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Triangulation of Incommensurable Concepts for Global Configuration

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Annex to *Reframing the Dynamics of Engaging with Otherness* (2011)

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Introduction

The main paper is a speculative exploration of the triadic relationship between three frameworks, deliberately chosen as extremely different if not totally incommensurable (*Reframing the Dynamics of Engaging with Otherness: triadic correspondences between Topology, Kama Sutra and I Ching*, 2011). They were considered as a [ternary complementarity of metaphorical language](#).

The concern in what follows is to note various approaches to a "triadic", "ternary" or "triune" perspective, with the purpose of [Enabling comprehensible global configuration of concept maps](#) (2011), as suggested in the latter exploration. It follows from earlier exploration of [Spherical Configuration of Categories to Reflect Systemic Patterns of Environmental Checks and Balances](#) (1994).

Triadic logic ?

As discussed previously (*Tao of Engagement -- Weaponised Interactions and Beyond: Fibonacci's magic carpet of games to be played for sustainable global governance*, 2010), seemingly missing, is recognition of a ternary pattern. Binary logic is so fundamental to both discourse, computer operations and electronic communications that the potential importance of a ternary pattern is effectively ignored.

The *Wikipedia* entry on [ternary numeral systems](#) notes:

- a base-three system is used in Islam to keep track of counting *Tasbih* to 99 or to 100 on a single [hand](#) for counting prayers (as alternative for the *Misbaha*). The mnemonic benefit is that counting within this system then reduces distraction since the counter needs only to divide *Tasbihs* into groups of three.
- use of ternary numbers conveniently to convey self-similar structures like a [Sierpinski Triangle](#) or a [Cantor set](#). The ternary representation is useful for defining the [Cantor Set](#) and related point sets, because of the way the Cantor set is constructed.
- ternary as being the integer base with the highest [radix economy](#), followed closely by [binary](#) and [quaternary](#). It has been used for some computing systems because of this efficiency. Rarely mentioned is the existence of [ternary computers](#) (notably defining a tryte to be 6 trits, analogous to the binary byte).
- use in the representation of 3 option *trees*, such as phone menu systems, which allow a simple path to any branch.

Of further relevance to the pattern of argument here is the role of [ternary valued logic](#). Such a three-valued or trivalent logic is one in which there are three [truth values](#) indicating *true*, *false* and some third value. This is contrasted with the more common [bivalent](#) logics (mentioned above) which provide only for *true* and *false*. or *guilty* and *not-guilty*. An exception occurs in the Scottish legal system providing additionally for *not-proven* (a distinction which would seem to be of considerable current significance with respect to many

detained in Guantanamo Bay).

Conceptual form and basic ideas were initially created by [Jan Lukaszewicz](#), [C. I. Lewis](#) and Sulski. These were then re-formulated by [Grigore Moisil](#) in an axiomatic algebraic form, and also extended to n -valued logics. In the argument here, the question is whether the pattern in the diagram above holds a meaningful relationship with a range of [multi-valued logic](#) systems.

Triadic dialectics

The triadic dialectic has been developed from the work of [Georg W. F. Hegel](#) (Robert R. Williams, *Recognition: Fichte and Hegel on the other*, 1992). This is often (mis)presented in terms of [thesis](#), [antithesis](#), [synthesis](#). The triad is usually described as:

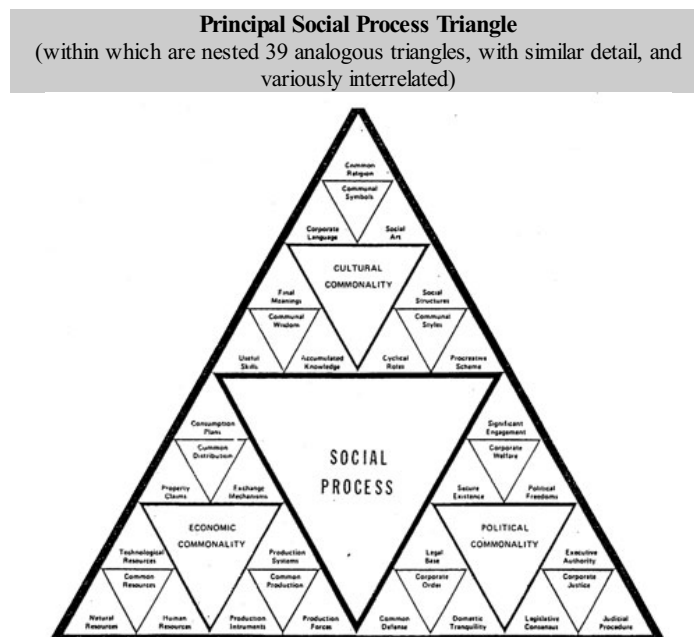
- thesis as an intellectual proposition.
- [antithesis](#) is simply the negation of the thesis, a reaction to the proposition.
- synthesis solves the conflict between the thesis and antithesis by reconciling their common truths, and forming a new proposition.

In the presentation by James Bunch ([Improvisation and Hegelian/Triadic Dialectic in Vinko Globokar's Correspondences](#)):

At root, triadic dialectics is a logical technique or formulation used to engage with an object or an idea. The triad is expressed as thesis (affirmative proposition), antithesis (negative proposition), and synthesis (affirmative proposition). It involves the resolution of two opposites (thesis and antithesis) into a higher unity (synthesis) by showing that the antithesis can be deduced from the thesis (that the thesis in a sense, 'contains' its opposite). The opposition of a thing or a concept is called its negation. The goal of the dialectic process is not simply to discard one way of thinking for another, but to sublate (to assimilate) two opposites or extremes into a higher unity' that is, into a higher, more developed way of thinking that contains and encompasses both, including the contradictory space carved out by their mutually exclusive properties. According to Hegel, sublation (synthesis) 'destroys, preserves, and elevates' oppositions at the same time. It renders the former way of thinking about a concept or thing as obsolete 'as incomplete and thus unsatisfactory' replacing it with a more reasonable/logical one.

Triadic strategic applications

A remarkable triadic pattern was developed in the period 1970-72? in support of the strategic initiatives of the [Institute of Cultural Affairs](#) by Jon Jenkins and Maureen Jenkins ([The Social Process Triangles](#), 2001), as separately described and illustrated ([Collective strategy-making: designing a strategic array](#), 1994). An overview is presented through the following triangle, the dynamics of whose component triangles are further articulated elsewhere..



Triadic conceptualization

Triad systematics: Considerable attention has been given to the systematics of the triad by [J. G. Bennett](#) (*The Dramatic Universe*, 1966). Efforts have been made to identify the conceptual and practical power of [Christopher Alexander's](#) theory and practice of wholeness (*A Pattern Language*, 1977; etc.) in the light of clues provided by Bennett's work by David Seamon (*"Intensify this Awe": Threeness, the Triad, and Christopher Alexander*, 2008):

Threeness, Bennett argues, relates to relationship, process, action, dynamism, and reconciliation. "Without an understanding of the triad," writes Bennett "it is difficult to make any real change in the world." My aim here is to summarize Bennett's understanding of the triad and then to ask what insights it offers for better understanding Alexander's theory and practice of wholeness. In Bennett's terminology, the triad is a system of three independent but mutually related qualities, each of which Bennett designates by the word impulse, to suggest a sense of force or motivation that, blending with the two other impulses of

the triad, leads to a specific mode of action, process, or happening

Sociophysics: Another remarkable exception is the triadic clustering of concepts, notably in relation to political order, as explored by [Paris Arnopoulos](#) (*Sociophysics: cosmos and chaos in nature and culture*, 2005). Elsewhere Arnopoulos explores the possibility of a "neoethics" -- which might be said to be a characteristic of a New Renaissance (*Nova Magna Moralia -- physics-ethics-politics: neoclassic concepts for postmodern times*, *Skepsis: a journal of philosophy and interdisciplinary research*, 2002-3). Following his earlier work, he emphasizes a trilateral pattern of global morality combining physics, politics and ethics: physics because nature is the underlying context of global existence, politics because culture is the highest creation of human evolution, and ethics because it provides the conjunction between the other two.

