This article offers a history and theory of “whole design” as it emerged through countercultural ecology, by offering a critical reading of the Whole Earth Catalog and its affiliate publications, and correlating it with design projects and related philosophies from the 1960s to the present day. The article proposes that the Catalog was itself a sort of architecture, a colloquium connecting its participants to design and to the world at large. Despite its determinist, systems-based origins, the article suggests that whole design harbored an ideologically and aesthetically vibrant indeterminism of continuing relevance to sustainability.

Introduction
Is the discourse of sustainability sustainable? Does ecological design inspire the engagement of ever more practitioners and publics, or does it, over time, feel prescriptive and prescriptive, subcultural, overarching in its “naturalness,” apolitical, quasi-theological? I approach such questions here by examining the ecological thinking of the 1960s counterculture, following the historical and theoretical trajectory of the hippie directory the Whole Earth Catalog¹ (Figure 1).

It is symptomatic, perhaps, that architectural history and theory rarely follow this trajectory,² which passes through such snares as technophilia, antihumanism, mysticism, lifestyle marketing, and neoliberalism. “The apolitical counterculture,” ran the justifiably skeptical judgment of someone who took part in it, “furnished no coherent ideology for either its social or architectural experiments,”³ a point of view largely confirmed by the New Age consumerism, libertarianism, and technophilia cited as the legacy of the counterculture and its Catalog in a slew of recent literature. Countercultural ecology can be condemned as a retreat from Vietnam era protest movements, one that still provides a pious platform from which to survey globalization with little remorse for its deleterious details. Meanwhile, the stature of ecology in design remains uncertain, as though it is a matter of taste or branding, or worse that it answers blindly to laws of energy and biology that may be managed but not altered.

This deterministic air is one reason, perhaps, why architecture should keep its distance from ecology, retaining architecture for the “culture” side of the traditional divide between “nature” and “culture,”⁴ remaining guarded against ecology’s moralizing tenor, its nonfiguration, its semantic deficiency, and its deferral to environmental generalization. This article may actually add to doubts about the Whole Earth Catalog’s relevance to architecture. Was the Catalog’s gambit to address “the whole” a hubristic conceit bound to fail morally, epistemologically, and technically? In the 1970s and 1980s, poststructuralism, and advancing capitalism, rendered suspect the very notions of a dialectically or rationally defined “whole,” “nature,” and “reality” upon which ecological architectures depended.

But this article’s ultimate concern is quixotic: what could or should countercultural architecture have been? At its inception, the Whole Earth Catalog offered to bridge rationality and its poststructural “deterioralization,”⁵ science and its nemesis in culture, the market economy and its nonmarket alternatives. Rejecting the professionalization of design, the Catalog took sustainability to be a concern for the citizenry at large, one best approached as a “design Wiki,” so to speak, refusing to cede to political and industrial hegemony, or to the supposition that nature is a limiting condition on society.

The Whole Earth Catalog was first published in 1968 by the countercultural entrepreneur and journalist Stewart Brand. A raffish offspring of mismatched but upstanding parents—Diderot’s Encyclopédie (1751–1765) (Figure 2) and the Sears’s Catalog (1888–1993)—the Catalog provided an unparalleled resource on ecology, technology, energy, communications, and social experimentation, initially aimed at exurban readers “dropping-out” in the new communalism movement but soon addressing readers looking to effect change from inside the city and suburbs. Filled with its readers’ recommendations for products ranging from books to outdoor equipment, from seeds to electronics, such was the Catalog’s cultural footprint that it won America’s 1972 National Book Award and spawned an intellectual, social, journalistic, and technological network which survives today (for convenience only, I refer to this as a “Whole Earth network”). The circulation figures of publications associated with the Whole Earth network easily compare with, and often eclipse, those of staple design literature of the same era. Lloyd Kahn’s Shelter (1973) (Figure 3), for example, sold more than 185,000 copies (for comparison, 112,000 more copies to date than a benchmark architectural
treatise published a year earlier, Venturi, Scott Brown, and Izenour’s *Learning from Las Vegas*).\(^5\) Under Stewart Brand’s editorship alone, the *Whole Earth Catalog* sold a total of more than 2.5 million copies.\(^6\)

The *Whole Earth Catalog* posited an aesthetic of “whole design” committed to a mediation of people and totality far exceeding that implied in conventional architectural education. But within architectural culture, excitement about the counterculture’s rediscovery of ecology all but vanished following its momentary cachet in France, around Italy’s neo-avant-garde Global Tools initiative (1973–1975), and at progressive schools like London’s Architectural Association\(^7\) (Figures 4 and 5). Upon reissue as *Architecture Today*, the entire five-chapter section on counterculture contained in Charles Jencks’ book *Contemporary Architecture* (1981) was excised (in favor of postmodern historicism).\(^8\) Likely reasons for its estrangement from architectural schools and offices were that countercultural design touted an indifference to artistic form and had a quizzical approach to modernization itself.

Unremitting advocates of grassroots organization, unfettered scientific enquiry, and technological futurism at one level, the Whole Earth network is so achingly modern as to appear radical, fanatical, and fantastical, almost in the manner of the historical avant-gardes. Underwriting the Whole Earth project were fascinations with evolutionary and systems models that subsumed differences between people, economies, cultures, technologies, and species into one whole. Its inflated reverence for nature, it seemed, was at the expense of a reverence for culture, advocating holistic, and cybernetic evolutionism as an organizational model for society. The Catalog’s respect for business as a mechanism of social evolution arguably made its project still more suspect, a hippie variant of consumerism and managerialism.\(^9\)

Arrayed against these drawbacks, though, was whole design’s advocacy of “coevolution,” which I reassess through philosopher Bruno Latour’s contention that, at base, ecology is cultural. This is demonstrably the case in whole design’s immersive, “ecology of mind” proposals that in practice were all too human and far from systematic. The *Whole Earth Catalog* was accordingly a grand mediator of political ecology, an “assembly” that offered a sort of architecture in and of itself—iconic, encyclopedic, pragmatic, and collaged. In every way, whole design encouraged an approach that mediated past, present and future, here and there, individual and society, instilling a sense of long-term responsibility beyond immediate and parochial concerns, and reinstating a Kantian sense of beauty as the transcendent experience of reason. Behind the overexcited positivism, then, was a quest for an ecological metaphysics that asked questions about our being in the world.

