 feet tall. Located under a remote limestone mountain near Van Horn, Texas, it will require a day's hike to reach its interior gears. Just reaching the entrance tunnel situated 1500 feet above the high scrub desert will leave some visitors out of breath, nicked by thorns, and wondering what they got themselves into.

To see the Clock you need to start at dawn, like any pilgrimage. Once you arrive at its hidden entrance in an opening in the rock face, you will find a stainless steel

door, and then a second door beyond it. These act as a kind of crude airlock, keeping out dust and wild animals. You rotate its round handles to let yourself in, and then seal the doors behind you. It is totally black. You head into the darkness of a tunnel a few hundred feet long. At the end there's the mildest hint of light on the floor. You look up. There is a tiny dot of light far away, at the top of top of a 500 foot long vertical tunnel about 12 feet in diameter. There is stuff hanging in the shaft. The dot of light beckons you. You begin the ascent. You start climbing a continuous spiral staircase, winding up the outer rim of the tunnel, rising toward the very faint light overhead. The stairs are carved out of the rock. The material above each step has been removed from the tunnel leaving astoundingly precise rock stairs. To cut the spiral staircase Stuart Kendall of Seattle Solstice invented a special stone slicing robot to continuously grind out the stairs at the rate of a few stairs per day. His robot incrementally creeps downward while the debris falls into the central shaft out of the way.

Round the tunnel and up the tube toward the light you head. The first part of the Clock you encounter on the ascent up the spiral staircase is the counterweights of the Clock's drive system. This is a huge stack of stone disks, about the size of a small car, and weighing 10,000 pounds. Depending on when the clock was last wound, you may have to climb 75 feet before you reach the weights.

After you pass the weights, you arrive at the winding station. It is a horizontal windlass, or a capstan like the turnstile on an old sailing vessel that winds up an anchor. It takes two or three visitors to push around the capstan of the clock and to lift its 10,000-pound stones. You rotate around until you can no further. Now the clock is wound.

You keep climbing. For the next 70-80 feet of ascent you pass 20 huge horizontal gears (called Geneva wheels), 8 feet in diameter, each weighing 1,000 pounds. This is the mechanical computer that calculates the over 3.5 million different melodies that the chimes will ring inside the mountain over the centuries. The chimes never repeat so that every visitor's experience is unique, and the calculated variety creates a sense of progressive time, rather than endless recycling. And "calculate" is the correct word, because cut into the gears is an elaborate system of slots and sliding pins, which, much like a Babbage Difference Engine, will perform digital calculations, generating the next sequence of the ten bells. Only the Clock calculates without electricity, using your stored energy to moving its physical logic gates and bits. This is the world's slowest computer.

On days when visitors are there to wind it, the calculated melody is transmitted to the chimes, and if you are there at noon, the bells start ringing their unique one-time-only tune. The 10 chimes are optimized for the acoustics of the shaft space, and they are big.

Finally, way out of breath, you arrive at the primary chamber. Here is the face of the Clock. A disk about 8 feet in diameter artfully displays the natural cycles of astronomical time, the pace of the stars and the planets, and the galactic time of the Earth's procession. If you peer deep into the Clock's workings you can also see the time of day.

But in order to get the correct time, you need to "ask" the clock. When you first come upon the dials the time it displays is an older time given to the last person to visit. If no one has visited in a while, say, since 8 months and 3 days ago, it will show the time it was then. To save energy, the Clock will not move its dials unless they are turned, that is, powered, by a visitor. The Clock calculates the correct time, but will only display the correct time if you wind up its display wheel. So yet another hand-turned wheel awaits your effort to update the face of time. This one is much easier to wind because the dial motion consumes less power than ringing bells. You start winding and the calendar wheels whirr until BING, it stops and it shows the current date and time.