The triadic argument of Arnopoulos has been criticized by Chris Goldspink (review of *Sociocybernetics: Complexity, Autopoiesis, and Observation of Social Systems*, 2001) as:

an example of what Khalil and Boulding [*Evolution, Order and Complexity*, 1996] call identificational slips -- associating or seeing as related, disparate phenomena on the grounds of a superficial resemblance. In this case it takes the form of suggesting a homologous relationship between a (long) list of natural science concepts and social phenomena where even metaphorical association would be stretching a point.

In terms of the argument here however, this criticism may be flawed in its failure to take account of the manner in which individuals may engage emotionally to bind together sets of categories, otherwise treated as the "bloodless categories" of scholasticism -- hence the value of the language of the *Kama Sutra*. Chris Lucas (*Ethics as Emotions: an evolutionary approach*, 2004) argues that "ethics, as practised, are emotions and not thoughts and are in fact prior to ethical thought processes".

This is the question of how such "cognition" is "embodied" (George Lakoff and Mark Johnson, *Philosophy in the Flesh: the embodied mind and its challenge to western thought*, 1999). The triangulation may be understood as thereby "grounded" or "anchored" in a manner consistent with the arguments of [enactivism](#). The triangulated pattern is thereby given coherence from a fourth "perspective" such that the resulting tetrahedral configuration is a fundamental systemic embodiment in a sense explored by Buckminster Fuller.

The sustainability of autopoiesis in psychosocial systems -- the capacity for sustained self-organization in response to new configurations of circumstances -- is dependent on poesis to re-member continually the factors intrinsic to that process, to the coherence of the outcome, and to its attractiveness. Autopoiesis in such systems is not sustainable if it is envisaged and designed in terms of "bloodless categories". This is the challenge of engendering and sustaining any "will to change".

Triarchic intelligence: It is appropriate to note here the arguments of [Robert J. Sternberg](#) for a [triarchic theory of intelligence](#) (*The Triarchic Mind: a new theory of human intelligence*, 1988) which he distinguishes as:

- metacomponents: the "white collar" processes of human intelligence
- performance components: the "blue collar" processes of mental self-management
- knowledge-acquisition components: the students of mental self-management

Triune paradigms: The [Triune Continuum Paradigm](#) was developed by A. Naumenko (*Triune Continuum Paradigm: a paradigm for general system modeling and its applications for UML and RM-ODP*, 2002). The paradigm allows for building of rigorous conceptual frameworks employed for systems modeling in various application contexts (highly tailored as well as interdisciplinary). The paradigm defines a set of scientific foundations (principles) within which conceptual frameworks used for system modeling in different contexts can be built, tested, evaluated and if necessary revised.

The paradigm is based on three theories: [Tarski's Theory of Truth](#), [Russell's Theory of Types](#), and the Theory of Triune Continuum. It produced the corresponding three principles that compose the paradigm, ensuring:

- *coherency* and *unambiguity* within modeling interpretations of a single modeling framework.
- *internal consistency* of descriptions and specifications that are constructed with the aid of a modeling framework.
- *necessary* and *sufficient* minimal set of modeling concepts to cover the representation scope of a modeling framework on the most abstract level (on the level that corresponds to the first order propositions in Russell's Theory of Types).

Triadic education and learning

Triadic education: David Clarke, Sandra Frid and Carne Barneti (*Triadic Systems in Education: categorical, cultural or coincidence*. 1993) argue that recent research in education, and mathematics education, in particular, has led to the identification of independent categorizing systems intended to mirror the structures found in such diverse fields as teacher professional development (Barnett. 1992); student writing in mathematics (Clarke, Stephens, and Waywood, in press); and student acquisition of calculus knowledge (Frid. 1992). There are particular characteristics of .. these categorizing systems which display a tantalising similarity:

- Contextual similarity: the common location of all three studies within educational environments;
- Structural similarity: the "three-valued" (triadic) structure of all three categorizing systems;
- Conceptual similarity: categories in each system resemble each other in the nature of their conceptual distinctions.