**Whole Systems**

Whole design favored social and technological practices that evolve by continual reconfiguration.
Design was not even specified by the *Whole Earth Catalog* as something existing of itself. Design, it appears from the Catalog, is everywhere and nowhere, a practice among practices, a system among systems (Figure 6). The *Whole Earth Catalog* carried prospectuses by Bernard Rudofsky, Christopher Alexander, Ian McHarg, Lewis Mumford, and others for design practices extending beyond personalities and charismatic objects into folk art, pattern finding, environmental restoration, and technical investigation; but mostly unlike these sources, whole design relished amateurism, welcomed change, and was unerringly optimistic. While a chief interest of several key contributors to the Catalog was architectural, formal design training within this hippie intellectual corps was rare. Contributors were typically not professional designers at all, but polymaths—carpenters, ex-servicemen, engineers, mathematicians, photographers, and scientists. Stewart Brand, for example, enjoyed recreationally building on his land in British Columbia, though he was a Stanford biologist by training. *Whole Earth Catalog* coeditors Lloyd Kahn, Jay Baldwin, and Steve Baer rose to fame as builders of Richard Buckminster Fuller’s geodesic domes, but the status of the geodesic domes as architecture remained questionable, particularly following their 1965 civilian premiere at the countercultural Colorado settlement Drop City—the example of which inspired Brand as...
he prepared the first *Whole Earth Catalog* (Figure 7).

The first page of the *Whole Earth Catalog* declaimed its origin in Fuller’s whole system ideas, and Fuller’s geodesic system was instated as the summary form of the rational use of materials and energy (Figure 8). Since the 1920s, Fuller had called for a new sort of designer—the apolitical “Comprehensive Designer,” tackling the world’s social and ecological imbalances as a technical problem of the grandest sort. Yet, Fuller was a point of departure for the Whole Earth network, much as he was for the communards of Drop City, which was no camp for sober Comprehensive Designers but a site for immediate, experimental, even amateurish intervention in reordering lived reality. The *Whole Earth Catalog* advertised itself as a point of “access to tools,” as an assemblage of ideas and techniques, one mode of praxis arrayed alongside another, coexisting and competing.

The invitation to think at ever more integrative levels had been picked up by the *Whole Earth Catalog* from twentieth-century systems analysis, which used mathematical tools to study how the components of complex systems interact. Outside of its strategic importance in the Second World War, systems analysis found applications in society, technology, and ecology, promising the transformation of environment and society. The inventor Buckminster Fuller, mathematician Norbert Wiener, literary philosopher Marshall McLuhan, and anthropologist Gregory Bateson separately emerged as articulate and imaginative spokesmen for a composite systems theory informing the stance taken by the *Catalog*. Fuller viewed the world as a singular problem overseen through engineering. The figuring of the world’s animal and mechanical contents as a single entity acquired rapid scientific development with the 1948 publication at MIT of Wiener’s theory of cybernetics. McLuhan theorized the emergence of a sort of ecology of representation through mass media and electronics, and Bateson speculated on an ecology of mind.

Wielding its systems thinking, whole design threatened to quite supersede the modern movement in design, deeming modernism isolated from wider cultural and natural systems. Whole design replaced modernism’s homages to craft and industry with methods taken directly from craft and industry, their capacity to yield information about materials and processes transferred intact to the whole designer. Nonetheless, whole design was in some ways attuned to the aims of modernism. In 1968, the *Whole Earth Catalog* assumed sponsorship of an environmental totality that was slipping from modernism’s tutelage. All design, it can be claimed, is totalizing in its ambition, whether overtly or covertly. The archetypal twentieth-century instance of this was the Bauhaus under Walter Gropius: “I believe that the New Architecture is destined to dominate a far more comprehensive
sphere than building means today; and that from the investigation of its details we shall advance towards an ever-wider and profounder conception of design as one great cognate whole.¹⁴ Stewart Brand’s complaint, however, was that Bauhaus-style modernism had been insufficiently universal (and he came to regard architectural postmodernism with still more disdain for its stylistic superficiality, exaggerated fragmentation, and servility to property development).¹⁵ The Whole Earth Catalog was a Bauhaus without walls, design a social contract that encompassed both of the key rivals for the soul of modernism, summarized for us by historian Mark Wigley as “the romantic idea of resistance to industrialization through the design of hand-crafted, one-off environments, and the equally romantic idea of embracing progressive machine-age reproduction.”¹⁶

Like modernism, whole design progressed toward an ever more complete unity. It was impelled, though, not by modernism’s Hegelian teleology, but by Darwinian and cybernetic vectors. That is to say, whole design called for an architecture that “operates by hindsight rather than foresight,” “always away from known problems rather than toward imagined goals.”¹⁷ Whole design sought the whole not as a philosophical, future goal to be approached through abstract logic, but as an already present environmental condition with which to align through practice. Much as the Ancient Greeks distinguished theory from practice, “The Darwinian mechanism of vary-and-select . . . doesn’t seek to maximize theoretical fitness; it minimizes experienced unfitness.”¹⁸ If modernism found “natural selection” in singular “object types” (ball bearings, Bugattis) revered by professional tastemakers, whole design saw natural selection at work in a sort of species diversity of competing technologies and actor networks. Whole design relinquished teleology as unworkable, unnatural, and largely counterproductive in human affairs. Against all programmatic methodologies of design in which form is purportedly dictated by

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a priori analyses of function, whole design posited form as a continual state of becoming, ever a posteriori. Only a methodology that rolls with the world (by group effort, connection, and pragmatism) is likely to achieve solid results, whole design implied, as though reiterating Bergsonian intuitions of the evolution of life away from matter and toward ‘‘mind.’’

Composed of material and energy, human and nonhuman, the mind of whole design embraced more than reason. This is not to say that whole design was only a reactive and systematically stupid servomechanism. Whole design required human decision, learning, speculative logic, and an inevitable, if suppressed, politics: Why else publish the Whole Earth Catalog? Systems, I contend, were foremost a culture, a discourse. Certainly, the Whole Earth network believed in certain systematic absolutes—for instance, in a universe governed by scientific laws—but it concentrated on the alto-lutes—for instance, in a universe governed by Earth network believed in certain systematic absolutes. Certainly, the Whole Earth network believed in certain systematic absolutes. This appeal to the American libertarian tradition gained an explicit political critique—‘‘So far,’’ Brand wrote in the foreword to the Whole Earth Catalog in a tone reminiscent of the Enlightenment philosophes, ‘‘remotely done power and glory—as via government, big business, formal education, church—has succeeded to the point where gross defects obscure actual gains.’’

In his idiosyncratic volume of 1974, II Cybernetic Frontiers, Brand claimed that computing was a counterpart to the group mind theories of second-order cybernetics, overlapping recto/verso like a Venn diagram. As Brand’s colleague from USCO, Steve Durkee, informed a visitor to the Steve Baer designed Lama Foundation spiritual retreat in New Mexico (1967), ‘‘We’ve been talking about putting in a computer terminal here—a kind of group mind to serve as a storage bank of all the minds in all the communes and what they’re learning’’ (Figure 9). To hasten the coevolutionary mergence of architecture and computing, in 1969 Brand introduced Durkee, Baer, Kahn, and communards from Drop City’s successor settlement Libre to computer engineers from the Stanford Research Institute, the contract research institute alleged at the time to be colluding with the military-industrial complex, but
sanctioned by Brand for developing the sort of popular interfacing devices (like the 1963 computer mouse) appropriate to cybernetic coevolution. Brand was likewise one of the only critics to review the introduction of computing to architecture described in *The Architecture Machine* (1973), written by Nicholas Negroponte, director of MIT’s Architecture Machine Group, the 1967 progeny of Wiener’s cybernetic group. Negroponte reciprocally appointed Brand to the group’s prestigious successor, MIT’s Media Lab, founded 1985. In 1984, the Whole Earth network established the archetypal electronically networked community, the Whole Earth ‘Lectronic Link, or WELL for short: hereafter, the World Wide Web was heralded as the sort of hive or “village well” earlier sought in the communes.

