

# Notes on Buckminster Fuller's Theory of Ephemeralization

CHARLES F. RUDOLPH  
Georgia Institute of Technology

## INTRODUCTION

I did not set out to design a house that hung from a pole, or to manufacture a new type of automobile, invent a new system of map projection, develop geodesic domes or Energetic Geometry. I started with the Universe—as an organization of regenerative principles manifest as energy systems of which all our experiences and possible experiences, are only local instances. I could have ended up with a pair of flying slippers.

- R. Buckminster Fuller

The idea for this paper stems from a short essay/review which discussed the work presented via lecture by Guy Nordensen, an engineer with Ove Arup and Partners, New York. Mr. Nordensen, whose work (as part of design teams) had been included in the Museum of Modern Art's "Light Construction" exhibit (curated by Terence Riley in 1995) stressed the creative advantages of Arup's multidisciplinary methodology and the timeliness of resurgent engineering leadership being exercised within projects of increasing scale and complexity. In support of his argument for a technology-driven design process, Nordensen made several references to R. Buckminster Fuller, to Fuller's concept of *design science*, and to the effects (and pleasures) of *ephemerality*.

These references to Fuller, to both oeuvre and aura, offered as they were as accreditation for the total design philosophy practiced by Nordensen (and Arup), seemed at first anachronistic within the lecture's decidedly 'architectural' framework. Why talk about Bucky, who after all once dismissed architecture as "voodoo?" The concept of *design science* seemed equally to possess a productionist, maximizing and technocratic undertow. Is *design science* not a fundamentally different, if not opposing, strategy than that of "design art?" However, it was the topic of *ephemerality*—as relating to Fuller and to architectural production—whether acknowledged or not, that has been influenced by him, which struck the chord most strangely. Nordensen spoke of "ephemeralization principles," in theory, as the fluid technological trajectory which propels design towards the mathematically precise modeling and subsequently precise mate-

rialization of form. In addition he included phenomenal descriptions of the *ephemeral*, related mostly to glazed buildings and spaces, using terms such as "effect," "sensation," and "emotion."

How does architecture imply, represent, or constitute the conditions of impermanence, transience, or to apply ephemera's roots, "lasting only a day?" What are the philosophical and ontological implications of wishing or willing a disappearance via construction—the ultimate renunciation of *tekne*? Most importantly, what kinds of political attitudes towards the institutions of commerce and industry, the 'institutionality' of production which defines tasks, does the idea of ephemerality assist, restore or resist? Ephemerality as a condition is metaphysical, it concerns the changing states of matter and the interconnected flow of time which animates the vision, or intuition, of a change of state, which for Fuller must be an anticipatory act resulting in an ephemeral artifact, living out only its useful duration. To regard ephemerality as an aesthetic phenomenon related to the aura of objects, or to their "return from history" is in conflict with Fuller's idealist notions of *design science*—the applicable understanding of material and method as technological tool for balancing world environment and rendering political structures and their limitations as themselves ephemeral.

In light of the conference theme, *Architecture: Material and Imagined*, and anticipating a go-round with the issue of tectonics, or Being-based "auratic" building, questions of ephemerality and dichotomous science/art subjectivities seem as appropriate as they are intimidatingly broad. A study of the "Light Construction" exhibit and the curator's introductory essay offer some points for departure but does not deal satisfactorily with the "Bucky factor" which resists such an enclosing context of architecture-as-art. Juxtaposing Fuller's truly global career and production with that of Avant-garde artists and architects, which he considered wholly irrelevant to his work, is interesting historically and may offer insights into certain British post-war influences and emergent themes, particularly those championed by Banham, Price, and Cook. Above all this paper seeks to examine *ephemerality* and attempted "ephemeral architec-

tures” based upon the evidentiary hunch that R. Buckminster Fuller figures prominently in the formation (which in his work dates back to the 1920’s) of an ethics or aesthetics of “lightness” which is based on an optimizing and idealizing view of anticipatory techniques. Similarly, Fuller’s legacy may exist in the ability of designers within dominant systems to form, synergistically if you will, political critiques of technical culture through design.

