

Planetary Planning

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Source: *The American Scholar*, Vol. 40, No. 1 (Winter, 1970-71), pp. 29-63

Published by: [Phi Beta Kappa Society](#)

Stable URL: <http://www.jstor.org/stable/41209819>

Accessed: 26-12-2015 09:35 UTC

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Planetary Planning

R. BUCKMINSTER FULLER

WE ARE in an age that assumes the narrowing trends of specialization to be logical, natural and desirable. Consequently, society expects all earnestly responsible communication to be crisply brief. Since advancing science has now discovered that all the known cases of biological extinction have been caused by overspecialization, where concentration only of selected genes sacrificed general adaptability, the specialist's brief for pinpointing brevity is dubious. In the meantime, humanity has been deprived of comprehensive understanding. Specialization has bred feelings of isolation, futility and confusion in individuals. It has also resulted in the individual's leaving responsibility for thinking and for social action to others. Specialization breeds biases, which ultimately aggregate as international and ideological discord, which, in turn, leads to war.

In thus opening our discourse, we are not seeking a license to ramble wordily. We are intent only upon being adequately concise. General systems science discloses the existence of minimum sets of variable factors that uniquely govern each and every system. Lack of knowledge concerning all the factors and failure to include them in our integral impose false conclusions. Let us not make that error of inadequacy in honoring Nehru's concern not only for all of humanity's history, but also for favorable use of all its options.

Nehru was so comprehensive a thinker and doer, and his influence is so ever-increasingly vast, that we cannot honor him to the degree that we wish without examining our own most

© R. BUCKMINSTER FULLER presented "Planetary Planning" as the Third Annual Jawaharlal Nehru Memorial Lecture in New Delhi on November 13, 1969. The above is part one of the lecture. Part two, a "historical philosophic background," will appear in the Spring, 1971, issue of the SCHOLAR.

comprehensive inventory of experiences and thoughts regarding the evolving affairs of all humanity.

There is an inherently minimum set of essential concepts and current information, conversance with which could lead to operating our planet Earth to the lasting satisfaction and health of all humanity. And it was to all of humanity that Jawaharlal Nehru so effectively dedicated his magnificent life. We, therefore, dedicate our memorial lecture to reviewing the spectrum of significant experiences and seeking therein the greatest meanings as well as the family of generalized principles governing the realization of their optimum significance to humanity aboard our sun-circling planet Earth.

To fulfill our pledge to Nehru, we must start with scientific fundamentals, and that means with the data of experiments and not with assumed axioms predicated only upon the misleading nature of that which only superficially seems to be obvious. It is the consensus of those who have proved themselves to be great scientists that "science is the earnest attempt to set in order the facts of experience." Holding within their definition, we define Universe as: the aggregate of all of humanity's consciously apprehended and communicated, nonsimultaneous and only partially overlapping experiences. But all experiences are terminated, ergo, finite. An aggregate of finites is finite. Our Universe as defined is finite but nonsimultaneously conceptual. The single-frame picture of a caterpillar does not foretell its transformation into a butterfly. Nor does one picture of a butterfly tell the viewer that the butterfly can fly. Universe as defined is a scenario. Those who ask, "What is outside Universe?" are asking a single-picture question, which is as ignorant as asking, "Which word is the dictionary?" Summarizing, *Universe is a finite but nonsimultaneously conceptual scenario.*

The human brain is a physical mechanism for storing, retrieving and restoring again each special case experience. The experience is often a "packaged" concept. Such packages consist of complexedly interrelated and not as yet discerned but, nonetheless, potentially experienceable phenomena. A "rose," for instance, grows, has thorns, blossoms and fragrance but often is stored in the brain only under the single word—"rose."

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As Korzybski, the founder of general semantics, pointed out, the consequence of its single tagging is that the "rose" becomes reflexively considered by man only as a red, white or pink device for paying tribute to a beautiful girl, a thoughtful hostess, or a deceased acquaintance. The tagging of the complex biological process under the single title "rose" tends to detour human curiosity from further differentiation of its integral organic operations as well as from consideration of its interecological functionings aboard our planet. We don't know what a rose is! Thus, for long have we inadvertently deferred potential discovery of the essential roles in Universe that are performed complementarily by many, if not most, of the phenomena we experience. But, goaded by youth, we older ones now are taking "second looks" at almost everything. And that promises many, ultimately favorable, surprises. The oldsters do have vast experience banks, not available to the youth; integrated and reviewed, their memory banks may readily disclose generalized principles of eminent importance.

The word "generalization" in literature usually means covering too much territory too thinly to be persuasive, let alone convincing. In *science*, however, a *generalization* means a principle that has been found to *hold true in every special case experience*.

The principle of leverage is a scientific generalization. It makes no difference of what material either the fulcrum or lever consists—wood, steel, reinforced concrete. Nor do the sizes of the lever and fulcrum in any way alter either the principle or the mathematical regularity of the ratios of physical work advantage, which are provided at progressive, fulcrum-to-load increments of distance, outward from the fulcrum in the opposite direction, along the lever's arm to where the operating effort is applied.

Mind is the weightless and uniquely human faculty that surveys the ever-larger inventory of special case experiences stored in the brain bank and that, seeking to identify their intercomplementary significance, from time to time discovers one of the rare scientifically generalizable principles running consistently throughout all the relevant experience set. The thoughts that discover

these principles are *weightless* and *tentative* but may also be *eternal*. They suggest eternity but do not prove it, even though there have been no experiences thus far that imply exceptions to their persistence. It seems also to follow that the more experiences we have, the more chances there are that mind may discover, on the one hand, additional generalized principles or, on the other hand, exceptions that disqualify one or another of the already catalogued principles, which, having heretofore held "true" without contradiction for a long time, had been tentatively conceded to be demonstrating *eternal persistence* of behavior. Mind's relentless reviewing of the comprehensive brain-banks' storage of all our special case experiences tends both to progressive enlargement and to refinement of the catalogue of generalized principles that interaccommodatively govern all transactions of Universe.

It follows that the more specialized society becomes, the less attention does it pay to the discoveries of the mind, which are intuitively beamed toward the brain, there to be received only if the switches are "on." Specialization tends to shut off the wide band tuning searches and thus to preclude further discovery of the all-powerful generalized principles. Again, we see how society's perverse fixation on specialization leads to its extinction. We are so specialized that one man discovers empirically how to release the energy of the atom, while another unbeknownst to him is ordered by his political factotum to make an atomic bomb by use of the secretly and anonymously published data. That gives much expedient employment, which solves the politicians' momentary problem but requires that the politicians keep on preparing for further warring with other political states to keep their respective peoples employed—assuming that employment is the only means by which humans can both earn the right to live and know how much wealth is available for distribution. All this is rationalized on the now scientifically discredited premise that there never can be enough life support for all. Thus, humanity's specialization leads only toward warring with such devastating tools, visible and invisible, as ultimately to destroy all Earthians.

Only a comprehensive switch from the narrowing specializa-

tion and toward an evermore inclusive and refining comprehension by all humanity—regarding all the factors governing omnicontinuing life aboard our spaceship Earth—can bring about reorientation from the self-extinction-bound human trending, and do so within the critical time remaining before we have passed the point of chemical process irretrievability.

Quite clearly, our task is predominantly metaphysical—for it is: how to get all of humanity to educate itself swiftly enough to generate spontaneous social behaviors that will avoid extinction?

Living upon the *threshold* between yesterday and tomorrow, which threshold we reflexively assumed in some long ago yesterday to constitute an eternal *now*, we are aware of the daily occurring, vast multiplication of experience-generated information by which we potentially may improve our understanding of our yesterdays' experiences and therefrom derive our most farsighted preparedness for successive tomorrows.