However extraordinary the Whole Earth network’s forecasting ability, it is a moot point whether the Web succeeded in leveling the distribution of information and political power. The empowerment of the grassroots through Alternative Technology, meanwhile, remained gestational. The effort to found a coevolutionary architecture through Alternative Technology was exhaustively promoted by *CoEvolution Quarterly* and the 1978 volume *Soft Tech*, edited by Brand and Baldwin. 28 Institutions with close ties to the Whole Earth network—the New Alchemy Institute (with its 1976 laboratories on Prince Edward Island and Cape Cod),29 the Integrated Life Support Systems Laboratories (cofounded by Baldwin), and the Zomeworks company (cofounded by Baer)30—explored the gentle extraction of nature’s solar, wind, geothermal, and biofuel reserves through Alternative Technologies such as updated windmills and greenhouses (Figure 10). In 1976, Governor Jerry Brown appointed Sim Van der Ryn, founder of an Alternative Technology sister organization to the Whole Earth Catalog, the Farallones Institute,31 as California State Architect and director of the state’s groundbreaking Office of Alternative Technology,32 which also employed Baldwin. Completing the ascent of the whole design ethos to state government, Brand was retained as a consultant to Governor Brown from 1977 to 1979, as Van der Ryn completed the Bateson Building (1977–1981), a large, deep-plan, low-energy office block for the State of California filling a block of the Sacramento capitol (Figures 11 and 12).

A “biological paradigm” according to design team member Peter Calthorpe—a former dome builder alongside Lloyd Kahn (Figure 13) and participant at the Farallones Institute—the Bateson Building was poignantly named for Gregory Bateson, the systems theorist of an ecology of mind.34 Using an exposed precast concrete structural...
Whole Earth Catalog
something of the urban holism requested by the raced voids of its open frame. The building recalled sheltered atrium to the outside world via the ter-
rhetorically connected its climatically and socially New Alchemy, for example, the Bateson Building
human.36 It is a line of argument of unusual rele-
tance to the way in which the Whole Earth net-
work’s “coevolutionary” projects for happenings,
domes, books, electronic networks, laboratories, and offices fell short of their holistic, cybernetic, and hive-like ideal. Indeed their saving grace, it could be argued, was the way in which they could not help being unsystematically human. Whole design was hardly potently political, nor was it always exciting or spectacular, but as a precursor to politics—assembling people, technologies, and values—it compared favorably to anything hailing from more mainstream design.

Longevity and Learning
Brand wrote in CoEvolution Quarterly that “Ecology is a whole system, alright, but coevolution is a whole system in time. The health of it is for-
ward—systemic self-education which feeds on certain imperfection. Ecology maintains. Coevolu-
tion learns.”37 Here is Brand reformulating design as an learning process in a private notebook entry from January 1972:

Perfectionism and Group Process. Perfectionism is taking an idea personally. Perfectionist energy flows because it thinks it knows. But it doesn’t know. And if the flow is other than desired, or other than useful, it doesn’t want to know. The perfectionist is sending, not receiving. What does know is history, consequences. What sometimes knows in advance is Other People with some experience of their own and without pledged allegiance to the perfectionist’s great surmise. Enter group process. Exit perfection.38

Two decades later in How Buildings Learn, Brand cast the architect as the perfectionist with no more than a stylistic concern for historical process.39 Brand’s dynamic of adaptation required that the designer pay sustained attention to time, the unseen vector of all systems, including that of building. That concern for time—the medium for learning, change, and communication—prompted the founding in 1995 of The Long Now Foundation by Brand and others, principally dedicated to the installation of a solar-driven clock in the high desert plateau adjoining Great Basin National Park in New Mexico40 (Figure 14). Conceived by computer scient-
entist Danny Hills, it is an intriguing commission to measure time, record culture, and preserve dying languages for a “long now” of ten thousand years; but the clock is obviously a poetic device foremost, a memento of finitude (our lives) and seeming infinitude (the duration of the world), and thereby of our collective and individual responsibility in man-
aging the world. No more determinist than an heir-
loom clock on the (Earth’s) mantelpiece, the Clock of the Long Now (and its role as a mental figure) competes with architecture’s ability to gather our attention around the things about which we care. Buildings, too, are clocks of the long now, and so it was that Brand’s interest in Hills’s invention first appeared on the last page of How Buildings Learn, as though an afterimage of everything that the book claimed for architecture. “My approach is to examine buildings as a whole—not just whole in space, but whole in time,” Brand explained.41

An urge to relate design to longevity is trace-
able back to the Whole Earth network’s internal disagreements over Fuller’s geodesic dome concept in the 1960s and 1970s. Such was the initial loyalty to the domical vision that one edition of the Whole Earth Catalog was edited inside a 1969 pillow dome made by the vanguard Ant Farm group, with a geodesic dome within, another without.42 But Lloyd Kahn’s interest in Fuller waned markedly shortly after the outstanding success of his own Domebooks (Figure 15). “There will be no
wondrous new solution to housing,” Kahn suddenly warned; “... we have learned that there is far more to be learned from wisdom of the past: from structures shaped by imagination, not mathematics, and built of materials appearing naturally on the earth, than from any further extension of whiteman technoplastic prowess.”

Kahn’s classic 1973 compendium Shelter was typeset on sophisticated Whole Earth Catalog machines and was cinematic in its sequence of double-page spreads, but it switched allegiance to traditional, vernacular, and folk dwelling, relinquishing Kahn’s reputation as the best known dome builder in America (Figure 3).

Peter Calthorpe—Kahn’s erstwhile dome builder colleague and a Bateson Building codesigner—arrived at comparable conclusions when, in the 1980s, he became a chief advocate for the New Urbanism and its avowed promotion of “local history, climate, ecology, and building practice.”

Kahn delivered his seeming halt to modernization during an address at the birthplace of cybernetics, MIT, after he was shown Negroponte’s SEEK Architecture Machine manipulating bricks by robotic arm (Figure 16). Industrial modernization had prompted the foundation of MIT in 1861 and, sixteen years before that, the retreat of protoecologist Henry David Thoreau to nearby Walden Pond. Analogously to Thoreau’s deliverance, Kahn’s discovery that the world contains “no wondrous new solution” became a dictum of whole design, positing instead a dialectic between modernity and tradition. This relation of dwelling to totality has roots in Transcendentalism, the literary and philosophical movement of nineteenth-century New England, which figured a universe composed of “corresponding forms.”

