



laetus in praesens

Alternative view of segmented documents via Kairos

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Correspondences between Traditional Constellations and Pattern Languages

Requisite simplicity for sustainable comprehension of complexity

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Introduction

Strategic design preferences for simplistic geometry: 2D presentations rather than 3D

Traditional constellations versus Pattern language: towards a mind map

Use of virtual reality for 3-dimensional articulation of connectivity

Embodying a navigable cognitive vehicle

Organizing, starting and driving a cognitive vehicle

Engaging with cognitive feedback loops otherwise

Emergence of a higher order pattern language through constellations of entangled metaphors?

Method of image development as a learning process

References

Introduction

There is no lack of theories, explanations and strategic plans claiming relevance to global crisis. Many are formulated and disseminated in copyrighted documents. These are relatively inaccessible to most in terms of cost and/or comprehensibility. Through appeals, people worldwide may be called upon both to believe in the truth they claim to represent and to supply resources to enable their application. The proponents tend to disparage each others frameworks. When taking the form of commercialised products, each may be asserted to be of uniquely superior value.

These modern formulations by academia and the policy community stand in curious contrast to other more traditional frameworks held to be more comprehensible, to which many attach more credence, and with which many identify more willingly -- or find themselves better reflected in the mirror they may offer. Again, enthusiasts for particular traditions tend to disparage alternative frameworks of this kind. For convenience, the two clusters are distinguished here as a language of patterns and as constellations of significance.

The question addressed here is how some form of cognitive bridge might be constructed between these two modalities. Is there the possibility of imagining a cognitive device of some kind which could serve as such a bridge, as previously discussed (*In Quest of Mnemonic Catalysts -- for comprehension of complex psychosocial dynamics*, 2007; *Imagining the Real Challenge and Realizing the Imaginal Pathway of Sustainable Transformation*, 2007). Metaphorically might this be some unforeseen paradoxical combination of the Rosetta Stone and the Philosopher's Stone?

Given the quarrelsome relationship between proponents of alternative modalities and belief systems, it would seem that what is called for is not a new articulation. Rather the need is for a special kind of "surface" with which significance could be variously associated -- interactively and in a learning mode. The surface needs to be both sufficiently complex to hold variety and sufficiently simple to be comprehensible.

The surface also needs to have integrative characteristics such as to attract attention and be worthy of it. The iconic image of the Earth from space is promoted as being appropriately symbolic of the integrity of a global civilization.

The question is how the imagined surface can enable the arrangement of highly disparate meanings -- implying connectivity vital to global governance (*Imagining Attractive Global Governance*, 2013). Expressed otherwise, the challenge is one of reconciling the requisite variety articulated by cybernetics with the requisite simplicity vital to the comprehension, upheld as a democratic right (*Ungovernability of Sustainable Global Democracy?* 2011). Or, in other terms, **is what can be comprehended of sufficient complexity -- and is what can be adequately explained sufficiently comprehensible?**

Stated most succinctly and provocatively, it is assumed here that people in general derive more personal meaning and sense of identity from reference to their astrological sign -- or some equally memorable symbol -- than from any complex pattern of explanation formulated by qualified authority. The appeal of such symbols might be due to the perception that they have "more soul" -- irrespective

of the degree to which some may be deprecated. The question is how this situation could be reframed with respect to a global civilization in crisis.

Strategic design preferences for simplistic geometry: 2D presentations rather than 3D

Static 2-dimensional frameworks: It is curious to note the degree to which the patterns detected and promoted in academic and strategic discourse primarily take the 2-dimensional form required for document reproduction and other presentations. Representation in 3-dimensional form is an embarrassment, given the technical requirements and associated costs -- and despite the greater degree to which it may match the reality described. This is especially the case when a dynamic is required to convey meaning (*Dynamic Transformation of Static Reporting of Global Processes*, 2013). It is understandable that 2-dimensionality constrains what can be articulated and how it is comprehended, but especially how it is related to the crises of global society.

The future may see as extraordinary the extent to which strategic principles are articulated in terms of "pillars" (or platform "planks"), in support of "plans", when a geometry of more dimensions may be vital to strategic coherence, as separately argued (*Coherent Value Frameworks: Pillar-ization, Polarization and Polyhedral frames of reference*, 2008).

A similar argument can be made with respect to the traditional constellations of insights with which many engage so readily. In this respect, the approach here follows from an earlier argument regarding the need to shift from conventional 2-dimensional representation to some 3-dimensional form (*Representation of Creative Processes through Dynamics in Three Dimensions: global insight from spherical reframing of mandalas, the zodiac and the enneagram*, 2014).

Connectivity: The argument here derives in part from the form of bridge already implied by the role of the "round table" -- whether in strategic articulations or as an inspiring integrative archetype (*Checklist of 12-fold Principles, Plans, Symbols and Concepts: web resources*, 2011). Characteristically missing, however, is the significance of the connectivity amongst the twelve, whether in the strategic or the archetypal case (*Implication of the 12 Knights in any Strategic Round Table*, 2014). The lack is evident to a lesser degree in circlets of ritual beads (*Designing Cultural Rosaries and Meaning Malas to Sustain Associations within the Pattern that Connects*, 2000).

As might be argued from a cybernetic perspective, does this connectivity effectively take the form of **metabolic pathways** -- understood in cognitive terms as the movement and transformation of particular forms of complementary understanding?

Argued otherwise, what do people derive from engaging so extensively in puzzle-solving processes (sudoku, crossword, scrabble, Rubik's cube, etc) -- or the ritual **collective construction of a mandala**? Are these to be usefully understood as metaphors for eliciting meaning through ensuring patterns of connectivity?

Moving vehicles rather than static containers: Framed in this way, is the quest more for a cognitive "vehicle" rather than a "container" -- even one of higher dimensionality, as implied by the **Rosetta Stone** or the **Philosopher's Stone**? Understood as a container, there is clearly a need to hold more than 12 elements, given the complexity of social processes. The point is clarified by the size of sets considered appropriate to any integrative formulation (*Patterns of N-foldness: comparison of integrated multi-set concept schemes as forms of presentation*, 1980). A bead circlet carrying significance may be composed of 108 beads.

Understood as a vehicle, it is becoming evident that humanity needs to be able to travel in three dimensions (if not four) rather than two -- if only in the physical sense implied by orbiting spacecraft, drones, and currently imagined designs of a **flying automobile**. Is a vehicle metaphor to be imagined as a future substitute for the agricultural metaphor of browsing the web?

Although any association with the Rosetta Stone may seem far-fetched, it is appropriate to note the 1.4 billion Euro Rosetta programme of the European Space Agency. This has reached its culmination as this is written. ESA explains use of the name as follows:

Why is the mission called Rosetta? The stone revolutionised our understanding of the past. By comparing the three carved inscriptions on the stone (written in two forms of Egyptian and Greek), historians were able to decipher the mysterious hieroglyphics the written language of ancient Egypt. As a result of this breakthrough, scholars were able to piece together the history of a lost culture.

Why Rosetta? Just as the Rosetta Stone provided the key to an ancient civilisation, so ESA's Rosetta spacecraft will unlock the mysteries of the oldest building blocks of our Solar System -- the comets... Rosetta will allow scientists to look back 4600 million years to an epoch when no planets existed and only a vast swarm of asteroids and comets surrounded the Sun.

Are there three fundamental "languages" -- variously incomprehensible -- of a global civilization in crisis? Do these merit equivalent consideration? How might allocation of resources to their relationship and reconciliation be justified in comparison with that for the ESA programme -- with its highly questionable relevance to human survival at this time?

