art, science

No More Secondhand God
and Other Writings

R. Buckminster Fuller

These prose pieces and prose-poem essays show the development of the thinking of R. Buckminster Fuller, the world-famous inventor of the Geodesic dome. Fuller himself aptly describes these pieces as "mental mouthfuls and ventilated prose." The title poem "No More Secondhand God," written in 1940, proposes practical means for daily or hourly telephone voting by democracy. It is typical of Fuller's visionary thinking that this idea has only recently reached the threshold of technical feasibility. In another prose-poem Fuller formulates his "comprehensive anticipatory design science." Each of the pieces in this book is an adventure for the mind; each "generates the sublimity of those poetical moments of man's fleeting glimpses of the omniscient."

"There is an extraordinary momentum to Buckminster Fuller's thinking. He is a man incapable of developing only one idea at a time. His ideas stream from him in clusters as he talks two, three, or seven hours at a stretch, one idea suggesting its successor, one cluster of ideas creating new clusters, some ideas expressed in words of his own invention."
—Book Week

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No More Secondhand God

R. BUCKMINSTER FULLER

wherefore individuals receiving direct validation of faith
tend humbly to grateful silence;
and the enormous growth of faith
is historically documented
primarily by the compounding accomplishments
of silent individual dedications
either to the effectively anticipated elimination
of man's recurrent sufferings,
or to design solutions by physical instruments
competently anticipating man's survival,
process and enfreshment needs

and all the concomitant
freely investible life quanta gains thereby induced
are realizable by all men
as consisting of newly augmented degrees
of amplified freedoms of thought realizations
and as conscious enjoyments of the enlarging potentials
and permitted ramifications
of man's thoughtfully initiable, furthering commitments
within the omnideveloping regenerative integrity—
universe.

Introduction to Omnidirectional Halo

The useful but infrequently used word *epistemology* means *science of the thought processes*. A total epistemological reorientation and, to the best of my knowledge, a unique philosophical reconceptioning, regarding the regenerative constellar logic of the structuring of the universe (both as a new cosmology and as a new cosmogony), seem to have followed gradually upon my hypothetically-initiated querying regarding the possibility of formulating more comprehensive and symmetrical statements regarding dawningly apparent natural laws. I intuited in irrepressible degree that such a potential formulation might be accruing and harvestable in all of our acceleratingly-reconsidered and progressively-integrated world-around, all-history experience as now only diffusely inventoried at the middle decades of the twentieth century.

Out of multi-overlaid experience patternings there sometimes emerges an awareness of what we may call a *coincidence pattern* —a localized thickening of points. These emergent patterns of frequency congruences and concentrations display a unique configuration-integrity which has up to now been so dilute in any one experience as to be only invisibly common to many differentiated or special experiences, e.g., a pack of one hundred 4-inch by 5-inch file cards each riddled with hundreds of different sized small holes. Each card appears to be chaotically patterned with holes. However, when the cards are stacked with edges

aligned three holes in each card are vertically aligned; all others are obscured by blank spaces on one card or another. A triangular pattern relationship of the light coming through three tubes in the stack of cards is now lucidly conceptual. To such persistently emergent, uniquely mutual, coincidence-patterning relationships as the same triangle array of holes in each and every card we may apply the term "pattern generalization" as used in a mathematical sense, in contradistinction to the word "generalization" as used in the literary sense. The latter often means a too-ambitious subject range which consequently permits only superficial considerations of any specific case data.

When the uniquely emergent generalized patternings become describable by us in *mentally regenerative conceptual terms,* as completely divorced from any one of the specific sensorial conditions of any of the special experiences out of which they emerged, yet apparently, as seen in retrospect to have been persistent in every special case, then we may *tentatively assume* such unique mutual pattern content to be a *generalized conceptual principle,* as for instance the conception of *tension* as opposed to *compression* independent of textures, smells, colors, sound, or size of any one tension-dominated experience.

It is in just such an epistemological process that we discover that size is not a generalized conceptual principle. Whether referring to the size of an object in respect to other objects or the *sizes* of any one object's subdivision, *size* emerges exclusively as a *frequency* concept uniquely differentiating-out each "specialized case." Generalized shape conceptioning is independent of size. A triangle is a triangle independent of size.

When a *second order* of pattern distillation as a *generalized conceptual principle* emerges, but this time exclusively from the emergently-induced *co-ordinate consideration* of a *plurality of generalized conceptual principles* themselves, each independent of any special case sensoriality, and in such a regeneratively-recognizable manner of patterning as to provide a means of mathematical accounting and therefrom a tentative forecasting

capability, not only of generalized developments but also of special forward experiences in the terms of specific sensorial conditions, and those calculated forecast conditions materialize, and the forecasting capability is subsequently verified by recurrent experimental demonstrations under controlled generalized conditions, then we may tentatively assume that we have discovered at least a clause of "natural law." For example, we tentatively assume that *radiation* is *generalized compression* and that gravity is *generalized tension* and that tension and compression are inseparable, precessionally-complementary functions of universal structure.

Newly recognized *generalizable principles* seem emergent in unprecedentedly accelerating accumulation as reported from the instrumentally extended range, velocity, and exactitude of special case experiences in the most recent moments of history's scientific venturing. The manywhere local probings have been meticulously organized and reported regarding measurable relationships and rates of changing relationships throughout the vast macrocosmic and exquisite microcosmic angle and frequency universe events both infra and ultra to man's direct tuneability yet instrumentally tuneable and transformably readable within *regeneratively informative tolerance* despite inherently limited observational exactitude.

Out of cumulative patterning overlays there emerges what seem to be generalized principles apparently governing all associative and disassociative transformings and their resultant regeneratively persistent hierarchy of constellar configurations. These hierarchies of constellar configurations disclose in turn a hierarchy of dynamically symmetrical constellation phases and their respective maxima-minima, asymmetric and complementary, accommodative transformabilities which are apparently permitted within an omnirational, omnidirectional, omniequi-economic, energy-accounting, co-ordinate system of universe. This omnirational, arithmetical-geometrical accountability is of such sublime simplicity in contrast to the awkward "mathemat-

ics" of all known yesterdays as to have occasioned an almost universal incredibility and nonconsideration of its potential significance though it has been in disclosure for one quarter of a century.

This co-ordinate system may be described as an *isotropic vector system*; that is, a generalized Avagadro system in which the energy conditions and relative quanta ratios are everywhere the same yet multi-differentiable in local patterning aspects, which aspects are interchangeably emergent without altering the comprehensive energy equilibrium or its unitary totality as implicit in the *Law of Conservation of Energy* by which it is assumed that energy may be neither created nor lost.

The discovered co-ordinate system is apparently governed by generalized laws, some of whose mathematical equatability I have been allowed not only to discern (as far as I know for the first time by anyone) but also to codify and translate into unique structural realizations. This codification governs the total co-ordinate abundance ratios of the unique pattern aspect relationships of uniquely irreducible co-operative function aspects of locally nonsimultaneous events and their equilibrious pattern totality.

Discovery of the primary and corollary laws of constantly co-ordinate relative abundance of pattern function-aspects of totality as an omnirational regularity governing all local patternings of universe as a minimum-maximum family of complexedly complementary yet uniquely identifiable conceptual function-patterning relationships followed upon intuitive formulations of the seemingly most comprehensive self-querying question I was capable of propounding to myself regarding possible detectable pattern significances accruing to progressive life experience integrations and overlays.

That most comprehensive question was, "What do you mean by the word 'universe'?" "If you cannot answer, you had best abandon use of the word 'universe' for it will have no meaning." My intuitively-adopted rules for self-questioning and answering

were that the answer must be made exclusively from man's experience patterns. I learned many years later that the Nobel physicist Percival Bridgeman had identified this same rule adopted by Einstein as "operational procedure," subsequently a much-abused phrase. My answer (or discard of the word "universe" as a communication tool) was operationally inherent: "Universe is the aggregate of all consciously apprehended and communicated (to self or relayed to others) experience of man." If my finite answer holds against all specific experience challenges as being comprehensively anticipatory and adequate, the *universe is finite*, and all its components *definable*. Each life as we know it is *definitive*, i.e., consists of a plurality of terminable, ergo definite, experiences, beginning with each awakening and terminating with each surrender to sleep (no man can prove upon awakening that he is the man who he thinks went earlier to sleep, or that aught else which he thinks he recollects is other than a convincing dream). The intermittent beginnings and endings of conscious experience constitute an aggregate of definitive experiences—and the aggregate is therefore finite.

In the recent moments of historical experience, men as scientists adopted the law of conservation of energy: as predicated upon the sum total experience of physicists which recalled no contradiction to this hypothesis. They thus accomplished a finite packaging of all physical behaviors of physical universe as predicated also upon the hypothesis that all physical phenomena are entirely energetic.

