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Education Automation on Spaceship Earth: Buckminster Fuller's Vision—More Relevant than Ever

*Allegra Fuller Snyder
with Victoria Vesna*

R. Buckminster Fuller (Fig. 1) took an extraordinary path in his own education, from a turbulent history at Harvard University, where he was expelled twice, to receiving 67 honorary doctorate degrees. He left behind an enormous body of documentation, now housed at the Buckminster Fuller Institute in Santa Barbara, California, which is directed by his daughter, Allegra Fuller Snyder. Fuller Snyder is herself a pioneer in the field of dance ethnology and a professor emeritus at the University of California, Los Angeles. She is dedicated to promoting her father's work and to making the documentation of it accessible. She is particularly excited about the possibilities offered by the World Wide Web in this respect. What follows is a brief interview centering around Fuller Snyder's education by her father and how her father's philosophy influenced her life and work.

Victoria Vesna: Marshall McLuhan wrote in 1962 that Buckminster Fuller "provides us all with a foretaste of the Extension of Consciousness that is near in the Electric Age"

[1]. Fuller was an architect, designer, engineer, poet, philosopher, author and global iconoclast, but, most of all, a proponent of the philosophy of synergy [2]. He was also very much involved in promoting his visionary ideas of education in the future. Would you speak about your own experience with

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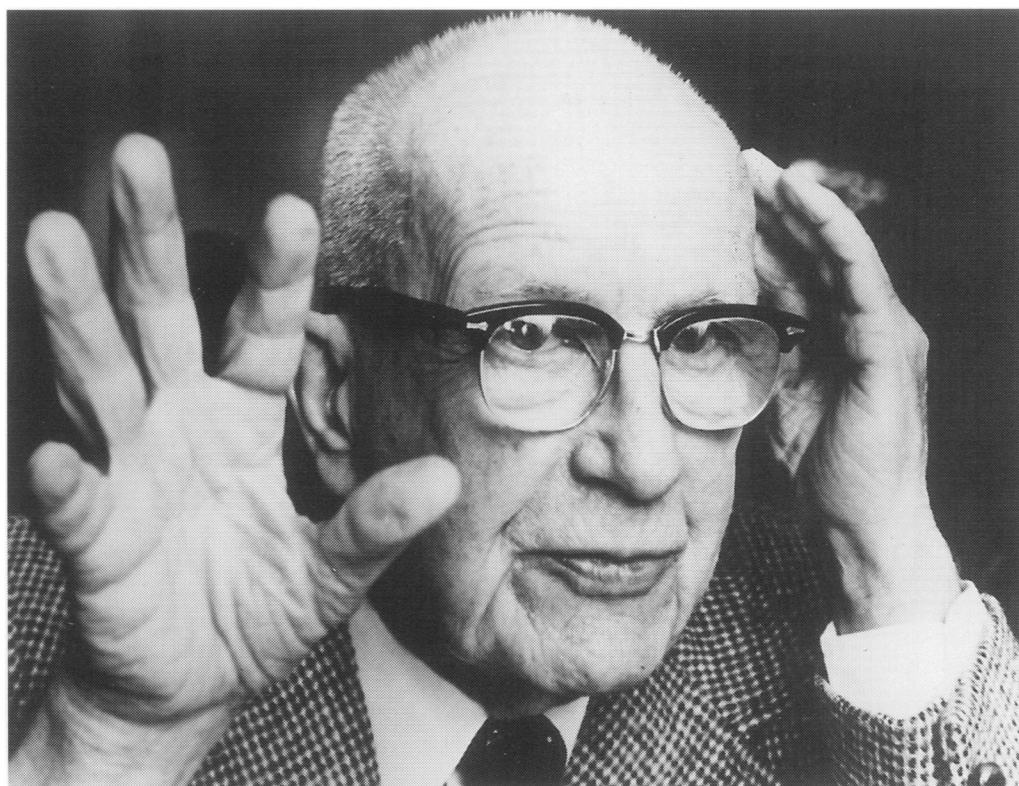
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This article is part of the *Leonardo* special project entitled "Planetary Collegium: Towards the Radical Reconstruction of Art Education," guest-edited by Roy Ascott. This project features writings that address the present and future needs and nature of art education in light of contemporary developments in technology, science and the arts.