Out of such reconsiderations, leading, we hope, to a better understanding of Universe, has come, for instance, our recent years' physical discovery that all of our experiences are periodically terminated. The terminations characterize the physical and the metaphysical aspects of both our observing faculties and the observed phenomena. There are no experimentally known continuums. Physics has found no solids. We have only *awake* or *asleep*—*experience* and *nonexperience*—occurrence durations and nonoccurrence intervals—only discrete and very fundamental quanta—that is, unique and discrete *packages* of either *energy* or *thought*, on the one hand, and nonenergy or nonthought, on the other hand. All of these are as uniquely differentiable and separable from one another as are the individual stars of the Milky Way.

There are no specific directions or localities in Universe that may be opposingly designated as *UP* or *DOWN*. In their place we must use the words *OUT* and *IN*. We move in toward various individual masses or we move out from them. But the words *IN* and *OUT* are not mirror-image opposites. *IN* is in respect to individual experience focuses—*OUT* is common to all. *IN* is discrete. *OUT* is general. The *IN*'s are discontinuous. The

OUT's are continuous. OUT is nothingness, nonexperience. Only the nonexperience nothingness infers a continuum. The nonevent continuum is the NOVENT. Inferentially, the NOVENT continuum permeates the finitely populated withinness and comprises the finite NOVENT WITHOUTNESS. The rubber glove stripped inside-out from the left hand now fits only the right hand. First, the left hand was conceptual and the right hand was nonconceptual—then the process of stripping off inside-out seemingly *annihilated* the left hand and *created* the right hand—then vice versa as the next strip-off occurred. When physics finds experimentally that a unique energy patterning—erroneously referred to in archaic terms as a particle—is annihilated, that annihilation is only of the rubber glove kind. The positive becomes the negative and the positive only seems to have been annihilated. We begin to realize conceptually the finite, yet nonsensorial, out-ness that can be converted into sensorial in-ness by the inside-outing process. Ergo, NOVENT is the finite but nonsensorial continuum. Sensoriality is a corporeally external phenomenon—reportedly relayed inwardly to the brain and therein imaginatively scanned by the mind, which conceptualizes independently in generalized formulations—for example, a nuclear grouping around a nucleus is conceptualized quite independently of size. Size and intensity are sensorial comparing functions of the special case experiences by brain and not by mind. Mind is concerned only with principles that hold true independently of size yet govern the relative size relationships.

Theoretically, a flat surface is infinitely extensible laterally, that is, in all diametric planar directions. As a laterally unbounded, or infinitely open, extensibility, the theoretical flat plane is only partially definable. That which is definable of the plane forbids its returning upon itself.

A system is the first subdivision of Universe. It divides all the Universe into three parts: first—all of the Universe outside the system, second—all of the Universe within the system, and third—the small remainder of Universe components that constitute the system considered. A system is an enclosure consisting of a conceptual aggregate of recalled experience items, or events, having inherent insideness and outsideness. A system is the anti-

thesis of nonsystem, which latter lacks omnidirectional definition. Nonsystems such as theoretical planes or straight lines cannot be found experimentally. We are scientifically bound to experimentally demonstrable systems thinking. All systems are subject to comprehension and can be coped with systematically.

General systems theory deals with phenomena that are holistically comprehensible. The objects of our experience are finite systems. Their superficial outline closes back upon itself multidirectionally as a systematic continuity of relevantly contiguous events. They are thus separable from other systems. There are systems comprised of systems.

Typical of all finitely conceptual objects or systems is the tiger's skin. It can be pierced and slotted open and, thereafter, by enlarging the slotted hole by gashes in various directions, the skin can be peeled off all in one piece. It can be made to lie out flat by making a lunar gash from the skin's edge into any remaining domical area of the skin. The slitting of a paper cone from its circular edge to its apex allows the paper to be laid out as a flat "fan," intruded by an angular sinus. A sinus is an angle. Sinus means in Latin "a withoutness"—an opening out—having nothing between convergent edges. The surface contour of every object or system—be it a complex creature such as a crocodile, or a simple cube or a dodecahedron—can thus be "skinned" and laid out in the flat. It will be discovered that the sum of the angles of all the sinuses of any system opened to allow it to be stretched out flat is always 720 degrees. This is to say that the difference between open and closed systems is always 720 degrees. The sum of the angles of all the corners of one tetrahedron also is always 720 degrees. A tetrahedron is a triangularly faceted polyhedron of four faces. It is unique as a system, for it is the minimum possible system.

A necklace is unstable. The length of the beads in the necklace does not change. Only the angles between them change. Stable refers only to angular invariability. By structure we mean self-stabilizing. The triangle is the only self-stabilizing polygon. The tetrahedron is the minimum structural system, for we cannot find an enclosure of less than four sides—which is also to say, of less than 720 degrees of interior (or exterior) angle interaction.

The tetrahedron is a vectorial model of one quantum of energy. The tetrahedron is the basic structural system of Universe.

An angle is a central sinus fraction of circular unity—the opening in a circular birthday cake, when a triangular wedge is cut out radially from its center. Circular unity is conventionally divided into 360 degrees. The size of an angular sinus is independent of the length of the radius of the circle. An angle's size is not affected by the length of the edges between which it occurs. A triangle is a triangle independently of its edge-sizing, as is the tetrahedron independent of edge lengths or of its relative volume. In tetrahedrons of any size, the angles are always sum-totally 720 degrees. Tetrahedrons always have six edges, four faces and four vertices.

We can say that the difference between any conceptual system and total but nonsimultaneously conceptual—and, of course, nonsimultaneously sensorial—scenario Universe is always one tetrahedron of whatever size may be necessary to account for the balance of all the finite quanta thus far accounted for in scenario Universe, outside the conceptual system considered.

The invisible and n-sized tetrahedron, which complements all systems to aggregate as finite but nonsimultaneously conceptual scenario Universe, is mathematically analogous to the annihilated left-hand phase of the rubber glove during the right-handed occupation of the glove. We now can say, scientifically, that the difference between the sensorial, special case, conceptually measurable, finite, separately experienced system and the balance of the nonconceptual scenario Universe is one finitely conceptual, but nonsensorial, tetrahedron.

We can say that scenario Universe is finite because, although nonsimultaneously conceptual and considerable, it is the sum of the conceptually finite, afterimage furnished thoughts of our experience systems plus one finite but invisible n-sized tetrahedron.

This scientific realization permits our general systems capability to be applied comprehensively to our Nehru dedicated search for adequate understanding and reliable technoscientific support of humanity's essential functioning in Universe. It also provides the scientific, computerized means for determining and

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employing the most effective technological strategies and priority systems for the most feasible realization of the human function support.

As a consequence of all the foregoing, we also no longer can overlook the fact that science has found no solids, no continuous surfaces, no infinity, no straight lines, no 180 degree angular continuums. To the best of our experimentally informed knowledge, *all* such formerly accepted axiomatic concepts are false. Axiomatic means "self-evident." This seemingly obvious quality of most of yesterday's axioms was permitted only by the lack of knowledge of that which would be disclosed by microscopic inspection. We must desist from further imposition of such pre-microscope-telescope assumed, but now knowledgeably false, premises upon our children. We have been tolerating the fictions only because they were included in yesterday's textbooks, which we say, also ignorantly, we cannot afford to replace. The time has come, and there is little of it left within which to effect entirely new, world-around, educational strategies.