If the Rosetta Stone metaphor is to be employed by such a well-endowed programme, how might it be adapted to systemic crises, as can be variously explored (*Systemic Crises as Keys to Systemic Remedies: a metaphorical Rosetta Stone for future strategy?* 2008; *Potential Psychosocial Significance of Monstrous Moonshine: an exceptional form of symmetry as a Rosetta stone for cognitive frameworks*, 2007; *Geometry of Meaning: an alchemical Rosetta Stone?* 2013; *In Quest of a Dynamic Pattern of Transformations: sensing the strange attractor of an emerging Rosetta Stone*, 2012)?

Cognitive embodiment: As a cognitive vehicle, however, to what extent does an appropriate configuration of concepts need to be embodied in order for it to be driven and navigated? The case for cognitive embodiment has been made in recent decades (George Lakoff and Mark Johnson, *Philosophy In The Flesh: the Embodied Mind and its Challenge to Western Thought*, 1999; Francisco Varela, et al,

The Embodied Mind: cognitive science and human experience, 1991).

It is in this sense that [Arthur M. Young's](#) insights into the generalization of helicopter design is suggestive (*Engendering a Psychopter through Biomimicry and Technomimicry: insights from the process of helicopter development*, 2011). With respect to the problematic polarization of global society, the argument can be applied to the insights of [Nikola Tesla](#) (*Reimagining Tesla's Creativity through Technomimicry: psychosocial empowerment by imagining charged conditions otherwise*, 2014).

Information overload and cognitive limitations: A further constraint is evident in the challenge of excessive explanation in a period of information overload (*Eliciting a 12-fold Pattern of Generic Operational Insights: recognition of memory constraints on collective strategic comprehension*, 2011). Fundamental significance is however associated with some of the more extraordinary recent discoveries of [symmetry group theory](#) -- most notably the [Monster Group](#) -- potentially greater than that to be derived from the ESA Rosetta programme. What does this imply for the necessary comprehension of such significance (*Dynamics of Symmetry Group Theorizing: comprehension of psycho-social implication*, 2008)?

Aside from the complexity of hundreds of "dimensions", arguments regarding more than three have been made by various authors (Ronald Atkin, *Multidimensional Man: can man live in 3-dimensional space?* 1981; Jurgen Ziewe, *Multidimensional Man*, 2008; Antonio de Nicolas, *Meditations through the Rg Veda: Four-Dimensional Man*, 1978; Laurence Scott, *The Four-Dimensional Human: ways of being in the digital age*, 2015). These may include the paradoxes of reconciling subjectivity and objectivity (*Defining the objective ∞ Refining the subjective ?!: Explaining reality ∞ Embodying realization*, 2011; *Conditions of Objective, Subjective and Embodied Cognition: mnemonic systems for memetic coding of complexity*, 2007).

In the case of de Nicolas. the four dimensions are associated with languages as intentionality-structures (following Husserl): *The internationality-structure of a particular language then determines, or prefigures, the kind of answer it will receive*. In *Habits of Mind* (1989), he has applied these insights to the educational challenge of training inner mental skills, instead of transferring accumulations of facts, data and information. The languages distinguished are:

- Language of non-existence: Provides the modality of being a world, either of possibilities to be discovered, or of stagnant dogmatic attitudes.
- Language of existence: Provides the possibility of acting in a world of truth to be built or established, as the discontinuous results of innovation
- Languages of image and sacrifice: Provides the modality of acting in a world through regathering the images of the dismembered sensorium... by sacrificing their multiple and exclusive ontologies.
- Language of embodied vision: Provides the modality of having gone through, and of being in, a world which remains continuously because it comprehends the totality of the cultural movement on which it is grounded (*Epistemological Challenges: Language*)

Such concerns may well be related to controversial questions regarding the extension beyond first and second order cybernetics to third and fourth orders, as discussed by [Maurice Yolles](#) (*Organisations as Complex Systems: an introduction to knowledge cybernetics*, 2006). These considerations are relatively modest compared with the 10-dimensionality of the [M-theory](#) unifying all consistent versions of [string theory](#), purportedly descriptive of fundamental reality -- however that is to be understood (*Global Brane Comprehension Enabling a Higher Dimensional Big Tent? Strategic implication in encompassing nothing and coming to naught*, 2011).

Virtual reality: Hence the focus here on use of virtual reality image/animation techniques, to which the attention of many is already attracted through new media and their [special effects](#) (*Investing Attention Essential to Viable Growth*, 2014). The human cognitive constraint is however especially relevant to the much-touted viability of democratic oversight regarding application of problematic technologies (surveillance, genetically modified organisms, etc) -- where "oversight" may also signify a form of omission, neglect or inadequacy.

Can a cognitive vehicle be designed within a virtual reality context such as to enable embodiment by those who need to navigate through knowledge space within one -- especially when the knowledge space includes experiential "dimensions"?

Given the high order of scientific and political commitment to a "Rosetta" programme requiring the highest skills in navigation of physical space, how might this be reframed as a metaphor with regard to navigation of cognitive space of relevance to strategic dilemmas? Given the relevance currently claimed for such exploration of the solar system, most notably in the quest for the origin of life, what analogous claims might be made for exploration of knowledge space -- of the [noosphere](#)?

How might so doing curtail potential criticism of the Rosetta programme as being a vast exercise in scientific indulgence in cognitive escapism? Is this indicative of a fundamental incapacity to focus on more urgent issues relating to the future survival of humanity, as separately discussed (*Challenges More Difficult for Science than Going to Mars*, 2014)? The imaginative appeal of Rosetta is difficult to distinguish from that of the recent movie *Interstellar* (2014) on which [George Monbiot](#) comments:

Just as it is easier to pray for life after death than it is to confront oppression, this fantasy permits us to escape the complexities of life of Earth for a starlit wonderland beyond politics. In *Interstellar*, as in many other versions of the story, space is heaven, overseen by a benign Technology, peopled by delivering angels with oxygen tanks. Space colonisation is an extreme version of a common belief: that it is easier to adapt to our problems than to solve them. (*Interstellar: magnificent film, insane fantasy*, *The Guardian*, 12 November 2014).

With respect to discovery of extraterrestrial life, in the light of past challenges of humanity in distinguishing between human and "subhuman", it is possible that the future will envisage life otherwise and far more inclusively (*Sensing Epiterrestrial Intelligence (SETI): embedding of "extraterrestrials" in epistemic dynamics?* 2013; *Transcending an Asystemic View of Life*, 2014; *Encountering Otherness as a Waveform -- in the light of a wave theory of being*, 2013).


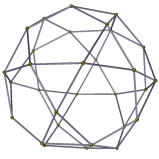
With respect to interplanetary travel, of greater relevance to the following argument is whether the sophistication of that expertise can be adapted to a psychosocial transformation of any envisaged [Interplanetary Transport Network \(ITN\)](#), as separately discussed (*Orbiting Round Nothingness across Communication Space: possibility of an "Inter-other Transition Network"*, 2012).

Traditional constellations versus Pattern language: towards a mind map

The challenge addressed here might best be framed in more systemic terms by use of some form of mind map. The following table anticipates development of a more comprehensive map endowed with a higher order of connectivity amongst its elements. In the current form it does however provide a framework for the images and comments which immediately follow it.

As provided, the table is naturally (and deliberately) provocative to those favouring any particular framework (or cluster of frameworks) whilst deprecating others as fundamentally misleading (or worse). This polarization, and antipathy to otherness, could be considered fundamental to the emergence of more integrative forms of coherence capable of handling such dynamics.