So how does the Clock keep going if no one visits it for months, or years, or perhaps decades? If it is let to run down between visits, who would keep resetting it? The Clock is designed to run for 10,000 years even if no one ever visits (although it would not display the correct time till someone visited). If there is no attention for long periods of time the Clock uses the energy captured by changes in the temperature between day and night on the mountain top above to power its time-keeping apparatus. In a place like a top of a mountain, this diurnal difference of tens of degrees in temperature is significant and thus powerful. Thermal power has been used for small mantel clocks before, but it has not been done before at this scale. The differential power is transmitted to the interior of the Clock by long metal rods. As long as the sun shines and night comes, the Clock can keep time itself, without human help. But it can't ring its chimes for long by itself, or show the time it knows, so it needs human visitors.
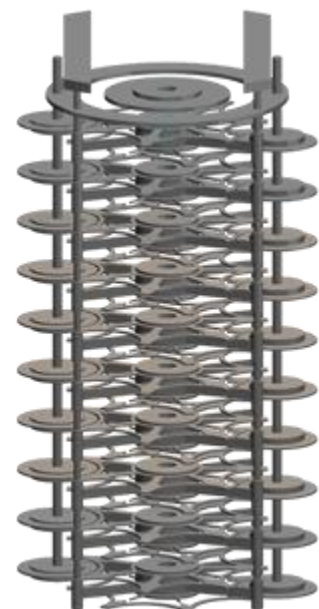
If the sun shines through the clouds more often than expected, and if the nights are colder than usual, the extra power generated by this difference (beyond what is ordinarily needed to nudge the pendulum) will bleed over into the Clock weights. That means that over time, in ideal conditions, the sun will actually wind up the chimes, and wind them up sufficiently for them to ring when no one is there. The rotating dials, gears, spinning governor, and internal slips of pins and slots within the Clock will be visible only if you bring your own light. The meager dot of light above is not sufficient to see much otherwise. Lights off, the Clock sits in near total darkness, talking to itself in slow clicks, for perhaps years at a time. In the darkness you can hear things moving, crisp non-random pings, like a crude thought trying to form inside a dim unlit brain.

Shining your light around the rest of the chamber you'll see the pendulum and escapement encased in a shield of quartz glass – to keep out dust, air movements,

and critters. The pendulum, which governs the timing of the Clock, is a 6-feet-long titanium assembly terminating with football-sized titanium weights. It swings at a satisfyingly slow 10-second period. The slight clicks of its escapement echo loudly in the silence of the mountain.

Building something to last 10,000 years requires both a large dose of optimism and a lot of knowledge. There's a huge geek-out factor in the Clock because the engineering challenges are formidable. What do you build with that won't corrode in 100 centuries? How do you keep it accurate when no one is around? The Clock's technical solutions are often ingenious.

Almost any kind of artifact can last 10 millennia if stored and cared for properly. We have examples of 5,000-year-old wood staffs, papyrus, or leather sandals. On the other hand, even metal can corrode in a few years of rain. For longevity a 10K year environment is more important than the artifact's material. The mountain top in Texas (and Nevada) is a high dry desert, and below, in the interior tunnel, the temperature is very even over seasons and by the day (55 degrees F) – another huge plus for longevity since freeze-thaw cycles are as corrosive as water. Dry, dark and stable temperatures are what archivists love. It's an ideal world for a ceaseless Clock.


Still, the Clock is a machine with moving parts, and parts wear down and lubricants evaporate or corrode. Most of the Clock will be made in a marine grade 316 stainless steel. Because the engineering tolerances of the huge Clock are in fractions of an inch, rather than thousandths, the microscopic expansion by a film of rust won't hurt the time

keeping. The main worry of the Clockmakers is that elements of a 10K-year Clock — by definition — will move slowly. The millennial dial creeps so slowly it can be said to not move at all during your lifetime. Metals in contact with each other over those time scales can fuse – defeating the whole purpose of an ongoing timepiece. Dissimilar metals in contact can eat each other in galvanic corrosion. To counteract these tendencies some of the key moving parts of the Clock are non-metal — they are stone and hi-tech ceramics.

Ceramics will outlast most metals. We have found shards of clay pots 17,000 years old. And modern ceramics can be as hard as diamonds. All the bearings in the Clock will be engineered ceramic. Because these bearings are so hard, and rotate at very low speed, they require no lubrication – which normally attracts grit and eventually cause wear.