Ostensibly, Brand’s reception of Negroponte’s SEEK Architecture Machine was diametrically opposed to Kahn’s reaction against it. Yet Brand’s meditations upon building, too, drew a line under the ultimate worth of technology as the medium of whole design. After decades studying MIT’s cybernetic projects, for example, Brand found his ultimate architectural ideal not in the cybernetic experiments taking place at MIT, but in the timber-framed hulk of the building where the experiments took place. At MIT’s Building 20, hurriedly built in 1943 in response to the war effort, Brand discovered a structural tolerance for “rhizomatic” organization as Wiener and his cybernetic scientist colleagues
tunneled electronic rigs through walls and floors (Figure 17). Such mutability was in vivid contrast to the rigid, 1985 I.M. Pei building which would house the Media Lab across the way, an institution reified, Brand argued, by Pei’s conclusive, artistic form (Figure 18). Brand’s detection of How Buildings Learn was in the end convivially everyday, placing architecture at the disposal of anyone with a copy of the Reader’s Digest Complete Do-It-Yourself Manual. The sale between 1973 and 1990 of some eight million copies of this utilitarian handbook for amateurs, Brand noted without embarrassment, was evidence of a sustained mass desire to engage with habitat. Brand’s journalism aimed to make the techniques of construction, communication, and agriculture accessible again; and others in the Whole Earth network, like Baldwin and Baer, pursued rigorously independent, garage-assembly research, as though in defiance of technology’s sequestering by governmental, academic, and private labs.

In accordance with this adjusted sense of design, the agrarian shed simplicity of Kahn’s self-built home at Bolinas, California, was in marked contrast not only to the renowned and technically complex 1971 geodesic dome he had previously constructed on the site but also to the fine octagonal tower which replaced the dome in 1975 and from which the house grew (Figure 19). That tower had taken its cue from agricultural and vernacular buildings, which Kahn encountered when staying in the English village of Mapledurham in the early 1970s. Brand was similarly influenced by traditional English architecture when preparing How Buildings Learn. The Whole Earth network, then, maintained through design a curious dialectic between essentializing, premodern models, and a modern relativism. For example, Kahn’s first construction after abandoning dome building was little short of reactionary in its design, a gable-ended shed; but materially, there was a contemporary spirit in the little building, with fiberglass for the lights in the gable ends, its timber mostly recovered as waste from the streets of San Francisco (Figure 20). Much of Kahn’s book Shelter similarly suggested not straightforward tradition, but bricolage and hybridity. Here was a nonteological modernism, an excursion into architecture’s imminent losses and gains simultaneously.

The conclusion drawn by Kahn and Brand, that a built object must work with its local material ecology, was markedly different from their founding enthusiasm for the geodesic dome arriving in a locality as an envoy from a higher, more abstract, and atemporal synergy. Contrary to modern architecture’s furious attempts at efficiency, Kahn...
summarized his newfound sense of what made housing aesthetically, functionally, and ecologically satisfactory: the employment of the human hand, the integrity of materials, and a respect for time and place. The best materials originated not in industry, Kahn now argued, but “are those that come from close by, with the least processing possible”—in temperate climates, trees; in deserts, adobe.53 Kahn was critical of attempts to copy nature straight, though like many other Whole Earth Catalog reviewers, he was guardedly impressed by the exposition of natural design processes found in D’Arcy Wentworth Thompson’s classic of 1917, *On Growth and Form* (Figure 21). Here was a handbook, the Catalog contended, of importance to “artists, inventors, engineers, computer systems designers, [and] biologists” alike54—it supplied a natural language, of infinite longevity, for the disparate disciplines trying to assemble the whole as a time-based open work.

**The Ontology of the Whole**

Whole design might amount to little more than an expanded modernism—like modernism, but still more universal, with a corresponding devaluation of particularity.55 True, Kahn and Brand refocused attention on the genius of place and the experience of making; but where particularity matters the most—in the political realm—the Whole Earth network constantly moved attention away from particular sufferings, inequities, and identities toward a more general, more abstract, and more universal systematization.56 Whatever its power to direct our attention to the interaction of the components of a system (be it a building, a society, a world, or indeed all these, all at once), holism implies the overbearing presence of an absolute, which can have political consequences ranging from naïveté to totalitarianism.57 There is little point disputing that the Whole Earth network enjoyed a relative social privilege, producing a largely white, Bay Area, middle-class, male, and educated constituency’s idealization of culture and nature, dreamt up while innercity America smoldered. Suspicion of a Whole Earth–style ecological nation, which Governor Jerry Brown’s administration in California was deemed to prototype, was memorably articulated in *California Über Alles*, the 1979 punk song by the Dead Kennedys recorded while Brand and Van der Ryn served in Sacramento: “Zen fascists will control you/100% natural/You will jog for the master race/And always wear the happy face.” Publication of the Catalog, Brand candidly confessed of a purpose with wider implications for politics, “meant that I could work on the communes without actually having to live on one.”58
It is at the risk, then, of a wishful reading that this article draws attention to the way that the Whole Earth Catalog combines the most appealing features of universalism and particularism: it approached the world at the most abstract and equitable levels on the one hand and at the most material and identity-centered on the other. It prototyped this miraculous universalist-particularist world—I shall refrain from claiming that it achieved it—by providing a space of assembly to a suburban, mall-oriented, late-capitalist, Cold War America. Its ambition was comparable to the print-based “public sphere” of the seventeenth and eighteenth centuries.59

In order to habilitate ecology into politics, Bruno Latour has extended a Kantian ethics to all things, human and nonhuman—which is simply to treat all things as ends in themselves. “No entity is merely a means. There are always also ends. In other words, there are only mediators,” Latour writes of an ethos that he thinks should underwrite a politics dealing with real things in a postmodern world.60 The Whole Earth Catalog, its pages filled with things, was such a grand mediator, I suggest. “Objects—taken as so many issues—bind all of us in ways that map out a public space profoundly different from what is usually recognized under the label of ‘the political,’” argues Latour in Making Things Public.61 Extending a Kantian reading, we can claim that the Catalog presented particular objects not for their formal beauty, but so as to share beautiful experiences as accessed through the objects (Figure 22). This aesthetic experience was a capacity to reason and act, at which point readers recognized their own universal humanity within a coherent whole.

To this I will add the proposal that the Catalog was itself modeling whole design. As an object, as a structure, the Whole Earth Catalog was deeply appealing and curiously modern. Its cover images of the whole earth could evoke emotional responses comparable to the photographs of machine ball bearings used to argue the case for modernism in the 1920s. The Whole Earth Catalog delivered a modernistic shock of the new, in the things it showed, the connections it made, and the making strange of familiar things, all characteristic of the bourgeois encounter with the agrarian and industrial.62 It remains a fascinating read because it was by this kaleidoscopic method that it, like Diderot’s Encyclopédie before it, alerted its reader to the opportunities effected by modern society’s increasing remove from mere subsistence. Political slogans at the time, since devalued as clichés, are redolent with the fascination of unexpected
relationships availed between human community, technology, and nature: “Think Globally, Act Locally,” urged René Dubos as an advisor to the United Nations Conference on the Human Environment in 1972, suggesting seven years later the creation of an ecological World Order in which “natural and social units maintain or recapture their identity, yet interplay with each other through a rich system of communications,” a vision redolent of the Whole Earth Catalog’s.

