

Introduction **by R. Buckminster Fuller**

At all times nowadays, there are approximately 66 million human beings around Earth who are living comfortably inside their mothers' wombs. The country called Nigeria embraces one-fourth of the human beings of the great continent of Africa. There are 66 million Nigerians. We can say that the number of people living in Wombland is about the same as one-fourth the population of Africa. This 66 million Womblanders tops the total population of either West Germany's 58 million, the United Kingdom's 55 million, Italy's 52 million, France's 50 million, or Mexico's 47 million. Only nine of the world's so-called countries (China, India, Soviet Union, United States, Indonesia, Pakistan, Japan, and Brazil) have individual populations greater than our luxuriously-living, under-nine-months-old Womblanders.

Seemingly switching our subject, but only for a moment, we note that for the last two decades scientists probing with electrodes have learned a great deal about the human brain. The brain gives off measurable energy and discrete wave patterns disclosed by the oscillograph. Specific, repetitive dreams have been identified by these wave patterns. The neurological and physiological explorers do not find it extravagant to speculate that we may learn that what humanity has thus far spoken of mystifiedly as telepathy, science will have discovered, within decades, to be ultra-ultra high-frequency electro-magnetic wave propagations.

All good science fiction develops realistically that which scientific data suggests to be imminent. It is good science fiction to suppose that a superb telepathetic communication system is inter-linking all those young citizens of worldaround Wombland. We intercept one of the conversations: "How are things over there with you?" Answer: "My mother is planning to call me either Joe or Mary. She doesn't know that my call frequency is already 7567-00-3821." Other: "My mother had better apply to those characters Watson, Crick, and Wilkerson for my call numbers!" And another of their 66 million

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Womblanders comes in with, "I'm getting very apprehensive about having to 'go outside.' We have been hearing from some of the kids who just got out— They say we are going to be cut off from the main supply. We are going to have to shovel fuel and pour liquids into our systems. We are going to have to make our own blood. We are going to have to start pumping some kind of gas into our lungs to purify our own blood. We are going to have to make ourselves into giants fifteen times our present size. Worst of all, we are going to have to learn to lie about everything. It's going to be a lot of work, very dangerous, and very discouraging." Answer: "Why don't we strike? We are in excellent posture for a 'sit-down.'" Other: "Wow! What an idea. We will have the whole population of worldaround Wombland refuse to go out at graduation day. Our cosmic population will enter more and more human women's wombs, each refusing to graduate at nine months. More and more Earthian women will get more and more burdened. Worldaround consternation— agony. We will notify the outsiders that, until they stop lying to themselves and to each other and give up their stupid sovereignties and exclusive holier-than-thou ideologies, pollutions, and mayhem, we are going to refuse to come out. Only surgery fatal to both the mothers and ourselves could evacuate us."

Another: "Great! We had might as well do it. If we do come out we will be faced with the proliferation of Cold War's guerrillized killing of babies for psycho-shock demoralization of worldaround innocent communities inadvertently involved in the abstruse ideological warfare waged by diametrically opposed, equally stubborn, would-be do-gooder, bureaucratic leaders and their partisans who control all of the world's means of production and killing, whose numbers (including all the politically preoccupied individuals around the Earth) represent less than one per cent of all humanity, to whose human minds and hearts the politicians and their guns give neither satisfaction nor hope. Like the women in *Lysistrata* who refused intercourse with their men until they stopped fighting, we Womblanders would win."

Until yesterday, what are now the 150 member nations of our planet's United Nations were tiny groups of humans who for two million years had been regenerating around our globe so remotely

from one another that each colony, nation, or tribe was utterly unaware of one another's existence. Only through telepathy, as supposedly operative in the previous paragraphs, could those remote cells of precariously-surviving human beings have been aware of one another throughout those two million years. In the last few split seconds of overall history, there emerged a dozen millennia ago from the womb of tribal remoteness a few sailors and overland explorers who began to discover the presence of other humans scattered around the mysterious world. Finding the tribes to be each unaware of either the surprising resources or the vital needs and desires of the others, they kept the whereabouts of these surprise demands and supplies secret and thus were able, through monopoly of commerce and middle-manning, to exploit to their own special advantage the vital needs, ignorance, and the wealth of life-support to be generated by expediting or slowing the physical resource interactions with humanity's available time to work the resources into higher advantage tools, environment controlling devices, and metabolically regenerative sustainers.

Throughout all the two million years up to the Twentieth Century, the total distance covered by an average man in an average lifetime disclosed to him less than one-millionth of the surface of our spherical planet. So tiny was a human and so relatively large is our planet that it is not surprising that humans as yet celebrate only in terms of a "wide, wide world— a four-cornered Earth," situated in the middle of an infinite plane, to which all the perpendiculars are parallel to one another and lead only in two directions— UP and DOWN— with sky UP there and earth DOWN here. Don't think it is only an illiterate unemployee who is misoriented and ignorant; even now the senses and brains of all the Ph.D. scientists are so reflexively misoriented that they too see the sun go down, plunging into the infinite plane at a mysterious and never-discovered place called the West, to rise mysteriously from it again next morning at a never-identified place called East— and Astronaut Conrad bursts out spontaneously from his moon advantage talking about being " ... up here on the moon..." and the President of the United States congratulates the astronauts on "...going up to the moon and back down to earth." Scientists not only admit but assert that there are no locales in the Universe to be identified as UP and DOWN. None of

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the perpendiculars to our spherical Earth's surface are parallel to one another; they lead in an infinity of directions.