There is more than just technology in the mountain. The ticks of time are a very human invention. Astronomical calendars are among the first pieces of culture, and often the mark of civilizations. The cave holds culture. The Clock in the mountain not only plays the music of an ever-changing slow melody, but it will collect cultural expressions of time, ticks to mark the passage of decades and centuries. Off to the side of the main cavern of the Clock are a series of small grottos to explore and collect these notices of time. Their contents will be a surprise.
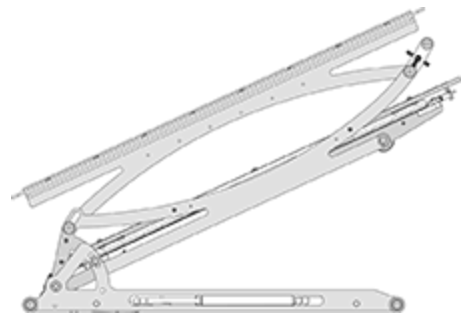
Behind the main chamber's dials the stairs continue up to the outside summit of the mountain. The shaft above Clock continues to the surface, where its opening to the daylight is capped with a cupola of sapphire glass. This is the only part of the clock visible from outside, on the mountain peak. In this outdoor cupola sits the thermal-difference device to power the timekeeping, and also a solar synchronizer. Every sunny noon, a prism directs sunlight down the shaft and slightly heats up this ingenious mechanical device. That synchronizing signal is transmitted by rods further down to the Clock's innards, where the imperceptible variations in the length of the day as the earth wobbles on its axis will be compensated so that the Clock can keep its noon on true solar noon. In that way the Clock is self-adjusting, and keeps good time over the centuries.

The journey to the Clock in the mountain ends on the summit in light. It is the sun that powers its ringing below. Like a heart beating while we sleep, the Clock in the mountain keeps time even when we pretend the past did not happen and the future will not come.

The biggest problem for the beating Clock will be the effects of its human visitors. Over the span of centuries, valuable stuff of any type tends to be stolen, kids climb everywhere, and hackers naturally try to see how things work or break. But it is humans that keep the Clock's bells wound up, and humans who ask it the time. The Clock needs us. It will be an out of the way, long journey to get inside the Clock ringing inside a mountain. But as long as the Clock ticks, it keeps asking us, in whispers of buried bells, "Are we being good ancestors?"

How do you become one of those time-conscious beings who visit and wind the Clock? Long Now Members will have priority to visit the Clock when it is completed and should check the Visit the Clock box in the Notifications tab in your Member Settings when you are signed in as a member on the Long Now website.

Jeff Bezos' team at Amazon have also created a new website at 10000YearClock.net with information for the public about the project as well as a public sign up page for learning about the eventual visiting opportunities there.

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11. Writing
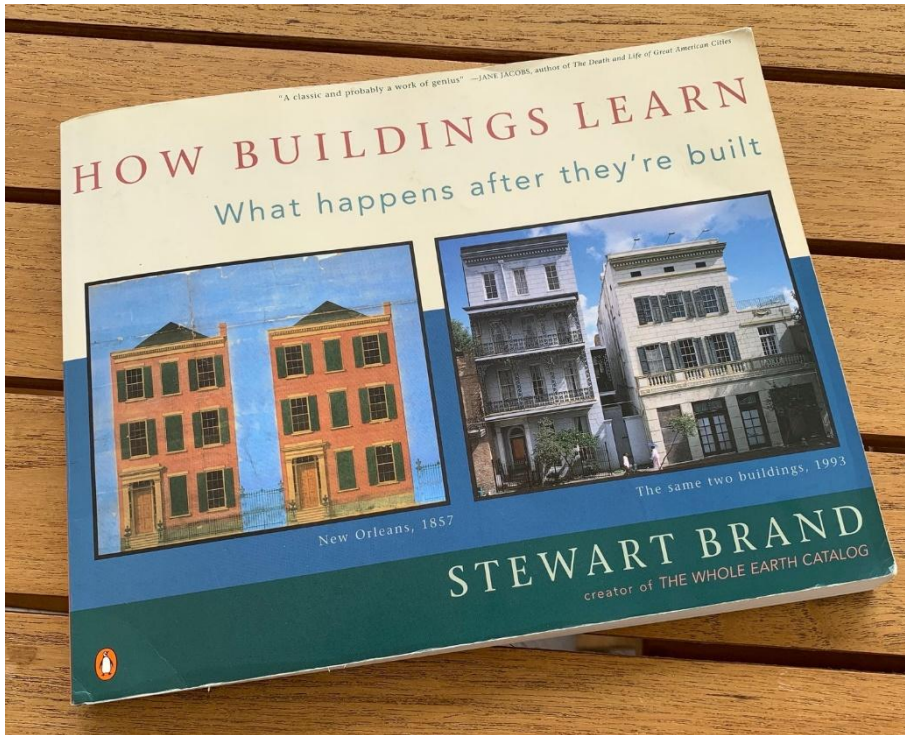
Cybernetic Frontiers, 1974, ISBN 0-394-49283-8 (hardcover), ISBN 0-394-70689-7 (paperback)