## EPHEMERALITY AS WORKING THEORY AND TECHNICAL/INTELLECTUAL UTOPIA

The significance of the passage of time and the redundancy of people and things was printed right through Buckminster Fuller’s world view. It extended from his interest in the ancient art of rhetoric—through which pre-industrial men had come to understand that the minimum number of words and gestures achieved the maximum effect—to his concern with the engineering challenge of designing the most with the least in a world of indiscriminate production. These apparently disparate matters, and the connections that he saw between them, were part of his most important theory—the theory of ephemerization.

- Martin Pawley  
(from Design Heroes Series:  
Buckminster Fuller, 1990)

Buckminster Fuller’s life and career so closely parallels the violent emergence of American technological supremacy in the world as to suggest, as he might have, that he was one with its spirit. During his first ten years on Spaceship Earth (Fuller’s ‘60’s term) gasoline engines, x-rays, relativity theory, the airplane and transatlantic radio were all discovered or invented. He entered Harvard in 1913, the year subway travel between Boston and Cambridge began, but was expelled twice, the final dismissal occurring in 1915. In place of formal academic training Fuller worked first as an apprentice millwright and then as “management trainee” with a New York City meatpacking company. After Fuller’s marriage to Anne Hewlett, daughter of a respected Long Island architect, in 1917, a long relationship with the empirical source of Fuller’s technological speculations—the US Military, began when he enlisted in the Navy Reserve at the age of twenty one.

The underpinnings of Fuller’s theories of ephemerization and design science within his military experiences are well recorded, and his nearness to events, discoveries, and to the “technological material” itself appear to have cultivated his irascible optimism—not in redemptive machinery, but in the ordering of natural laws towards applications. According to the biographer Lloyd Sieden, Fuller was among the last W.W.I officers to receive comprehensive training in tactics, ballistics, reconnaissance, and communications prior to the total investiture in full radio communications systems (1918). Therefore, practical training in shipbuilding, astral navigation, naval economics, even law and diplomacy, was en-

gaged by Fuller while still in his twenties. The young Fuller’s studies in both maritime and land-based warfare led him to conclude that symbiotic wealth/power/resource relationships existed to a sophisticated degree in naval enterprises and that these were dependent upon the application of anticipatory technologies.

Realizing power at sea depended upon deploying fleets of smaller vessels which were light and maneuverable while armed so as to prey upon the heavier cargo carrying vessels. Fuller theorized that the wealthy, ruling navies, once power had been attained, tended to abandon technology-seeking in favor of technology-consolidation and expansion. His famous usage of the words “pirate” or “outlaw” of industry, in place of “captain” is derived from his navy years and always accompanied detailed comparisons of predatory—yet valuable, technological energies with emergent or awaiting environmental needs. Through his experiences Bucky became keenly aware of the role of productive competition in materials science during W.W.I, especially with metals and metal alloys in the search for strength, lightness, and durability. As his biographers have traced it, Fuller’s propensity for intellectual synchronization with his environments through technological media began at sea and moved skyward as he emerged from the famous ‘silent years’ of 1927—the year, coincidentally, of Lindbergh’s flight and the first printing of *Vers Une Architecture* in England.

According to Siemen, Fuller observed ephemerization theory at work, along with synergetics, in the marshaling of scientific and scholarly talent toward the development of weaponry and transport hardware. Fuller would speak tirelessly in later years of the magnitude and hegemony of world “wealth-energy” resources, which for him included the physical (brain) and metaphysical (mind) in a multiplying and regenerating process, immune to entropy due to the continuous “wealth building” process of experiential cause-and-effect learning. The many dense and obtuse explanations of *Synergy* reduce basically to an argument that man will (forever) accumulate “interest” within the larger wealth-energy account because all advantages gained through (individual or team) invention are shared as forward linkages to other potential advantages and exponentially greater wealth. Bucky believed this chain reaction scenario to be equally valid in capitalist and socialist contexts, and that “accounting mentalities” institutionalizing wealth and trade as *matter* overlooked real wealth-energy in their legitimizing of lethal competition (for matter). And how, one may ask, is a class-structured production economy, and its bureaucracy, so easily eclipsed and enlightened from within? By excitable geniuses such as himself, of course, who prove their mettle for the job! Fuller writes in his 1969 book *Operating Manual for Spaceship Earth* (p.95):