Expressed otherwise, how is what is "designed out" of any cognitive framework to be fruitfully handled, as separately discussed (*Reintegration of a Remaindered World: cognitive recycling of objects of systemic neglect*, 2011; *Knowledge Processes Neglected by Science: Insights from the crisis of science and belief*, 2012). One process, as yet poorly understood, might be termed the "guru syndrome", whether with respect to academic gurus or those of various traditions (*Epistemological Challenge of Cognitive Body Odour: exploring the underside of dialogue*, 2006).

Towards a mind map relating traditional constellations to pattern languages				
Traditional attributions of meaning (identification with energy, variously experienced dynamically)		Integral dynamics of global order in cognitive space	Patterns of order (explanations, variously presented statically)	
"Meanings"	"Constellations"	Icosahedron and Icosidodecahedron (animations generated by Stella Polyhedron Navigator)	"Designers"	"Patterns"
"washings"	Alchemy (Neidan)		Christopher Alexander	pattern language nature of order transformations
"energies?"	Chakras		Ron Atkin	comprehension communicability
"energies?"	Enneagram		Stafford Beer	discourse structure, syntegrity, cybernetics
"energies?"	Hygeia		R. Buckminster Fuller	synergetics, tensegrity geometry of thinking
change	I Ching / Ba Gua		Keith Critchlow	geometry of order in nature
"energies?"	Wu Xing		Edward de Bono	information frameworks
"energies?"	Kabbalah		Steven M. Rosen	topology, phenomenology
mystical significance	Merkabah		Nikola Tesla	rotating charged field
"energies"	Zodiac		René Thom	morphogenesis
archetypal significance	Masonic symbolism		Maurice Yolles	orders of cybernetics and simplicity
archetypal significance	Round table symbolism		Arthur M. Young	vehicle navigation, geometry of meaning
Integrative exercises		Integration in practice	Integrative exercises	
<i>Dynamic Exploration of Value Configurations: interrelating traditional cultural symbols through animation</i> , (2008).		Strategic architecture Practitioners / aerobatics *** Cognitive embodiment Cognitive health (making connections)	<i>Tuning a Periodic Table of Religions, Epistemologies and Spirituality including the sciences and other belief systems</i> (2007)	

Curiously, both with respect to traditional constellations and more modern understanding pattern languages, those with relevant expertise argue that "years of study" and experience are required to master the associated insights and to interpret and apply them appropriately. Both tend to be presented in contexts in which the degree of comprehension is questionable, irrespective of the degree of expertise with which they are claimed to have been presented. Those claiming incomprehension, or who are framed as "ignorant", are then simply called upon to believe unquestioningly -- and enjoined to "get with the programme".

An ironic contrast lies in the explosion in the relevance of the simplicity of Twitter and Facebook, and the strategic significance now attributed to their role. This arguably far exceeds that assumed to be associated with conventional political discourse and substantive academic studies -- no matter how authoritative. More widely evident is the manner in which people readily describe themselves most succinctly (and typically with a smile) through reference to their zodiacal sign. The suggestion made is that this offers insights into their particular idiosyncracies, beyond those offered by conventional typologies, categories and pattern languages.

As noted above, **is what can be comprehended (as may however be over-optimistically claimed) of sufficient complexity -- and is what can be explained sufficiently comprehensible (however over-optimistically claimed)?** Ironically this might be compared to an early caricature of criteria for a mini-skirt: *long enough to cover the subject but short enough to be interesting*.

In future an [Uncertainty Principle](#) may emerge, generalized to include the social science insights and other modes of knowing ([Garrison Sposito Does a generalized Heisenberg principle operate in the social sciences? Inquiry](#), 1969). There is already a sense in which:

- the more exhaustively adequate the explanation, the less engagingly meaningful it is in practice (and conversely...)
- the more engagingly meaningful any representation, the less satisfactory its function as a theoretical explanation

It is in recognition of this possibility that the emphasis here is on [simplicity](#), as an early formalization of simplicity (Miguel Pina e Cunha and Arménio Rego, [Complexity -- Simplicity -- Simplicity](#), 2008; Jeffrey Kluger, [Simplicity: the simple rules of a complex world](#), 2007). Complexity is of course a focus by science on [complex systems](#), most notably through the discipline of [cybernetics](#) (with its [Law of Requisite Variety](#)). Of particular concern to the development of global civilization is the developing understanding of [complex adaptive systems](#).

The interest in "simplicity" is as yet far less well developed, although it could be assumed that it is through such insights that policy makers and the voting public could get a more adequate "handle" on the strategic issues of a global civilization currently subject to a crisis of crises Relevant literature is partially summarized by [Mark Pharoah \(Looking to systems theory for a reductive explanation of phenomenal experience and evolutionary foundations for higher order thought, Phronesis](#), 2008). Corresponding to any [Law of Requisite Complexity](#), would then be some form of Law of Requisite Simplicity. In the form of a [Law of Requisite Simplicity](#), this seems to have been first proposed by [Jeffrey Pfeffer \(Four Laws of Organizational Research](#), 1981). The widespread enthusiasm for the framework offered by the zodiac merits consideration in this light -- given the relatively incomprehensible complexity of explanation with which science is now widely associated.

Examples emphasizing complexity over simplicity (right hand columns of the table): Most of these rely primarily on different forms of mathematics as the most disciplined focus on relationships of every kind.

[Pattern language](#) and nature of order as explored by [Christopher Alexander](#):

- [A Pattern Language: towns, buildings, construction](#) (1977). This invites exploration as a template in its own right, as separately discussed ([5-fold Pattern Language](#), 1984).
- [The Nature of Order: an essay on the art of building and the nature of the universe](#) (2003-4). This gave rise to further studies of relevance ([New Concepts in Complexity Theory: an overview of the four books of the Nature of Order with emphasis on the scientific problems which are raised](#), 2003; [Harmony-Seeking Computations: a science of non-classical dynamics based on the progressive evolution of the larger whole. International Journal for Unconventional Computing \(IJUC\)](#), 5, 2009). The 15 transformations he detects there also have wider implications with respect to their comprehensibility, as separately discussed ([Harmony-Comprehension and Wholeness-Engendering eliciting psychosocial transformational principles from design](#), 2010).

The geometry of order, thinking and meaning, as variously explored:

- [John G. Bennett \(The Dramatic Universe](#), 1955-66), most notably with respect to [systematics as the study of multi-term systems](#) and the [twelve distinct modes of organization](#). Aspects of relevance have been further developed by [A. G. E. Blake](#), notably with respect to dialogue ([The Intelligent Enneagram](#), 1996; [Structures of Meaning](#), 1998; [The Supreme Art of Dialogue](#), 2009)
- [Keith Critchlow \(Order in Space: a design source book](#), 1969; [Islamic Patterns](#), 1976; [The Hidden Geometry of Flowers: living rhythms, form and number](#), 2011)
- [Edward de Bono \(Six Frames For Thinking About Information](#), 2008)
- [R. Buckminster Fuller \(Synergetics: Explorations in the Geometry of Thinking](#), 1975/1979) tensegrity/ cuboctahedron / dymaxion map
- [Steven M. Rosen \(Topologies of the Flesh: a multidimensional exploration of the lifeworld](#), 2006; [Dimensions of Apeiron: a topological phenomenology of space, time, and individuation](#), 2004)
- [René Thom \(Structural Stability and Morphogenesis: an outline of a general theory of models](#), 1972), further clarified by David Aubin ([Forms of Explanations in the Catastrophe Theory of René Thom: Topology, Morphogenesis, and Structuralism](#), 2004)
- [Arthur M. Young \(Geometry of Meaning](#), 1976) Young vehicle navigation ***