The Catalog can be compared, as well, to the devices of Gilles Deleuze and Félix Guattari, synchronous intensities spinning into diverse fields, pages by turn connecting technologies to bodies to plants, and humans to nonhumans. I hesitate to say posthumans: while the comparison of the Catalog and the Deleuzian “plateau” is productive (Deleuze and Guattari read Gregory Bateson), the Catalog’s ecology of mind was resolutely grounded in reason. It was a rhizomatic rationalism, if we can imagine such a thing, a hippie Enlightenment revival. We know this from the comparison Brand has drawn between the Catalog and the Encyclopédie, and in any case, the lines written by Diderot’s collaborator Baron d’Holbach, in the Système de la nature of 1770, could serve as a rationale for the Catalog with no modification:

... man is a production formed in the course of time; who is peculiar to the globe he inhabits, who is the result of the peculiar laws by which it is directed; who, consequently, can only date his formation as coeval with that of his planet.

We can also correlate the Catalog to the struggle for humanism following the Second World War by comparing it to Edward Steichen’s legendary 1955 photographic exhibition and catalog The Family of Man (Figure 23). In each, an inspired editor, dependent upon the participation of others, assembled a sense of totality from the massed fragments of things. Both were compelled by the Cold War’s mental and literal image of the atomic


17. Building 20, MIT, Cambridge, Massachusetts, 1943 (demolished). (Source: data unknown.)
bom\textsuperscript{b} and both were derided, in retrospect, for their universalizing, apolitical overtone, their unabashed empathy with the world.

Philosopher Maurice Merleau-Ponty’s description of the human individual as a vital “pivot” for making sense of the world has been revisited by art historian Blake Stimson as a way to better understand the import of post-War serial photographic projects such as \textit{The Family of Man}.\textsuperscript{68} Separated by a decade during which consumerism had accelerated, the “pivot” role of the viewer of \textit{Family of Man} can apply, through adaptation, to the reader-contributor of the \textit{Whole Earth Catalog}. The Catalog’s reader-contributors were, if anything, still more intriguing subjects—consumers and citizens at one and the same time, pivots for great series of testimonials about how things work in the world. This combination of postmodern and modern sensibilities was momentary but not perverse insomuch as the \textit{Whole Earth Catalog} was trying to reconcile modernization’s twin phenomena of reason and commerce. The Catalog employed copywriting finesse (Brand came from a family in the advertising business) to “sell” mighty and apparently unprofitable ideas about the world. A conventional assumption is that avant-garde projects are doomed because the designer cannot change the conditions of production, so the \textit{Whole Earth Catalog} tackled the problem in reverse, changing the conditions of consumption. Faced with the worrying alternative paths of unchecked consumerism, militarism, and ecologies of anarchistic, deep, or millenarian cast,\textsuperscript{69} the Catalog staked out the ground for an almost “middle-American” ecology available through mail order.

The \textit{Whole Earth Catalog}’s aesthetic system—a collage of content, set between iconic images of the Earth—implied that each reader “constructed” the world by knowledge, experience, and choice held within a natural boundary set by the biosphere at large. Collage, admittedly, can be as illusionistic of “the whole” as it was illustrative.\textsuperscript{70} In 1974, architectural theorist Manfredo Tafuri trenchantly cautioned that “language can speak of the indeterminate, the casual, the transient, since in them it greets the advent of the Whole. Yet this is but an endeavor to give a form of expression to the phenomenon of mass consumption,” with “roots in the technological myth. Technology can thus be read mystically, as a ‘second nature’.”\textsuperscript{71} But Catalog editors doubtless saw its technological collage less as a system in itself than as a \textit{portal} to a material system awaiting the reader in the world. In a description

18. I.M. Pei, Wiesner Building (Media Lab), Massachusetts Institute of Technology, Cambridge, Massachusetts, 1985. (Source: Wikipedia Creative Commons [Attribution-ShareAlike License].) (Photo by Harris Wang.)

of the book format befitting the *Whole Earth Catalog*, Deleuze and Guattari wrote that:

There is no longer a tripartite division between a field of reality (the world) and a field of representation (the book) and a field of subjectivity (the author). Rather, an assemblage establishes connections between certain multiplicities drawn from each of these orders, so that a book has no sequel nor the world as its object nor one or several authors as its subject. . . . The book as assemblage with the outside against the book as image of the world.72

The high-quality color images of Earth on its cover were the overriding aesthetic legacy of the *Whole Earth Catalog*, picturing design’s raw material at a new and completely meta level (Figure 1). Whereas *The Family of Man* reserved color for its climactic image of the atomic bomb, the *Whole Earth Catalog* affectingly did the same for the image of the planet threatened by the bomb.73 It was a publishing first, and Brand’s moral purpose in distributing the image of Earth as widely as possible74 is distinct from classical, Romantic, and scientific traditions of observing nature by oneself, usually from a privileged viewpoint, and as a man.75

That we have in the covers of the *Whole Earth Catalog* an aid to collective reason, not just a poster, is suggested by the fact that Brand did not long entertain the idea that in these beautiful pictures of the whole earth we have really seen the whole earth. At a 1971 sauna party, Brand was invited by another guest to consider, apparently of an aspect of the view from the sauna, that “The mountain has two sides.” “And either before or after,” Brand recalled, “he said, ‘Imago’. Which put together in me to realize The mountain has two sides. The image has one.”76 Similarly, the picture of the whole earth on the cover of Brand’s *Catalog* was more an idealized mental picture, an imago.77 Unlike the “unfurled” cartographic projections (including Fuller’s Dymaxion Maps) that purport to show the world in its whole circumference and in continuous duration, the images Brand obtained from NASA were necessarily restricted to depicting one side of the globe at one moment (as Fuller pointedly reminded Brand in 1966).78 “The perpetual limitation of knowledge, of consciousness,”79 brooded Brand. The whole earth depicted on the cover of the *Catalog* was sublime in its capacity to inspire awe and pleasure (all the moreso for a viewer on drugs) but acted, then, as a call to reason, morality, and action, pointers to which would be found within the *Catalog*’s directory.