Brain deals exclusively with the physical, and mind exclusively with the metaphysical. Wealth is the product of the progressive mastery of matter by mind, and is specifically accountable in forward man-days of established metabolic regeneration advantages spelt

out in hours of life for specific numbers of individuals released from formerly prescribed entropy-preoccupying tasks for their respectively individual yet inherently co-operative elective investment in further anti-entropic effectiveness.

To derive that Bucky clearly viewed global economics from beyond or above politics as a pure process of ephemeralization, reliant upon principles of *Synergy* (never holding back or personally accruing knowledge, power, influence) leads one to assume that the same idealistic, predestining logic must apply to the technological domain if the system of chain and surge is to remain anti-entropic. Without the interwoven textures of Fuller's chemical/biological meta-construct of "universe" or the id-arresting rhetoric of his forward propulsion, one may view the synergetic theory as merely a still, transparent veil covering another naked Myth of Progress. As if a result of the sheer tenacity and cascading momentum of his postulations; administered throughout his career to listeners through the heralded "thinking out loud" sessions, Bucky engineered the ephemeralization of his own reason, his own thoughts.

#### FULLER'S THEORY AND THE AVANT GARDE

In the distance shines our tomorrow. Hurray, three times hurray for our kingdom without force! Hurray for the transparent, the clear! Hurray for purity! Hurray for crystal! Hurray and again hurray for the fluid, the graceful, the angular, the sparkling, the flashing, the light—hurray for everlasting architecture!

- Bruno Taut  
(excerpt from "Down with Seriousism," 1920)

It seems altogether reasonable, in the discussion of Fuller and his ephemeral polemics, to summon up for comparison a few examples of brave technological vistas authored by European architect/thinkers who felt compelled to write or draw into the future (most without benefit of cosmic epiphany, an experience which Fuller claimed). One obvious choice would have to be works by the Germans Taut and Scheerbart: the builder and the bohemian, mythic Glass Chain ringleader and science fiction poet. Scheerbart's prophetic and technically astute *Glass Architecture* manifesto was published in *Sturm* in 1914 (Fuller was then nineteen, and Scheerbart died the following year). That same year Bruno Taut's "Glass House" exhibit structure—dedicated to Scheerbart, was constructed in Cologne at the Deutscher Werkbund Exhibition. In his essay, "The Glass Paradise" (1959), Reyner Banham grants overdue recognition to Paul Scheerbart as being the major contributor to the mystical/expressionist, or "irrational," impulses of avant-garde architects building and visualizing in glass. He does so by tracing the "glass legend" back to the Werkbund Exhibition to point out where historians had selected Gropius' office block—specifically the curving glass staircase—as the canonical image of glazed modernism, over-

looking Taut's curious *gesamtykunstwerk* pavilion. While Gropius' building was still compositionally classical despite its crisp, hard-edged detailing, Taut's structure offered visual and aural immersion within a new space, the ephemeral and dematerializing *space* of glass. In a chapter entitled "Space" in *Guide to Modern Architecture*, Banham describes the experiential effects of a Fuller geodesic in counterpoint to rectangular spatial ordering. He writes:

When entering one of Buckminster Fuller's domes for the first time, one receives a most emphatic sensation of space, modern space, if not square space. But all his domes do possess a very regular and emphatic structure, which gives a powerful sense of being caged in a pervasive geometry, and they often have a translucent covering which admits light, and thus implies space, evenly from all directions.