As taught in the late twentieth century, geometry commences with plane geometry. This is because geometry was conceived and methodically formulated in history during the early times when humanity envisioned the world as a mountained and valleyed island floating upon an infinitely deep, watery plane that extended laterally in all horizontal directions to infinity. Above everywhere was the sky. But the experience of remotely converging lines of perspective suggested reflexively to man that an optical aberration existed, whereby, although you could not see that far, all the upward-bound parallel lines, perpendicular to Earth, must ultimately converge, as do all parallels receding from where one stands. The parallel up-lines were assumed to converge in Heaven—a haven—a sky harbor. (Until the twentieth century, individuals within their respective entire lifetimes saw less than a millionth of the total surface of our spherical space-vehicle Earth.) All the foregoing conceptioning is so logical that, despite theoretical knowledge to the contrary and despite their quick denial of such misconceptions, approximately all humans as yet "see" the world in that image. Witness that they all use the words "UP" and "DOWN"; speak about "getting down to Earth,"

"the four corners of the Earth"; "the wide-wide world"; and always spell Earth with a small "e" because it is simply the stuff under our feet "down here," which stretches away laterally to infinity.

It is not surprising that we continue now to start our children's geometry—meaning "world measuring"—with *plane* geometry. This, however, is intellectually devastating and constitutes the parting of the ways, with one road leading into the scholar's "pure" mathematics and the other continuing as the reality, which disagrees with all that is found by physics, mathematics and chemistry to be the natural orderliness of Universe. The "practical" man who was disgruntled by the awkward misconceptions of mathematics is one who is so dull as not to be bothered by the measurable discrepancies and keeps on "brilliantly and courageously" doing all the shortsighted, expedient "things" that, applauded by the most powerfully advantaged selfists, are swiftly consigning man to extinction, as "unfit" for survival in the vast reality of the Universe of weightless, invisible, omniinteraccommodative, generalized principles, which are forever faithfully governing electromagnetic, wave-frequency-radiating propagations and mass attraction's concentricity, the integrity of which has to a great degree become understandable by humanity's metaphysically comprehending mind.

Foremost of the debilitating effects of predicating all the students' conceptually calculable logic upon a plane geometry foundation is the spontaneous persuasion of the reasonableness of forthright bias that it engenders. Thus, for instance, *loyalty*—which is powerfully one-sided—has come to be rated as a *noble attribute*. Loyalty can take outright lies in its stride. It thinks nothing of defending a fallacy. How does that all come about? Prove your contention. All right! All the entities and conceptual formulations of plane geometry commence as follows:

"A triangle is an *area bound by a closed line* consisting of three edges and three angles. A circle is an *area bound by a closed line* everywhere equidistant from a point." "*Areas bound by closed lines*" are the essence of plane geometry. Only that which is bound by a closed line is *definable*, valid, calculable and useful. Why is this so? Because the plane *outside* the bound area leads in all lateral directions away to

infinity—and, therefore, is *undefinable*. On the *inside* of the boundary line was *definability*—finitude; on the *outside* was only *undefinability*—infinity. The IN's were reliable, the OUT's were dangerously unpredictable, *et cetera*.

Only the phenomenon on one side of the line was valid. So there is your taught-in bias of all the world-around's schooled society. The outlaws and the inlaws. I am okay, You? My family *in*—Yours *out*—Our town, “the damned foreigners,” *et cetera*. Now we at least know theoretically that both sides of the lines are valid. How do we know that mathematically?

We have already learned how. Starting with finite but non-unitarily conceptual scenario Universe, we could divide Universe into three parts: (1) all the outsideness, (2) all the insideness, (3) the system itself that subdivides the first two. We have also learned that one such system plus one conceptual, but nonsensorial, tetrahedron together account for all Universe—the imaginary but finite tetrahedron itself having an insideness and an outsideness. The surface of any system is finite—that is, it returns upon itself. Our Earth sphere is a system. The surface of any system such as the Earth is finite. It is closed back upon itself—like the tiger's skin remounted around its stuffing, which, incidentally, closes “out” all the sinuses of the skin's opened edge—and thereby discards the 720 degrees of angle, which 720 degrees is one abstract tetrahedron and accounts for the difference between a flat plane and a finite but nonunitarily tangible Universe.

If we draw a closed line such as a circle around our Earth, it must divide its total unit surface into two areas as the equator divides our Earth into Southern and Northern hemispheres. If we draw a lesser-sized circle on the Earth, such as the circle of North latitude 70 degrees, it divides our Earth's total surface into a very large southern area and a relatively small northern area. If we go outdoors and draw a circle on the ground, it will divide the whole area of our planet Earth into two areas and one will be *very* small and the other *very* large. If our little circle has an area of one square foot, the big circle has an area of approximately five quadrillion square feet, because our eight-thousand mile diameter Earth has an approximately 200,000,000 (two-hundred million) square mile surface and each square mile has approxi-

mately 25,000,000 (twenty-five million) square feet, which multiplied gives a five followed by fifteen zeros, 5,000,000,000,000,000 square feet; this is written by the scientists as 5×10^{15} square feet, which, while compact, tends deliberately to disconnect from our senses. Scientists have been forced to disconnect from our senses due to the errors of our senses, which we are now able to rectify. As we reconnect our senses with the reality of Universe, we begin to regain competent thinking by humans and thereby possibly their continuance in Universe as competently functioning team members—members of the varsity or University team of Universe. If, instead of drawing a little one square foot circle on the ground—which means on the surface of spherical Earth—we were to draw a square one foot on each side, this would give us the same sized local area as before—one square foot. A square, as defined by Euclid, is “an area bound by a closed line of four equal length edges and four equal and identical angles.” By this definition our little square one foot to a side, which we have drawn on the ground, is a closed line of four equal edges and equal angles. But this divides all the Earth’s surface into two areas, both of which are equally bound by four equal length edges and four equal angles. Therefore, we have two squares: one local little one and one enormous one. And the little one’s corners are approximately 90 degrees each, which makes the big square’s corners 270 degrees each. While you are not familiar with such thinking, you are confronted with a physical experiment’s results, which have informed you that you have been laboring under many debilitating illusions.

If you make your small square a little bigger and your bigger one a little smaller by increasing the little one’s edges to one mile each, you will have a local one square mile—a customary unit of measuring ranches in the western United States—and the big square will be approximately 199,000,000 square miles. As you do so, using great circle lines, which are the shortest distances on a sphere between any two points, to draw the squares’ edges you will find the small square’s corner angles are increasing and the big one’s corners are decreasing. If you now make your small square so that its area is one-half that of Earth’s 200,000,000 square miles, in order to have all your edges the same and all your angles

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the same you will find that each of your edges is approximately six thousand miles long and that each of the corners of both squares are 180 degrees. That is to say, the edges of both squares lie along the Earth's equator so that the areas of both are approximately 100,000,000 square miles.

And so it would go with a triangle, a pentagon, an octagon or any other equiedged closed line figure that you may draw on any system's surface. The closed line surface figure will always and only divide the whole area into two complementary areas.

That each human, thus discovering this experimentally, says spontaneously: "I didn't mean to make the big triangle or the big square, or, indeed, the big mess of pollution," in no way alters these truths of Universe. We are all equally responsible not only for the big complementary surface areas that we develop on systems by our every act, but also for the finite, complementary outward tetrahedron automatically complementing and enclosing each system that we devise. We are inherently responsible for the complementary transformation of Universe, inwardly, outwardly and all around every system that we alter.