Threefold learning cycle: Following from his insights as the developer of the Bell helicopter, and from its control in flight, these were articulated in terms of a threefold and fourfold learning cycles by [Arthur Young](#) (*The Geometry of Meaning*, 1984):

- In discussing the (fourfold) learning cycle, I implied that fourfold analysis is insufficient as a general description of process...the

cycle includes not only actions but other factors as well. This is the threefold cycle of stimulus, response, and result. The three aspects in this case are again different categories, for which it is quite difficult to find sufficiently general names. (p.25)

- So the generalized description of the threefold cycle is...relationship, act, state. In returning to a state, which it must do to be a cycle, the process does not necessarily return to the same state that initiated it; it only returns to a state of some kind....The threefold is not limited to this cycle. In fact, the cycle, as an analytic concept, does not fully describe the threefold. In the more general sense, this is a way by which wholes divide into three inter related factors, often, but not always, in the form of two elements plus that which is between them....Since it is basically nonconceptual, it cannot be defined... (p.26-27)
- The threefold operator, represented analytically as equidistant points on a circle, is actually a three-dimensional activity, whose measure gives only its analytic aspect. The analytic aspect, which is in two dimensions, does not convey the full meaning of the cube root; it is like the shadow of a solid figure. The threefold nature of the cube root is nonanalytic. It involves categories which differ from one another more profoundly than those of the fourfold. (p.55)
- We may think of the threefold as an endless line (curving though space in an arbitrary fashion). Between any two points on this line, we can say which is before, but we cannot look at a piece of it without getting off the line....It is a reality which is always with us, yet perpetually eludes analytic descriptionIf we try to analyze what it is that the threefold describes, we are in a bind, for it is just that element of participation in life that analysis cannot, and does not even pretend to, cope with. (p.57)
- The threefold is an entirely different way of cutting the cake. It is much more fundamental (than the fourfold), and it cannot be analyzed....In fact, the threefold is the natural way we move in life. We see something, buy it, and enjoy it; food, eating, satisfaction; stimulus, response, result. There are three categories of terms: relations, acts, and states. The reader will recall the difficulty of finding sufficiently general words. (p.99)
- But when the stimulus causes wrong action and the result is not achieved, the (fourfold) learning cycle becomes necessary. Thus the learning cycle occurs only when there is an obstacle in the larger, threefold cycle. (p.24)
- In sum, we have shown that the threefold, despite the seamless quality which makes it difficult to get "hold of", is still in the measure formulae of science. These expressions, which constitute a basic vocabulary of science, fall into three groups of four: actions, states, relations." (p.102).

Some earlier tentative adaptations of Young's insights are presented in:

- *Characteristics of phases in learning / action cycles*
- *Typology of 12 complementary strategies essential to sustainable development,*
- *Typology of 12 complementary dialogue modes essential to sustainable dialogue.*

Interrelating multiple triadic approaches

The value, if not the necessity, of a minimum of three complementary languages can be usefully appreciated through the variety of skills now widely recognized as valuable in a "team" A minimum "team" could be understood as built on three distinct skill sets. For example the work of [Meredith Belbin](#) (*Management Teams*, 1981) has resulted in the *Belbin Team Inventory* (aka *Belbin Self-Perception Inventory*) recognizes 3x3 roles: [Plant](#), [Resource Investigator](#), [Co-ordinator](#), [Shaper](#), [Monitor Evaluator](#), [Teamworker](#), [Implementer](#), [Completer Finisher](#), and [Specialist](#).

The hexagram encoding of the *I Ching* is significantly based on multiple triadic forms and the transformations between them. A triad of strategic issues -- such as health, wealth and stealth -- may be speculatively "combined" with another such triad -- youth, couth, and truth. The assumption being that together these constitute a form of "attractor" of fundamental significance to psychosocial dynamics (*El-Attractor -- Timeless Complex Dynamic Health, Wealth, Stealth / Youth, Couth, Truth*, 2007).

When combined in this way, the result can be presented as the traditional Star of David -- with all that this may inspire. As a further exercise, the hexagrams of the *I Ching* can also be displayed in that form rather than as the traditional set of parallel lines. Such possibilities lend themselves to various kinds of animation of potential significance for comprehension (*Animation of Classical BaGua Arrangements*, 2008; *Sustainability through Magically Dancing Patterns: 8x8, 9x9, 19x19 -- I Ching, Tao Te Ching / Tai Hsüan Ching, Wéiq? (Go)*, 2008; *Dynamic Exploration of Value Configurations: interrelating traditional cultural symbols through animation*, 2008).