Although Fuller certainly did not consider his technical artifact aesthetically, and by all accounts rarely, if ever, discussed the concept of space, it is nevertheless interesting to discover images of domed space similar to those described by Banham in Scheerbart's writing. In "Glass Architecture," Scheerbart writes:

Iron construction makes it possible to give walls any form that may be desired. Walls need no longer be vertical....The dome effects up above can be displaced to the sides, so that when sitting at a table one need only look sideways and upwards in order to observe the dome effect....The significance of the ground plan in architecture is thereby greatly reduced; the design of the outline of the building acquires greater importance than hitherto.

"Glass Architecture" was very much a technical manifesto which provided a consistent duality of practicality and visionary imagery. Scheerbart anticipates the need for lightness and durability of material, the "wrap-around-view," and even transportability. With iron and glass as the medium, the new ephemeral cities which float and soar are comprised of pure dome structures, cellular multi-dome structures, and spheres or crystalline shapes: Regarding transportability, he offers the following conjecture:

Transportable glass buildings can also be manufactured. They are particularly well suited for exhibition purposes. Such transportable buildings are not exactly easy to produce. But let it not be forgotten that when something new is involved it is very often precisely the most difficult problem that is tackled first.

The German fascination with glass materials and spaces and sensations of crystalline ephemera certainly had much to do with pre- and post-war anxieties concerning the spirit/matter dialectic which was of great concern to artists and intellectuals observing the new order of a technological work/market place. Concepts of urbanity and urban life were reconsidered and reformulated according to theories and

principles promoting synthetic artistic and aesthetic production through technological amelioration. Buckminster Fuller's visions differed so sharply from those of the avant-garde because he did not wrestle with the issue of art's "survival," the new role of artist/architect towards a machine-age *kunstwollen*, the emerging politics of architectural "planning," nor was he even aware of the heady torrent of manifestoes or the propagandizing of movement leaders.

During the hothouse years of the avant-garde in Europe, Fuller traveled the Midwest as a national accounts sales manager for Kelly-Springfield Truck Company, by his own accounts drank and caroused heavily, and suffered the loss of his four year old daughter, Alexandra, in 1922, which Fuller attributed to poor quality of shelter and environmental controls. After losing his sales job Bucky spent four years in Chicago steering a small company which manufactured wood and paper based building blocks designed by his father-in-law (the Stockade System) but was fired when the company failed to profit and was sold to Celotex Company. He began his self-imposed exile in 1927, frustrated by his capitalist shortcomings but with renewed determination to untether himself from the traditional wage-earning system by exposing its destructive limitations, its physical and metaphysical wastefulness, through comprehensive strategy. If the avant-garde concerned itself primarily with the spirit of the age, that is with its "expression," Bucky achieved a total condensation of spirit into mathematical/geometrical principles which he believed to be a universal prototype, unifying mind, matter and space. His absolute resolve in applying the abstract prototype structures to technological problems stemmed from his study of metaphysical phenomena as relationships, or performances, of energy.

For Fuller, a thorough explanation and incorporation of metaphysical phenomena was necessary in order to proceed, at full strength and top-speed, so to say, with effecting change through the ephemeralization principle. Using such visual aids as a film of his eating breakfast in reverse, Bucky attempted to demonstrate the fallaciousness of physicality, of irrelevance of beauty and sensuousness, and in effect the powerlessness of memory. What mattered was the understanding of total interconnectedness, of infinite flux (Universe) yielding or emitting episodes which may be dog, mountain or man, more and less complex but invariably sharing the same structure. Having arrived at this analysis and working toward its representation, any influence upon Fuller from the realm of art or architectural theory promulgating during the 1920's and 30's appears virtually impossible. The future "world astronaut/inventor" had already, as it were, pulled the epistemological chain.

#### **THE DESIGN LEGACY OF FULLER: DESIGN SCIENCE AND IRONIC EPHEMERALITY**

The implication that the whole surface of the world can give equal service is possibly pointing to the time when we can all be nomads if we wish. At the same time the

network of support (even if "soft" like radio) is still there to be escaped from.