No matter how you may look upon the matter morally and ideologically, the assumption that humanity could or could not own a piece of land with all the earth vertically below it and all the air vertically above it is not only scientifically invalid— it is scientifically impossible. The scheme is geometrically possible only as an up-and-down make-believe flat world.

To understand the scientific impossibility of such a scheme, let us consider a cube inside of a sphere, with the cube's eight corners congruent with the surface of the sphere. Let the cube's twelve edges consist of steel structurals. A light is at the common center of the cube and sphere and casts a shadow of the twelve structural edges of the cube outwardly upon the surface of the translucent sphere. We will now see that the total spherical surface is divided symmetrically by great circle arcs into six equilateral four-edged areas. Though each of the four-sided symmetrical areas has 120-degree corners instead of 90-degree corners, each is called a spherical square. Altogether they constitute a spherical cube.

We will now suppose the spherical cube to be the planet Earth. We will suppose that war and treaties have resulted in the total Earth's being divided equally amongst six sovereign groups— each empowered by its laws to grant deeds to properties within their respective spherical square surfaces on the planet, regardless of whether covered by water or not. We will suppose that, as at present, each of the world's major sovereign nations assumes the authority to deed or lease the titles to subdivisions of each of their respective lands to corporations, sub-governments, and individuals. All the legally recognized deeds to property anywhere around our Earth date back only to sovereign claims established and maintained exclusively by military might.

Now that we have the model of a cubical subdivision of the sphere, let us color our cube's six faces, respectively, red, orange, yellow, green, blue, and violet. Let Russia sovereignly possess the red face of the cube. Consider all the perpendiculars to the red face of the internally positioned cube as being the up and down perpendiculars defining the property claims to all the land *below* the surface

and all the air *above* the surface. Under these conditions, it will be seen that the red square owns all the interior of the cube which occurs perpendicularly below that red surface square. Therefore, each of the six countries would be claiming exclusive possession of the same "whole" cube, which obviously invalidates each and all of their claims to only one-sixth of the cube. This realization is mildly reminiscent of Portia's admonition to Shylock that he must be able to cut loose his pound of flesh without letting a drop of blood.

"Alright," you say, "I will concede it is impossible to demonstrate the validity of the claims to the lands lying perpendicularly below my surface map without invalidating all other land owners of the world. Therefore, I will try to live on the surface of my land and just claim it and the air space vertically above me." "Alright," we say to you, "what air are you talking about, because it just blew away." You retort testily, "I don't mean that nonsense... just the air geometrically above me. That is what I refer to when I say you are violating my air space— you are violating my overhead geometry." "Alright," we say to you, "which stars were you looking at when you said, '...that space above me'? Our Earth has been revolved away from those stars. Other stars are now above us. Not only are we revolving, but we are simultaneously orbiting around the sun, while all the planets and stars are always in swift motion, but are so far away from us and our lives so short that we are unable to perceive those motions. The distances involved are so great that the light from the next star to the sun takes four and one-half years to come to our solar system while traveling 700 million miles per hour and the distance across our galaxy is more than 300,000 light years, while the next nearest of the millions of galaxies are multi-millions of light years away from our galactic nebula. With those kinds of distances in the heavens, the amount of star motion that you and I can detect in our lifetime is humanly unrecognizable. Most of the star speeds within their galaxies are in the order of only 100,000 miles per hour, which is a negligible speed beside light's speed of 700 million miles per hour."

Because all the stars in the Universe are in motion, our planet orbits rotatively in an ever-changing, omni-circus of celestial events. There is no static geometry of omni-interrelationship of Uni-

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verse events. Some of the stars you are looking at have not been there for a million years— Some no longer exist. As Einstein and Planck discovered, "Universe is a scenario of non-simultaneous and only partially overlapping, transformative events." One frame in the scenario of caterpillar does not foretell the later scenario event of its transformation into butterfly. One frame of butterfly cannot tell you that the butterfly flies; only large time-sequence segments of the scenario can provide meaningful information. Cogitating on the myriads of stars apparently scattered in disorderly spherical array about the heavens, individuals often remark, as may you, "I wonder what is outside outside?"— asking for a one-frame answer, which is as unintelligent as asking, "Which word is the dictionary?" You know the order of the dictionary to be alphabetical, but its words do not read sequentially. Just hearing them read aloud, they make an only apparent, disorderly array. This is typical of the manner in which nature hides her orderliness in only apparent disorder.

Back to little Space Vehicle Earth and that question of property. The most that the individual could be entitled to own would be the inside of an infinitely thin blueprint of his land, because there is no geometry of space outside it and no exclusively occupiable land below. Our planet Earth is the home of all humans, but scientifically speaking it belongs only to Universe. It belongs equally to all humans. This is the natural, geometrical law. Any laws of man which contradict nature are unenforceable and specious.