By embracing all the energetic phenomena of total experience, the scientists secured a synergetic advantage for all energy accounting and prospecting. "Synergy" means "behavior of whole systems unpredicted by the behavior of any of its components or by any sub-array of its components." Corollary to synergy is *the law of the whole system*. Systems are definite as they return upon themselves in a plurality of directions, ergo have concave inwardness and convex outwardness, ergo inherently subdivide universe into mutually exclusive definitive macro and micro en-

tities. *The law of whole system* states that, given the sum of whole system pattern conception its component behaviors may be differentially discovered and predictably described as required by the already evidenced behavior functions implicit in the a priori-definitive experience and conceptioning of any given experience-verified system. Thus by the law of whole system as corollary of synergy, the component behaviors of systems may be predictably differentiated as primary and secondary componential sub-divisions of whole system and then progressively isolated and locally reconsidered for further dichotomy.

Adopting synergetic advantage, science hypothesized that the physical portion of universe is energetic and finite. Under this hypothesis Einstein wrote his equation of physical universe as $E = MC^2$. This said that the total of local system energy is the product of all concentric local systems of energy's self-interfered, shunt-holding patterns (M for mass) as multiplied by the entirely noninterfered local omnidirectional velocity of surface growth of an omnidirectional, outward-bound spherical wave of radiant energy (in terms of second power of radial wave module frequency growth rate).

In Einstein's formula mass constitutes all the patterns of precessionally self-interfered and concentrically shunted, ergo locally articulated and locally and periodically regenerative holding patterns of energy. This is also to say that M equals all the locally complex, concentric, self-associative, unique holding patterns of all energy, and C^2 equals all the eccentrically disassociative individual patternings of all energy (C being the radial or linear speed of radiant energy, which is approximately 186,000 mps).

But physical science lacked the experience which might have persuaded it to hypothesize what all universe is. Physical science therefore restricted its comprehensive accounting strategy to the special case of definitive isolations within the *physical* portion of universe. This left the remainder of all experiences, no matter how earnestly and meticulously reconsidered, outside the *defini-*

tive portion of comprehended experiences of universe, i.e., the physicists said all that is not physically encompassed as $E = MC^2$ is metaphysical.

However, by my definition of universe, all that was relegated to metaphysical nebulosity is now embraced by finite universe along with the physically energetic wherefore all the hitherto "inexact sciences" may become rigorously defined, enjoying equatable treatability at optimum degree of determinability.

I have found a general law of total synergetical structuring, which we may call "The Scenario Principle." This principle discloses that "universe" of total man experience may not be simultaneously recollected and reconsidered, but may be subdivided into a plurality of locally tuneable event foci or "points" of which a minimum of four positive and four negative points are required as a "considerable set"; that is, as a first finite subdivision of finite universe. (This fourness coincides with basic quanta strategy.) All experience is reduced to nonsimultaneously "considerable sets" and holds irrelevant to consideration all those experiences which are either too large and therefore too infrequent, or too minuscule and therefore too frequent, to be tuneably considerable as pertaining to the residual constellation of approximately congruent recollections of experiences. A "considerable set" inherently subdivides all the rest of irrelevant experiences of universe into macro-cosmic and micro-cosmic sets immediately outside or immediately within the considered set of experience foci.

There are two inherent twilight zones of *"tantalizingly almost-relevant recollections"* spontaneously fed back in contiguous frequency bands—the macro-twilight and the micro-twilight.

It is a corollary of this first subdivision of universe that a *considerable set* is a locally definitive system of universe returning upon its considerabilty in all circumferential directions and therefore has an inherent *withinness* and *withoutness*, which two latter differentiable *functions* inherently subdivide all universe into the two unique extremes of macro and micro frequencies.

The "Principle of Design Co-Variables" says that "local structure is a set of frequency associable (spontaneously tuneable) recollectable experience relationships, having a regenerative constellar patterning as the precessional resultants of concentrically shunted periodic self-interferences, or coincidences of its systematic plurality of definitive vectorial frequency, *wave length and angle* inter relationships."

The precessionally regenerative concentricity of structure is antientropic, and evolutes toward optimally economic local compressibility and symmetry. (See *Dymaxion World of Buckminster Fuller*, by Robert Marks, for Fuller's Law of omnioptimally-economic, omnitriangulated-point-system, symmetry relationships and relative abundance of frequency modulated multiplicative subdivision of unitary local systems; i.e., M (mass) means: All the universe's self-interfering complexes having concentrically self-precessing, local-focal-holding patterns resulting in locally regenerative constellar associabilities as positive-outside-in structures. C^2 (radiation) means: All the universe's nonself-interfering complexes having eccentrically inter-precessing, omnidirectionally diffusing patterns resulting in comprehensively degenerative negative limits of dissociabilities as negative (inside-out) de-structures.

In the chapters on Energetic-Synergetic Geometry I identify *second powering* with the point population of any one radiant (eccentric) or gravitational (concentric) wave systems circumferential arrays of any given radius stated in terms of frequency of modular subdivisions of the circumferential arrays radially-read systems' concentricity layering; *third powering* with the total point population of all the successive wave layers of the system; *fourth powering* with the interpointal domain volumes; *fifth* and *sixth powering* as products of multiplication by frequency doublings and treblings, etc. The *Doppler effect* or wave reception frequency-modulation caused by motions of *the observer* and *the observed* are concentric wave system fourth and fifth powering accelerations.

The Doppler effect is usually conceived of as an approximately "linear" experience. "You," the observer, stand beside a railway track (which is a "linear" model); a swift train approaches with whistle valve held open (at constant frequency pitch as heard "on board" by the engineer "blowing" the whistle). The whistle sound comes to you at approximately 700 mph, but the train is speeding toward you at 100 mph. The train's motion reduces the interval between the successive wave emissions, which in effect decreases the wave length which gives it "higher" pitch as heard
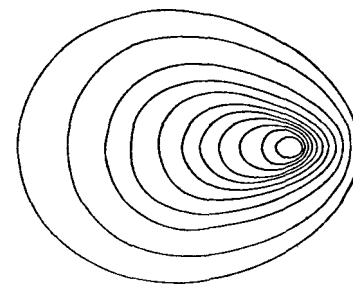

Fig. 1. Omnidoppler Effect

at your remote and "approached" hearing position. After the train goes by, the train runs away from each successive wave emission, thus increasing the interval between wave "crests" and therefore lengthening the waves, which apparently "lowers" the pitch as you hear it but not as others elsewhere may hear it. This is pure *observational* "relativity." But the real picture of the Doppler effect is not linear; it is omnidirectional.

The Doppler effect may also be *explained* in *omnidirectional*, experience-patterning conceptionality which is more informative than the familiar linear conceptioning of the railroad train and "you, at the crossing." "You" were flying in an air transport which exploded, and because of the sudden change in pressure differential between your in'ards and your out'ards at high altitude you personally have just been "exploded" into many separate parts receding from one another at high velocity. A series of secondary

explosions follows from somewhere in the center of the galaxy of exploding debris, as one item after another of the late airplane's explosive cargo is reached by progressive local conflagration-heat concentrations. The sound waves of the successive explosions speed after your receding parts amongst which are your two ear diaphragms as yet "stringily" interconnected with your exploding brain cells, which "hear" the explosion's sound waves first at low pitch. But as your parts explode from one another at a decelerating rate because of air friction, etc., the waves of remote explosion sounds "shorten" and pitches go "up." Now consider many separate, nonsimultaneous, secondary explosions of your various exploding parts all of varying intensities of energetic content and in varying degrees of remoteness and realize that the decelerations and accelerations of Doppler effects will render some of the explosive reverberations infra and some ultra to your tuning range limits of hearing, so that the sum total of *heard* events provides very different total conceptioning as heard from various points in the whole galaxy of exploding events whose separate components would tend to new grouping concentrations.

The Halo discovered in the next chapter is that of an omnidirectional, complex, high-frequency, Doppler-effected *hypothetical-zone experience* in an omnidirectional universal maelstrom of nonsimultaneous near and far explosions and their interaccelerating and refractive wave frequency patternings. Several of these fundamental concepts are also repeated several times in Halo, being reintroduced in various complex associations each of which provides unique discoveries.

In order to generate a spontaneous comprehension of the significance of the thoughts expressed in "Halo," which now follows, the latter essay will open with a swiftly marshalled digest of the epistemological concepts of this introduction.

Omnidirectional Halo

Synergy means behavior of integral aggregate systems unpredicted by behaviors of any of their components or subassemblies of their components. Chrome-nickel-steel has a higher tensile, or integrally self-cohering, strength than the sum of the separate tensile strengths of its alloyed elements. Synergetic behaviors are commonplace throughout chemistry and biochemistry but so unfamiliar to man's visible spectrum range events that the word *syn-ergy*, though the equal in age of its companion word *en-ergy*, is popularly unfamiliar.