- Archigram, 1966

The pre-packaged frozen lunch is more important than Palladio. For one thing it is more basic. It is an expression of human requirement and the symbol of one efficient interpretation of that requirement that optimizes the available technology and economy.

- Peter Cook (from "A Guide to Archigram 1961-74")

I consider it unlikely that architecture and planning will match the contribution Hush Puppies have made to society today, let alone approach that of the transistor or loop, until a total reappraisal of its particular expertise is self-imposed, or inflicted from outside.

- Cedric Price

(from the essay "Life Conditioning," 1966)

When Cedric Price so appropriately was chosen to eulogize Buckminster Fuller at a special gathering of the RIBA in 1983, he got to the point straightaway, calling attention to not only the staggering achievements of the man he called a "Classical Scientist," but to the architectural profession's inability to understand or profit from his labors. Price spoke that:

The strength and importance of his philosophy establishes Bucky as one who is likely to put such a primarily superficial group as architects ill-at-ease....Examples of the architectural profession's inability to realize Fuller's value are numerous, ranging from individual perplexity to collective boorishness.

Price was not referring only to the British profession. He dutifully told of the rejection, by the American Institute of Architects in 1929, of Fuller's Dymaxion House prototype—which included the infamous "peas-in-a-pod" brush-off line dismissing prefabrication as a concept for housing. What proved an (aesthetic) blasphemy requiring righteous abrogation to the AIA was, in concert with his chain of inventions and representations from the Depression through the 1950's, a source of wild inspiration to British experimental architects. Fuller's primary influence was through the Architectural Association in London, where he first spoke and circulated during the late 1950's. The three individuals who most astutely realized the richness of the Fuller polemic and whose work either developed directly from the imagery or the operative conceptual strategizing of Bucky were Price, historian/critic Reyner Banham, and architect/educator Peter Cook.

Intellectually, these three Londoners must have seen in Fuller a radical social technologist, a space-age cowboy and a promethean "yank," who offered for them a lethal toolbag for criticizing the conservative inertia of English modernism and planning after World War II. Kenneth Frampton's description of the "ideological vicissitudes" of CIAM and

Smithson's Team X in *Modern Architecture: A Critical History* (1980) sets the stage for a new avant-gardism antithetical to the prevalent heroism and seriousness (Taut's meaning) of the urban debate. The attempts through mega-building urban schemes, arising paradoxically from pluralistic concerns for cultural/regional continuity, "house versus city" hierarchies, and place/form topologies to transpose 'life as event' upon new environmental structure could not succeed. As Frampton points out, the New Brutalist, total-urban-(building)-design trajectory only served to spotlight, in the revolts of 1968, "a (necessary) culmination of the crisis in architectural education, but also a reflection of the deeper and more significant dysfunction of architectural practice and theory—the latter often serving to mystify the true network of power and exploitation permeating the entire society." Amidst this atmosphere, one must imagine, of heavy architectural tragedy, Bucky Fuller appeared for cynics and dreamers alike a hypercool new visage—truly lighter than air.

The appropriation of Fuller's anti-aesthetic imagery (more brutal, really, than Brutalism) within the work of Archigram (Cook, Webb, Greene, Herron, Chalk and Crompton as original conspirator/members) combined with serious modernist reformation style writings by John McHale and Banham to form a counter-culture within the AA during the 1960's that gained power as much from the outlandishness of project proposals as from their value as cultural criticism. The "throw-away" aesthetic, which Bucky would uncategorically denounce as entropy-producing, was a functional derivative in Archigram's comicbook schemes which alternately mocked and reified the Fuller principle of ephemeralization. Indeterminacy of form, the hallmark concept, was wed with a total design engineering ethos stemming, one may suspect, from the CIAM preoccupation with existenz minimum research in the 1930's. Codes of *Neue Sachlichkeit* socialist/reformist aesthetics of course were replaced by NASA-inspired capsules, staging platforms, helipads, and the like. Robotic anthropomorphisms which actually contained or, through a new giddy terror, elicited synthetic action environments in the sky or on what was left of the ground became the new game of technological joke/prophesy. The great British "empirical tradition" collided with its own Pop Culture hedonism in the case of the most excessive protagonists of what could only be called experimental and conceptual art.