ABSTRACT

R. Buckminster Fuller is perhaps best known for his inventions of the geodesic dome and the Dymaxion car; his inventive ideas and approach to education have mostly been ignored. He was passionate about teaching and lectured widely. This aspect of Buckminster Fuller is discussed by someone intimately familiar with the multifaceted man—his daughter, Allegra Fuller Snyder—in an interview with artist/educator Victoria Vesna. Currently, Fuller Snyder is chairperson of the Buckminster Fuller Institute, an organization that acts as a central repository for an enormous collection of artifacts, manuscripts and media documenting the life and work of Buckminster Fuller.

Fig. 1. R. Buckminster Fuller, circa 1980s. Buckminster Fuller was a visionary who expressed his ideas in disorganized fragments and marathon lectures. He possessed a magnetic personality that was mesmerizing and inspirational to those he had contact with, even if they did not understand all he was saying.



your father, as a child having direct access to him?

Allegra Fuller Snyder: My father felt that the highest priority in education is revolution based on synergy, which means that the behavior of a whole system cannot be predicted by the behavior of any of its parts taken separately. Thinking synergistically requires the complete reversal of our present system of the compartmentalization of knowledge, which goes from the particular to the even more specific. My father called himself a "Comprehensive Anticipatory Design Scientist"—a strange and difficult label to live with, but after spending a great deal of my own life trying to arrive at a simpler and more accessible label, I have recognized that this is the only term that really is right. Furthermore, he wanted us all to remain such comprehensivists—that was the first step in my educational process. He completely honored who I was and my inherent self-education process. He found schools that supported that process. I loved my schooling and experienced myself constantly growing in and through the educational process. I assumed all students felt that way. It was only years later, when I myself was a teacher, that I learned that the great majority of my students had very, very different experiences.

My father wrote that "Life, as born, is inherently comprehensive in its apprehending, comprehending, and coordinating capabilities. Every child is interested in the universe. The child's questions are universal" [3] (Fig. 2). But what is referred to as "elementary education" consists of bits and pieces; it tries in every way to destroy comprehensive understanding. He found the goal of education was to "de-genius" the child, for, as he said, "every child is born a genius." The mind of a child is an exquisite tool ready to explore the universe. All the child lacks is experience. The challenge is to find the way to present the most complex ideas in relation to children's existing levels of experience. In *Tetrascroll* [4], his intent was to share with me his most critical thinking. I remember, for instance, that he wanted me, at the age 4 years, to have some experience of his own explorations into Einstein's theory of relativity. He wanted to include three chapters about Einstein's theory in his first book *Nine Chains to the Moon* [5], published in 1938. The publisher said, "You're not on the list of people who understand Einstein, so we can't publish it." My father said he thought that Mr.



Fig. 2. R. Buckminster Fuller lecturing, circa 1980s. Invited to give more than 2,000 lectures at 500 universities and colleges, and making 48 trips around the world, Buckminster Fuller was a tireless performer. Famous for his non-stop "talkathons," he put his ideas to test in architectural designs, in 18 books and, toward the end of his career, in the World Games.

Einstein would disagree, so Lippincott, the publishers, sent the material to Einstein, and he was very interested. My father went to Princeton and had a wonderful meeting with Einstein. Very shortly thereafter he wanted to share some of this with me. He often rehearsed his thinking with me, as he felt that the best communicators were able to say the most complex ideas in ways that a child could understand. He was particularly excited about the great paradigm shift he felt would affect all of us as we move from static Newtonian thinking to the Einsteinian understanding that change is constant, change is normal. So he would explain these things to me, using the Goldilocks story as a link to my experience. I was Goldy.