The lack of popular and academic familiarity with the word *synergy*, which in the English language alone denotes the behavior of whole systems unpredicted by behavior of their components, means that man in his everyday social world has not been in need of this word, which in turn tells us that he lacks this fundamental conception in his conscious thinking processes. He ascribes all behaviors unpredicted by his statistical probabilities to "luck" or miracle. This particular gap in man's everyday fundamental thinking and common sense accounts for many fallacies in his spontaneous reflexing and contemporary behavior. Ignorant of the regenerative significance of synergy, man is vulnerable to de-generative feed-back consequences in his comprehensive determinations.

Universe is the comprehensive integral-aggregate system embracing all the separate integral-aggregate systems of all men's

consciously apprehended and communicated experiences. The total of experiences is integrally synergetic. Universe is the comprehensive a priori *synergetic integral.* Universe continually operates in comprehensive, coordinate patternings which are transcendental to the sensorially minuscule apprehension and mental comprehension and prediction capabilities of mankind, consciously and inherently preoccupied as he is only with special local and nonsimultaneous pattern considerations.

Encyclopedias and dictionaries inventory man's progressively invented words for communicable identification of all his evolving experience cognitions. *Dictionary* is a collective concept. *Universe* is the ultimate collective concept—i.e., the collection of all intelligible, inherently separate evolutionary event aspects which latter apparently occur exclusively and only through differentiating considerations which progressively isolate the components of whole and inclusive sets, super-sets, and sub-sets of generalized conceptioning in retrospectively abstracted principles of relationships. The *generalized comprehensive principles of interrelationships* progressively discovered as governing our subsidiary generalized principles are embraced by our finition of universe.

The word con-sider-ation comes from *sidus*, the Latin for star, the focal point of an as yet nondifferentiated concentration of events—ergo, con-*sider-able*, or con-*stellar* patterning, means an exploratory grouping of "stars" or complex idea entities that seem to man's limited tuneability to stand out together.

Neither the set of all-experiences nor the set of all-the-words which describe them nor the set of all the generalized conceptual principles harvested from the total of experiences are either instantly or simultaneously reviewable. "What was that man's name?" Our answering service may take five seconds, five minutes, five hours, five days, or five generations to reply. Our conscious orderly reconsideration of our variable lag experiences discloses *subconsciously* co-ordinated regularities of feed-back rates governing the recall phenomena.

All experiences are finitely furnished with differentiated cognitions, recognitions and comprehensions. The finite furniture consists of widely-ranging degrees of comprehensive constellar complexities. A wide range of time investment magnitudes must be assigned to the respective considerations of the multitude of different constellar, experience-pattern comprehensions. We cannot read simultaneously all the words in the dictionary; yet the dictionary is a finite collection of finite word entities each in turn consisting of collections of finite letter symbol entities.

Universe is finite because it is the sum total of finitely furnished experiences. The comprehensive set of all-experiences synergetically constituting universe discloses an astronomically numbered variety of sub-set event-frequency rates and their respective rates of conceptual tuneability comprehension. It takes entirely different lengths of time to remember or "look up" different names or past event facts. *Universe*, like the dictionary, *though integral* is *ipso facto nonsimultaneously recollectable* and, therefore, as with the set of *all* the words of the dictionary, *is nonsimultaneously considerable* and therefore is also nonsimultaneously reviewable, ergo is synergetically incomprehensible, yet progressively revealing.

The age-long fallacial propensity which has frustrated adult man's adequate conceptioning of universe is that of spontaneously assuming that universe must consist of a simultaneously unit conceptuality—ergo, of simultaneous geometry or shape, i.e., a *simultaneous structure.* What is the shape of the universe? What are its boundaries? These are unitary, simultaneous static questions. They have no logical answer for universe *though finite is a nonsimultaneous structure.* Children know this better than their parents through innate conceptioning as yet unspoiled by erroneous logic. They remember the juggler putting a simultaneous array in the sky with nonsimultaneous tosses. The childhood representational pictures depict their dynamically arrayed concept of the "whole world" inventory, of mentally juggled arrays of

nonsimultaneously occurring experiences agglomerated without any intended geometrical interrelationships. In all lands the children's spontaneous pictures contain "the" house, trees, birds, dogs, flowers, grass, clouds, stars, the sun and *the moon*. The parents say, "Darling, a nice picture, but we don't have both the moon and the sun at the same time." The parents are wrong— both the sun and moon coexist at all times whether temporarily covisible or not. The parents' rationale has been damaged so that it can only consider and associate those items which are simultaneously grouped in unitarily static array. Yet in equal illogic the parents keep on attempting to see the universe of nonsimultaneity in unitary, static and simultaneous geometrical array as a "thing"—a very big "thing"—the biggest "thing."

It is in evidence that universe, as the coordinate integral of allexperience is finite yet nonsimultaneously recollectable—ergo, unitarily unpatternable—ergo, conceptually unthinkable—ergo, undefinable. This is to say *undefinable* does not mean *infinite* or *un-finite*. It means that—definability—*de-finite* is a sub-set of *finite* —ergo, pattern *definition* is a subdivision of *finite-yet-unitarily-undefinable universe. The definable conception is therefore the first thinkable sub-set functioning of universe.*

There are metaphysical yet cogent early words emergent from the limbo of prehistory's quasi-logical accounting continuities which show that intellect has long been aware of the *DE*function. For instance, DI-Vine, DI-, DE- (of Di-chotomy—cell division—regenerate through bi-multiplication). The concept of a DE-VINING DE-ITY, i.e. the defining deity, the great intellectual capability of differentiating discernment, probably originated in the same conceptual logic as did DI-VIDE out of DI-*VISION*— *to see* the whole as functionally differentiable yet *only locally* and *progressively conceptual*. In the differential calculus this becomes the delta—Δ δ D—of fundamental differentation.

Differentiable function x in respect to y. Functions do not occur exclusively of one another. Functions occur only as inher-

ently co-operative and accommodatively varying sub-aspects of synergetically transforming wholes. MULTIPLICATION accomplished only by DIVISION. Universe expanding through progressively differentiating considerations.

Definable thought patterning deals only progressively (by rescanning) with the local event foci of experienced patternings of universe. Definable thought though constituting systematic consideration and orderly reconsideration, which returns omnidirectionally upon itself in local conceptual relationships in only a subdivision of *finite*, which is universe, which is *inherently inconceivable unitarily*.

Inconceivability does not mean *infinite* anymore than does *invisible*. Finite is unique to universe because it means complete, but not terminal. The locally definable entity is not complete, for it does not exist by itself. All experiments show that local entities are inherently both entropic and antientropic, i.e., all local systems are always intimately linked with the rest of universe by measurable *import* and *export* pattern transactions. Definable entities are uniquely functioning components of universe. Universe is the minimum as well as the maximum closed system of omni-interacting, precessionally transforming, complementary transactions of synergetic regeneration. Local perpetual motion systems are impossible, since universe is the minimum regenerative set of perpetually intercomplementary transformative functioning.

Systematic conceptioning and recollected conceptioning, both universal and local, which progressively traces, relates, and compares nonsimultaneously observable locally functioning entities is self-disciplined. The self-discovered capability to communicate to others by the recollectable and pictured word-tool developed a co-ordinate memory of all men.

Generalized systematic conceptuality's omni-directional relationships are only angularly configured and are independent of size or dimension. No man has ever "seen" outside himself. His

brain is a multi-frequency (four sensory ranges) scanning (TV) integrator, continually operating in co-ordination with a multitude of memory (kinescope taped) TV scanners. The whole array of *new* and *memory* TVs is frequency monitored by an angular and frequency modulated *pattern commonality scoring and score-predicting* conceptual co-ordination capability. The TV co-ordinating conceptual capability includes a score-guessing and score-guess testing faculty, as well as a strategic-tests-contriving-pattern considerator, all of which conceptual patterning proclivities are self-started and regenerated by synergetical *intellection.*

The conceptual process is never static. *Thinking* does not consist of the insertion of invented images into an otherwise empty vacuum-tube chamber called brain. *Thinking* is the self-disciplined process of preoccupied consideration of special-case sets of feed-back answers selected out of the multitude of high frequency alternating trans-ceiver brain traffic. This traffic consists of omniexperience processed answers to present or past questions, formulated either by the conscious or subconscious co-ordinating initiative of the individual or possibly by the individual overlapping generation of group memory.

Because of the varying depths of storage of past experiences, some answers come back swiftly, some slowly. The recollectability rates are unpredictable. The returning-answers traffic is heterogeneous. Many answers come to questions we have forgotten that we have asked. Conceptually systematic tuning of questions and feed-back answers, comparatively considered in the brain, results in temporary, tuneably valved exclusion of all other incoming signals traffic. Discreet tuning admits consideration only of those recollections which are *clearly relevant* to the omnidirectional rounding out of systematic comprehension of the special case set of events intuitively selected for momentary focal consideration. Thinking consists then of a self-disciplined

deferment of conscious consideration of any incoming information traffic other than that which is lucidly relevant to the experience intuited quest for comprehension of the significance of the emergent pattern under immediate priority of consideration.