**Conclusions: Toward Whole Architecture**

The *Catalog*’s methodology was all too close to modern architecture’s, one might say: Brand was an “architect” in the way he provided an institutional and material framework through which to stage the desires of others and assuage antagonism80 (“who could dream of a better example of hybrid forums,” asks Latour, “than the scale models used by architects all over the world to assemble those able to build them at scale 1?”).81 The way in which constraint exercises a space for coevolution became of marked interest to Brand, in politics as in building, in building as in the environment. By the time Brand wrote *How Buildings Learn*, he accepted the role of building code, for instance:

A building is the interface between two human organizations—the intense group within and the larger, slower, more powerful community outside. . . . As a youth I regarded building

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A paradigm classic. Everyone dealing with growth or form in any manner can use the book. We’ve seen worn copies on the shelves of artists, inventors, engineers, computer systems designers, biologists. Would one of you do a thorough review of D’Arcy Thompson’s venerable book for the CATALOG?

When Plateau made the wire framework of a regular tetrahedron and dipped it in soap solution, he obtained in an instant a beautifully symmetrical system of six films, meeting three by three in four edges and three four edges running from the corners of the figure to its centre of symmetry. Here they meet, two by two, at the Maraldi angle; and the films meet three by three, to form the re-entrant solid angle which we have called a ‘Maraldi pyramid’ in our account of the architecture of the honeycomb. The very same configuration is easily recognized in the minute siliceous skeleton of Cylindrus. There are two discrepancies, neither of which need raise any difficulty. The figure is not rectilinear but a spherical tetrahedron, such as might be formed by the boundary edges of a tetrahedral cluster of four co-equal bubbles; and just as Plateau extended his experiment by blowing a small bubble in the centre of his tetrahedral system, so we have a central bubble also here.

This bubble may be of any size; but its situation (if it be present at all) is always the same, and its shape is always such as to give the Maraldi angles at its own four corners. The tension of its own walls, and those of the films by which it is supported or slung, all balance one another. Hence the bubble appears in plane projection as a curvilinear equilateral triangle; and we have only got to convert this plane diagram into the corresponding solid to obtain the spherical tetrahedron we have been seeking to explain. (Fig. 63.)

The geometry of the little inner tetrahedron is not less simple and elegant. Its six edges and four faces are all equal. The films attaching it to the outer skeleton are all planes. Its faces are spherical,

The engineer, who had been busy designing a new and powerful crane, saw in a moment that the arrangement of the bony trabeculae was nothing more nor less than a diagram of the lines of stress, or directions of tension and compression, in the loaded structure: in short, that Nature was strengthening the bone in precisely the manner and direction in which strength was required; and he is said to have cried out, ‘That’s my crane!’

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codes as the embodiment of all that was unoriginal and constricting in society. Later I learned their value.82

As a consequence, whole design increasingly sounded notes of conservatism, not directionless ebb and flow. Its disdain for modernist architecture, its respect for tradition as a prerequisite of learning, and its call for established building techniques accessible to the lay builder were summarized in the romantic reverence shown by How Buildings Learn for the English country house. Brand’s book was almost bereft of truly “public” buildings—monuments, he implied, to architects, and to inert institutions, which are impressed upon fragile local social ecologies. The apparently mundane technical defects of modernist architecture that Brand painstakingly recounted were indicative, he suggested, of buildings devised by “artistes” who will not inhabit them and are not invested in the collective development of culture.83

Nevertheless, the prevailing tenor of Brand’s theories (if not of all those hailing from the Whole Earth network) has been gently anarchic. His preferred building methods were ad hoc, additive, rehabilitating, unmortgaged, environmentally sensitive, multiple authored.84 Brand—who organized the first conference for computer hacking (1984)85—brought something of the sensibility of open-source software to bear on architecture. Relatively unpolluted by the claims of capital and intellectual property, it is an idealistic vision in which community leans ever toward inclusion rather than exclusion and consensus never slides into hegemony. Supporting the vision is a drive toward common, nonproprietary building methods that revere craft and nature as links to an emerging future as much as to a receding past. Similarly, it would seem, Lloyd Kahn has advocated simple, speedy stud wall construction and the observation of local building custom so that buildings do not become fetish objects, but instruments and containers for life. Like evolutionary biology and...
learning, Kahn’s preferred architecture operates away from known problems—he asks the builders he interviews for his books what they would do differently in retrospect.86 And Kahn’s own building career, again in retrospect, is better understood as a dialectical process than as a return to the past: Around Mill Valley and Big Sur in the mid-1960s, Kahn had worked in massive concrete and post and beam, before turning to the supreme lightness and complexity of geodesics, finally synthesizing the contradiction of mass and lightness to his own satisfaction, in the 1970s, with the material and creative manipulability of stud wall construction.

Can such buildings convey any larger public meaning? We can try to extrapolate how a design could possibly be judged according to its pertinence to “the whole” by turning back to Gregory Bateson. He wrote that “Any aggregate of events or objects” (and here we can imagine a building, or even the Whole Earth Catalog, as such an aggregate):

shall be said to contain “redundancy” or “pattern” if the aggregate can be divided in any way by a “slash mark,” such that an observer perceiving only what is on one side of the slash mark can guess . . . what is on the other side of the slash mark. We may say that what is on one side of the slash contains information or has meaning about what is on the other side.87

For Bateson, “redundancy” and “pattern” were the mechanisms of meaning. “The whole” might have to be accessed in this way—aesthetically, as something perpetually beyond summary, even by science. The inevitability of aesthetic judgment helps diagnose a problem discovered by students at Rhode Island School of Design in 1968. “This,” their structures instructor announced as the newly published Catalog was held aloft, “changes everything,” but students who attempted the straightforward unification through design of all things found that their disagreements about what mattered were still more prominent than their agreements.88 Of importance to Bateson was that an “aggregate” announce the presence of contexts ultimately beyond its control, but in which it is embedded.

It was the collective human need to imagine the shape of these contexts that explained the success of religion, Bateson thought—“My father, the geneticist William Bateson, used to read us passages of the Bible at breakfast—lest we grow up to be empty-headed atheists,”89 he recollected in a passage quoted by the Whole Earth Catalog. And the present article will conclude within a perplexing nexus of design, ecology, polity, and religion partly because it is as startlingly present today as it was at the inception of the Whole Earth Catalog. In 1969, Bateson urgently framed a reasoned rejoinder to the California State Board of Education’s assertion of equal scientific standing for Biblically based “creation theory” and scientifically based evolutionary theory. For all his anthropological sympathy with religion’s attempts to picture the whole, Bateson wanted students to work back from imagination to reason.90 So did Brand—as evangelicals, hippie pantheists, and deep ecologists were variously claiming that humanity is subject to a divine whole, the predominant tone of Whole Earth publications was proscientific,
antifundamentalist, and discursive. The famous opening line of the first Whole Earth Catalog put it this way: “We are as gods and might as well get good at it.” Only the rational “we,” cognizant of a larger natural system and inspired by its picturing, could attain the power once imagined as God.