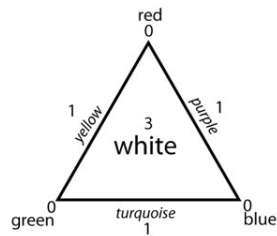
Integrative thinking

What might be considered an exercise in triadic integration is offered by the implicit relationship between three integrative thinkers as carefully documented by [Jennifer Gidley](#) (*A Macrohistorical Planetary Tapestry: the fascinating integral narratives of Steiner, Gebser and Wilber*, 2007) as part of her exploration of *The Evolution of Consciousness as a Planetary Imperative: an integration of integral views* (*Integral Review*, 2007, 5).

The challenge of integration beyond any binary clash is admirably clarified using the mathematics of q-analysis as developed by Ron Atkin (*Multidimensional Man; can man live in 3-dimensional space?*, 1981), as separately summarized (*Comprehension: Social organization determined by incommunicability of insights*). Atkin illustrates the challenge of comprehension in relation to experience "within" the geometry of a triangle -- especially with regard to the perspective necessary to comprehend the geometry of the triangle as a whole. The perceptual significance of this approach is well-illustrated by visual sensitivity to colours resulting from the three primary hues (red, green and blue). These may be represented on a simple triangle. Here the vertices (0-simplexes) represent the primary hues, the sides are twofold combinations (1-simplexes), and the combination of the three hues makes the central white (2-simplex).

Schematic used by Ron Atkin to illustrate the challenge of recognizing a higher-order perspective

0-dimension vision:



- Red, Green or Blue

1-dimension vision:

- Yellow (=Red/Green)
- Purple (=Red/Blue); or
- Turquoise (=Blue/Green)

2-dimension vision:

- White (=Red/Green/Blue)

Enhancing coherence through spherical triangulation

R. Buckminster Fuller has argued extensively regarding the fundamental importance of triangulation as the basis for the stability of structures, notably with respect to his application of spherical triangulation to geodesic domes (*Synergetics: explorations in the geometry of thinking*, 1975). He demonstrates the need for **omnitrangulation** as a fundamental requirement of system integrity:

Not until we have *three* noncommonly polarized, great-circle bands providing omnitrangulation as in a spherical octahedron, do we have the great circles acting structurally to self-interstabilize their respective spherical positionings

It is possible therefore that the integrity of psychosocial systems, and the connectivity of the "patterns which connect" of Gregory Bateson, involve an "omnitrangulated" **emotional** engagement. To that extent Bateson's **mental** focus on *Mind and Nature: a necessary unity* (1979) may be obscuring the need for an essentially emotional "glue" through which coherence is engendered and experienced -- as tends to be obvious from a depth ecology understanding as articulated by David Abram (*Depth Ecology*, 2002; *The Spell of the Sensuous: perception and language in a more-than-human world*, 1996). In discussing depth ecology (from the perspective of Abram and others) and the use of Merleau-Ponty's phenomenology in relation to reflection in a sensuous rationality, Chris Schlotmann (*Embodiment and Embeddedness in Philosophies of Ecology: deep ecology, Confucian ecology, and Maurice Merleau-Ponty's phenomenology*, 2002) argues:

A significant tension develops from integrating sensuousness with rationality. Sensuousness and emotion do not seem to have the quality of self-reflection, as intellect does. Sensuous rationality is therefore not subject to this corrective mechanism, and seems to be less verifiable.

The case for a metaphorical or cognitive architecture "beyond three" can be variously made (*Spherical Configuration of Categories to Reflect Systemic Patterns of Environmental Checks and Balances*, 1994). Its feasibility is increasingly evident in a web environment (*Spherical Configuration of Interlocking Roundtables: Internet enhancement of global self-organization through patterns of dialogue*, 1998). The cognitive "flatness" of a triangle may be provocatively called into question by mathematicians (Dionys Burger, *Sphereland: a fantasy about curved spaces and an expanding universe*, 1965; Ian Stewart, *Flatterland*, 2001), with the latter exploring non-Euclidean geometric implications.