Without the infinitely-extended lateral plane, the words up and down are meaningless. The airman initiated the correct descriptive terms "coming IN for a landing and going OUT." It is meaningful to say "INSTAIRS and OUTSTAIRS." Say it for a week and your senses will discover and notify that you are living on a planet.

What do you mean, "astronaut?" *We are all astronauts.* Always have been— but really! Never mind your "Never-mind-that-space-stuff, let's-be-practical, let's-get-down-to-Earth" talk— brain-talk as undisturbed by knowledge as is a parrot's brain-talk by any awareness born of thought. Brain is physical— weighable; thought is metaphysical— weightless. Many creatures have brains. Man alone has mind. Parrots cannot do algebra; only mind can abstract. Brains are physical devices for storing and retrieving special case experi-

ence data. Mind alone can discover and employ the generalized scientific principles found holding true in every special case experience.

Universe has disclosed to astrophysics an elegantly orderly inventory of ninety-two regenerative chemical elements, each with its unique behaviors, all of which are essential to the success of Universe. All are in continual interexchange within the total evolutionary process of Universe. Ignorant humans aboard Space Vehicle Earth are now screaming, "Pollution!" There is no such phenomenon. What they call pollution is extraordinarily valuable chemistry essential to Universe and essential to man on Earth. What is happening is that the egocentricity of omni-specialized man makes him ignorant of the value with which his processing is confronting him. The yellow-brown content of fume and smog is mostly sulphur. The amount of sulphur going out of the smokestacks around the world each year is exactly the same as the amount of sulphur being taken from the Earth each year to keep the world ecology going. It would be far less expensive to catch that sulphur while concentrated in the stack, and to distribute it to the original users, than to do the original mining AND to get it out of human lungs, et cetera, when all the costs to society over a deteriorating twenty-five years are taken into account. But humanity insists on holding to this year's profits, crops, and elections. World society is lethally shortsighted.

Subconsciously reflexing to the as yet mistaken concept of an infinite plane, men have felt that they could dispose of annoyingly accruing substances with which they did not know how to deal by dispatching them outward in some cosmic direction, assumedly to be diffused innocuously in infinity. "I spit in the ocean. So what?" Humans as yet cerebrate secretly and hopefully that— inasmuch as yesterday's exhaustion of customary resources has always been followed by discovery of alternate and better resources— the great infinity is going to keep right on taking care of ignorant carelessness and waste. "So what the hell?" say the "down-to-earth" status-quoers. "Pump all the fossil fuel energy-depositing of billions of years out from the Earth's crust. Burn it up in a century. Fill all your bank accounts with ten-place figures. To hell with the great grandchildren. Let them burn up our Space Vehicle Earth's oceans with hydrogen

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fusion. Let them do the worrying about tomorrow."

Just as biological protoplasmic cells are colonized into larger organisms, the most complex and omni-adaptable of which is the human, so too do humans colonize and inventively externalize the same organic tool functions for their mutual metabolic regeneration. We call this complex mutual tool externalization by the name industrialization, in which each of us can use the telephone or the electric light in our special, unique tasks, all of which require increasing development of worldaround access to the total resources and worldaround distribution of the advantages comprehensively produced in total metabolic regeneration.

The world population which, after the cell-colonizing within its controlled environment, has been emitted from the thin, protoplasmic, tissue-sheathed, human womb into planet Earth's larger biosphere-sheathed, industrial organism womb, goes on colonizing, integrating, and specializing locally as innocently and ignorantly as did the protoplasmic cells within the woman's womb, all the while mistrusting one another as they evolve their utter interdependence around Earth, as do the individual protoplasmic cells of the residents of human Wombland gather together selectively, finally to form a whole child. In due course, we will realize a one world human integrity and with each degree of physical integration a new degree of metaphysical freedom will be attained.

Earthians in their more roomy biosphere are as yet provided-for, despite their utter ignorance of the infinitely-exquisite reliable interactions of cosmic mechanics. Mothers don't have to invent a breast to feed the baby or invent oxygen for it to breathe. Nor do they have to tell the child how to invent its cell growth. Humans are utterly ignorant of what goes on, how, and why.

The Universe is a self-regenerating and transforming organic machine. Human womb graduates now gestating within the biosphere's world industrial organism womb are discovering and employing a few of the principles governing micro-macro cosmic mechanics, all the while ignorantly speaking of their accomplishments of the generally-disregarded obvious as "inventions" and "creations." Now humans have become suspicious of their little machines, blaming them for the continual disconnects of the

inexorable evolutionary processes of cosmic gestations which—transcendental to their brain detecting—ever and again emit them into a greater, more inclusively exquisite spherical environment of automated mechanical controls that progressively decontrol humanity's thought and action capabilities—ever increasing humanity's options—emancipating it from its former almost total preoccupation with absolute survival factors.