This theological turn is relevant to design because the casting of rational humans as godlike has a long ancestry in western architectural theory which, from the Renaissance on, tends to instate the designer as a proxy god.91 “The world (universe) is a machine for making gods,” Richard Buckminster Fuller reminded himself in 1967 as he contemplated Brand’s demand to see an image of the whole earth.92 The invocation of divinity left the Whole Earth network fatally vulnerable to mystical readings: a 1955 “noosphere” model of global consciousness, published by Jesuit scientist Pierre Teilhard de Chardin,93 eventually impressed some prominent commentators of the Whole Earth network who saw the interconnection of biological, physical, social, and informational patterns as a kind of cybernetic divinity.94 At its core, however, the Whole Earth Catalog accepted the “mysterious” interconnection of things not as the end of human enquiry but as its instigation. In 1989, for example, the Whole Earth Catalog published The Fringes of Reason, an appendix on alternative “New Age” belief systems. “Oh God,” wrote Brand in his foreword, “how did I get into this room with all these weird people?” He answered his own question with Batesonian composure—“The believers of strange, strong beliefs are living a particularly ripe form of myth, tapping directly into hidden cultural structures that probably shape the rest of us as well, though indirectly”—and closed by suggesting that the scientific process itself “really is two-minded; it has to be to get anywhere. One mind gleefully speculates, the other ruthlessly slaughters speculation.”95

Sustainable architecture might proceed accordingly “two-minded” to avoid, at one extreme, an adoration of “organic” forms purporting to represent the underlying order of the world (Figure 24), or at another extreme, a cybercultural euphoria in the purportedly weightless economy, or at another, the materialist banality of designs driven by energy consumption calculations. Only an architecture that speculates, then slaughters speculation, that offers a “slash mark” which leaves loose ends, can honestly respond to the ecological whole if ecology itself is impossible to picture. Ecological politics, Latour tells us:

... Neither cybernetics nor hierarchy make it possible to understand the agents that are out of equilibrium, chaotic, Darwinian, as often as they are global, sometimes rapid, sometimes slow, that it brings into play via a multitude of original experimental devices whose mixed unity precisely does not—and this is the point—form an exact and definitive science.96

After Vitruvius, Mark Wigley claims, “The figure of the architect became established as the
organizer of domains about which he or she doesn’t necessarily have expertise.”¹⁹ This potentially cheerful incompetence is compromised if the architect clings to the mantle of divinity, manifested as authorship of an holistic-seeming built object in which “shallow guesses are frozen as deep decisions.”²⁰ The real lesson of Moses’ prohibition of graven images, Latour drolly concludes, was “Thou shalt not freeze frame.” If you stick to them, images are dangerous, blasphemous, idolatrous, but they are safe, innocent, indispensable if you learn how to jump from one image to the next.²¹ The designer jumping from one image to the next in the Whole Earth Catalog enjoyed a vastly expanded realm of nonexpertise, and experienced something of an awakening of total vision. “The Whole Earth Catalog introduced new ideas and information to a large number of people,” writes Don Chaffey and written by Vincent Tilsley.)¹²

Acknowledgments

For their aid in preparing this article, I particularly wish to acknowledge Lloyd Kahn; the Humanities Institute, UC Davis, and their 2006–2007 Fellows; the distinguished participants of the Whole Earth Symposium held at UC Davis in 2006, and my coconvener for that event, Douglas Kahn; Blake Stimson; the editor and reviewers of the Journal of Architectural Education; and my patient household.

Notes

1. An early version of this article was given at “The Whole Earth: Parts Thereof” symposium, University of California, Davis, May 8, 2006.

8. See W. Chaitkin, “Alternatives,” and Charles Jencks, Architecture Today (London: Academy, 1988). Jencks explained that he had been unable to update the excited sections following Chaitkin’s death, but conceded that “alternative architecture” had led to movements like community architecture, computer-aided design, and the Grazi School (p. 330).
10. The Catalog originated when Brand and his then-wife, Lois Jennings, were touring New Mexico and Colorado selling provisions to intentional settlements. F. Turner, From Counterculture to Cyberculture, pp. 70–71, and A. Kirk, Counterculture Green, pp. 47–48.
17. S. Brand, How Buildings Learn, p. 188.
18. Ibid.
21. This fear was epitomized in popular culture by the classic 1967 dystopian television thriller The Prisoner. Confronted by a vision of “The whole earth, as The Village,” “a perfect blueprint for world order” in which “the sides facing each another suddenly realize that they are looking into a mirror,” The Prisoner’s individualist hero, Prisoner No. 6, scarily declares his ambition “to be the first man on the moon” (The Prisoner—The Chimes of Big Ben, Alternate Version, 1967, directed by Don Chaffey and written by Vincent Tilsley).

23. Here quoted from Whole Earth Catalog (Menlo Park, CA: Portola Institute, Fall 1969), inside cover.


29. Alternative Technology drew increasing attention in the early seventies with the coincidence of the Energy Crisis and a burgeoning library of mass-selling books predicting ecological doom, notably Rachel Carson’s Silent Spring (1962), Paul Ehrlich’s The Population Bomb (1968), and the Club of Rome’s The Limits to Growth (1972).


32. They were both housed at the nonprofit Portola Institute. See the Web site of the Ecological Design Institute, http://www.ecodesign.org/edu/projects/education/paradigms.html (accessed March 16, 2007), see also F. Turner, From Counterculture to Cyberculture, p. 70. On the Portola Institute, see A. Kirk, Counterculture Green, p. 43ff.

33. Van der Ryn was a professor of architecture, at University of California, Berkeley, who Brown appointed after a chance meeting at a Zen retreat.


36. For a critique of the vagaries of the Bateson Building’s ecological program and others like it, see Dell Upton, Architecture in the United States (New York: Oxford University Press, 1998), pp. 142–47.

37. Quoted in Kelly, Out of Control, p. 85, no citation given.

38. Folio 1, correspondence 1974, January 15, 1972, Stewart Brand, Editorial Files, Series 1, Box 1, Whole Earth Access/Co-Evolution Quarterly Records, Stanford University Special Collections.

39. See S. Brand, How Buildings Learn, p. vi. Research for this book started as a class at University of California, Berkeley, on the invitation of Sim van der Ryn in 1988 and was supported by Brand’s Global Business network.


43. Lloyd Kahn, “Smart But Not Wise,” in Kahn, ed., Shelter, p. 112. Kahn was attending the May 1972 MIT conference Responsive House-building Technology, with Steve Baer, Ken Kern, and Sim Van der Ryn. The proceedings were published by convener Edward Allen as The Responsive House (Cambridge, MA: MIT Press, 1974). “Smart But Not Wise has had a wide reading here,” Allen responded. “The usual reaction is that you are either not wrong, or mostly right, but that you made a rather biased selection of MIT projects to discuss.” Kahn’s very journey from his home in California to the MIT conference repelled him: the bathroom of the Boeing 747 gave him, he complained, “an insight into Buckminster Fuller’s ideas of housing.”

44. “We wanted it to be like a movie”—Lloyd Kahn, interview in Bolinas, California, December 2004.