The thinking process results in varying degrees of lucidity of the arrayed residue of focal event patterns *uniquely consequent* to the *disciplined deferment* of irrelevancies. Thinking is a putting-aside, rather than a putting-in discipline, e.g., putting aside the tall grasses in order to isolate the trail into informative viewability. Thinking is FM—*frequency modulation*—for it results in tuning-out of *irrelevancies* as a result of definitive resolution of the exclusively tuned-in or *accepted* feed-back messages' pattern differentiatability. As the exploring navigator picks his channel between the look-out detected rocks, the intellect picks its way between irrelevancies of feed-back messages. And as the navigator realizes secondarily that the channel winds between two sets of rocks, the rocks to starboard and the rocks to port, intellect also discovers secondarily that all the irrelevancies of feed-back information have inadvertently fallen into *two main* classes, as follows.

1. The class of all the finitely-furnished experience events which are *too large and too infrequent* to have *considerable frequency significance in-tuneability* in respect to the modular magnitude ranges under consideration.

2. The class of all the finitely-furnished experience events *too miniscule of wave module and of too high frequency* to in any way be significantly tuneable into the considered spectrum range.

Each class has its twilight zone of *almost* (or tantalizingly almost) *relevancy* which, if we were to accelerate our consideration rate, *might* attain *considerability* within the tactical limits of assignable capital-life-time intuitively budgetable to such consideration. Between the twilight zones of almost-too-large and almost-too-small to be relevantly considerable lies a *zone*

of lucidly tuneable relevancy of the experienced event recollections.

Because of the incessant *wheeling about* of humans first in the womb, then in the baby carriage, then on foot, in the auto and ship and plane roundabout a spinning earth in a spinning solar system within an involuting-evoluting, spirally spinning galaxy, totally inventoried experiences are inherently omnidirectional when considered as the sum of observational orientations. Universe (as all-experience) is inherently omnidirectional in its observational orientations—ergo, the temporary putting-aside of the two classes of irrelevancies requires an omnidirectional putting aside which differentiates as an *outwardly* dismissed macrocosmic disposition of the too-large and too-infrequent conceptual informations and an *inwardly* dismissed residue set of all the too minuscule and too frequent events—ergo, the lucidly *tuned in, residually considerable* set of event-foci lies within *a spherical zone* between the thus separated twilight zones of almost-considerable minuscules and bigs, respectively. As a consequence, the residual set of tuned-in experience event-foci are caught in a spherical zone trap of feed-back recollected considerability appropriate to systematic reviewing and possible definition.

Out of nonsimultaneously conceptual, yet finite, universe has emerged a *definitively conceptual geometry*, not a geometry invented by the conceiver but an a priori geometry discovered by the re-considerer as a residual relevancy constellation.

We thus discover that systematic recollection and thought-out *definition* lies within a *geometrically conformed* zone which inherently subdivides the universe into distinctly separate microcosm and macrocosm, which two are, however, only meagerly isolated from one another by a local constellation of considerable relationships. No matter how meager the network of zonal relationships of the residually considered star set of holding-pattern relevancy, the latter shuntingly impedes in some degree the

velocity of omnidirectional universal information traffic, forced by geometrical surroundment to pass through the zonal constellation. If a squadron of boats enters a river's mouth and passes upstream and anchors, their presence and the friction of their hulls will mildly retard or choke the river's flow. Thus do the constellation of considered events mildly choke the otherwise unim-
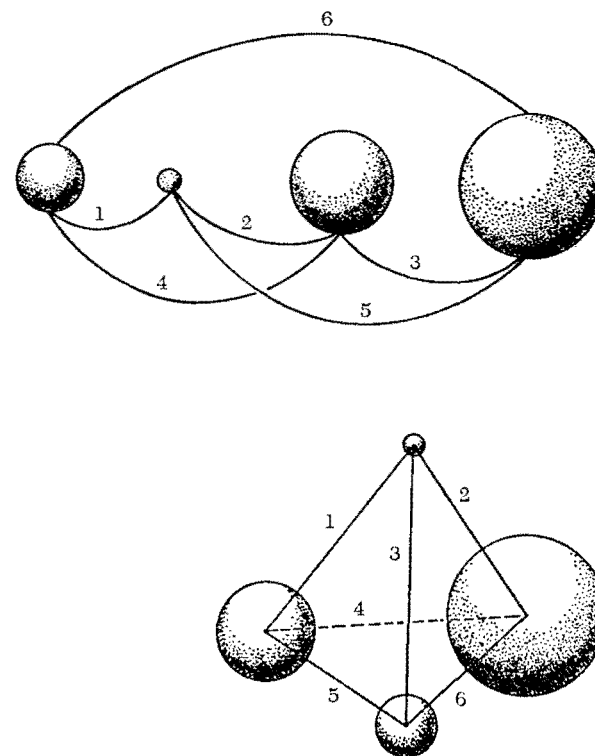

Fig. 2. Linear Tetrahedron. (A) A linear tetrahedron has six relationships. (B) Four unique frequencies (sizes) of entities, or particles, comprise the tetrahedron.

peded universal and geodesically-inter-routed communication traffic which they have separated into the two (micro–macro)

realms. As Heisenberg shows in his principle of ultimate inde-
terminism the physical act of measurement always alters the be-
havior of the measured phenomenon. In the same way we show
here that the thinking process inherently alters the fundamental
patterning of universal thought-about interrelationships.

We thus discover that thought and its tuneably differentiating
local definitions constitute the *first subdivisions of finite universe.*
Ergo finite universe is something greater than any definable
local system's zone of constellar, geometrical lucidity which zone
is itself *secondarily definable by its disparity of concavity of
withinness* and *convexity of withoutness.*

In a con-sideration four is the minimum number of stars hav-
ing an inherent arrangement of within-ness and without-ness.
Therefore we discover next that the minimum *conceptually-
considerable* generalized-experiences-set, affording macro–micro
separation of universe, is a set of four local event-foci. These
four stars have an inherent sixness of interrelationships. This
four-foci, six-relationship set is definable as the tetrahedron. This
minimum *fourness* of relevant-frequency, ergo *thinkable* "stars"
coincides with quantum mathematics' requirement of four unique
quanta numbers per each uniquely considerable "particle,"
quanta are inherently tetrahedronal.

In the prime dichotomy of universe into a thinkable tetrahe-
dronal zone between unconsiderable irrelevancies, which in turn
requires a secondary zonal separation into macro–micro mo-
mentarily unthinkable cosmoses, it becomes evident that the
tetrahedronal zone itself introduces a *tertiary dichotomy*—into
the *two* inherent twilight zones of *almost considerable bigness*
and *almost considerable littleness,* respectively.

We find a *fourth-stage dichotomy* of universe when we con-
sider that the big and little twilights each respectively are again
also comprised of two tetrahedra as minimal requirement, one
as the *concave inward* tetrahedron and the other as the *convex
outward* tetrahedron.

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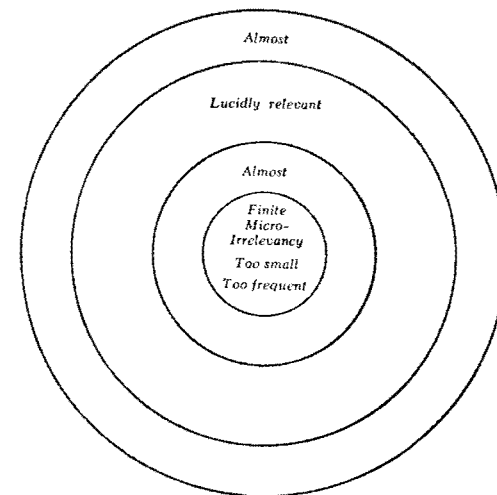
Finite Macro-Irrelevancy,
Too large, Too infrequent

*Fig. 3. Pattern of Thought. Thinking is frequency modula-
tion—tuning out finite irrelevancies into two main classes:
micro-macro, which leaves residual defined system as lucidly
relevant.*

We next, fifthly, discover that the positive-negative (convex-
concave) tetrahedra constitute only the *minimum* functional
dichotomy of finite universe, resulting in a *minimum* portion of
the universe disposed in the microcosm and a maximum portion
of universe assigned to the macrocosm. Among geometrical sys-
tems a tetrahedron encloses the minimum volume with the most
surface and a sphere the most volume with the least surface. An
approximately spherical polyhedronal zonal dichotomy of finite
universe by a spherical array of considered relevancies provides
*the minimum portion of sum totally finite universe assigned to
the macrocosm and the maximum relative portion of finite uni-
verse assignable to the microcosm.*
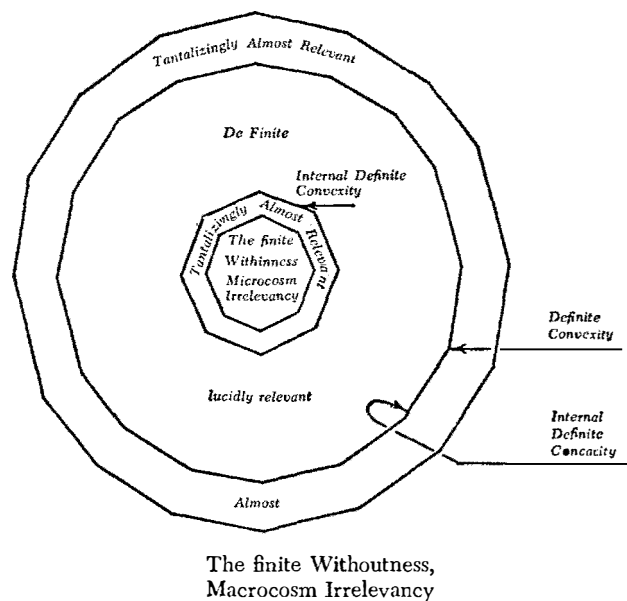
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The finite Withoutness,
Macrocosm Irrelevancy

Fig. 4. Pattern of Thought—Phase 2. De-finite equals finite minus outwardness and inwardness.