Assuming erroneously that their day-to-day positive experiences should be rendered perpetual and their negative experiences eliminated, humans try to freeze the unfreezable evolution at specific stages. They try to make "plastic flowers" of all momentarily satisfying events and paraphernalia. In the past, they tried to do it with stone. Separated from the familiar, confronted with the unfamiliar, and reflexed only by the brain's mechanical feedback, unthinking humans— not realizing that there are no straight lines, only wavy ones, and not realizing that waves can only be propagated by positive-negative oscillating—find their straight linear strivings forever frustrated by the wave system realities of Universe. Ignorantly they speak of the evolutionary waves' regeneratively oscillating complementaries as "good" and "bad," though the scientist can find no such moral and immoral qualities in the electron or its complementary opposite, the positron.

Humanity as a whole is indeed being emitted from a two-million-year gestation within the womb of permitted ignorance, for which infantile period cosmic mechanics have been making ample provision not only to offset ignorance and waste but also to permit humanity's gradual trial-and-error experimental discovery of the relatively negligible effectiveness of its muscle— which it had at first employed not only exclusively but savagely— and the concomitant discovery of the infinite apprehending and comprehending effectiveness of the human mind, which alone can discover and employ the Universal verities— and thereby realize comprehensively the potential, progressive, non-wasteful, competent, considerate mastery of the physical environment by the metaphysical intellect.

The metaphysical integrities manifest throughout the everywhere inter-transforming Universe's omni-inter-accommodative cosmic organic system apparently are from time-to-time emulated in meager degree by the intellect of the human passengers who are gestating

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within the spherical womb sheath of planet Earth's watery, gaseous, and electro-magnetic biosphere.

Humanity's most recent sorties to the moon from within Space Vehicle Earth's womb-like biosphere sheath have been tantamount to a premature, temporary surgical removal of a baby from its human mother's womb, skillfully enclosed within a scientifically-controlled environment, still attached to the mother, and after successful surgery being returned into the human mother's womb to loll-out its remaining gestation days to the successful detached-action launching outwards in Universe which we ignorantly identify as "birth." Sovereign nation "landing cards" require answers to ridiculous questions: "When were you born?" "Where do you live?" Answer: "I am immortal. I check in here and there from celestial-time-to-celestial-time. Right now I am a passenger on Space Vehicle Earth zooming about the Sun at 60,000 miles per hour somewhere in the solar system, which is God-only-knows where in the scenario Universe. Why do you ask?"

Humanity's sorties to the moon have been accomplished only through instrumental guidance of their controlled-environment capsules and mechanical-enclosure clothing by utterly invisible electromagnetic wave phenomena referenced to instrument-aligned star bearings, with the invisible mathematical integrations accomplished by computers, uncorrupted and incorruptible by ignorantly opinionated humans. Thus has man been advantaged by the few who have thought and acted to produce the instruments, as yet relieving the vast majority of humans from the necessity of having to think and coordinate their sensings with the realities of cosmic mechanics.

Humans still think in terms of an entirely superficial game of static things— solids, surfaces, or straight lines— despite that no things— no continuums— only discontinuous, energy quanta— separate event packages— operate as remotely from one another as the stars of the Milky Way. Science has found no "things"; only events. Universe has no nouns; only verbs. Don't say self-comfortingly to yourself or to me that you have found the old way of getting along with false notions to be quite adequate and satisfactory. So was the old umbilical cord to your mother. But you can't re-attach it and your mother is no longer physically present. You can't go back. You can't stay put. You can

only grow and, if you comprehend what is going on, you will find it ever more satisfactory and fascinating, for that is what evolution is doing, whether you think, ignorantly, that you don't like it or do.

To each human being, environment is "all of Universe that isn't me." Our macrocosmic and microcosmic "isn't me-ness" consists entirely of widely dissynchronous frequencies of repetitions of angular changes and complex inter-actions of waves of different lengths and frequencies of repetition. Physics has found a Universe consisting only of frequency and angle modulations.

Our environment is a complex of frequencies and angles. Our environment is a complex of different frequencies of impingement— from within and without— upon the individual "me-nesses." We are in a womb of complex frequencies. Some of those frequencies man identifies ignorantly with such words as "sight, sound, touch, and smell." Others he calls "tornadoes, earthquakes, novae." Some he ignorantly looks upon as static *things*: houses, rocks, and human-like manikins.

Very, very slow changes humans identify as inanimate. Slow change of pattern they call animate and natural. Fast changes they call explosive, and faster events than that humans cannot sense directly. They can see the rocket blasted off at 7,000 miles per hour. They cannot see the hundred-thousand times faster radar pulse moving 700 million miles per hour. Humans can sense only the position of pointers on instrument dials. What they call "radio"— electro-magnetics— they learn of through scientific instrumentation. Of the total electro-mechanical spectrum range of the now known realities of Universe, man has the sensory equipment to tune in directly with but one-millionth of the thus far discovered physical Universe events. Awareness of all the rest of the million-fold greater-than-human-sense reality can only be relayed to human ken through instruments, devised by a handful of thought-employing individuals anticipating thoughtfully the looming needs of others.