46. On the influence of Thoreau in ecological architecture, see too Peder Anker, “The Philosopher’s Cabin and the Household of Nature,” Ethics, Place and Environment 6, no. 2 (2003): 133.


49. See S. Brand, How Buildings Learn, pp. 24–27, 52, passim. Building 20 has since been demolished and replaced by Frank Gehry’s Sta De Center (2004), which reverently contains a fragment of Building 20 and which, in uncanny keeping with Brand’s critique of modernist buildings in How Buildings Learn, was subject to a prominent 2007 lawsuit for alleged design and construction defects.


52. Interview with Lloyd Kahn, Bolinas, California, December 2004. On Kahn’s projects, see also Patricia Leigh Brown, “ If I Had a Hammer: What Do You Mean If?,” New York Times (October 14, 2004), House & Home sec.


55. “Political ecology,” cautions philosopher Bruno Latour, “does not seek and has never sought to protect nature. On the contrary, it wants to take control in a manner yet more complete, even more extensive, of an ever greater diversity of entities and destinies. To the modernism of world domination, it adds modernism squared.” “From Realpolitik to Dingpolitik, or How to Make Things Public,” in Bruno Latour, Making Things Public: Atmospheres of Democracy (Karlsruhe, Germany: ZKM/Center for Art and Media in Karlsruhe, 2005), p. 37.

56. Notoriously, for example, the hippie settlements tended to collapse in the absence of clear political procedures, typically reproducing or even exaggerating unequal gender relations and roles, tacitly excluding variance in race, and dismissive of the local communities to which they became neighbors (see, for instance, F. Turner, From Counterculture to Cyberculture, pp. 76–77, 119). Ecology meanwhile slid from radicalism through the more centrist Earth Day toward the conservative orientation of President Nixon’s National Environmental Policy Act in 1970. See Martin, “Environment, c. 1973.”


60. B. Latour, “From Realpolitik to Dingpolitik,” p. 16.

61. Ibid., p. 15.


65. Brand’s foreword to Howard Rheingold, ed., *The Millennium Whole Earth Catalog* (New York: Harpercollins, 1994), insisted that the original Catalog was, at heart, an Enlightenment project.


67. Stewart Brand’s thinking was profoundly affected by the Cold War and in some ways made him a quintessential anticommunist Cold Warrior. See, for instance, F. Turner, *From Counterculture to Cyberculture*, and A. Kirk, *Counterculture Green*.


69. See, for instance, the anarchistic ecology of Murray Bookchin and the millenarian ecology of Hal Lindsey (whose *The Late, Great Planet Earth* was first published in 1970 and went on to sell a reported thirty-five million copies).

70. “The serendipitous allure of the Catalog’s holistic abundance,” Binkley has found, “captivated both countercultural and mainstream consumers with the interpretive puzzle it appeared to pose” (S. Binkley, “The Seers of Menlo Park,” p. 298).


73. The whole earth, the emblem presiding over Earth Day, April 22, 1970, supplanted “the image of the mushroom cloud” in whose shadow people had “cowered … for 20, 25 years” (interview with Stewart Brand, http://www.massivechange.com/StewartBrand.html (accessed August 28, 2006)).

74. “Why haven’t we seen an image of the Whole Earth yet?” Brand asked in 1966 on buttons sold at Berkeley, Stanford, Columbia, Harvard, and MIT, and in questionnaires mailed to U.S. senators, personnel of the U.S. and Soviet space programs, and public intellectuals like Marshall McLuhan and Buckminster Fuller. Only Fuller responded defending the technicians of the space program against the accusatory tone of Brand’s question by framing it in terms of technical priority.


77. Cf. the interpretation of the Fuller sphere put forward by C. Macy and S. Bonnemaison, “Closing the Circle,” p. 315, which draws on Gianni Vattimo.


80. In reaction to conventional management, Brand went so far as to give his method at the Catalog a name, “Transcendental planning,” which avowedly entailed a sublimation of self-interest within collective action. See F. Turner, *From Counterculture to Cyberculture*, p. 91, and on other problems of power and leadership, pp. 64–65. At the back of the *Lost Whole Earth Catalog*, Brand even published the “source code” of his enterprise, down to its financial records. In practice though the *Whole Earth Catalog* was not an entirely open work, but managed by individuals, Brand above all. “What is crucial to notice about modernity,” writes the technology pioneer Jaron Lanier of projects like Diderot’s *Encyclopédie* and Brand’s *Whole Earth Catalog*—which he approvingly distinguishes from truly “hive mind” models—“is that structure and constraints were part of what sped up the process of technological development, not just pure openness and concessions to the collective.” Jaron Lanier, “Digital Maxism: The Hazards of Online Collectivism,” *Edge* (2006), http://www.edge.org/3rd_culture/lanier06/lanier06_index.html (accessed March 16, 2007). Brand now concedes that politics are a necessity that cannot be overcome by organization (see, for instance, the interview with F. Turner, Stanford University, November 2006, http://vodreal.stanford.edu/sul/sgr/06/1109.ram).


82. S. Brand, *How Buildings Learn*, p. 18. Brand praises “property lines … geometrical, two-dimensional, out of this world. But nothing else so rigorously sculpts everything we build.” (Ibid., p. 73). This reiterates, from a diametrically opposed viewpoint, a thesis that can also be found in Rem Koolhaas’s *Delirious New York* (1978).

83. “Don’t get involved in a trip when you’re building.” Lloyd Kahn concedes. “Stick to rectangles or you’ll ruin your life, your marriage.” Interview with Lloyd Kahn, Bolinas, California, December 2004. One could draw an interesting parallel between these arguments for an “artless” architecture and the demand for cultural “running-room” restated by Hal Foster, *Design and Crime* (London: Verso, 2002).


86. Interview with Lloyd Kahn, Bolinas, California, December 2004.


89. G. Bateson, *Steps to an Ecology of Mind*, p. 343, also quoted in Stewart Brand, “Understanding Whole Systems,” in *Whole Earth Epilog* (San Francisco, CA: Point, 1974). William Bateson is reputed to have coined the word “genetics.”


92. “Mixed 1960s” folio, Dymaxion Chronofile, Vol. 315, Box 166, Folder 6, 1967, Richard Buckminster Fuller Archives, Stanford University Special Collections. Fuller’s note is next to Brand’s questionnaire; I suppose the connection between the two. Fuller ascribed the thought to Nietzsche, which oddly changes its Nietzschean intent. Jay Baldwin attributes the interest in geodesic domes in the sixties to a belief among design students that “there were patterns that had significance other than the mere whim of the architect-as-artist” (Zelov, *Design Outlaws*, p. 73.)


94. I particularly refer here to John Perry Barlow and Kevin Kelly. Teilhard de Chardin was meanwhile an inspiration to U.S. theologian Francis Schaeffer, who urged the church to revisit the role of Christian stewardship over nature, and is credited with providing the groundwork for the American conservative project to establish political policies based on religious beliefs.