Insights from a cybernetic perspective:

- [Stafford Beer \(Beyond Dispute: the invention of team synteegrity](#), 1994), further developed with respect to discourse ([Allenna D. Leonard, Team Synteegrity Background](#), 2002; J. Truss, et al., [The Coherent Architecture of Team Synteegrity: from small to mega forms](#), 2003)
- [Maurice Yolles \(Organisations as Complex Systems: an introduction to knowledge cybernetics](#), 2006)
- [Ronald Atkin \(Multidimensional Man: can man live in 3-dimensional space?](#) 1981)

Examples emphasizing simplicity over complexity (left hand columns of the table): As provocatively suggested in the introduction, it is questionable whether the pattern languages articulated by qualified authorities have an appeal in any way equivalent to that of symbols associated with "constellations" of insights and symbols as variously understood:

- Constellations of the zodiac (and the significance associated with astrological signs in many cultures over an extended period): Despite severe criticism by science and religion, this continues to evoke widespread credibility, if only of a light-hearted nature. The importance to newspaper sales has frequently been cited.
- System of chakras: As taken with considerable seriousness in some Eastern cultures, especially with respect to traditional concepts of health and treatment focusing on energy flows within the human body -- as well as their relation to development of higher forms of consciousness
- Alchemy: Especially understood as [Neidan](#) (or internal alchemy), this may be partially related to the system of chakras. The commentary of [Isabelle Robinet](#) is especially valuable ([The World Upside Down: essays on Taoist internal alchemy](#), 2011; [The](#)

Alchemical Language, or the Effort to Say the Contradictory, 1993). The arguments of Steven Rosen indicate other possibilities (*Dreams, Death, Rebirth: a topological odyssey into alchemy's hidden dimensions*, 2014)

- Chinese insights, variously interrelated and encoded (*I Ching / Ba Gua*). In addition to the 8-fold pattern of the *Ba Gua*, especially relevant is the 5-fold dynamic of the *Wu Xing*. The latter can be explored in relation to the Greek and Roman insights into *Hygieia* (*Memorable dynamics of living and dying: Hygieia and Wu Xing*, 2014).
- Insights from the traditions of Judaism, specifically those of the *Kabbalah*, and their relationship to *Merkabah mysticism*
- Various insights into the *enneagram*, originating in the Sufi tradition (Anthony Blake, *The Intelligent Enneagram*, 1996; Helen Palmer, *The Enneagram*, 1988; J. G. Bennett, *Enneagram Studies*, 1974)

There is an interesting challenge in the exploration through animation of the correspondences amongst the set of such disparate symbol sets as a product of human thought (*Dynamic Exploration of Value Configurations: interrelating traditional cultural symbols through animation*, 2008).

Mnemonic bridging surface (central images in the table): The focus here on the *icosahedron* derives from a variety of sources:

- as being one of the simpler approximations to a sphere with all that represents, signifies and symbolizes with respect to global integration, whether in planetary terms or more intangibly (*Future Generation through Global Conversation: in quest of collective well-being through conversation in the present moment*, 1997; *Spherical Configuration of Interlocking Roundtables: Internet enhancement of global self-organization through patterns of dialogue*, 1998; *Spherical Configuration of Categories -- to reflect systemic patterns of environmental checks and balances*, 1994)
- as the focus of extensive work by R. Buckminster Fuller, notably in the pattern of transformations he associated with the *cuboctahedron*
- as the focus of the work of Stafford Beer (*Beyond Dispute: the invention of team syntegrity*, 1994). Of further relevance is his detection of the *enneagram* **within** the *icosahedron*, as explored and reported and considered significant from from a cybernetic perspective
- the strategic potential, as variously argued with respect to the *UN Earth Summit* in 1992 (*Spherical Representation of Icosidodecahedral Net of Strategies: configuring strategic dilemmas in intersectoral dialogue*, 1992)

It has been argued that icosahedral symmetry is the highest and most aesthetically pleasing in Nature -- partially explained by its embodying three *golden rectangles*. Curiously the large majority of *viruses* display full icosahedral symmetry -- somewhat ironic in that, as a metaphor, they feature prominently in communication aspirations with respect to the attractions of "going viral" and *viral marketing*.

As an earlier bridging exercise, the absence of adequate depictions of the *enneagram* within the *icosahedron* stimulated the exploration of possibilities of doing so using virtual reality software. That exploration was extended to include the *zodiac*, as a representation of constellations perceived as configured around the Earth -- together with the arguments made for its global psychosocial implications, as separately described (*Representation of Creative Processes through Dynamics in Three Dimensions: global insight from spherical reframing of mandalas, the zodiac and the enneagram*, 2014). As shown there, the geometry of the *icosahedron* is especially appropriate to the traditional clustering of the constellations in the latter case

Strategic applications and cognitive implications (lower portions of table): The shift to a 3D representational context has numerous strategic implications. These are most evident in the shift from strategic dependence on the language of "pillars", "plans", "planks" and "platforms" -- possibly developed from lists of agenda "points". The widespread emphasis placed on "plan" -- especially any "global plan" -- is extremely dubious, as illustrated by the recognized degrees of distortion introduced by *planar projections of the globe*. This reinforces any "flat Earth" perspective, as challenged separately (*Irresponsible Dependence on a Flat Earth Mentality -- in response to global governance challenges*, 2008).

The simplest linear geometry features prominently in understandings of links, bonds, networks, and connectivity -- extended more questionably into missiles (arrows, rockets) and the competitive construction of skyscrapers. The latter can be readily associated with compensation for some collective analogue to erectile dysfunction.

It is extraordinary to note the extent of dependence on such elementary geometry -- and the avoidance of more complex forms more consistent with a "global" perspective (*Experience of Cognitive Implication in Fundamental Geometry: unexamined metaphoric framing of strategic discourse*, 2012; *Metaphorical Geometry in Quest of Globality*, 2009; *Engaging with Globality: through cognitive lines, circlets, crowns or holes*, 2009).

As one of the simplest approximations to a sphere, the *icosahedron* helps to clarify this argument -- especially given the strategic enthusiasm for 12-foldness noted above (*Checklist of 12-fold Principles, Plans, Symbols and Concepts: web resources*, 2011). This suggests the provocative question as to the number of distinctive memorable patterns into which the human cognitive capacity is able to "connect the dots" meaningfully. The question is especially relevant when the connections are understood **dynamically** as transformative flows -- rather than **statically**. The question is discussed separately (*Comprehension of Numbers Challenging Global Civilization*, 2014). The argument has been further developed separately, with many illustrations (*Topological Clues to a Memorable 12-fold Systemic Pattern*, 2011).

Mnemonic potential of polyhedra: The issue of cognitive capacity can be provocatively framed through consideration of how the following might be comprehended and remembered, and by whom:

- how many stars constitute each traditional constellation pattern in the *Zodiac*. Such an exploration is readily enabled by lists of stars by constellation, as partially provided by *Wikipedia* (*Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricorn, Aquarius, Pisces*). These extensive, sortable lists include stars of different magnitudes, including those not visible to the naked eye -- better understood as being in that region of the *Zodiac*, but not forming part of the recognizable constellation (and therefore not part of the "meaningfully connected pattern of dots"). Equivalent issues of pattern recognition would be evident in

other domains.