The almost totally invisible, nonsensorial, electro-magnetic womb-sheath of environmental evolution's reality-phase into which humanity is now being born— after two million years of ignorant, innocent gestation— is as yet almost entirely uncomprehended by humanity. 99.9 per cent of all that is now transpiring in human activity

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and interaction with nature is taking place within the realms of reality which are utterly invisible, inaudible, unsmellable, untouchable by human senses. But the invisible reality has its own behavioral rules which are entirely transcendental to man-made laws and evaluation limitations. The invisible reality's integrities are infinitely reliable. It can only be comprehended by metaphysical mind, guided by bearings toward something sensed as truth. Only metaphysical mind can communicate. Brain is only an information storing and retrieving instrument. Telephones cannot communicate; only the humans who use the instruments. Man is metaphysical mind. No mind— no communication— no man. Physical transactions without mind— YES. Communication— NO. Man is a self-contained, micro-communicating system. Humanity is a macro-communicating system. Universe is a serial communicating system; a scenario of only partially overlapping, nonsimultaneous, irreversible, transformative events.

As yet preoccupied only with visible, static, newspaper views of superficial surfaces of people and things— with a one-millionth fraction of reality which it has cartooned in utter falsehood— society fails to realize that several hundred thousand radio or TV communications are at all times invisibly present everywhere around our planet. They permeate every room in every building— passing right through walls and human tissue. This is to say that the stone walls and human tissue are invisible and nonexistent to the electromagnetic wave reality. We only deceived ourselves into reflexing that the walls are solid. How do you see through your solid eyeglasses? They are not full of holes. They are aggregates of atoms as remote from one another as are the stars. There's plenty of space for the waves of light to penetrate.

Several hundred thousand different wide-band radio sets can at any time be tuned in anywhere around our biosphere to as many different communications. Going right through our heads now, these programs could be tuned in by the right crystals and circuits. Crystals and circuits consist of logically structured atomic arrays. Such arrays could operate even within our brains. Tiny bats fly in the dark by locating objects ahead in their flight path by ever more minuscule radar sending and receiving, distance-to-object calculating mechanisms. Right this minute, five hundred Earth-launched satellit-

es with sensors are reporting all phenomena situated about our planet's surface. Tune in the right wavelength and learn where every beef cattle or every cloud is located around the Earth. All that information *is* now being broadcast continually and invisibly.

For humans to have within their cerebral mechanism the proper atomic radio transceivers to carry on telepathetic communication is no more incredible than the transistors which were invented only two decades ago, and far less incredible than the containment of the bat's radar and range-finding computer within its pin-point size brain. There is nothing in the scientific data which says the following thoughts are impossible and there is much in the data which suggests that they are probable. The thoughts go as follows: The light of a candle broadcasting its radiation in all directions can be seen no farther than a mile away in clear atmosphere. When the same candle's flame is placed close in to the focus of a parabolic reflector and its rays are even further concentrated into a beam by a Freznel lens, its light can be seen at ten miles distance. The earliest lighthouses were furnished with such reflectively concentrated beam lights of tiny oil lamps.

What we speak of as light is a limited set of frequencies of the vast electro-magnetic wave ranges. All electro-magnetic waves can be beamed as well as broadcast. When beamed and lensingly concentrated (as with the laser beams refracted through rubies), their energies are so concentrated as to be able to bore tunnels in mountains. The shorter the waves, the smaller the reflector and refractor may be.

We know that the human has never seen outside himself. Electro-magnetic waves of light bounce off objects outside him and frequencies are picked up by the human eyes and scanningly relayed back into the brain. Because the light is so much faster than touch, smell, and hearing, men have tended to discount the billionth of a second it takes light to bounce off one's hand and to get the information back into one's brain. All sensing is done by humans entirely inside the brain, with information nerve-relayed from the external contact receivers. The human brain is like a major television studio-station. Not only does the brain monitor all the incoming, live, visible, audible, smellable, and touchable 3D shows, it also makes

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videotapes of the incoming news, continually recalls yesterday's relevant documentaries and compares them with incoming news to differentiate out the discovered new and unexpected events from the long-familiar types, and to discover the implications of the news from those previously-experienced similar events, in order swiftly to design new scenarios of further actions logically to be taken in respect to the newly-evolved challenges.

So faithful has been the 4D, omni-directional, image-ination within the human omni-sense transceiving studio-stations of human brains that the humans themselves long ago came to assume spontaneously that the information received inside the brain made it safe to presume that those events were, in fact, taking place outside and remote from the seeing human individual. The reliability of all this imagining has been so constant that he now tends to think he sees only outside himself.

The shorter the electro-magnetic, air, water, sand, or rocky earthquake wavelengths, the higher their frequency. The higher the wave frequencies, the more the possibility of their interfering with other high-frequency, physical phenomena such as walls, trees, mountains. The nearer they approach the same frequencies, the less do they interfere with one another. For this reason, the very high-frequency electro-magnetic waves of radio and television get badly deflected by obstacles. As a consequence, man learned to beam short wave television programs from horizon to horizon. He developed parabolic transceiver reflectioning cups that took in and sent out waves in parallel beam-focused rays. At the transceiver relay stations on the horizons, additional energy is fed into the signals received and their projection power is boosted so that, when they arrive at final destination after many relayings, their fidelity and power are as yet exquisitely differentiated and clearly resonated.