The argument here however is that rather than "categories" configured by spherical triangulation, there is merit in considering the integrative implication of metaphorical languages so configured. To the extent that metaphors are traditional vehicles for wisdom, the possibility may be explored in terms of the design and construction of "wizdomes" in a web environment (*Transforming Static Websites into Mobile "Wizdomes": enabling change through intertwining dynamic and configurative metaphors*, 2007).

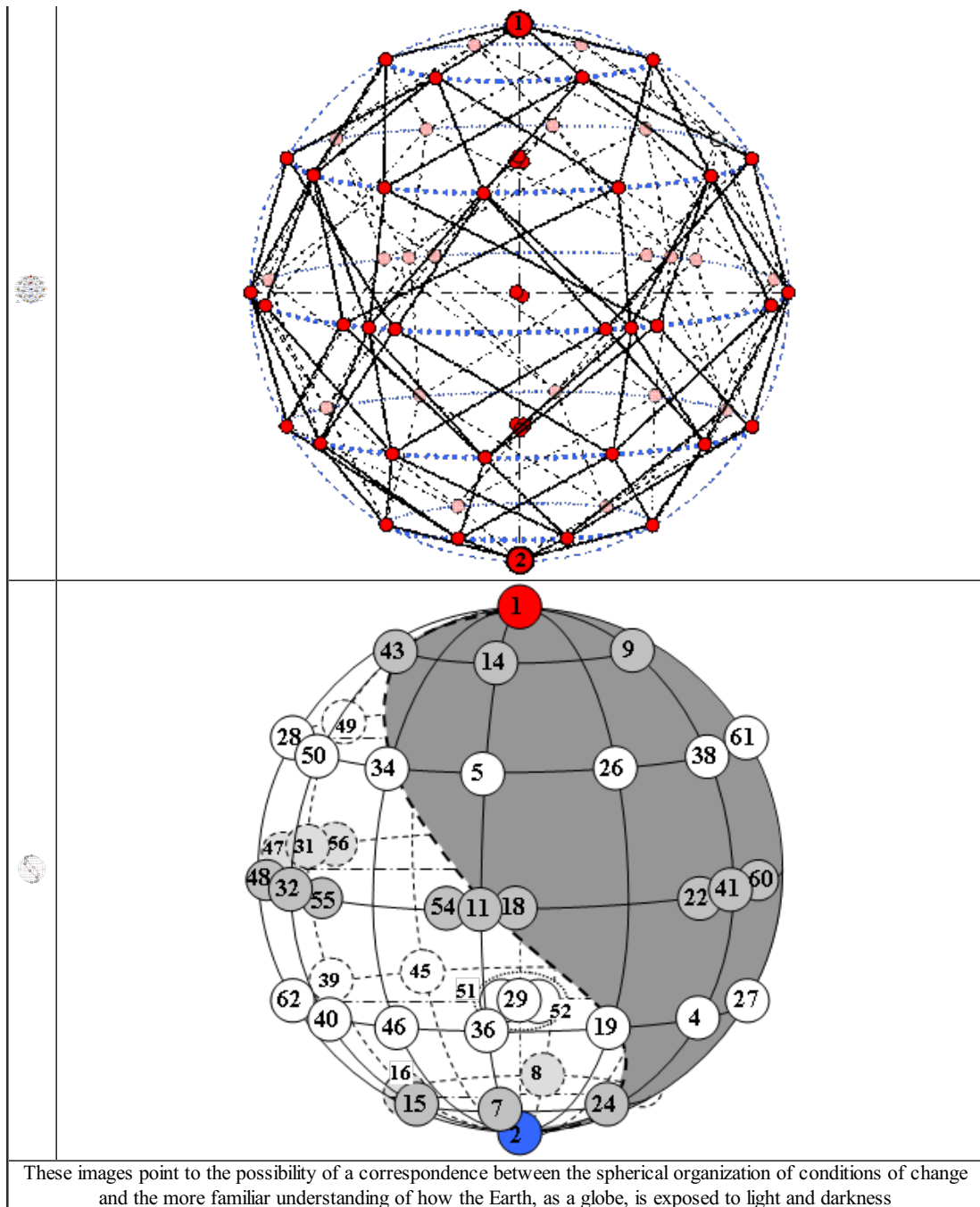
As envisaged there, the cognitive process of "wizdome building" is one of configuring knowledge elements such as to provide an integrative sense of perspective (in French *une position de recul*). This sense of perspective is however associated with a particular form of detachment (perhaps even in the Buddhist meditative sense) from the polarization and dualistic thinking characteristic of many modes of thought. These multiple polarities of the mundane world are then embodied in the structural elements of the wizdome as (overarching) vault "beams" basic to the creation of its central "space". These are fruitfully understood in terms of a spherical metaphor -- and architecturally as a form of dome. This is in effect the cognitive analogue to the geodesic domes of Buckminster Fuller.