We may say that the minimum zonally defined withinness conformation is tetrahedronal and the minimum zonally defined withoutness is spherical. Therefore, the most extensive *lucidly conceptual and definable recollected-experience zone range* lies between a *tetrahedronal "withinness" twilight* and a *spherical "withoutness" twilight,* beyond which are the nontuneable (1) *outwardness* and (2) *inwardness*—the subtracted Euler's *twoness* from *nonconceptual finiteness* which permits conceptual definiteness or definition of cognition.

Because the permitted *conceptuality* involves a unit expenditure from universe of a de-finite *twoness,* unit conceptuality must have a finite *twoness* penditure value, ergo prime conceptual unity acquires an inherent value of two. Unity is inherently plural. Unity is always divisible as twoness, or fourness, or six-

ness, of inherent minimum relationships. The alternate relative proportions of finite universe's micro–macro magnitude limits of definitive dichotomy as tetrahedronal minimum or spherical maximum introduce an inherently alternative propensity of universal finite accountability whose alternative eccentric-concentric reciprocity of omnidifferential-lag-rate compensations inherently
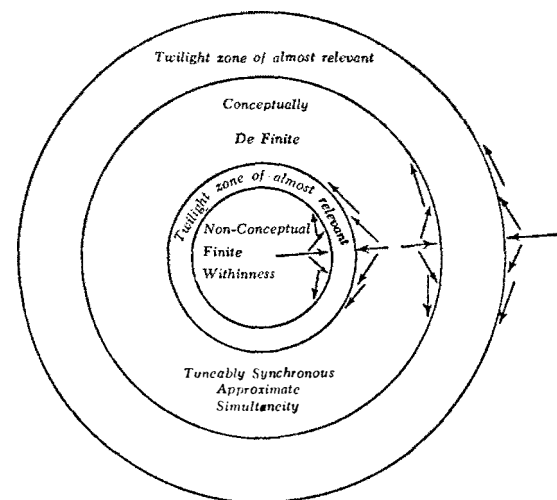
Non-Conceptual Finite Withoutness
Nonsimultaneity, Nonsynchronously Tuneable

Fig. 5. Pattern of Thought—Phase 3. Concave means concentrate; convex means diffuse.

propagate and regenerate preferably considered universal evolution accomplished by omnidirectionally expansive-contractive wave propagating oscillations.

Frequency of modular subdivision of vectorial lines are ratioed to cyclic increments of time realizing the accomplished velocity. Unity is the full circle sweep around an axis. Angles are fractions of cyclic unity. Frequency means a discreet plurality of cycles within a given greater cyclic increment. Angle means a fraction

of one cycle. Angle is therefore sub-cyclic-unity, while frequency is plural unity. Angle is less than finite cyclic unity. Frequency is greater than finite cyclic unity. All physical *realizations* have relative-size, i.e., dimensionality. The phenomenon size consists of frequency modulated linear (i.e. vectorial) dimension. Angular phenomena being sub-finite cyclic unity, or zero frequency, may be independent of size. Generalized angular or tri-angular or tetrahedronal conceptioning may be independent of size.

The three angles of one face of a triangle always add up to 180° as a phenomenon independent of the relative dimensional size of the triangles. 180° is one-half definitive cyclic unity. Every triangle has two faces—its obverse and reverse. Unity is two. So we note that the angles of both faces of a triangle add up to 360°. The sum of the external angles of two triangles' obverse and reverse faces is 720°. The sum of the external angles of a tetrahedron is 720°. The sum of two triangles' external angles is equivalent to one tetrahedron.

The relative size of a triangle is a secondary, observer induced consideration and depends upon the frequency modulated edge increments of the triangle as ratioed to some other physical experience entity.

Angles of tetrahedra always add up to 720° independent of size. The angles of a cube always add up to 2160° independent of the cube's size. A tetrahedron is definite yet independent of size. All angularly modulated definite geometrical systems or figures are independent of size.

Relationships which have definite integrity and independence of size are conceptual principles of abstract thought independent of physical realization.

The difference between the sum of all the angles around all the vertices of *any* system and the total number of the vertices times 360° (as angular unity) is 720° which equals two unities. The sum of the angles of a tetrahedron always equals 720°. The tetrahedron may be identified as the 720° differential between
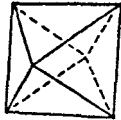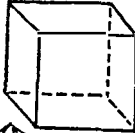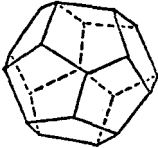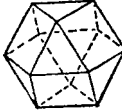
	No.of Vertices	Sum of Angles around each Vertex	Sum of angles multiplied by No. of Vertices. De-Finite	No. of Vertices multiplied by 360° Finite	Finite minus De-Finite
Line	2	0°x1=0°	0° / x2 / 0°	360° / x2 / 720°	720° / −0 / 720°
Triangle	3	60°x2=120°	120° / 3 / 360°	360° / 3 / 1080°	1080° / 360 / 720°
Tetrahedron	4	60°x3=180°	180° / 4 / 720°	360° / 4 / 1440°	1440° / 720 / 720°
Octa	6	60°x4=240°	240° / 6 / 1440°	360° / 6 / 2160°	2160° / 1440 / 720°
Cube	8	90°x3=270°	270° / 8 / 2160°	360° / 8 / 2880°	2880° / 2160 / 720°
Icosahedron	12	60°x5=300°	300° / 12 / 3600°	360° / 12 / 4320°	4320° / 3600 / 720°
Dodecahedron	20	108°x3=324°	324° / 20 / 6480°	360° / 20 / 7200°	7200° / 6480 / 720°
Vector Equilibrium	12	90°x2=180° / 60°x2=120° / 300°	300° / 12 / 3600°	360° / 12 / 4320°	4320° / 3600 / 720°

Table 1. Angular Topology Independent of Size.

any *definite local* geometrical system (Greek *solid*) and *finite universe*.

A line has two vertices with angles around each of its vertexial ends equal to 0°. The sum of these angles is 0°. The sum of the vertices (2) times unity (360°) is 720°. The remainder of 0° from 720° is 720° or two unities, or one tetrahedron, Q.E.D.

A triangle has three vertices. The sum of the externally viewed angles around each is 120° of which 60° is on the obverse side of each vertex of the triangle; for a triangle, like a line, if it exists, is an isolatable system always having its positive and negative aspects. The angles of ob- and re-verse triangles add up to 360°. The triangle is three vertices times 360°=1080° which minus 360° (sum of triangles' angles) = 720° Q.E.D.

Two triangles' external angles make one convex tetrahedron or 720°. The coincident concave tetrahedron's angles add up to 720°. The positive and negative tetrahedra always coexist +720° −720° = 0°.

Four vertices equal one positive tetrahedron; therefore, one positive conceptual convex tetrahedron is +720° and the difference between it and finite universe is one-negative nonconceptual concave tetrahedron. Neither the positive nor the negative tetrahedron may occur without the other.

A zero tetrahedron is vector equilibrium, is *universe*.

Experience is inherently discontinuous and islanded and each special experience represents a complex of generalized principles operative in special or limited size (i.e., dimension, i.e., frequency) modulated realization.