It may well be that human eyes are just such infra-sized parabolic transceiver cups. It may be that our transceiver eyes adequately accommodate the extraordinarily low magnitude of energy propagating of the brain as electro-magnetic wave pattern oscillations to be picked up by others.

Early photography required whole minutes of exposure. As film chemistry improved, exposure times decreased. Yesterday, one-thousandth of a second was fast. Today's capability makes one

millionth of a second a relatively slow electro-astrophotography exposure. Pictures taken in a millionth of a second today are clearer than those of yesterday which took minutes. The scanned-out picture signals travel 700 million miles per hour. The effect in terms of man's tactile, hearing, and smelling senses is instantaneous.

Speakers who appear frequently before large audiences of human beings over a period of years have learned that the eyes of the audience "talk back" so instantaneously to them that they know just what their audiences are thinking and they can converse with their audiences, even though the speaker seems to be the only one making audible words. The feedback by eye is so swift as to give him instantaneous, spontaneous reaction and appropriate thought formulation.

The parabolic reflector-beamed, ultra-ultra high frequency, electro-magnetic waves— such as can be coped with by transceivers with the infra-diameter of the human eye— are such that they would be completely interfered with by walls or other to-us-seemingly-opaque objects. However, when they are beamed outwardly to the sky in a cloudless atmosphere, no interference occurs. Ultra short wave radio and radar beams which are interfered with by mountains and trees can be beamed into a clear sky and bounced off the moon, to be received back on Earth in approximately one and three-fourths seconds. In a like manner, it is possible that human eyes operating as transceivers, all unbeknownst to us, may be beaming our thoughts out into the great night-sky void, not even having the sun's radiation to interfere mildly with them. Such eye-beamed thoughts sent off through the inter-celestial voids might bounce off various objects at varying time periods, being reflectively re-angled to a new direction in Universe without important energy loss. A sufficient number of bouncings-off of a sufficient number of asteroids and cosmic dust could convert the beams into wide-angle sprays which diffuse their energy signals in so many angular directions as to reduce them below receptor-detection level. Eye-beamed thoughts might bounce off objects so remote as to delay their 700 million mile per hour travel back to Earth for a thousand years, ten thousand years, a hundred thousand years. It is quite possible that thoughts may be eye-beamed outwardly not only from Earth to bounce back to Earth at some later period from some celestially-mirroring object, but

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also that thoughts might be beamed— through non-interfering space to be accidentally received upon Earth— from other planets elsewhere in Universe. There is nothing in the data to suggest that the phenomenon we speak of as *intuitive thought* may not be just such remote cosmic transmissions. Intuitions come to us often with surprising lucidity and abruptness. Such intuitions often spotlight significant coincidences in a myriad of special case experiences which lead to discovery of generalized scientific principles heretofore eluding humanity's thought. These intuitions could be messages to the Earthian brain receiving it to "Look into so-and-so and so-and-so and you will find something significant." Intuitions could be thoughts dispatched from unbelievably long ago and from unbelievably far away.

As Holton wrote in the *American Journal of Physics* and as reported on the "Science" page of *Time* magazine, January 26, 1970:

To fully recognize the extraordinary intellectual daring of Einstein's equations, we note the great scientist's own explanation of their origin: "There is no logical way to the discovery of these elementary laws. There is only the way of intuition."

Because humans consist of a myriad of atoms and because atoms are themselves electro-magnetic frequency event phenomena— not things— it is theoretically possible that the complex frequencies of which humans are constituted, together with their angular inter-positioning, could be scaningly unraveled and transmitted beam-wise into the celestial void to be received some time, somewhere in Universe, having traveled at 700 million miles per hour, which is approximately 100 thousand times faster than the speed of our moon rockets a minute after blast-off. It is not theoretically impossible in terms of the total physical data that humans may have been transmitted to Earth in the past from vast distances.

Retreating from such a speculative mood, we come now to consider closer-range possibilities and probabilities. We recall that humans, who to our knowledge arrived on Earth at least two million years ago, have been regenerating aboard that small, 8000-mile diameter, Space Vehicle Earth throughout all those years without even knowing that they were aboard a space vehicle. They are now

emerging, however, from the womb of permitted ignorance of their early, subjective, taken-care-of phase and are now beginning to become comprehensively aware of all the matters we have discussed so far. They are beginning to understand that they are within a limited biosphere life-support system whose original excessively-abundant living supply was provided only to permit humanity's initial trial-and-error discovery of its anti-entropic function in Universe. Humans are coming swiftly to understand they must now consciously begin to operate their Space Vehicle Earth with total planetary cooperation, competence, and integrity. Humans are swiftly sensing that the cushioning tolerance for their initial error has become approximately exhausted.

Each child emerging from its mother's womb is entering a larger womb of total human consciousness which is continually modified and expanded by subjective experiences and objective experiments. As each successive child is born, it comes into a cosmic consciousness in which it is confronted with less misinformation than yesterday and with more reliable information than yesterday. Each child is born into a much larger womb of more intellectually competent consciousness.