While the sheer scale and technical magnitude of several of Fuller's later proposals—the Manhattan geodesic of 1968 (the "urban iron lung"), the Old Man River Project for St. Louis of 1970-71, the floating Triton City Project of 1968, and the Utopian Projects of 1969-70 (floating pyramid and airborne spherical cities)—would certainly rival the audacity of Archigram's images (Walking City, Plug-in City), these projects were consistent with Fuller's principles of global anticipatory design. While Fuller would have a seamless, synergetic explanation for the displacement of 300,000 families—adrift somewhere over Greenland or floating in San Francisco Bay, Cook was content only to

romanticize a mediatized noble-and-mobile consumer savage. Ironically, the sensuous treatment of Archigram's (and later Cook's own) moonshot aesthetics of ephemerality in drawings and photo-montages had its effect on a second generation of architects both in and out of the AA. Norman Foster met Fuller in 1968, and his influence upon Piano and Rogers, Future Systems leader Jan Kaplicky, Fuller and Kaplicky biographer Martin Pawley, Nicholas Grimshaw, Ian Ritchie and many others is evident in their work, which attempts to make rigorous the design science ideal and legitimize it within architectural culture. The quest for lightness through aesthetic control of the ephemeralization principle can be seen as well in the work of former Archigramists Herron and Webb. Having accounted for the "Techies," it must be noted that *Ephemeralization* as a principle of least means yielding most performance—a technological "controlled strike" utilizing stored synergy to propel further environmental improvements, was most clearly understood, or at least applied, by Cedric Price. No other English architect/intellectual of his generation came closer to humanizing the Fuller vision, and by professional necessity avoiding an escapist monumentalism, which is pointed out by Frampton in *Critical History*, p.281):

...Cedric Price, whose Fun Palace of 1961 and Potteries Thinkbelt of 1964 were nothing if not realizable and, in theory at least, both indeterminate and capable, respectively, of meeting an evident demand for popular entertainment and a readily accessible system of higher education.

As an Archigram contributor in the early 1960's and by association a member of the "Dymaxion school of design" Price nonetheless managed to achieve a reputation based more on his skills at posing the socio-psychological "why?" than on displaying the technological "how." His indebtedness to Bucky is more in the area of total design philosophy—shifted acutely into a precise political space and off the Synergy launch pad, and from this inherently architectural position Ced Price's projects of the late '60's and '70's offer the richest potential for exploring *real* ephemerality. It would be unfair to say that Fuller's juggernaut polemic was devoid of wit, humor and pleasure, or that his universal, optimizing methodologies were destructive for lack of social, behavioral, or ethnographic realism. His anticipatory approach to thinking through environmental complexities and realizing, with such "light" inevitability, architectural machines that so radically transcended the machine aesthetic, is so radical that it has disappeared from the pedagogical menu today. What lives on in the form of *design science* practitioners such as Ove Arup, or the Renzo Piano Building Workshop, is the fascination for understanding through commitment to, rather than facilitating a flight from, the labyrinthine environment of the (late) technological society.

As a concluding, yet anticipatory, gesture towards contemporary "lightness" in architecture, which seems at present to be at least an aesthetic preoccupation, the following

quotations from Bucky and from the Japanese architect Toyo Ito are offered up together.

*Q: Some people have labeled your work as "temporary construction." Is that your phrase or somebody else's?*

A: Those are my words. They were meant to imply the antithesis of monumental architecture, that is, the type of building which wants to stand for eternity. The word "temporary" was to convey this concept...It may be contradictory to try and capture this sense of movement and also simultaneously convey it through an architectural prototype. But it is in this contradictory phrase which we find the most fascinating aspects of contemporary architecture. New technology has made it possible to try and tackle these contradictions.