Thinking of Universe only as an infinitely extensive plane, humanity felt itself logically justified in throwing away its refuse outside the boundaries of its particular domain—there was infinity into which all pollution would be ultimately dissipated to infinite innocuousness. It means nothing to dump a teacup into an infinite ocean. If there is an infinitely extended world, then we may assume that when we exhaust the present familiar resources, we will, as in the past, keep on finding new and better alternate resources, ad infinitum. So why should we worry and be fussy? Never mind about tomorrow. Never mind about the other fellow. The more ruthlessly selfish one is, the better off is one and all one's descendants.

So the difference between both closed system surfaces and a closed Universe in respect to the utterly open, infinite flat slab world concept with which man has been ignorantly rationalizing all past experience is the "similar difference" between humanity's extinction or its continuation upon this beautifully equipped and provisioned, closed system, space-vehicle Earth. It is clearly to be UTOPIA or OBLIVION—and no half measures. We must begin

today to expose our youth and ourselves to the fundamental self-discipline conceptioning that is the only real educational process.

Vectors are spearlike lines representing the integrated velocities, directions and masses of the total aggregate of nonredundant forces operating complexedly within a given energy event as the latter transpires within a generalized environment of other experiences whose angular orientations and interdistance relationships are known.

Engineering holds that the prime difference between the point of view of laymen and engineers is that the laymen do not recognize, anticipate and pay heed, as do engineers, to the experimentally demonstrable fact that every action always has an equal and opposite reaction. But the engineers have not modernized their concept to accommodate and adjust refiningly to two of the scientists' recent physical discoveries and measurements: first, of light's speed—as well as speed of all electromagnetically propagated radiation, and, second, the phenomenon known as precession. The approximately one billion kilometers per hour speed of all radiation being too fast for human sense apprehensibility, the engineers have not yet been constrained to recognize, as must the physicist, that there is no *instant universe*, as was misassumed by all pre-twentieth-century scientific cosmologies and cosmogonies, before the knowledge that light had indeed a speed. Engineering must now acknowledge realistically and accommodate analytically the experimentally demonstrable fact that every action has not only a reaction but also a nonsimultaneous but immediately subsequent resultant. This means that every physical event in nonsimultaneous scenario Universe is characterized by three, multidimensionally interlinked vectors, which interact at angles other than 180 azimuthal degrees to one another as in the multidimensional, helically zig-zagging pattern of lighting.

The physicists now assume that there never could have been a universal condition of chaos, for a basic orderliness of universe is provided by the always coexisting proton and neutron, which, although complexedly intertransformable, are not mirror images of one another, nor are they of equal mass or weight. As vectors, the protons and neutrons, being energy events, both have *reaction*

and *resultant vectors*, which, due to precession, are never 180 degrees angular diversions of the actions. Each set of three vectors looks like a Z. The *proton's* vector group, with its *electron* and *anti-neutrino*, and the *neutron's* group, with its *positron* and *neutrino*, are each called *one-half Planck's constant*, or *one-half spin*; or *one-half of an energy quantum*. When we bring together these two sets of three vectors each, they integrate as *six vectors* and make *one unit of quantum* and coincidentally also make *one tetrahedron* (of six vector edges). The tetrahedron is veritably *the conceptual unit of one energy quantum*.

Isotropic means "*Everywhere the same.*"

A *matrix* is an inter patterning of multidimensional events, such as a bee's honeycomb, or a candy-colored popcorn ball.

An *Isotropic Vector Matrix* is one in which all the forces are interacting everywhere equally in respect both to their (velocity $\times$ mass), linear magnitudes and to their relative angular direction interactions; wherefore all the lines must be of equal length and all their terminal interanglings must be the same.

In an isotropic vector matrix it will be discovered that there are only two clear-space polyhedra described internally by the configuration of interacting lines—these two clear space polyhedra are the regular *tetrahedron* and the regular *octahedron*. But all other regular symmetrical polyhedra known are described repetitiously by compounding rational fraction elements of the tetrahedron and octahedron. These elements are known as the A and B particles. They each have a volume of one-twenty-fourth of a tetrahedron. It will be discovered also that all the polygons formed by the interacting vectors consist entirely of equilateral triangles and squares—the latter occurring as the cross sections of the octahedra, and the triangles as the external facets of both the tetrahedra and octahedra.

Because all the vectors of this multidimensional matrix are "everywhere the same," the vertexes of the system are equidistant from one another. Each vertex can be the center of an identical diameter sphere whose diameter is equal to the uniform vectors' length. Each sphere will be tangent to the spheres surrounding it. The points of tangency are always at the mid-vectors. Because of

the omniequiangular intertriangulating, the omnitantental aggregating of identical size spheres constitutes what the physicist terms *closest packing of spheres*, and this closest packing characterizes all crystalline assemblages of atoms. All the crystals coincide with the set of all the polyhedra permitted by the complex configurations of the isotropic matrix. These closest-packed triangular sphere-assemblages find each single sphere surrounded by twelve others. The centers of the twelve spheres and the surrounded sphere altogether describe four planar hexagons, symmetrically surrounding each sphere's center. The second layering of closest-packed spheres consists of 42 spheres and the third layer consists of 92 spheres. The order of successively enclosing layers will be 162 spheres—252 spheres, *et cetera*. It will be noted that each layer has an excess of two diametrically positioned spheres that describe the successive poles of 25 alternate neutral axes of spin of the nuclear group. Thus we discover that the number of spheres in each successive nucleus enclosing layer or shell will always be *two*, plus the *second power* of the *frequency* of modular subdivision of the concentric, hexagon-sectioned, isotropic-vector-matrix system, multiplied by *ten*. This may be written as $10 f^2 + 2$ (f = frequency). It will also be discovered that the third layer of 92 spheres contains 8 new potential nuclei, which, however, do not become active nuclei until each has three more layers surrounding it, three layers being unique to each nucleus. This tells us that the nuclear group with 92 spheres in its outer or third layer is the limit of unique, closest-packed assemblage of unit-wavelength and frequency, nuclear symmetry systems. This is impressive, for the system's three layers of 12, 42, 92 add to 146, which is the number of neutrons in Uranium—which has the highest nucleon population of all the self-regenerative chemical elements—and whose 146 neutrons added to the 92 unengaged, mass-attracting protons of the outer layer give the predominant Uranium 238 from whose outer layer the excess 2 of each layer, which functions as a neutral axis of spin, can be disengaged, leaving the chain-reacting Uranium 236.

The polyhedral shape of these nuclear assemblages of closest-packed spheres, reliably interpositioned by the isotropic vector matrix's vertexes, is always that of the vector equilibrium (or cubo-octahedron), having always six square faces and eight triangular

faces. They are vector-equilibrium models because their explosive and implosive forces are always equal, as is shown by their four-dimensional hexagonal cross sections, whose radial and circumferential vectors balance. Nature never pauses her cycling at the equilibrium phase. She always closes her transformative cycles at the maximum positive or negative asymmetry stages. See the delicate crystal asymmetry in nature.

If the geometric *volume* of *one of the uniform tetrahedra*, delineated internally by the lines of such isotropic-vector-matrix systems, is taken as *volumetric unity* for assessing the respective volumes of the plurality of different equiedged, geometrically delineable polyhedra, symmetrically and repetitively permitted within the matrix, it will be found that the exact volume of the octahedron is 4, and the cube is 3; the rhombic dodecahedron is 6, Lord Kelvin's tetraxideca is 96, *et cetera*, and *the vector equilibrium's volume is always frequency to the third power times 20*. When the vector equilibrium's frequency is one (or radiationally inactive), its volume is $20 \times 1^3 = 20$.

This omniradiational isotropic-vector-system accounting shows a set of values corresponding to the omnirational quantation of all of chemistry's associative or disassociative events. It also shows that the vector equilibrium—consisting basically of twenty tetrahedral quanta—is at once the concentric, push-pull interchange, vectorial phase, or zone, of neutral-resonance, which occurs between outwardly pushing *wave-propagation* and inwardly pulling *gravitational coherence*.