I was seven years old before I saw an automobile, though living in the ambience of a large American city. Not until I was nine was the airplane invented. As a child I thought spontaneously only in terms of walking, bicycling, horse-drawn capability. Trips on railroads and steamships were dream-provokers learned of through a few older people who traveled. My daughter was born with cloth-covered-wing bi-planes in her sky and the talkie radio in her hearing. My granddaughter was born in a house with several jet transports going over every minute. She saw a thousand airplanes before she saw a bird; a thousand automobiles before a horse. To children born in 1970, trips to the moon will be as everyday an event as were trips into the big city to me when a boy. There was no radio when I was born. Television came when I was what is called "retiring age." The first Berkeley dissident students were born the year commercial television started. They have seen around the world on the hour ever since being born— they think world. The total distance covered by an average human being in a total lifetime up to the time I was born was 30,000 miles. Because of the great changes since my birth, I have

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now gone well over one hundred times that distance. The astronauts knock off three million miles in a week. The average airline hostess is out-mileaging my hundred-fold greater mileage than all the people before me. All this has happened in my lifetime. My lifetime has been one of emerging from the womb of human-being remoteness from one another to comprehensive integration of worldaround humanity. But all the customs, all the languages, all laws, all accounting systems, viewpoints, cliches, and axioms are of the old, divided, ignorant days. The corollary of "divide and conquer" is "to be divided is to be conquered." To be specialized is to be divided. The specialization which humanity perseveres in was invented by yesterday's armed conqueror illiterates. The separation of humans into more countries made them easy to manage. Nations may unite, as at present, without success. Strife is proliferating. Not until specialization and nations are dispensed with will humanity have a chance of survival. It is to be all or none.

In my first jobs before World War I, I found all the working men to have vocabularies of no more than one hundred words, more than 50 per cent of which were profane or obscene. Because I worked with them, I know that their intellects were there, but dulled and deprived of the information of visionary conceptioning. They had no way of expressing themselves other than by inflection and shock. Conquerors invented gladiatorial wrestling, self-brutalizing games, slapstick and illusionary drama to keep their illiterate masses preoccupied when not at work. This was not changed by any scheduled system of education— it was changed by the radio. The radio broadcasting employees were hired for their vocabularies and diction. The eyes and ears of human beings were able to coordinate the words of the radio and the graphic words of the newspaper. Literacy accelerated. In a half-century, worldaround man's vocabulary has been expanded to the equivalent of yesterday's scholar. Television's scientific invention and underwater and space exploration have accelerated this process of freeing humanity from its slave complex to an extraordinary degree. The young realize, as their elders do not, that humanity can do and can afford to do anything it needs to do that it knows how to do.

Those who ignorantly think of themselves as a well-to-do conservative elite are, in fact, so slave-complexed that they are shocked

when the younger generation throws aside their clothes and cars of distinction and— abandoning their make-believe mansions which only are their old conquerors' castles— congregate in hundreds of thousands in shameless, innocent bands on vast beaches and meadows. It is not an unspannable generation gap that has occurred, but an emancipation of youth from yesterday's slave-complex reflexes. This has been brought about solely by the proliferation of knowledge. "The medium is the message" is the message only of yesterday's middle-class elite. It said, "Never mind the mind. It's the body that counts." or "It's the physical that can be possessed— To hell with the metaphysical. You can possess a physical brain but not the universally free mind and its thoughts. Leave that to the intellectuals. Look out for those dangerous free thinkers." Higher education was an adornment— a mark of distinction— not something to be taken seriously. The problem of man's being born into the new womb of planetary comprehension, into the new world of integrated coordination and understanding of all humanity, is one not of educating a single absolute monarch, nor of educating either a fascistic or central party elite, nor of educating only the middle class. It is a matter of educating everyone everywhere to the realities of the emerging of man from the womb of permitted ignorance into the womb of required comprehension and competence. That education will have to be brought about by the extraordinary discarding of yesterday's inadequate amusements, shallow romances and drama, and make-believe substitute worlds to cover up the inadequacies of misinformed and underinformed, physically slavish or bureaucratically dogmatic, thoughtless life.

All the foregoing observations of human misorientations constitute but a minor fraction of those which can be truthfully and cogently made today with some chance of their not only being heard but heeded. And all this brings us all to this book by Gene Youngblood— an excellent name for one of the first of the youth who have emerged from childhood and schooling and "social experience" sufficiently undamaged to be able to cope lucidly with the problem of providing worldaround man with the most effective communication techniques for speaking universal language to universal man— for helping universal man to understand the great transitions, to understand the

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reasonableness of yesterday's only-transitional inadequacies, to understand that the oldsters are victims of yesterday's ignorance and not Machiavellian enemies of youth, to understand that any bias— one way or another— utterly vitiates competent thinking and action, to understand that 100 per cent tolerance for error of viewpoint and misbehavior of others is essential to new-era competence— and, finally, to understand that man wants to understand. Nowhere have we encountered a youth more orderly-minded regarding the most comprehensively favorable, forward functioning of humans in Scenario-Universe than in Gene Youngblood. His book *Expanded Cinema* is his own name for the forward, omni-humanity educating function of man's total communication system.