- from *A Conversation with Toyo Ito*  
(El Croquis #71, 1994)

While no politician or political system can ever afford to yield understandably and enthusiastically to their adversaries or opposers, all politicians can and will yield enthusiastically to the computers' safe flight-controlling capabilities in bringing all of humanity in for a happy landing....So planners, architects, and engineers take the initiative! Go to work, and above all co-operate and don't hold back on one another or try to gain at the expense of another. Any success in such lopsidedness will be increasingly short-lived. These are the synergetic rules that evolution is employing and trying to make clear to us. They are not man-made laws. They are the infinitely accommodative laws of intellectual integrity governing Universe.

- R. Buckminster Fuller  
(from *Operating Manual for Spaceship Earth*, 1969)

## REFERENCES

- Reyner Banham, *Theory and Design in the First Machine Age*. NY: Frederick A. Praeger, 1960.
- Reyner Banham, *Guide to Modern Architecture*. London: Architectural Press, 1962.
- Reyner Banham, *Design by Choice: Ideas in Architecture*. (ed. by Penny Sparke). London: Academy Editions/Rizzoli, 1981.
- Reyner Banham, *The Architecture of the Well-tempered Environment*. London: Architectural Press, 1969.
- Aldo Benedetti, *Norman Foster*. Barcelona: Editorial Gustavo Gili, S.A., 1995.
- Jean-Luis Cohen, *Scenes of the World to Come: European Architecture and the American Challenge 1893-1960*. Paris: Flammarion, 1995.
- Ulrich Conrads, edit., *Programs and Manifestoes on 20th Century Architecture*. (Michael Bullock, trans.) Cambridge, Mass: MIT Press, 1971.
- Peter Cook, *Architecture: Action and Plan*. London: Studio Vista, NY: Reinhold, 1969.
- Peter Cook, *Experimental Architecture*. NY: Universe Books, 1970.
- Peter Cook, *Architectural Monographs No. 28: Six Conversations*. London: Academy Editions, 1992.
- Peter Cook, edit., *Archigram*. London: Studio Vista, 1972.
- A Guide to Archigram: 1961-74*. London: Academy Editions, 1994.
- Foster Associates*. (Intro by Reyner Banham). London: RIBA Publications Ltd., 1979.
- R. Buckminster Fuller and Robert Marks, *The Dymaxion World of Buckminster Fuller*. Garden City, NY: Anchor Press/Doubleday, 1962.
- R. Buckminster Fuller, *Operating Manual for Spaceship Earth*. NY: Clarion/Simon & Schuster, 1969.
- Vittorio Gregotti, *Inside Architecture*. Cambridge: MIT Press, 1996.
- Robert Maxwell, *The Two Way Stretch: Modernism, Tradition and Innovation*. London: Academy Editions, 1996.
- John McHale, *R. Buckminster Fuller*. NY: George Braziller Inc., 1962.
- Joan Ockman, edit., *Architecture Culture 1943-1968. A Documentary Anthology*. NY: Columbia/Rizzoli, 1993.
- Martin Pawley, *Design Heroes Series: Buckminster Fuller*. London: Grafton (HarperCollins publ.), 1992.
- Martin Pawley, *Future Systems: The Story of Tomorrow*. London: Phaidon Press Ltd., 1993.
- Cedric Price: AA Works II* (exhibit publication). London: EG Bond Ltd., 1984.
- Terence Riley, edit., *Light Construction* (exhibit publication). NY: MOMA Publications, 1995.
- Richard Rogers, *Architecture: A Modern View (Walter Neurath Memorial Lecture 1990)*. London: Thames and Hudson, 1990.
- Lloyd Sieden, *Buckminster Fuller's Universe*. NY: Plenum Press, 1989.
- Alison Smithson, edit., *Team Ten Primer*. Cambridge, Mass.: MIT Press, 1968.
- James Ward, edit., *The Artifacts of R. Buckminster Fuller: A Comprehensive Collection of His Designs and Drawings in Four Volumes*. NY/London: Garland Publishing, Inc., 1985.