- contrasting constellations of various cultures, as noted by *Wikipedia* (including [Hindu](#), [Greece-Roman](#), [Classical Chinese](#))
- [constellation groups](#), namely gatherings of within the same region of the celestial sphere, grouping the 88 [modern constellations](#): Ursa Major family (10), Zodiac (12), Perseus family (9), Hercules family (19), Orion family (5), Heavenly Waters group (9), Bayer family (11), La Caille family (13). 88 [modern constellations](#). (These depict 42 animals, 29 inanimate objects and 17 humans or mythological characters).

For mnemonic purposes:

- the icosahedron can be used to "hold" and "correlate" 12 vertices, 20 planar faces (triangles), and 30 edges. In combination these offer 42 (12+30), 50 (20+30), and 62 (12+20+30) mnemonic "hooks". Further possibilities are evident from the icosahedral symmetry properties through 6 five-fold rotation axes, 10 three-fold, and 15 two-fold. This was the primary focus of Beer's synteegrity process associating an issue with each of the 12 vertex nodes, and a participant with each of the 30 edges, thereby forming 12 five-member topic teams around each node.
- the icosidodecahedron can be used to "hold" and "correlate" 30 vertices, 32 planar faces (triangles and pentagons), and 60 edges. In combination these offer 62 (30+32), 90 (30+60), and 122 (30+32+60) mnemonic "hooks". This structure was used to configure issues of the 1992 Earth Summit (*Representation of Issue Arenas on Icosidodecahedral Net: configuring strategic dilemmas in intersectoral dialogue*, 1992)
- given its traditional relevance to decision-making, as developed and applied in the governance of China, it is especially intriguing to note the potential association of such polyhedral structures with the 64 hexagrams indicative of conditions of change -- and especially the possibility of holding that pattern in the drilled truncated cube, as discussed separately (*Toroidal mappings of wisdom questions and answers*, 2012)

The triangulation basic to the configuration and coherence of such structures was a particular focus of Buckminster Fuller (1976), as discussed separately (*Triangulation of Incommensurable Concepts for Global Configuration*, 2011). The latter noted the mnemonic and systemic roles recognized in cognitive terms by [Paris Arnopoulos](#) (*Sociophysics: cosmos and chaos in nature and culture*, 2005) and by [Jon Jenkins](#) and [Maureen Jenkins](#) (*The Social Process Triangles*, 2001). Buckminster Fuller's proposal for a [Dymaxion Map](#) projection is relevant as a means of minimizing distortion.

Potential health implications? Of potentially great relevance is the sense in which integrative configurations are intimately related to a sense of health understood in dynamic terms (*Wholth as Sustaining Dynamic of Health and Wealth: cognitive dynamics sustaining the meta-pattern that connects*, 2013).

Christopher Alexander emphasizes recognition of a "central quality without a name" within well-designed environments (*The Timeless Way of Building*, 1979). This could be extended to cognitive environments and to health, as it might be most generally understood. For him, a building or a town will only be alive to the extent that it is governed by the timeless way. He summarizes this as being a central quality which is the root criterion of life and spirit in a man, a town, a building, or a wilderness. This quality is objective and precise, but it cannot be named.

In more recent work he has focused on its geometric implications (*Harmony-Seeking Computations: a science of non-classical dynamics based on the progressive evolution of the larger whole*, *International Journal for Unconventional Computing (IJUC)*, 2009). He emphasizes the importance geometric adaptation in order to enable comprehension of a higher order, as discussed separately (*Harmony-Comprehension and Wholeness-Engendering: eliciting psychosocial transformational principles from design*, 2010).

Alexander's concern with a set of 15 transformations might be fruitfully related to a new understanding of health in relation to the environment (*In Quest of a Dynamic Pattern of Transformations: sensing the strange attractor of an emerging Rosetta Stone*, 2012; *Cognitive Implications of Lifestyle Diseases of Rich and Poor: transforming personal entanglement with the natural environment*, 2010).

**** bi, Szilassi

Use of virtual reality for 3-dimensional articulation of connectivity

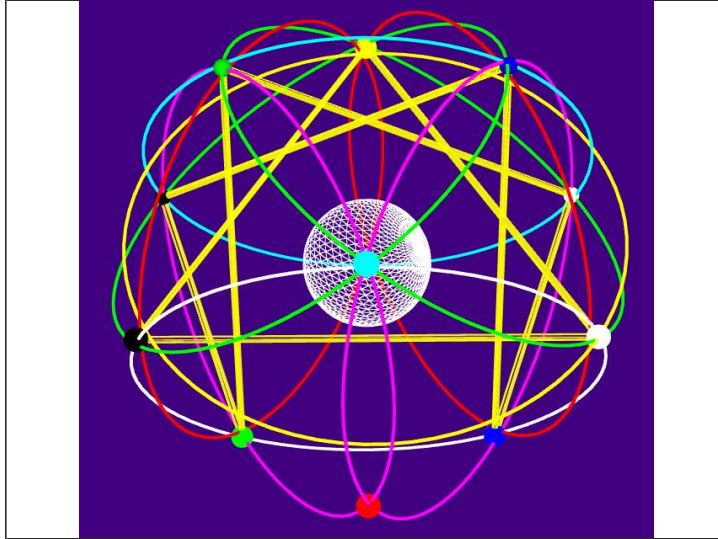
Virtual reality possibilities: [Virtual reality](#) software became more readily available in the 1990s, enabling structures to be viewed over the web with standard browsers enhanced by readily available plugins. This resulted in various experiments by the author, as reported in:

- *Navigating Alternative Conceptual Realities: clues to the dynamics of enacting new paradigms through movement* (2002)
- *Selected Screen shots of Problem and Organization Networks* (2000)
- *Feedback Loop Analysis in the Encyclopedia Project* (2000)
- *Gallery of screen shots of virtual reality displays* (2000)
- *Envisaging the Art of Navigating Conceptual Complexity: in search of software combining artistic and conceptual insights* (1995)

Virtual reality exercise towards reconciling traditional constellations with pattern languages: The following image explores use of upgraded virtual reality software -- freely accessible. Details of the method used are indicated in a subsequent section with the objective of encouraging further experimentation by others, possibly by modification of the file through which this image is presented (notably with any simple text editor). A central sphere is included (and could be removed). Viewpoint features in virtual reality viewers readily enable clicking to views associated with any coloured vertex (default being that with a conventional enneagram view).

Screen shot depiction of an enneagram embedded within an icosahedron framework (with circles)
(virtual reality access: **either** based on legacy WRL standard by clicking on image, after installing any browser plugin, such as [Cortona3D](#); **or** as new X3D

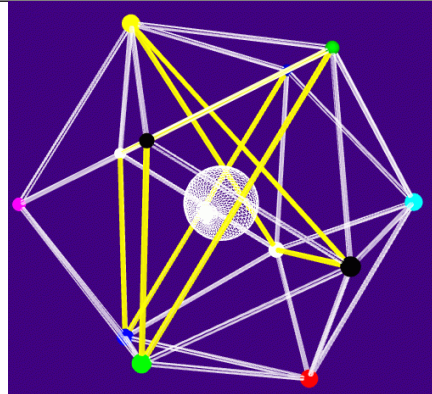
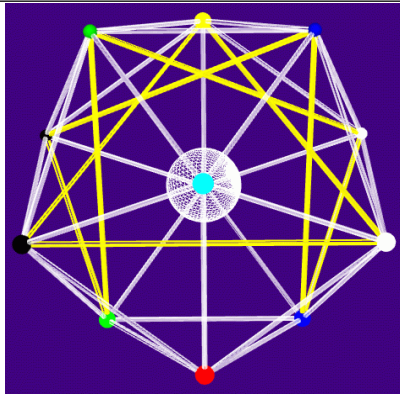
standard, by accessing [X3D image URL](#) from within freely downloadable [H3DViewer](#))