Bucky loved to do freehand sketches. He knew that if he could visualize things

for me, I would understand. I became Goldilocks, but instead of doing what Goldilocks used to do in Grimm's fairy tales, in my father's stories I went out and had all these adventures in the universe. I cannot tell you how much of Einstein's theory I really understood, but my father brought me into the context of his thinking in a way that is still valid to me today. When I was 6 or 7 years old, I participated in the experience of the emergence of the Dymaxion car (Fig. 3) [6], visiting the plant in Bridgeport, Connecticut, as his vision came to life, riding with him as he tested first the chassis and then the whole car and its many marvels.

I was 12 or 13 years old when he began to work on synergetics, his new system of geometry [7], and he involved me in his process. Our apartment in

New York at that time was very small and we had an all-purpose table—dining table some of the time, working table most of the time—so he would spread out on it all the things he was working on. At that time, I had a natural appetite for mathematics, and he got me to look at patterns that he saw operating in numbers. I took to this readily and worked right along with him, witnessing numbers take on shape and form. I never felt there was any kind of barrier between his thinking and my understanding. This was the way he felt as well.

My father used to say that the only difference between the child and the adult is experience—learning should be the process of encouraging the child to keep having experiences that validate their understanding. Then they can gain more and more confidence about and assume responsibility for what they know. Information is experience; experience is information. It is the relation between the mind, which Bucky often talked about, and experience and experiencing that I found to be the key that unlocks his work and inspired my own.

V.V.: Could you say a bit about Bucky's relationship with Gilbert Seldes and the kind of impact this had on his thinking regarding mass media?

A.F.S.: Bucky was a regular guest (Fig. 4) when Gilbert Seldes was directing CBS's experimental television broadcasts to approximately 100 sets of receivers in New York City in the 1930s, a decade before TV was established commercially. Seldes was one of the first critics and writers to understand the impact that new media, including film and the newly emerged television, would have on our world. Seldes's first book, *The Seven Lively Arts* [8], was a pioneering statement about these issues. Bucky was fascinated with understanding these new media. *Education Automation* [9] evolved from this early introduction to telecommunication.

V.V.: One of the most inspiring qualities of Buckminster Fuller was his visionary combination of art and science, particularly useful to artists working with technology.

A.F.S.: Technology, from my father's point of view, was always meant to be an extension and enrichment of experience, not a substitute for experience. First of all, he wanted us to realize that we are all completely involved with technology, whether we want to admit it or not, and that there is nothing wrong with technology. The universe is technology—the most comprehensive complex technology. Human organisms are the

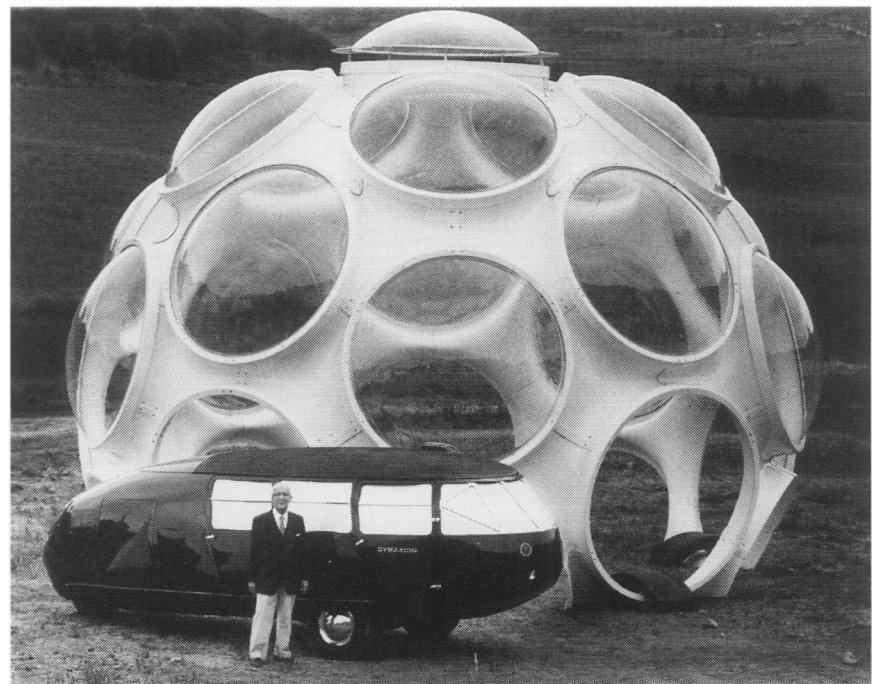
universe's most elaborate local technologies. By his definition, "technology is the integrity of interoperativeness of principles which make possible an eternally regenerative Universe" [10]. The technology is always a tool—it is the tangible thing. My father was a very "hands-on" person—sensory input was always critical. He distrusted abstract thinking and felt that every idea that has validity can be modeled—physically demonstrated—somehow. So, again, technology is the physicalization—the tool that we are involved with—that surrounds us. He would talk about the metaphysical, the "something else" that the mind brings to all of this, taking us beyond the physical to the metaphysical. This is where the artist is and where we all should be. Artists allow the metaphysical to drive them in a way that others, limited in their categorizations of themselves, cannot do as easily. My father wanted us to get rid of categorizations as much as possible because he felt they totally hinder our effectiveness. We have so many capabilities, so many interests and directions. Your appetite and mine may be at this moment entirely different, yet we are both driving toward the whole; so it is our constant awareness and perception of the whole and our hunger for understanding at this moment—but within the context of the whole—that drive us as evolving human beings. A child when growing up should be able to satisfy each of these appetites.