When, as in our school-taught geometry, the square and the cube are assumed to be almost exclusively rational, other geometrical forms are "interesting" but awkward because volumetrically irrational. For when the cube is taken as unity and its volume is one, the volume of the tetrahedron is $.1179\alpha$; the octahedron is $.4714\alpha$; the rhombic dodecahedron is $.7042\alpha$; and the vector equilibrium is 2.3574α . For this reason—despite Plato's "solids," Archimedes' polyhedra, Euler's topology and Coxeter's comprehensive geometrical inventory—the rationally valued hierarchy of logically interrelated symmetrical polyhedra based on the tetrahedron as unity and their intimate role in the physical world was utterly overlooked until 1917 when I started exploring in the

terms of the vector-edged tetrahedron as being the simplest structural system. In the same year I concluded that nature had no separate departments of physics, chemistry, geology, biology and mathematics. I decided that she had only one department and one coordinate system. Then my search for nature's own most economically integrated, comprehensive, coordinate system began thirty years ago to disclose the omnirational relationships I have presented here. I concluded that I was not important enough to have caused nature to secrete these elegant omnirational, omninterrelationships within her cosmic scheme just to trap me into foolishly thinking them to be significant and worthy of general adoption by humanity as its prime mensuration system. In this system, society will have to learn that n^2 stands for n "triangled" and *not* "squared"; and that n^3 is n "tetrahedroned" and *not* "cubed." I call this comprehensively rational coordinate system ENERGETIC-SYNERGETIC GEOMETRY.

In En-Syn geometry the vector equilibrium's mass value of 20 shows why nature requires that the cube's volumetric value of three be multiplied by Planck's empirically discovered but heretofore scientifically inexplicable constant $6.665 \rightarrow ?$ to correct for the mistaken assumption by both mathematics and physics that the cube's volume was nature's logical volume of one—instead of its actual volume of three, in nature's most economical system of both physical and metaphysical accounting. The physicists find that nature is always "most economical." Planck's empirical constant of correction was also required to remedy the mistaken assumption by physics that the cube of one centimeter to the edge, filled with water at 4 degrees centigrade (as the unity of X, Y, Z; 90 degree coordinated, gram, second system) was also suitable as the basic unit of energy for computing radiational propagation. The 6.6 radiational constant correction of the mistakenly assumed suitability of the cube, and its conversion thereby to the value of the vector equilibrium's base 20, also required the further 10^{-27} reduction in size to reduce the gram of water's reference size to a photon's energy magnitude. The closest-packed sphere layers of the vector equilibrium account for the nonsolid proton-quantation of the wave's outer layer value of frequency (or velocity) to the second power, as required by Einstein's c^2 of his equation $e = mc^2$

and eliminates the necessity to consider the second power as characterizing *continuous* surfaces of systems.

The vector equilibrium's surface sphere growth rate of the second power also accommodates Newton's discovery of gravitation's mass attraction as being governed by the second power of the relative proximities of the masses, expressed in the terms of their respective radii (or modular frequency). The gravitational constant also requires the 6.66 ± 1 correction of its gram cube base to conform it to the vector equilibrium, and requires a 10^{-8} reduction of size to conform to the electron volt magnitude of energy.

The many mildly differing values empirically arrived at for both Planck's constant and for the gravitational constant seem to indicate that the radiational constant is just a little less than $6.666 \propto$ and that the gravitational constant is complementarily just a little bit greater than $6.666 \propto$.

When a century ago electromagnetics introduced completely invisible energy behaviors, scientists were unable to explain their discoveries conceptually to the news reporters to humanity. When experiments in electromagnetics disclosed energy behaviors of n^4 and n^5 , the scientists concluded that our X, Y, Z geometrical coordinate system's inability to provide a conceptual model of more than n^3 or three dimensionality suggested that nature's fourth and fifth dimensions needed no models because they said nature was using only mathematically abstract formulations. Now energetic-synergetic geometry's disclosure that nature is coordinating with the tetrahedron as volumetric unity, which uses only one-third the volume of space employed by the cube, it becomes possible to make fourth- and fifth-dimensional models. Thus conceptuality returns to reunite the language and fundamental understanding of the sciences and humanities.

I am presenting, as an appendix, a chart of the hierarchy of rational vectorial-geometric relationships that characterize general systems discovery of the tetrahedron as the basic structural unit of physical Universe quantation.

This hierarchy of vectorial geometry correlates rationally Euler's topology, Kepler's Third Law and Newton's theory of gravity, Willard Gibb's Phase Rule, Einstein's $e=mc^2$, and explains the necessity to employ Planck's Constant $h=\text{gram cm}^2/\text{sec}$

$\times 6.6 \times 10^{-27}$ and the Gravitational Constant's gram cm/sec $\times 6.6 \times 10^{-8}$ to convert the arbitrary XYZ; the centimeter-gram-second mensuration system was adopted by science to bring these calculations into agreement with the experimentally disclosed values of micro-macro, electromagnetic physical Universe realities which we now find experimentally to be coordinate rationally with the isotropic vector matrix as was always implicit in the omnirationality of all chemical associating and disassociating.

Although our social sciences have been earnestly seeking generalized principles that might give them the insights and design virtuosity enjoyed by physics, chemistry, *et al.*, they have until now had no important success. The reason we have introduced the general systems' vectorial geometry here is because it provides the connection between social and physical science. It opens the doors to powerful planning.

The number of telephone lines necessary to interequip various numbers of individuals so that any two individuals will always have their unique private telephone line is always $(n^2-n)/2$, where n is the number of telephones. This is to say that all the special interrelationships of all experiences—comprehension of which would be the key to what we call complete understanding of “what everything is all about”—is always $(n^2-n)/2$.

$(n^2-n)/2$ is also the number of balls in a triangular grouping such as that of pool balls grouped for the “break”: in the top row we have one ball, in the second row two, in the third row three, in the fourth row four.

The sum total of balls in the triangular group will always be $(r+1)^2-(r+1)/2$, where r is the number of rows of balls, or the number of balls in the longest row.

We can stack such successively rowed triangular groups of balls, with one ball at the top, three below that, and six below that as cannon balls or oranges are stacked. Such stacks are always inherently tetrahedral. We can say that the sum of all the interrelationships of all our successive experiences from birth to now, for each individual, as well as for the history of all humanity, is always a tetrahedral number.

Pursuing this tetrahedral quantation further, we find that the sum of the angles around all the surface vertexes of any system

—from those of the complex surfaced crocodile to that of the symmetrically chorded interactions of all the surface atoms of a ping-pong ball—will always be a number evenly divisible by 720 degrees. And 720 degrees is the unique angular description of one tetrahedron.

Thus we see both the rational energy quantum of physics and the topological tetrahedron of the isotropic vector matrix rationally accounting all physical and metaphysical systems.