Isaac Newton, as the greatest Olympian of classical science whose influence reigned supreme until the turn of the Nineteenth into the Twentieth Century, assumed the Universe to be *normally at rest* and abnormally in motion. Einstein realized that the experimental data regarding the Brownian Movement and the speed of light made it clear that Universe was not normally at rest, for when its energies were released in a vacuumized tunnel they traveled linearly at 186 million miles per second. This he assumed to manifest its norm, since that is how Universe behaves normally when unfettered in a vacuum. Any seemingly motionless phenomena, he reasoned, such as seemingly solid matter, consisted of energy moving at 186 million miles per second but in such small local orbits that their speed and the exquisitely small, self-huddling orbit made them impenetrable; ergo, apparently solid. This was the basis of his formulation of his extraordinary $E=mc^2$, which, when fission and fusion occurred, proved his locked-up-energy formulation to be correct. The utter difference between Newton's norm of *at rest* and Einstein's norm of 186 million miles per second provides humanity's most abrupt confrontation regarding the epochal difference of conceptioning between that in the womb of yesterday's ignorance and in the womb of new-dawning awareness, from which and into which, respectively, man is now experiencing the last phases of delivery.

Thinking in terms of 700 million miles per hour as being normal— and informed by the experiments of scientists that no energies are

lost— Einstein abandoned the Newtonian thought of Universe and assumed in its place Universe to be "A scenario of non-simultaneous and only partially overlapping transformative events." Einstein's observational formulations, however, are subjective, not objective. In the mid-1930's I suggested in a book that Einstein's work would eventually affect the everyday environment of humanity, both physically and mentally. After reading what I had written, Einstein said to me, "Young man, you amaze me. I cannot conceive of anything I have ever done as having the slightest practical application." He said that to me a year before Hahn, Strassman, and Lisa Meitner had, on the basis of $E=mc^2$, discovered the theoretical possibility of fission. You can imagine Einstein's dismay when Hiroshima became the first "practical application."

Gene Youngblood's book is the most brilliant conception of the objectively *positive use* of the Scenario-Universe principle, which must be employed by humanity to synchronize its senses and its knowledge in time to ensure the continuance of that little, three-and-one-half-billion-member team of humanity now installed by evolution aboard our little Space Vehicle Earth. Gene Youngblood's book represents the most important metaphysical scenario for coping with all of the ills of educational systems based only on yesterday's Newtonian-type thinking. Youngblood's *Expanded Cinema* is the beginning of the new era educational system itself. Tomorrow's youth will employ the video cassette resources to bring in the scenario documents of all of humanity's most capable thinkers and conceivers. Only through the scenario can man possibly "house-clean" swiftly enough the conceptual resources of his spontaneous formulations. Tomorrow's Expanded Cinema University, as the word uni-verse— towards one— implies, will weld metaphysically together the world community of man by the flux of understanding and the spontaneously truthful integrity of the child.

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Inexorable Evolution and Human Ecology

Until humanity starts behaving
In logical ways
For logical reasons
Natural evolution will force it
To keep on behaving logically
For seemingly illogical reasons—
Resulting inexorably, as at present,
In humanity's backing
Rump-bumpingly into its future
While disregarding opportunities
To about-face and realize
Its inspiring passengership
Aboard Planet Earth—
As its exploratory mothership
Of ever vaster and more exquisite
Macro- and micro-cosmic realms.
And the frustrations
Of fearfully clung-to customs
Will persist unabated until
Humanity undertakes
Seriously, imaginatively,
Courageously, inspiringly
To employ effectively
The ever-more with ever less—
Of effort, material, time
And tolerance of error
Per each accomplished task
The comprehensively anticipatory
Design science revolution—
Being intent thereby
To make all of humanity
Successful in every sense.
As it undertakes design revolution

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Humanity also must realize
That it can always afford rearrangements
Of the physical environment constituents
Which produce sustainable increases
In the proportion of all of humanity
Enjoying comprehensive success—
Provided only the task
Is physically feasible
Within ecologically critical limits
Of electro-magnetics, chemistry, time.
"We cannot afford" assumes spending
Intertransforming as matter or radiation
Energy cannot be spent
Know-how always increases
Wealth multiplies irreversibly.
And not until then will nature
Cease to cope with humanity's
Ignorance-prolonged inertia
Just in the same way
That human parents
Cope with their newborns'
Innocently ignorant
Self-helplessness—
And that is by forcing man
To acquire the adequate technology
With which ultimately
To attain and sustain
That potential omni-success.
And until then it will be accomplished inversely—
Through activating humanity's
Death fearing instincts.
Fear forcing it to acquire
The adequate production-tool complex
As a consequence of inducing humanity
Into an investment and reinvestment
Of its best capabilities and resources
Only in preparation for war.
This inverse procedure will regenerate

To ever higher degree
Both the more-with-less energy processing
And its production equipment.
And when man learns, if he does
To initiate the more-with-lessing
Under peacefully purposed auspices
Peace then will be attained
And Universe sustained
But not until then.

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