If a child very early on is given access to the thing that his or her mental appetite desires in the way of accurate information, this will lead to the ideal way that education should be followed. My father saw this happening through what he envisioned for two-way video, which he wrote about in *Education Automation*. Now we have the Internet and digital media, which are capable of bringing us the most advanced levels of thinking. It is much like my father's vision of education: from childhood through adult life, education means having the highest level of thinking, knowledge, information available at our fingertips.

V.V.: I imagine that Fuller would be ecstatic about network technologies, particularly about the World Wide Web. In a sense, he predicted this evolving global network, so I am curious to hear about your vision of how his work will function on the Web.

A.F.S.: If Bucky is one contributor (and it is important to underline that he was but one contributor) to this body of knowledge called the universe, which we all should have access to, then everything we have here at the Buckminster Fuller Institute is a part of that contribution. Now, in some areas he was very advanced in his thinking—he was opening doors that other people had not yet opened. There may be areas today where his thinking can still help us, even though he has been dead for almost 15 years. That is

Fig. 3. Buckminster Fuller with a Dymaxion car in front of his 26-ft (7.9-m) Fly's Eye dome during his 85th birthday party at the Windstar Foundation in Snowmass, Colorado, 1981. (Photo: Roger Stoller)



the basis—we all should be contributing in our own way to this great body of knowledge. This knowledge should be out there, being worked on by everyone, shared by everyone—we are one group. Now, what also is exciting to me—I see it as truly fanning out—is the institute acting as a network within a network, within a network, within a network, connecting and interconnecting people. We are not yet up to full speed on this at the institute. We have a Web site [11], but it is just in the first stages of its potential. We are just beginning the enormous task of digitizing all of our holdings. Yet, we do a lot of interconnecting. If someone has an appetite and interest in some area of Bucky's work, the best we can do at the moment is connect him or her to people who are working on similar ideas. We do that on the Web site as well, with wonderful links to some very exciting work. The Web provides a useful framework to bring up and discuss many of the things Bucky felt were important. One project we are engaged in is the conversion of videotapes called the "Everything I Know" tapes to a digital format. Under the auspices of the Bell Labs, 43 hours of tapes were made in 1978, in which my father reviewed his thinking.

V.V.: Now, at the end of this century, schools—from elementary to university level—are really struggling with established systems that are based on specialization—exactly the opposite of Fuller's ideas about what youth needs. Do you have any ideas about how we can inte-

grate his philosophy in existing educational environments?