Social relationships must follow these laws but at a complex level. Social behaviors must follow all the generalized scientific principles, such as those of *synergy* and *precession*. Because precession imposes angles other than 180 degrees upon all interactions of all moving systems of the universe, there are no straight lines demonstrated in nature. The fundamental wave behavior of all nature is a consequence of the omniintereffective precession. Most of our social undertakings try to analyze subjectively and to objectively persuade individuals to move in 180 degrees or straight-line paths. Such attempts are inherently futile. When society recognizes realistically that everything moves in an angular wave patterning, society will be able to accommodate its behavior in a more realistic and satisfactory manner. Democracy's right-left pulsations are imposed by nature's wave behavior. When society comprehends the omnirational, isotropic-vector-matrix, 60 degree angle coordinate system, which we have just identified, it may then be able to emulate the behavior of the masters of sailing ships and learn how to beat, which means angling first left and then right 45 degrees off the course leading directly into the wind, in order to accomplish distances in the direction from which the wind moves. Society finds it easy to sail with the wind, but has demonstrated a lesser capability in negotiating windward passages. To sail with the wind is to yield to evolutionary forces. To sail into the wind is to master forces. Anticipating, cooperating with and employing the forces of nature can only be accomplished by the mind. The wisdom manifest in the omniinterorderliness of the family of generalized principles operative in Universe can only be employed by the highest integrity of engagement of the mind's metaphysical intuiting and formulating capabilities.

We are able to assert that this rationally coordinating system

bridge has been established between the science and humanities because we have made adequate experimental testing of it in a computerized world-resource-use exploration system which, by virtue of the proper inclusion of all the parameters—as guaranteed by the synergetic start with Universe and progressive differentiation out of all the parts—has demonstrated a number of alternate ways in which it is eminently feasible to provide not only full life support of all humans but also to permit all humans' individual enjoyment of all the Earth without anyone profiting at the expense of another and without any individuals interfering with others. We call this computerized assimilation of world resource uses The World Game.

While it takes but meager search to discover that many well-known concepts are false, it takes considerable search and even more careful examination of one's own personal experiences—and inadvertently spontaneous reflexing—to discover that there are many popularly and even professionally unknown yet nonetheless *fundamental* concepts that already have been discovered, by as yet obscure individuals, to hold true in all known cases. That is to say, many scientific generalizations have been discovered but have not come to the attention of what we call the educated world at large, thereafter to be incorporated tardily within the formal educational processes and even more tardily in the going political-economic affairs of everyday life. Knowledge of the existence and comprehensive significance of these as yet popularly unrecognized natural laws often is requisite to the solution of many of the as yet unsolved problems now confronting society. Lack of knowledge of the solution's existence often leaves humanity confounded when it need not be.

One of the least popularly known but highly valid members of our tentatively acknowledged *family of generalized principles* is the phenomenon *synergy*.

We describe synergy as *the behavior of whole systems unpredicted by the behavior of any of its separate parts or subassemblies of its parts*. If two massive spheres (A) and (B) of equal weight and diameter are suspended at a moderate distance apart, and both the distances between the points of suspension and between the centers of gravity of the two spheres are measured, it is found that the

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distance between the spheres' respective centers of gravity is less than the distance between the points of support and that the lesser distance between their gravity centers is even less than that which is caused by the fact that both are being pulled toward the same center of gravity of planet Earth. If sphere (A) is then moved and rehung from a point halfway between its first point of suspension and the point of suspension of (B), it will be discovered that the spheres (A) and (B) now hang even closer to each other than one-half the difference between their previously positioned centers of gravity. This phenomenon was first noted by Kepler. Newton showed that *halving* the distance between such masses four-folded their *mass attraction* for each other. This is to say that their attraction for each other increases as the second power of the rate of increase of their proximity to each other—halve the distance and the interattraction is four-folded. It explains Galileo's accelerating acceleration of falling bodies. There is nothing in the separate behaviors or in the dimensional or chemical characteristics of *any one such single massive entity*, that by itself suggests that it will not only attract but also be attracted by another neighboring massive entity. The behavior of the two together is unpredicted by either one by itself. There is nothing that a single massive sphere will or can ever do by itself that says it will both exert and yield attractively with a neighboring massive sphere. That is synergy.

Take three equiedged triangles, stack them together edge to edge as a three-sided tent. Inadvertently you have produced a fourth equiedged triangle at their base. Altogether they form a tetrahedron. This is synergy. One plus two equals four. Take one away from the four and only two remain. The one that was lost was annihilated.

Here is another synergy confirming instance: the tensile strength of chrome-nickel-steel is 350,000 pounds per square inch. This is 100,000 pounds stronger than 250,000 pounds per square inch, which is the sum of the tensile strengths of each and all of chrome-nickel-steel's constituent metals, which are: nickel 80,000 pounds per square inch, chromium 70,000, iron 60,000, while the sum of the minor ingredients—carbon, manganese, *et al.*—is 40,000 p.s.i. The augmented coherence of the whole chrome-nickel-steel alloy is accounted for only by the complex intermass attractions of

the crowded together atoms. That *is* synergy. What is more startling is the fact that no scientists have the slightest idea why masses attract one another. The *a priori* is utter mystery. Universe apparently is omnisynergetic—no single part or experience will ever be able to explain the behavior of the whole. The more experience one has, the more opportunity there is to discover the synergetic effects, such as, for instance, to be able to discern a generalized principle. Discovery of a plurality of generalized principles then permits the discovery of the synergetic effects of their complex interactions. The synergetic effect produced by the interaction of the known family of generalized principles is probably what is spoken of as Wisdom.

Mass attraction is also involved in precession, which is another of the important, but popularly unknown, generalized principles. *Precession* allows a spinning top to lean over sideways without tipping further. *Precession* makes the gyrocompass hold its true north orientation without magnets and despite the ships' changes of course.

Precession is the effect of any body in motion upon any other body in motion, and the closer the proximity the more powerful the effect, and since all known bodies of macro-micro Universe are always in motion, all the intereffects of all bodies are always precessional, and those effects always result in the production of an angular change of course in the effected bodies. Thus, for instance, does the Sun's pull on the Earth induce its orbiting in a course around the Sun at 90 degrees to the gravitational pull; that is, the effect on the other body is always produced as an angular re-direction other than a 180 degrees direction *toward* or *away* from each other.

A corollary of synergy discloses that the *known behaviors of the whole plus the known behavior of some of the parts may make possible discovery of the presence of other parts and the latter's kinetic behaviors, structural form and relative dimensional characteristics*. For instance, the sum of the plane triangle's angles has been discovered to be always 180 degrees. The Greeks, thereafter, discovered that the known dimensional characteristics of three of the triangle's six conceptually recognizable total parts made pos-

sible also the discretely calculable discovery of the dimensions of the other three parts.

Since we are intellectually advantaged with no more than the child's facile, lucid *eagerness to understand constructively and usefully the major transformational events of our own times*, it probably is *synergetically* advantageous to review swiftly the most comprehensive inventory of the most powerful, human-environment-transforming events of our *totally* known and reasonably extended history. This is especially useful in winnowing out and understanding the most significant of the *metaphysical, thought-and-viewpoint revolutions* now recognized as swiftly tending to reconstitute history. By such a comprehensively schematic review, we might identify also the unprecedented and possibly heretofore overlooked pivotal revolutionary events not only of today but also of those trending to be central to tomorrow's most cataclysmic changes.

It is synergetically reasonable to assume also that relativistic evaluation of any of the separate artistic, scientific, educational, economic and ideologic drives—and their complexedly interacting trends within our own times—may only be had through the most comprehensive historical sweep of which we are capable.

If we can complete such a sweep, a synergetic understanding of humanity's cosmic functioning could be produced, which, until now, had been both undiscovered and unpredictable due to our deliberate and exclusive preoccupation only with the separate statistics of separate events. As a typical consequence of the latter, we observe our society's persistent increase of educational and employment specialization, despite the already mentioned well-documented scientific disclosure that biological extinction is always occasioned by overspecialization. Specialization's preoccupation with parts deliberately forfeits the opportunity to apprehend and comprehend what is provided exclusively by synergy.