Brower's mathematical theorem states that if any number of points on a plane are stirred around an x amount on cessation of the stirring, one of the points may be shown to have been the center point of the stirring—and never to have moved in relation to the others. In order to be "stirred," these points must have multi-dimensionality and the cluster of stirred points must have obverse and reverse sides. Therefore, the obverse-reverse sides must each have visible points that were the centers of the stirring

| Tetrahedron	720°	$\dfrac{720°}{720°}$ =1 tetrahedron
Octahedron	240°x6=1440°	$\dfrac{1440°}{720°}$ =2 tetrahedra
Prism	240°x6=1440°	$\dfrac{1440°}{720°}$ =2 tetrahedra
Cube	270°x8=2160°	$\dfrac{2160°}{720°}$ =3 tetrahedra
Icosahedron	300°x12=3600°	$\dfrac{3600°}{720°}$ =5 tetrahedra
Rhombic Dodecahedron	109°28'x24=2628° 70°32'x24=1692° 2628°x1692°=4320°	$\dfrac{4320°}{720°}$ =6 tetrahedra
Dodecahedron	324°x20=6480°	$\dfrac{6480°}{720°}$ =9 tetrahedra
Triacontahedron	180°x60=10,800°	$\dfrac{10,800°}{720°}$ =15 tetrahedra
Two Frequency Regular Geodesic	180°x80=14,400°	$\dfrac{14,400°}{720°}$ =20 tetrahedra=5×2^2
Three Frequency Alternate Geodesic	20°x9=180° 180°x180=32,400°	$\dfrac{32,400°}{720°}$ =45 tetrahedra=5×3^2
Four Frequency Triacon Geodesic	180°x240=43,200°	$\dfrac{43,200°}{720°}$ =60 tetrahedra=15×2^2
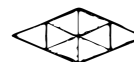
Table 2. Tetrahedronal Mensuration applied to Well-Known Polyhedra. We discover that the sum of the angles around all vertices of all solids is evenly divisible by the sum of the angles of a tetrahedron. The volumes of all solids may be expressed in tetrahedra.

and, short though the distance between the obverse-reverse surface neutral center points, the short line between the obverse-reverse visible central points' obverse-reverse poles constitutes a *neutral axis* of the system of points and isolates two points for axial functioning in every layer of both polar zones of every point system swarm. Pauli's exclusion principle verifies that each of the stirred points in Brower's theorem and the point which did not move have their inherently separate counter part points which discloses both the neutral axis formed by the two points that do not move and the obverse and reverse sets of moving points. Thus, we discover that even a "points" angular topological difference between its definiteness and finiteness is 720°.

There is no phenomenon "solid matter"; therefore there may not be a "solid" sphere, nor a "solid" surface sphere. All spheres consist of a high frequency constellation of event-points, all of which are approximately equidistant from one central event "point." All the points in the surface of a sphere may be interconnected. If most economically interconnected, they will subdivide the surface of the sphere into an omnitriangulated spherical web matrix. As the frequency of triangular subdivision of a spherical constellation of omnitriangulated points approaches subvisibility the *difference* between the sums of the angles around all the vertex points and the numbers of vertices when multiplied by 360° remains constantly 720° which is the sum of the angles of two times unity (of 360°). The sum of the angles of a tetrahedron, regular or irregular, is always 720°, just as the sum of the angles of a planar triangle is always 180°. We may state two laws which say: (1) the sum of the surface angles of any polyhedron equals V^n multiplied by 360° minus one tetrahedron; (2) the sum of the angles of any polyhedron (including a sphere) is always evenly divisible by one tetrahedron. We may also say that: Where unity (1) equals 360°, 180° equals one-half unity (½) and that 720° equals two times unity (2); therefore, we may identify a triangle as one-half unity and a tetrahedron as two unities (½), (2).
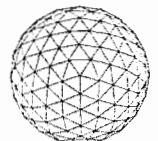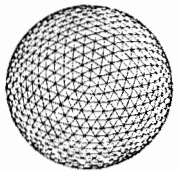
	Number of Vertices Multiplied by 360°	Number of Triangles Multiplied by 180° Equals Sum of Angles around All Vertices	Difference
Regular Geodesic Two-Frequency Icosahedron	42 x 360°=15,120°	80 x 180°=14,400°	15,120°—14,400°=720°= 1 tetrahedron
Regular Geodesic Four-Frequency Icosahedron	162 x 360°=58,320°	320 x 180°=57,600°	58,320°—57,600°=720°= 1 tetrahedron
Regular Geodesic Nine-Frequency Icosahedron	812 x 360°=292,320°	1620 x 180°=291,600°	292,320°—291,600°=720°= 1 tetrahedron

Table 3. Tetrahedronal Mensuration applied to Spheres.

The calculus assumes that a plane is infinitesimally congruent with the surface of a sphere at the point of the plane's tangency of the sphere. The calculus and the spherical trigonometry therefore also assumes that the sums of the angles around any point of any sphere are always 360°. The demonstration thus far made discloses that the sums of the angles around all the vertices of a sphere will always be 720° or one tetrahedron less than the sum of the vertices times 360°, ergo, one basic assumption of the calculus is invalid.

In review, this chapter shows that the phenomenon "infinity" of the calculus is inherently finite. Universe equals the aggregate of men's consciously apprehended and communicated experiences. By my definition, universe is nonsimultaneous but finite because all experiences *begin* and *end* and being terminal are finite; ergo, universe as the sum of finites is finite. The first subdivision of nonsimultaneous universe is effected by a local system which divides the universe into three finite parts: the portion of universe outside, the portion of the universe inside, and the system. We find local spherical systems of universe are definite rather than infinite as presupposed by the calculus' erroneous assumption of 360 degreeness of surface plane azimuth around every point on a sphere. Nonsimultaneous universe is finite but conceptually undefinable; local systems are definable. We discover that universe is finite and a local system is *definite* and the definite local system plus one tetrahedron (or two unities) equal finite universe. The difference between universe and any local system is always one tetrahedron. Every local system may be subdivided into whole tetrahedra.

If we combine, first, the fact of Van't Hoff's discovery that all the organic chemical compounds are structurally cohered in the terms of the tetrahedra's four vertexes and, secondly, the fact of Linus Pauling's X-ray diffraction implemented discovery that all the metallic elements thus far experimentally analyzed combine in nonvertexially interlinked tetrahedronal structures and, thirdly, the facts which I have disclosed in this and the preceeding pages

we may well conclude that it is reasonable to adopt the working assumption that: *all of the definable structuring of universe is tetrahedronally co-ordinate in rational number increments of the tetrahedron.*

Finite minus de-finite means two tetrahedra minus one tetrahedron. Finite universe equals four cyclic unities. Each tetrahedron equals two; therefore, finite (4) minus conceptual definite (2) equals two, which constitutes one negative invisible tetrahedron.

Reviewing again, this halo conceptioning discloses the minute yet finitely discrete inaccuracy of the fundamental assumption upon which the calculus was built; to wit, that for an infinitesimal moment a line is congruent with the circle to which it is tangent and that a plane is congruent to the sphere to which it is tangent. Calculus had assumed 360° around *every* point on a sphere. The sum of a sphere's angles was said to be infinite. The Halo concept and its angularly generated topology proves that there are always 720° or two times unity of 360° *less* than the calculus assumption of 360° times every point in every "spherical" system. This 720° equals the sum of the angles of a tetrahedron. We can state that the number of vertices of any system (including a "sphere" which must, geodesically, in universal energy conservation, be a polyhedron of N vertices) minus two times 360° equals the sum of the angles around all the vertices of the system. Two times 360° which was the amount subtracted, equals 720°, which is the angular description of the tetrahedron. The spherical error of calculus is one discrete tetrahedron. We have to take angular "tucks" in the nonconceptual finity (the calculus infinity) to make a local definite system (the calculus finity). The "tucks" add up to 720°, i.e., one tetrahedron. The difference between conceptual de-finity and non-conceptual finity is one nonconceptual finite tetrahedrin.

In the general theory of variables it has been recognized that the set of all the variables may be divided into two classes—(1) the class of all the inclusive variables within a given system and

Synergetically Symmetric

True Rational Volumes where Tetrahedron is Unity	Locally Symmetrical, Omni-triangulated	Locally Mixed Sym-asym. Omni-triangulated	Locally Asymmetrical, Omni-triangulated	Space Fillers	Complementary Space Fillers
1					•
4					•
3			•	•	•
20					•
18,510					
8,490					
27.000					
6			•	•	
25 986			•	•	
65 018			•		
91.004			•		
96			•		