A.F.S.: One of the expressions my father repeatedly used was "we continually back into our future." The world changes and yet we are not really aware of the change until the change is present all around us. As I sit at the computer, if I have a question, I can literally make some good steps forward in my quest to answer it, in my quest for knowledge and understanding. It seems to me that more and more people are doing that. I am very sensitive to this idea at the moment because my 6-year-old granddaughter is in kindergarten. She is just on the brink of being involved with the formal education process; her parents and even I are questioning what that should be. On the other hand, I already see her sitting at her daddy's computer. She has hungers and she is beginning to master the tools that will satisfying her hungers—this may drive her self-education process. I think we are all going to be sucked into this and sometime along the way ask ourselves: How did all this change, why do we need schools? We do need places for our children to learn to socialize. What we now know as the physical school is a place for socializing. It also provides the parents with some freedom and the time for doing their own learning and growing, so there is a function for some of those physical environments, but that is very different from the learning process. The learning will happen more at home, by the self. The scenario would seem to suggest that

eventually people will see how much more education is going on at home than at school and realize that our educational system is changing before our eyes.

V.V.: Is this where your work with dance connects with your father ideas?

A.F.S.: Yes, at the deepest level I think that in order to understand Buckminster Fuller's work, one must, in essence, allow oneself to be a dancer. One must understand one's body and experience as a way of knowing. In a functional way, ideas need to be embodied in one's own thinking/experiencing. Bucky was a dancer in the way that I understand dance—as a way of knowing—and his understanding of the universe was through his dancing in his mind. We must all try to be that way eventually.

References and Notes

1. McLuhan wrote this dedication inside his book *The Gutenberg Galaxy: The Making of Typographic Man* when he gave it to Buckminster Fuller. Marshall McLuhan, *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: Univ. of Toronto Press, 1962).
2. The theory of synergy states that the performance of a whole is unpredictable by an examination of its parts or any assembly of the parts. Synergy also occurs in geometry and chemistry. After finding many examples in nature, Fuller concluded that all of nature is synergetic. See E.J. Applewhite, *Synergetics Dictionary*, 4 Vols. (New York and London: Garland, 1986) Vol. 1, pp. 3–4.
3. Applewhite [2] Vol. 1, p. 583.
4. R.B. Fuller, *Tetrascroll* (New York: St. Martin's Press, 1975).
5. R.B. Fuller, *Nine Chains to the Moon* (Garden City, NY: Anchor Books, 1938).
6. The Dymaxion was Fuller's attempt to redefine the word "car." Fuller did not originally intend to design an automobile, but a small jet that would replace the car. As a compromise, he decided to start with a car design that eventually would become a flying machine design. In 1933, Fuller completed the first of three prototypes of the Dymaxion. The shockingly different design caused a media sensation and massive traffic jams. Unfortunately, the first prototype's involvement in a fatal accident caused problems with financing the futuristic project. The car was part of a series of Dymaxion designs, including a four-dimensional Dymaxion house, a Dymaxion Dwelling Machine, a Dymaxion bathroom and, most significantly, a Dymaxion map.
7. The word "synergetics" is a combination of the words "synergy" and "energetic," in reference to energetic geometry. Energetic geometry goes beyond Cartesian geometry, recognizing that everything in the universe is constantly in motion. Because the Cartesian x, y, z coordinate system does not take time into account, it is incomplete. See R.B. Fuller, *Critical Path* (New York: St. Martin's Press, 1981) p. 151; and J. Baldwin, *Bucky Works: Buckminster Fuller's Ideas for Today* (New York: Wiley) pp. 68, 69.
8. G. Seldes, *Seven Lively Arts* (New York and London: Harper & Brothers, 1924).
9. R.B. Fuller, *Education Automation* (Carbondale, IL: Southern Illinois Univ. Press, 1962).
10. Applewhite [2] Vol. 4, p. 135.
11. The Buckminster Fuller Institute's World Wide Web site is at <<http://www.bfi.org>>.

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Fig. 4. Buckminster Fuller and Gilbert Seldes photographed from a television screen in the mid-1930s. Taken at the CBS Experimental TV Broadcasting studios in New York.