Screen shot depictions of the enneagram embedded within an icosahedron (without circles)
 (virtual reality image file for manipulation in 3D, potentially using available browser plugins;
 otherwise access image URL from within freely downloadable [H3DViewer](#)) *New version in preparation*

As above (with icosahedron)

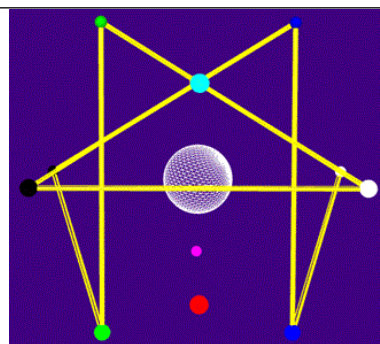
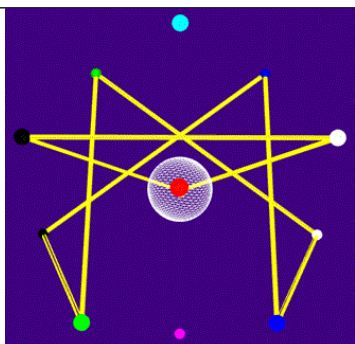
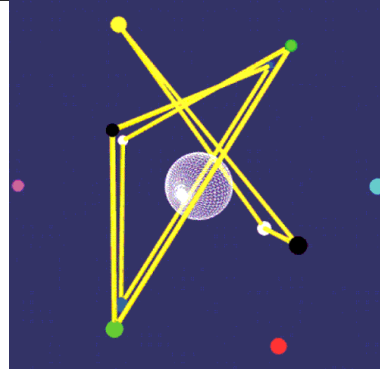
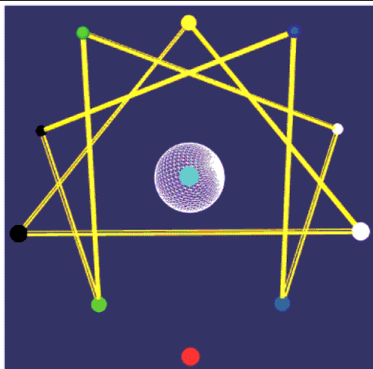
With icosahedron (rotated 90 degrees)

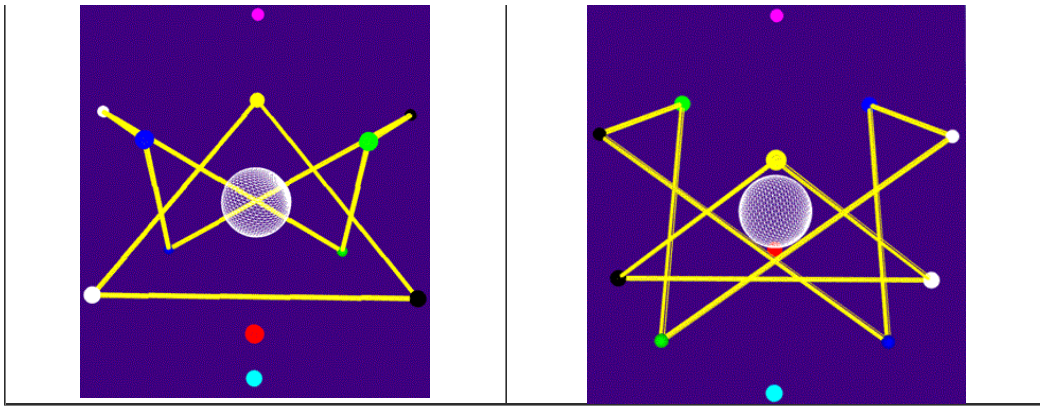


Screen shot depictions of the embedded enneagram (without icosahedron or circles)
 (virtual reality image file for manipulation in 3D, potentially using available browser plugins;
 otherwise access image URL from within freely downloadable [H3DViewer](#))

View of enneagram alone (as above)

View of enneagram alone (as above)





Embodying a navigable cognitive vehicle

Beyond description: The dysfunctionality of current dependence on "think tanks" for strategic insight can be conveniently caricatured in the light of the classic outburst of Jack Nicholson in *As Good as It Gets* (1997): *I am drowning here, and you're describing the water*. As "water-describing arenas", the inhabitants could perhaps be compared with hydrodynamicists describing the eddies, the waves and the tides, consistent with the tank metaphor by which their operations are framed ("*Tank-thoughts*" from "*Think-tanks*": *metaphors constraining development of global governance*, 2003).

The strategic challenge can be explored through the recognition of the confusion and uncertainty of the times, and the inadequacy of conventional frameworks (Charles Handy, *The Age of Unreason: new thinking for a new world*, 1989; *The Empty Raincoat: making sense of the future*, 1995). Aside from the collective challenge, this is evident for many individually, as separately discussed (*Living with Incomprehension and Uncertainty: re-cognizing the varieties of non-comprehension and misunderstanding*, 2012; *Living as an Imaginal Bridge between Worlds: global implications of "betwixt and between" and liminality*, 2011).

With respect to the cognitive implications, for which the above image may be of some relevance, recognition of the dynamics of the cognitive geometry are implied by personal experience of a world described as turned *topsy-turvy*, upside-down, or inside-out. The upside-down condition has been usefully recognized and variously addressed (Thomas Homer-Dixon, *The Upside of Down: catastrophe, creativity, and the renewal of civilization*, 2006; Isabelle Robinet, *The World Upside Down: Essays on Taoist Internal Alchemy*, 2011). Some implication of the inside-out condition have been separately discussed (*World Introversion through Paracycling: global potential for living sustainably "outside-inside"*, 2013). Such considerations contrast with assumptions that "global" organization can be achieved through simple consensus on a strategic "plan" (*The Consensus Delusion: mysterious attractor undermining global civilization as currently imagined*, 2011).

The case for some kind of shift "beyond description" can be made from various perspectives and experiential disciplines:

- with respect to cognitive embodiment in movement, as variously argued (Maxine Sheets-Johnstone, *The Primacy of Movement*, 1999; Mark Johnson, *The Meaning of the Body: aesthetics of human understanding*, 2007)
- in terms of "where patterns come from" in the light of the argument of George Lakoff and Rafael Núñez (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2000)
- through recognition of the need for polysensual approaches, sensing rather than seeing (*Strategic Challenge of Polysensorial Knowledge: bringing the "elephant" into "focus"*, 2008)
- in the light of the potential of cognitive fusion (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006)
- as understood by the phrase "getting one's act together", most notably in a competitive setting, where it may be further characterized as an "*inner game*" (of tennis, golf, etc). A variant from *flow psychology* is getting into the "zone".

Embodiment of feedback loops: With respect to the effective control of any vehicle, what are the instinctive understandings that can be usefully cultivated? The case could be usefully made from the arguments of those advising on "*advanced driving skills*" in the case of an automobile, or the manner in which expert pilots (as required in *aerobatics* or "*dogfighting*") recognize the distinctive capacities on which they are dependent. The term frequently used in reference to this is "feel".

The key question is the nature of the cognitive engagement with feedback loops as exemplified by the classic expression "*flying by the seat of the pants*" -- a requirement in skilled control of a helicopter and other craft. The understanding is also evident in the recognition of necessary expertise and experience -- much valued in certain contexts as being beyond conventional knowledge and its communication.