1:1   1:2   1:4.63   Area: Volume Ratio

System	Euler Formula $V+F=E+2$	Fuller Synergetic Treatment Extracts Two Polar Vertices For Neutral Axis $V+F=E$	Remainder Divided by Two $V^{NP}+F=E$ $2+4=6$ $\div2$ $\overline{1+2=3}$	Fuller Synergetic Treatment Divides by Fundamental withinness and withoutness, Convex—Concave Disparate Twoness $\div2$
Vector Edge Tetra	$4+4=6+2$	$\frac{2+4=6 \quad \div2}{1+2=3}$	$1+2=3$ $\times1$	Fuller's Topological Formula for all Dynamically symmetrical, Omni-triangulated Polyhedra (where P=A Prime No.) (where v=Frequency)
Vector Edge Octa	$6+8=12+2$	$\frac{4+8=12 \quad \div2}{2+4=6}$	$\times2$	
Alternating+to-tetra Vector Diagonal	$8+12=18+2$	$\frac{6+12=18 \quad \div2}{3+6=9}$	$\times5$	
Vector Equilibrium	$12+20=30+2$	$\frac{10+20=30 \quad \div2}{5+10=15}$	$\times5$	$v^2 P\left(\dfrac{V^{NP}+F=E}{1+2=3}\right)+2^{PV}$
Vector Edge Icosahedron	$12+20=30+2$	$\frac{10+20=30 \quad \div2}{5+10=15}$	$\times5$	
Vector Edge Cube	$14+24=36+2$	$\frac{12+24=36 \quad \div2}{6+12=18}$	$\times3\times2$	$\dot v = $ Frequency of Modular Subdivision of Exterior Edges of System, Tetra, Octa, Icosa.
Vector Diagonal Rhombic Dodecahedron	$14+24=36+2$	$\frac{12+24=36 \quad \div2}{6+12=18}$	$\times3\times2$	
Vector Edge Rhombic Dodecahedron	$14+24=36\div2$	$\frac{12+24=36 \quad \div2}{6+12=18}$	$\times3\times2$	Multiplication of one of first four prime numbers 1,2,3,5 or their powers or multiples by Topological Abundance Constant
Vector Edge Dodecahedron	$32+60=90+2$	$\frac{30+60=90 \quad \div2}{15+30=45}$	$\times3\times5$	$1+2=3$
Vector Edge Tetraxidecahedron	$32+60=90+2$	$\frac{30+60=90 \quad \div2}{15+30=45}$	$\times3\times5$	1 Non Polar Vertex +
Vector Edge Triacontahedron	$32+60=90+2$	$\frac{30+60=90 \quad \div2}{15+30=45}$	$\times3\times5$	2 Faces =
Vector Edge Enenicontahedron	$92+180=270+2$	$\frac{90+180=270 \quad \div2}{45+90=135}$	$\times3^2\times5$	3 Edges

$2V^P$

Table 4. Topological Hierarchies. Copyright 1959 by R. Buckminster Fuller. Reprinted by Permission of Mr. Fuller.

(2) the class of all those operative exclusive of the system. It has been further recognized that the variables outside the system may affect the system from outside. In varying degrees specific levels of sub-classes of these "background" or outside variables are identified as *parameters*. This background "inside and outside" concept is a two dimensional or flat-projection concept.

Our omnioriented Halo concept converts the *parameter* consideration to conceptual four dimensionality and discloses a set of parameters inside as well as *outside* the zone of lucidly considered system stars. And the parameters are at minimum fourfold: [1] the convex twilight zone of inward relevancy, [2] the concave twilight zone of outward relevancy, [3] the *stark* nonconceptual irrelevancy inward, and [4] the stark nonconceptual irrelevancy outward. Parameter [1] is a tetrahedron. Parameter [2] is a tetrahedron. Parameter [3] plus parameter [4] comprise an invisible tetrahedron.

The *considered* relevancy within the zone of lucidity consists of one more tetrahedron. For each "considered tetrahedron" there are three parameteric tetrahedra. We discover that our omni-halo epistemological accounting consists of rational tetrahedronal quantation.

When we missed the moon in our first attempt to shoot a rocket to it, the tetrahedronal tuck in universe may have represented that discrete error. It was directly relatable to our lack of awareness of the disparity of the calculus. This disparity is corollary to the same mathematical disparity that was physically discovered in atomic behavior, which brought its discoverer's the 1957 Nobel prize and which discovery invalidated "physics'" long held "law of conservation of parity" which held the obverse and reverse to be identical, ergo, redundant. A further corollary to the tetrahedronal disparity of systems invalidates the functioning significance of the transcendental irrational constant *Pi*. The comprehension of this mild error and implementation of the mathematical strategy of nature's co-ordinate system which I have disclosed and named Energetic/Synergetic Geometry

may greatly improve the extra-terrestrial undertakings whose effectiveness has not been frustrated so much by inadequate energy supply as by inadequacy of fundamental mathematical conceptioning and its resultant technical incapability. Our computer instrumentation is phenomenally good, but our problem stating and question asking have been inadequate.

In the inherently subjective language of physical transformation of an omni-interaltering and accelerating universe there are only two fundamental kinds of observable transformational changes, i.e., *angular*, or sub-unity *alterations*, and *linear*, or plural unity (frequency modulated) *accelerations*. These subjectively viewed transformations of universe are also objectively and locally controllable by man through designed angle and frequency modulations.

In the Energetic/Synergetic Geometry's isotropic, vectorially triangulated, omnidirectional matrix initiations the *angular* and *linear* accelerations are rational and uniformly modulated, whereas in the *xyz* co-ordinate analysis of the calculus only the linear is analyzable and the angular resultants are usually irrationally expressed.

Substituting the word tetrahedron for the number 2 completes my long attempt to convert all the residual heretofore unidentifiable integers of topology into geometrical conceptability.

By the omnidirectional star-studded Halo reasoning the development of a conceptual tetrahedron automatically charges a negative yet invisible tetrahedron into the nonsimultaneous, *nonconceptual finite* universe, comprehensive to the local definite conceptual system.

This discovery that all the differences between de-finite conceptual systems and finite, yet nonconceptual total universe seems to provide a fundamental means of identifying the physical phenomena entropy. Entropy no longer means inherent escape of energy from any local system or decrease of local order or increase to disorder. Entropy now means the invisible extraction from any local definitive system of the negative conceptual

Dymaxion Hierarchy of Vector Generated Fields, Volumes, Mass, Charge, Potentials of Geometric Forms, i.e. Potentials of Basic Energetic Transformations Where 3-fold unit and 4-fold axis rotate on 8 axii	(1) With energy potentialin equilibrium dispersion vector =2+ √9/8 =2×1.06066 =2.03053=V Volume=	(2) 480/Col 1. Where 'A' particle =480 makes en-fused whole volume particle fractions. Use for interaction of planes of 25 great circles	(3) Where edges of cube and all other planar-bound form=2 as per common Greek 3 Dimension, 'Coord.' System, regular solids' Euclidian platonic	(4) Where edges of cube and all other planar-bound form =2 as per common Greek 3 Dimension, 'Coord' System 'regular solids'	(5) Edge of tet, octa, icosa, dymax, rombsd, dodeca, tetraxhic, alt=2. Diag. diagonal of cube and rombidec 2 = 2, radius of sphere=2, or arc of sphere=2 as marked	(6) Special formula	(7) Ratios
'A' PARTICLE 1/6 of ½ of regular Tet. 1/6 of Tet. formed on 4 faces of regular Tet. with apex at C. at G. of Tet.	½V=edge (outer) .0416666 =1/24 of unity	Rational					
ICOSACENTET Each of 20 tets. Formed on 20 faces of Icosa with apex at C. of G. of Icosa.	V=outer edge .9255		.10908	.8726	.8726		
TETRAHEDRON (Regular Tet.) 4 equal triangular faces.	V=edge 1.0000	< Rational 11.32000	.1179	.9432	.9428	$\left(\dfrac{V^{\frac{1}{2}}}{2}\right)^{3}$	
CUBE (1) Edge of Cube=1 (=1.4122, Cube= Tet. +4 (⅓ Octa) on its faces fills all space. If edge of Cube=V, Vol. = 8.4904.	V=diagonal 1 = 3.0000	<Rational	1.0008	8.0000	2.828128	$Vol = \left(\dfrac{V^{\frac{1}{2}}}{2}\right)^{3}$	
OCTAHEDRON (Regular Octa) 8 equal triangular faces.	V=edge 4.0000	<Rational	.4714	3.7712	3.7712		
RHOMBICDODECAHEDRON (Rombidec. 1) Fills all space. 12 equilateral rhomboid faces=Octa and 8 (¼Tet). Radius Tet.=V.	V=long diag. face 6.0000	<Rational			5.6576		
CUBE (2) Where edge of Cube is Vector= 2.03054.	V=edge 8.4904	Comple-mentary Rational	2.4817	17.4536	17.4526	$\dfrac{20}{3}\sqrt{V^2}$	Vol. Icosa.: icosasphere 'R' = 1 : 1.01725
ICOSAHEDRON (Icosa) 20 triangular faces, Radius=1.02859. Perpendicular from C.G. Icosa to C.G. triangular face=1.574.	V=edge 18.5100						
DYMAXION (Dymax) 6 square and 8 triangular faces. All edges and radii identical and are identical vectors in omnidirectional equilibrium.	V=edge and radius 20.0000	<Rational	2.3574	18.8592	18.85618	Vol. dymax.: dymaxisphere 'A' = 1 : 1.54354, factor = 1/20 vol. dymaxisphere	dymaxion, dymaxisphere 'R' = 1.77715 Note √π = 1.772454
RHOMBICDODECAHEDRON (Rombidec. 2) Fills space. 12 rhomboid faces where edge=V.	V=edge 25.5960	<Rational	3.0622	24.4974	24.4974		
TETRAXIDECAHEDRON (Tetraxidec. 1) Lord Kelvin's all-space solid. 6 square, 8 hexagonal faces. Dymaxion + 1⅓ Octa = total 1⅓ Dymaxions.	V=edge 90.0000	<Rational					
ICOSASPHERE (A) Where arc 63° 26'=edge of spherical triangles of 20 Spherical triangles of Sphere=arc= 2.039051.	V=arc 63°26' 27.755	Spheres			arc 63°26'=2 26.1989		Icosasphere 'A': dymaxisphere 'A' = 1 : 1.1813
ICOSASPHERE (R) Where radius=V=2.039051.	V=radius 30.570				radius=2 25.8216		Icosasphere 'R': dymaxisphere 'R' = 1 : 1.16258 · Icosasphere 'R': dymaxisphere 'A' = 1.012454
DYMAXISPHERE (A) Where arc 60°=V=2.039051.	V=arc 60° 30.850				arc 60°=2, 29.18053; radius=2 1.0008	3.88=Vol.SP. sft = 6	dymaxisphere 'A': dymaxisphere 'R' = 1.148079
DYMAXISPHERE (R) Where arc 60°=V=2.039051.	V=radius 35.540				radius=2, 33.51029 arc=2.0944		
DODECAHEDRON 12 hexagonal faces.	V=edge 65.818	<Rational	7.6631	61.3048			
TETRAXIDECAHEDRON (Tetraxidec. 2)	V=edge 136.0000	<Rational	16.0242	128.1936			
	Note that 10 out of the 13 planar bound solids are rational and 2 others are complementary rational	Of above only cube is rational	Of above only cube is rational	Of above none is rational To convert above solids to values in column (1) multiply by 1.06066 = √9/8		