Today's news consists only of aggregates of fragments. Anyone who has taken part in any event that has subsequently appeared in the news is aware of the gross disparity between the actual and reported events. The insistence by reporters upon having advance

“releases” of what, for instance, convocation speakers are supposedly going to say, but *in fact have not yet said*, automatically discredits the value of the largely prefabricated news. We also learn frequently of prefabricated and prevaricated events of a complex nature purportedly undertaken for purposes either of suppressing or rigging the news, which in turn perverts humanity’s tactical information resources. All history becomes suspect. Probably our most polluted resource is that of the tactical information to which humanity spontaneously reflexes.

Furthermore, today’s hyperspecialization in socioeconomic functioning has come to preclude important popular philosophic considerations of the synergetic significance of, for instance, such historically important events as the discovery, within the general region of experimental inquiry known as virology, that the as yet popularly assumed validity of the concepts of *animate* and *inanimate* phenomena have been experimentally invalidated. Atoms and crystal complexes of atoms were held to be obviously inanimate—the protoplasmic cells of biological phenomena were held to be obviously animate. It was deemed to be common sense that warm-blooded, moist- and soft-skinned humans were clearly not to be confused with hard, cold granite or steel objects. A clearcut threshold between animate and inanimate was therefore assumed to exist as a fundamental dichotomy of all physical phenomena. This seemingly placed life exclusively within the bounds of the physical. The supposed location of the threshold between animate and inanimate was methodically narrowed down by experimental science until it was confined specifically within the domain of virology. Virologists have been too busy, for instance, with their DNA-RNA genetic code isolatings to find time or to see the synergetic significance to society of the fact that they have found that no threshold does in fact exist between *animate* and *inanimate*. The possibility of its existence vanished because the supposedly unique physical qualities of both animate and inanimate have persisted right across yesterday’s supposed threshold in both directions to permeate each other’s, previously conceived to be, exclusive domains. Subsequently, what was animate has become foggier and foggier and what is inanimate clearer and clearer. The inanimate alone is not

only omnipresent but is alone experimentally demonstrable. Belated news of this threshold elimination must be interpreted to mean that whatever life may *be* it has *not* been isolated and thereby identified as residual in the biological cell as had been supposed by the false assumption that there was a separate physical phenomenon called animate within which life existed. No *life* per se has been isolated. Because of the threshold's vanishing, those chemists who are preoccupied in synthesizing the particular atomically structured molecules identified as the prime constituents of humanly employed organisms, if chemically successful, will be as remote from creating life as are automobile manufacturers from creating the human drivers of their automobiles. Only the physical connections and development of complexes of distinctly "nonlife" atoms into molecules, into cells, into animals, has been and will be discovered. The genetic coding of the design controls of organic systems offers no more explanation of life than did the specifications for the design of the telephone system's apparatus and operation explain the nature of the *life* that communicates weightlessly to *life* over the only physically ponderable telephone system. Whatever else life may be, we know it is weightless. At the moment of death no weight is lost. All the chemicals, including the chemist's life ingredients, are present but life has vanished. The physical is inherently entropic—gives off energy in ever more disorderly ways. The metaphysical is antientropic and methodically marshals energy. Life is antientropic. It is spontaneously inquisitive. It sorts out and endeavors to understand.

The overconcentration on details of hyperspecialization has also been responsible for the lack of recognition *by science* of its inherently mandatory responsibility to reorient all our educational curricula because of the synergetically disclosed but popularly uncomprehended significance of the 1956 Nobel Prize-winning discovery in physics of the experimental invalidation of the concept of "parity," by which science previously had misassumed that positive-negative complementations consisted exclusively of mirror-imaged behaviors of physical energy phenomena. Inasmuch as the difference between any conceptual system and total Universe is always one weightless, invisible tetrahedron if our physical, con-

ceptual system is a regular equiedged tetrahedron, then its complementation may be a weightless, metaphysical tetrahedron of various edge lengths—ergo, nonmirror-imaged—yet with both the visible and invisible tetrahedra's corner angles adding to 720 degrees respectively, although one be equiedged and the other variedged.

In this connection it has also been overlooked by specialization that our society needed to realize that disclosures of nuclear physics show that every positively weighted particle has its negatively weighted complementary, but nonmirror-imaged, counterpart behavior—all of which combines to disclose that *the integrated weights of physical Universe add to zero*. This makes it synergetically clear that, while man makes his nonsimultaneous, separate, positive and negatively balancing measurements of physical phenomenon, sum totally—ergo, synergetically—Universe and its experiences cannot be considered as being physical for they balance out as weightless; and weightless experience is metaphysical—physical phenomena having been identified by the physicist as being *always* uniquely *weighable*, that is, ponderable—detectable by the mass-attracted levering of an indicator needle.

Science's self-assumed responsibility has been self-limited to the disclosure to society only of the separate, supposedly physical—because separately weighable—atomic component isolations data. Synergetic integrity would require the scientists to announce that in reality what had been identified heretofore as physical is entirely metaphysical, because synergetically weightless. Metaphysical has been science's designation of all weightless phenomena such as thought. Because, as noted before, science has made no *experimental* finding of any phenomenon that can be described as either a solid or as continuous, or as a *straight* surface plane, or straight line or as *infinite* anything, we are now experimentally and synergetically forced to conclude that all phenomena are metaphysical, wherefore as many have long suspected—"like it or not"—life apparently is but a dream.

As already mentioned, science has found no UP or DOWN directions of Universe—yet scientists are personally so ill-coordinated that they all as yet personally and sensorially see "solids"

going up or down as, for instance, they see the Sun “going down.” Sensorially disconnected from their theoretically evolved information, scientists sense no need on their part to suggest any educational reforms to correct their half-a-millennium-tolerated misconceiving.

Society depends upon its scientists for just such educational reform guidance—where else might society turn for advice? Unguided by science, society is allowed to go right on filling its children’s brain banks, reflexing with large inventories of competence, with devastating misinformation. Society will probably have to rely exclusively upon its individuals’ own minds to survey the pertinent experimental data, as have all great scientist-artists, in order to emerge from its massive ignorance. This in effect is what the intuition of world-around youth is beginning to do. Mind can now see that reality is evolving into weightless metaphysics. The well-spring of reality is the family of weightless generalized principles.

Given the honor and opportunity to present the Nehru Memorial lecture, why have I undertaken to discuss all these matters, when the length of my discourse breaks the bounds of protocol for such formal social occasions of humanity? I have done so simply because I knew Nehru, and having experienced the integrity of his mind, I am confident that I am doing exactly that which he would have me do on this occasion, no matter how long it may take.

I have never before prepared an address in advance. I have found that it is possible to discipline oneself to *think* aloud with recourse only to one’s best preparation, which is, of course, everything that we have learned in our total life to the moment of speaking. When I think aloud with audiences, large and small, as I have on many occasions, I look in their eyes throughout my discourse for inspiration and response. I have learned to communicate aloud for all present the silent dialogue of our minds. How do I know that it is so? Because so many audiences have stayed with me for such unusually long sessions and have applauded in a manner that said I was interpreting them correctly. Having learned that for the first time I must write an address in advance, I have thought of speaking directly and at length to Nehru, as I have in the past, and while

thinking of Nehru, I have had to think of all humanity for that is what Nehru did. On this occasion, I have the best opportunity that will ever occur in my life to gain the thought and attention of world man. If mankind is indeed listening to me, then I want to say, in the most economical way, all that I am convinced is essential toward releasing humanity from the false fixations of yesterday, which seem now to bind it to a rationale of action leading only to extinction.