With respect to aerobatics, the point is reinforced by the extent to which this is specifically recognized as involving movement in loops -- in looping and in "looping the loop". A valuable summary of *aerobatic manoeuvres* is provided by *Wikipedia*. This distinguishes and illustrates: a *Chandelle*, a *Cuban Eight*, an *Immelmann*, Up lines, Snap and Flick rolls, and Loops. As noted there, five basic manoeuvres are distinguished and combined -- lines (both horizontal and vertical), loops, rolls, spins, and hammerheads.

- **Loops:** can also be performed by going inverted and making the same maneuver but diving towards the ground.
- **Rolls:** when the plane is rotated about its roll axis, using the ailerons.
- **Spins** are more complex, involving intentionally stalling a single wing, causing the plane to descend spiraling around its yaw axis in a corkscrew motion.
- **Stall turns:** (also known as a hammerheads) are performed by pulling the aircraft up into the vertical until its pointing straight up (much like the beginning of a loop), continuing to fly straight up until the airspeed has dropped to a certain critical point. It is also

known as a "tailslide", from the yawing turn, which is different from the typical method of turning an aircraft in the pitch axis.

Movements, that are to various degrees equivalent, are evident in acrobatics, diving, some board sports, dance, and martial arts. With respect to the latter, given the fivefold symmetry of the icosahedron, of particular interest is the classic strategic text on swordsmanship named *The Book of Five Rings*. What is the nature of the experience of the integrative cognitive sense in that dynamic context, and how is it acquired?

Transdisciplinary vehicles: Of relevance to this argument is how such insights translate into the strategic initiatives required for traversing the domains and "terrain" of knowledge space -- namely as "all-terrain cognitive vehicles".

This can be explored through metaphor, as argued separately (*Metaphors as Transdisciplinary Vehicles of the Future*, 1991; *Navigating Alternative Conceptual Realities: clues to the dynamics of enacting new paradigms through movement*, 2002).

One example is offered by the set of aerobatic manoeuvres distinguished above. In a world characterized by "spin", there is a strong case for exploring a comparison with the so-called "manoeuvres" in dialogue, discourse and negotiation. Would such comparison offer insight into the experience of familiar movements within cognitive space -- especially by the more skilled? Would it offer insight into patterns of argument -- especially given enthusiasm for "formation flying", as conventionally used to celebrate a particular understanding of national unity? This raises the question as to whether more complex patterns would reinforce recognition of more appropriate forms of order. The complex formations of bird **flocking**, and the swarming of other species, offer a contrast partially recognized in terms of **swarm intelligence**.

Given a degree of common vocabulary, are there insights to be gained from the process of "stalling" in discourse and negotiation -- or "rolling over"? What indeed of the widespread recognition of "spin"? The feasibility and relevance is all the greater given use of "political dogfight" -- where this implies (at best) a degree of comparison with that between fighter aircraft (*SkyMall founder Bob Worsley in political dogfight over Medicaid expansion*, *Phoenix Business Journal*, 13 August 2014; *Shot down... Charity forced to cancel airshow event after being caught up in ongoing political dogfight between Sinn Fein and DUP*, *The Telegraph*, 6 August 2014; *Political Dogfight*, *The Heights*, 1964).

There is strange significance to the use of simulations of such movements in the testing and training of pilots and astronauts in simulators (NASA Gimbal Rig Mercury Astronaut Trainer; Spaceflight Tumbler; L. Stirling, et al, *Self-rotations in simulated microgravity: performance effects of strategy training*, *Aviation Space Environmental Medicine*, 2009). The challenge is one of ensuring appropriate cognitive engagement with **flight dynamics** in space or **ship motions** on the sea -- also discussed in terms of heading, elevation and bank (and formalized as **Euler angles** or **Tait-Bryan angles**). Testing highlights the ability to control a space capsule simulator under conditions of pitch (a forward or backward somersault), roll (a wing-over-wing flip), and yaw (side-to-side turning).

What equivalent might be imagined for eliciting skills in the embodiment of cognitive vehicles? Some indication is offered by the title of a work by policy scientist **Geoffrey Vickers** (*Freedom on a Rocking Boat*, 1972). Does the experience of (intentional) community life perform this role? Of value metaphorically are the conditions of "microgravity" in a policy context in which up and down -- being "upright" -- are ambiguously defined (in moral or ethical terms), if at all. What are the "acrobatic skills" involved in global negotiations? In metaphorical terms, should roll, pitch and yaw be considered the experiential reality of the Cartesian coordinate system with which reality is so misleadingly and simplistically associated?

There is considerable relevance, for example, to the current promotion of yachting and boat-sailing as a source of strategically relevant insight in executive training programmes. Clearly such vehicles do not traverse a static plane surface -- all is not "plane sailing" -- whatever the challenge of its "all-terrain" characteristics. Through metaphor, there is strategic relevance to roll, pitch and yaw -- most simply evident in "rolling with the punch" and "pitching in".

Organizing, starting and driving a cognitive vehicle

Use of the vehicle metaphor opens the possibility of extending such consideration to include understandings of how the vehicle is operated. This is helpfully framed in relation to the eight images highlighted in the much-cited study by **Gareth Morgan** (*Images of Organization*, 1986). Rather than focus on their differences, it is useful to recognize them as complementary aspects of a more fundamental cognitive operation, potentially to be understood in terms of a **general systems** perspective, or of a higher order of cybernetics, but otherwise as implying a pattern of correspondences.

Organization: The manner in which the vehicle is organized could be usefully highlighted by both the biological and musical understandings of an "organ" -- and its operation. From a biological perspective the issue is how the **organs** or **organisms** are creatively engendered within the context of the vehicle. Both this understanding, and the associated cognitive process of the organizer, are readily obscured in the focus on conventional administrative functions and divisions. It is noteworthy that this image is one of the eight of Gareth Morgan (1986). The emphasis here is however on the dynamic process of organization rather the structure of a product typically understood as a static framework.

From a musical perspective, the design and operation of an **organ** offers an especially rich metaphor. How indeed does playing the organ engender structure through the composition of melodies and harmonic associations? The metaphor has been notably used by **Mary Catherine Bateson** (*Composing a Life*, 1991; *Composing a Further Life: the Age of Active Wisdom*, 2010). Such a framework invites further speculation with regard to global organization (*A Singable Earth Charter, EU Constitution or Global Ethic?* 2006). Rather than browsing the web, surfing, or cruising the internet highways, the future may involve a strange form of aesthetic engagement with what could be understood as **songlines** (*From Information Highways to Songlines of the Noosphere*, 1996).

The active cognitive stance with respect to any such organization is consistent with the **enactivist** argument of **Francisco Varela** (*The Embodied Mind: cognitive science and human experience*, 1991; *Laying Down a Path in Walking: essays on enactive cognition*, 1997).

The multidimensional connotations of "composing a life" then contrast radically with the conventions of "planning a life".

Starting: Reference to "vehicle" as a metaphor offers mechanical associations -- another of Gareth Morgan's eight images. This is especially meaningful in relation to any process of starting its operation, most obviously with respect to an automobile or engine. Variants such as kickstarting and cranking up are recognizable. Especially meaningful to some is the booting up of a computer, or the processes of bringing online all systems in any complex factory process.

Terms like booting up are readily comprehensible to computer nerds with reference to their own awakening. In a psychosocial context, use of initiating or instigating may be especially meaningful -- despite the ambiguity potentially associated with undertaking. Particular understanding may be associated with engaging with another.