The integrative implications of such curvature is what induces the necessary "cognitive fusion" as explored more extensively elsewhere (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006; *Strategic Challenge of Polysensorial Knowledge bringing the "elephant" into "focus"*, 2008). Fuller's insight might be fruitfully developed in relation to the geometry of argumentation and proof, namely how to interrelate "lines" of argument that together make various "points". Of greatest interest is where this process shifts out of the plane (as characterized by "explanation") through the spherical triangulation that requires curvature such as to create the kinds of "volumes" required by the dialogue and discourse of the future (*Geometry of Organizations, Policies and Programme*, 1992).

Especially intriguing is the possibility that new forms of relationship may be found between complex metaphorical patterns, such as those of the *I Ching* and the *Kama Sutra*. The discovery of **fullerenes** ("bucky balls") as a new form of carbon, based on the spherical configuration of 60 carbon atoms, is indicative of such possibility, as separately discussed (*Understanding Sustainable Dialogue: the Secret within Bucky's Ball?* 1996). The configuration of *I Ching* hexagrams by József Drasny in his Yi-globe is suggestive in this respect.

Selected images of the Yi-globe of József Drasny

reproduced with permission from *The Image of the Cosmos in the I Ching: the Yi-globe* (2007)



As recently noted by Andreas Schöter (*Chorand Spheres, Yijing*, 2011)

This is, superficially, a completely different structure to that shown previously for the Receptive/Creative sphere. However, topology is concerned with the fundamental spacial properties of a structure, and in that case, the two Boolean structures are equivalent. Relating these structures back to the Boolean lattice: the first Chorand Sphere has 30 facets, so between them, both spheres have 60 facets. There are 240 facets in the complete Boolean lattice. So, 180 facets are hidden. These "missing" facets connect the two spheres together.

- vector equilibrium of metaphors ***
- "ascent" -- orbit -- flying

Navigation of the strategic universe

It is especially relevant to this argument that triangulation, as vital to the surveying of territory, is a pre-requisite for navigation -- most notably around a pherical globe. It is in this respect that the importance of a "long baseline" is required for finer resolution, notably in astronomy ([Very Long Baseline Interferometry](#); [Very Long Baseline Array](#)). **The argument for a "shocking" degree of difference between the three metaphorical languages may then be seen as offering triangulation in terms of long baselines such as to enable navigation through the psychosocial universe.** How then to articulate the case for a "Very Long Metaphoric Baseline"? How then to build on disagreement? (*Using Disagreements for Superordinate Frame Configuration*, 1992)

Relevant arguments in relation to topology include:

- Verena V. Hafner (*Evaluating cognitive maps for mobile robot navigation behaviour*, 2003) examines biologically inspired

cognitive map models, which provide an artificial navigating agent with a topological map of places after an exploration and learning phase in a previously unknown environment.

- Eleanor A Maguire, Neil Burgess and John O'Keefe (*Human spatial navigation: cognitive maps, sexual dimorphism, and neural substrates*, 1999) note that recent research on navigation has been particularly notable for the increased understanding of the factors affecting human navigation and the neural networks supporting it. The use of virtual reality environments has made it possible to explore the effect of environment layout and content on way-finding performance.

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