We recall our earlier geometrical discovery that a small closed-line figure such as a triangle or square or circle, drawn on the surface of a closed system such as the Earth, inadvertently produces a large triangle, square or circle, respectively, on the system's surface that complements the small one.

Throughout the last five millennia the most powerfully armed and navied northern nations of the world staked out their claims progressively to the southward, seizing from their inhabitants economic control of all the obviously productive dry land of our planet. They gradually left a smaller and smaller southern residue of unclaimed lands, the most populated of which has been known in historical geography as "India." Then some of the great powers claimed even those lands of India, although they were already occupied by one-sixth of all humanity crowded together. Then, because of waning strength, the powerful foreign rulers renounced their claims and withdrew, leaving the people there not as *sovereign claimants* but as the natives. The borders of these native world humans were simply closed in upon them. The people never claimed them. India is an inadvertent aggregate.

There happened to be among these people those whose vision and integrity enabled this vast aggregate to integrate itself as a self-governing entity. India should declare itself to be the first inherent home of world man. Because other states had declared their independent individual sovereignties, India is simply the remaining unclaimed region inadvertently identified by the others' sovereignty-claiming. The Earth has no naturally sovereign countries. Sovereignty is only an invention of powerfully armed ambitious men. The geographical location called "India" naturally embraces one-sixth of all humanity. These people are there only because it

is where they happened to be born. India has more different languages (300) within the lands left to it by all the others' sovereign claims than exist outside the borders closed in upon it. If India, renouncing sovereign claims and affirming its position as the residual free lands of world man, were to offer its passport to all who wished to be free world men, I think it highly possible that a billion young people around all the Earth would apply for such passports. They would not have to come to India but would live around the world with India's world man passport. Clearly, the world's young people abhor sovereign nationalism and bias of any kind.

India has all the world's different religions and political ideologies operative within it. It has pure and crossbred strains of all humanity and has the longest sustained known years of cultural continuity.

It has within it the world's largest proportion of total population committed to integrity of thought—and also has within it experience with all the ramifications of science, technology, agriculture and animal husbandry from their very beginnings. India has been exploited ruthlessly and selfishly by outsiders, who have not only robbed it progressively of the cream of its five thousand years of wealth production but, while doing so, also have organized the world's monetary exchange system to guarantee that India will remain the most depressed of all the world's economies. That world economic accounting scheme has not been the invention of contemporary world masters. It is a deliberate thought frustration maze of complexity, which is only continued because man does not know how to escape it and with what to replace it—and therefore, tolerates its continuance as a human custom, being reflexively accepted by little men in big places, who don't know any better than to copy the patterns of those who administered before them.

I have produced my geodesic dome structures in India. I have found India's metal-working craftsmen to be as capable as any in the world. They have the longest tradition and experience. India's metal workers are her highest paid craftsmen. I could take any of them to Detroit or Los Angeles in America where in the auto or airspace technologies they could have jobs as toolmakers, which

would pay them each day as much as they earn in half a year in India.

All the international exchanging is anchored exclusively to the value of metals. No international value is given to the hours of humanity. But, in fact, the limited increments of each human's lifetime constitute all of its prime capital assets. Only the struggle of each and every human in history to turn his available time to higher account has brought about the discovery of the principles hidden in Nature's behavior that have permitted humans to employ them to ever higher technical advantage. No improvement has ever accrued to base metals or real estate per se. All wealth augmentations are by the weightless, metaphysical mind. Yet all of the evaluations of everything socioeconomically accredited as constituting wealth have been imposed by armed might, as constituting only the physical media of exchange. Everything called wealth is, however, an a priori product of nature whose effectiveness has been amplified by individuals' experienced thought and hours of invested personal time. When, in exploiting scarcity producing stratagems, the so-called money-makers raise commodity prices, they do not make the metals or the real estate of greater value. They simply depress the purchasing equity given to humanity's time. Their commodities are extractions of the same old rock, sand and gravel. The lifetime savings of increasing numbers of hard-working, esteemed and now retired people are being rendered progressively inadequate by the price lifters' nonproductive stratagems. And the most depressingly affected numbers of humanity are those members of world society situated in India.

So let the headlines read, "India affirms its nonsovereignty claiming status. For it is the one-sixth segment of world-man society that had no ambition to conquer and for the moment happens to be confined geographically within the Indian peninsula by the world's masters-at-arms." India will have no trouble in continuing as a happenstance community because it is forced to coalesce by the external pressures upon it of the sovereign arms of others. Greater India is the millennium-long homeland base of world man. Humans have migrated away from it for untold eons carrying the basic root language to all the world's shores. For those untold

thousands of years its world-roving tribes have tarried here and there, sometimes for days, sometimes for centuries, sometimes for thousands of years, inbreeding with chieftains persistently marrying their close relations. This intruding has concentrated those particular genes most adaptable to the local geographical idiosyncracies. Their language was also inbred into remote dialects. All these inbreedings, which weed out general adaptability and universal characteristics, have made the world's people seem so different as to have given rise to the false assumption of an original installation of different races of humans aboard our planet. The wandering conquerors from time to time have come back to prey upon India, stealing her wealth away. They have exploited her long developing skills and have nibbled away her borderlands.

In our discovery of omnikinetic geometry's always-and-only, inward-outward and around systems complementations lies also the clue to the strength of Gandhi's passive resistance, whose success now may be amplified, for instance, by recognizing that nothing need be done to validate the area of India as belonging inherently to world humans—for Indian lands are "ipso facto" residually theirs. All the sovereign lands beyond the geography labeled "India" were indeed claimed by the strength of arms. They were not assigned to their conquerors by God, or by the alleged divine right of the king they served.

The people of India have no more need to claim the land on which they dwell than need the oceans establish legal pretense to ownership of the spherical Earth surface depressions that they fill.

It is only the metaphysical that can rearrange the physical landscape to human advantage, and the metaphysical proclivities are rampant in India. Words are memorials of the metaphysical victories of hard-earned mutual understandings of humanity. A large proportion of humanity's words were first formulated in India. The first-known philosophy of humanity written in words was found in India. Yes, India is the last unclaimed homeland of a fundamentally inspired, intellectually dominated humanity.

Three-quarters of the Earth is covered by water. Its powerful untamed ways have until now defied all attempts to establish sovereign ownership claims to the exclusive occupancy of any lat-

itude- and longitude-defined areas of its surging, drifting, ever-intermixing, world-around flowing turbulence. The present sovereign claimants to the dry land, however, are about to attempt to stake out for themselves sea-bottom areas as sovereign properties—doing so either by outright warring or by agreements exclusively amongst those of military might.

The youth of humanity all around our planet are intuitively revolting from all sovereignties and political ideologies. The youth of Earth are moving intuitively toward an utterly classless, omni-cooperative, omniworld humanity. India as a self-willed and self-organized people can publicly affirm the ipso facto nonclaimance to any sovereign lands. Such an act can catalyze the beginning of the beginning of humanity's realistic, metaphysical validation of the a priori worth of human life in Universe. Children freed of our ignorantly founded educational traditions and exposed only to their spontaneously summoned, computer stored and distributed outflow of reliable, opinion-purged, experimentally verified data shall indeed lead society to its happy egress from all lethally misinformed, fearfully imposed and physically enforced customs of yesterday. They can lead all humanity into omnisuccessful survival as well as entrance into an utterly new era of human experience in an as yet and ever-will-be fundamentally mysterious Universe. And whence will come the wealth with which India may afford to undertake to lead world man into his new and validly hopeful life? From the wealth of the minds of world man—whence comes all wealth. Only mind can discover how to do so much with so little as forever to be able to sustain and physically satisfy all humanity.

(This is the first part of a two-part article.)