The Media Lab: Inventing the Future at MIT, 1987, ISBN 0-670-81442-3 (hardcover); 1988, ISBN 0-14-009701-5 (paperback)

How Buildings Learn: What Happens After They're Built, 1994. ISBN 0-670-83515-3

The Clock of the Long Now: Time and Responsibility, 1999. ISBN 0-465-04512-X

Whole Earth Discipline: An Ecopragmatist Manifesto, Viking Adult, 2009. ISBN 0-670-02121-0

The Salt Summaries: Seminars About Long-term Thinking, Long Now Press, 2011. ISBN 978-1-105-75187-5 (paperback)

As editor or as co-editor

The Whole Earth Catalog, 1968–72 (original editor, winner of the National Book Award, 1972)

Last Whole Earth Catalog: Access to Tools, 1971

Whole Earth Epilog: Access to Tools, 1974, ISBN 0-14-003950-3

The (Updated) Last Whole Earth Catalog: Access to Tools, 16th edition, 1975, ISBN 0-14-003544-3

Space Colonies, Whole Earth Catalog, 1977, ISBN 0-14-004805-7

As co-editor with J. Baldwin: Soft-Tech, 1978, ISBN 0-14-004806-5

The Next Whole Earth Catalog: Access to Tools, 1980, ISBN 0-394-73951-5;

The Next Whole Earth Catalog: Access to Tools, revised 2nd edition, 1981, ISBN 0-394-70776-1

As editor-in-chief: Whole Earth Software Catalog, 1984, ISBN 0-385-19166-9

As editor-in-chief: Whole Earth Software Catalog for 1986, "2.0 edition" of above title, 1985, ISBN 0-385-23301-9

As co-editor with Art Kleiner: News That Stayed News, 1974–1984: Ten Years of CoEvolution Quarterly, 1986, ISBN 0-86547-201-7 (hardcover), ISBN 0-86547-202-5 (paperback)

Introduction by Brand: The Essential Whole Earth Catalog: Access to Tools and Ideas (Introduction by Brand), 1986, ISBN 0-385-23641-7

Foreword by Brand: Signal: Communication Tools for the Information Age, editor: Kevin Kelly, 1988, ISBN 0-517-57084-X

Foreword by Brand: The Fringes of Reason: A Whole Earth Catalog, editor: Ted Schultz, 1989, ISBN 0-517-57165-X

Foreword by Brand: Whole Earth Ecolog: The Best of Environmental Tools & Ideas, editor: J. Baldwin, 1990, ISBN 0-517-57658-9.

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2. Living in Boats

The Mirene. Stewart Brand says: The main thing is our houseboat community here, which is exceptionally congenial. The boat is inexpensive to live on, and you have no problem with earthquakes, wildfires or rising sea levels due to global warming.

Brand has lived in California since the 1960s. He and his second wife live on Mirene, a 64-foot (20 m)-long working tugboat. Built in 1912, the boat is moored in a former shipyard in Sausalito, California.] He works in Mary Heartline, a grounded fishing boat about 100 yards (90 metres) away. One of his favourite items is a table on which Otis Redding is said to have written "(Sittin' On) The Dock of the Bay". Brand acquired it from an antiques dealer in Sausalito.

Stewart Brand at the Mary Heartline. An office in a land boat.

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