NOTE: It may readily be seen from above why the preoccupation of mathematicians and laymen alike with the 3-dimensional coordinate system and its 'cube' has obscured the existence of the rational dymaxion hierarchy and that it would most naturally be discovered only by the pursuit of the concept of vectorial—omnidirectional equilibrium.

2⁴√9/8 = dymaxion constant

dymaxion	½ V = 1.0198255
	(½ V)² = 1.1250 1.0304504
	(½ V)³ = 1.06066
	(½ V)⁴ = 1.125 0000
	= 1 1/8
	= 9/8

1	2	3	4	5	6	7	8
0 — 0 — 0 — 0 — 0 — 0 — 0 — 0
1	2	3	4	5	6	7	8	9

Unique maxima of dymax nucleus employs above; 9 balls, 8 spaces.

This ratio has significant implications as in natural number behavior as indicated by basic sphere and dymaxion and octa-tets. It is seen that number integers take octave—nine modular congruence.

Table 5. Dymaxion Energetic Geometry. Copyright 1950 by R. Buckminster Fuller. Reprinted by permission of Mr. Fuller.

entity, i.e., one negative tetrahedron deposited into universe balance of energy conservation permitting the local extraction of any visible orderly conceptual system. Entropy is not random; it is always one negative tetrahedron. It may have a wide variety of relative size (frequency) dimensions. A tetrahedron is 720° and is an angular constancy independent of size. It is finite. It can account finitely for any discrete rate of energy loss.

In résumé: By our systematic accounting of angularly definable concave-convex local systems we discover that the sum of the angles around each of every local system's geodesically interrelated vertices is always two vertexial unities less than universal nondefined finite totality. We call this discovery the law of finite universe conservation. Therefore, mathematically speaking, *all defined conceptioning always equals finite universe minus two.* The indefinable quality of *finite universe-inscrutability* is exactly accountable as *two.*

$$\text{Ergo, finite−definite} = 2 \text{ De (Di)} = 2$$
$$\text{de-finite−finite} = -2 \text{ (di) de} = -2$$

This is a subtractive 2—not a divisive 2, which latter occurs as the second derivative stage of systematic zonal differentiation into the fundamentally positive and negative yet disparate and inseparable aspect characteristics of concavity and convexity.

The finiteness of universe is thus finitely proven by comprehensive geometrical system topological accounting. We have, therefore, a comprehensive universal synergetic accounting advantage in respect to all systematic experience considerations both physical and metaphysical.

The first synergetic accounting advantage of known man-history derived from the two-millenium-old discovery of the invariant sum (180°) of the angles of the obverse face of any plane linear bound triangle. The second major synergetical advantage accrued to Newton's inverse ratio law of gravity as a comprehensive astronomical accounting system. The third major synergetical accounting advantage was derived one hundred years ago from Euler's topological discovery that the numbers of vertices of polyhedra plus the number of their faces always equalled the sum of the number of the polyhedra's edges plus the number two.

The fourth major synergetical accounting advantage accrued a half century ago to the physicists' hypotheses of the law of conservation of energy which held that energy had shown experimentally that it could be neither created nor destroyed. From this assumption, which threw all scientific and nonscientific considerations, other than the energetically physical, into the then seemingly indeterminate realm of metaphysical, came the successive wave-quanta accounting theory and subsequent fission and successful nuclear components discovery and inventorying. Fifthly, Willard Gibbs' phase rule in a formula similar to Euler's in which the degrees of freedom are in effect the vectorial edges brought *synergetic* advantages to chemical strategy. Sixthly, the same synergetic accounting advantage is now extended by our law of *non-simultaneous finite universe pattern conservation* to embrace definitive consideration of any and all experiences, physical or metaphysical. The latter strategically equatable accounting advantage derives from a corollary of synergy which shows that systematic accounting of the behavior of whole aggregates may disclose discretely predictable angle and frequency magnitudes required of some unknown components in respect to certain known component behaviors of the total and known synergetic aggregate. Therefore, the definitive identification permitted by the *law of finite universe conservation* may implement conscious synergetic definition strategies with incisive prediction effectiveness, possibly of epoch initiating magnitude.

We inaugurate exploration with our *theorem of omniuniverse tetrahedronal structuring.* Whereas Van't Hoff showed that all inorganic chemical structuring is tetrahedronally configured in vertexial linkage and Pauling's X-ray diffraction analyses show omnitetrahedronal configuration interlinkages of gravitational centers of compounded atoms in all metals analyzed our omnitetrahedronal structuring as a triple bonded linear tetrahedronal

array may coincide with the *DNA* helix, and the tetra's four unique quanta corners may explain *DNA*'s dichotomy transferred T,A; G,C patterning control of all biological species reproductions.

A trial balance reconsideration and interconsideration of the significance accruing to the inherent order of consciously permitted cognitions thus far inventoried as derived from our epistemological premise that universe is the aggregate of consciously observed and communicated experiences discloses an orderly succession of derivative dichotomies and synergetic surprises accruing to the grand operational review of derivative patterns.

First, we recognize that *intellect took the measure of definitive energy universe* because Einstein as intellect wrote $E = MC^2$. And we recognize the inherent irreversibility of that definitive capability because the concept of energy defining intellect is unthinkable. The de-fining of finite universe is a function of intellect synergetically manifest in universe. Subsequent to Einstein's intellect's definition of energy universe in two conceptual functions M and C^2 his definitive physical realm hypothesis of universe was proven valid by fission. With fission came *empirical validation* of Einstein's theretofore hypothetical equation as now energetically definitive. Because the difference between definite and finite universe is definitively two, it follows that the difference between the physical portion of universe and total universe is definitive two. Whereas all metaphysical phenomena were shuntingly disposed by the Einsteinian physicists into a then supposedly infinite universe's ephemeralization; it now comes as a surprise result of our finite-universe hypotheses that the *metaphysical* is as strictly definitive as the *physical*. Ergo the definite physical portion of universe plus the metaphysical or nondefinitive portion of universe together equal total finite universe and the metaphysical must therefore equal a nondefinitive but finite twoness.

The metaphysical which is now also contained within the comprehensive finiteness of universe is greater by two in its comprehensive magnitude than the physical portion of universe which lies inherently within the micro–macro metaphysical. And as the metaphysical embraces intellection, we may say that the nonsimultaneous *all-knowledge* (omniscience, or wisdom) gained by all men out of *all-experience* (universe) is comprehensive by a discreet margin of two to *all-energy* (omnipotence) whose measure omniscience took. Omniscience is greater than omnipotence and the difference is two. Omnipotence plus two equals omniscience. $META = 2$.

Intellections are *cumulative pattern apprehensions* and are synergetically integrative as wisdom and wisdom initiates new mathematical hypotheses. Mathematics implements man's calculation within minutes regarding energy actions requiring eons of time. Man's intellect masters energy's fastest behaviors. Energy light years are calculated in intellect seconds. Omniscience is evidently of comprehensively transcendental alacrity to the speed of light whose relatively slow articulations in universe are readily anticipated by intellectually initiated and disciplined computation of mind.

There is a question-asking-possibility that omniscience may be transcendental in velocity to the definitive physical speed of energy omnipotence. The synergetic *anticipatory* capabilities of intellect (in respect to conceptual formulations of evolutionary transforming potentials of universe and the *anticipatory* stratagems evolved by intellect to test such hypotheses) imply the possibility of a velocity transcendence of omniscient functioning over omnipotence functioning which could mean an intellectually regenerated evolutionary extension of universe in generalized synergetical integrity. Intellect's comprehensive anticipatory objectivities indicates a speed of functioning transcendental to physical events. Intellect may be "creating" finitely extending and re-fining universe as it asks each next good question.