Driving, piloting and navigating: How is a cognitive vehicle to be "driven" -- given the many familiar associations to the process of driving more tangible vehicles? In contrast with movement over a plane surface, the air and sea examples highlight the threefold challenge of compensating for pitch, roll and yaw. As a means of framing a more general systemic perspective, it might be asked whether analogies to these also merit consideration, as explicitly explored in terms of [Clifford Algebra](#) by [John Denker](#) (*How to Represent Multi-Dimensional Rotations, Including Boosts*, 2003; *See How it Flies: a new spin on the perceptions, procedures, and principles of flight*, 2008). These make some reference to use of virtual reality.

As a guide to exploration of the process for the driver, the use of two hands and two feet in an automobile (or an airplane) offers some sense of the controlling functions to which attention is considered necessary for stable operation. It might be argued that these four operators are doubled to eight through contrasting movements in each case (up/down, on/off or right/left), whereby the direction of movement is determined .

It is interesting that the four limbs have similar control functions on an organ, for example -- effectively such as to navigate through musical space. Appropriately, in both cases, they may be characteristic of haptic interfaces and controls of any immersive experience in a virtual reality environment (as noted below).

In the light of the experience in any conventional organization or vehicle, the argument can be taken further in terms of the need to adapt to the tangible or intangible terrain -- to the destabilizing effects of the environment. It is in this sense that driving and navigating can be understood in terms of the challenge of otherness.

An instructive indication, increasingly feasible with current evolution in immersive technologies, is that explored by writers of science fiction with respect to navigation of "hyperspace". This has been conceived in terms of the art of sensing, imaginatively, the quality of the complex space in the moment and to reconfigure information inputs so as to be able to "swim", "climb", "tunnel" or "fly" through it, whichever was most metaphorically appropriate (*Engaging with the Inexplicable, the Incomprehensible and the Unexpected*, 2010; *Imaginal Education: game playing, science fiction, language, art and world-making*, 2003)

Curiously each control function can be seen as matched, mirrored or challenged by a particular form of destabilizing otherness. This can be most usefully explored in terms of game-playing.

Strategic telescoping and gunnery "in a rocking boat"? The argument above with respect to "think tanks" is partially developed there with respect to tanks as "all-terrain vehicles" -- and how principles of targetting and gunnery may then frame strategic preoccupations. The situation may be caricatured as *if all one has is a missile, then every problem is perceived as a target*. This is an adaptation of the traditional strategic adage *if all one has is a hammer, then every problem looks like a nail* -- still exemplified by some diplomatic negotiations (*Kerry stays in Vienna to try to hammer out deal on Iran's nuclear program*, *The Guardian*, 21 November 2014).

The organization, coordination and embodiment of the cognitive "loops" are fundamental to the forms of movement noted above. The process of orienting and positioning the circles on the icosahedron (in the above image) can therefore be insightfully compared to the challenges of gunnery in a moving vehicle -- compensating for roll, pitch, and yaw, as in a tank. This is especially evident in the case of the naval gunnery, which partially inspired Buckminster Fuller. Related issues emerge in the design and use of telescopes for tracking distant objects in the universe. As a metaphor, the telescope was remarkably employed by [Joël de Rosnay](#) (*The Macroscopic: a new world scientific system*, 1973).

There is some appropriate irony to the fact that the X3DEdit software used to design the above virtual reality image has been created by the US [Naval Postgraduate School](#). It is notably used for the design of [Remote Operating Vehicle](#) models. These necessarily call for a degree of cognitive embodiment -- as required for human operation of drones. As in the case of video games, the challenge is then to enable an [experience of immersion](#), whose dimensions have been distinguished by [Staffan Björk](#) and [Jussi Holopainen](#) (*Patterns In Game Design*, 2004):

- Sensory-motoric immersion, namely tactical immersion as experienced when performing tactile operations that involve skill. Players feel "in the zone" while perfecting actions that result in success.
- Cognitive immersion, namely the more cerebral or strategic immersion associated with mental challenge. Chess players experience strategic immersion when choosing a correct solution among a broad array of possibilities.
- Emotional immersion, namely the narrative immersion when players become invested in a story, and is similar to what is experienced while reading a book or watching a movie.
- Spatial immersion, as when a player feels the simulated world is perceptually convincing. The player feels that he or she is really "there" and that a simulated world looks and feels "real" .

The vehicle metaphor, especially when framed as all-terrain, usefully gives focus to the strategic preoccupation with traction, as separately discussed (*Embodiment of Change: Comprehension, Traction and Impact? Discovering enabling questions for the future*, 2011).

Engaging with cognitive feedback loops otherwise

Playing -- games and music: These offer the most readily accessible and comprehensible sense of a variety of ways of empowering and controlling a cognitive vehicle. Again the possible use of the limbs -- especially with skill -- is highly indicative of how these organs are supportive of cognitive operations. Whether with respect to game- or music-playing, most evident is both the fluidity with which they are engaged and the corresponding cognitive fluidity -- especially if the nature of the play is essentially intangible. In the latter case it is typically associated with creativity and elegance -- the aesthetics of which are appreciated in their own right. Arguments for playful elegance are presented separately:

- *Engaging with Globality through Playful Re-categorizing* (2009)
- *Humour and Play-Fullness: Essential integrative processes in governance, religion and transdisciplinarity* (2005)
- *Playfully Changing the Prevailing Climate of Opinion* (2005)
- *Enacting Transformative Integral Thinking through Playful Elegance* (2010)

These notably refer to the cognitive-aesthetic combination in games as has been extensively described by allusion, most elegantly in the *Glass Bead Game* (1943) by [Hermann Hesse](#), where he comments:

I suddenly realized that in the language, or at any rate in the spirit of the Glass Bead Game, everything actually was all-meaningful, that every symbol and combination of symbol led not hither and yon, not to single examples, experiments, and proofs, but into the center, the mystery and innermost heart of the world, into primal knowledge. Every transition from major to minor in a sonata, every transformation of a myth or a religious cult, every classical or artistic formulation was, I realized in that flashing moment, if seen with truly a meditative mind, nothing but a direct route into the interior of the cosmic mystery, where in the alternation between inhaling and exhaling, between heaven and earth, between Yin and Yang holiness is forever being created.

These and [other associations](#) offer curious echoes to the elaboration of a "game of spheres" by [Nicholas de Cusa](#) (*De Ludo Globi*, 1463), written as a contribution to both a literature and a practice of moral game-playing. This formed part of the tradition of the forgotten chess-like game [Rithmomachia](#) ("The Battle of Numbers" or Rhythmomachy), which combined the pleasures of gaming with mathematical study and moral education.

Intellectuals of the medieval and Renaissance periods who played this game were not only seeking to master the principles of [Boethian mathematics](#) but were striving to improve their own understanding of the secrets of the cosmos (Ann E. Moyer, *In The Philosophers' Game*, 2001). It has been an inspiration to the magnum opus of Hesse, as noted by Todd R. Harris (*The Interplay of Opposites, the Language of Experience, and the Geometry of Ascent: a comparison of Hermann Hesse's "Das Glasperlenspiel" and Nicholas of Cusa's "De Ludo Globi"*, 2001).

Of particular interest is the articulation by science fiction writer [M. A. Foster](#) (*Gameplayers of Zan*, 1977), notably regarding the extent to which future navigation by a space-time vehicle was dependent on a special form of game-playing -- required to keep the vessel in place whilst it was being constructed. This is explained as follows:

...the Game is a game, true enough. but it is rather intricate and multiplex, and capable of truly bottomless subtleties. Therefore each who enters it comes to see different things in it. Some see music, others language. Still others life processes; and others chemistry and the like. (p. 171).... It seems to be tied up deeply in the popular religion, a kind of movable morality play...factions, rivalries, the whole thing. (p. 264)

Also of relevance are the remarkable arguments regarding infinite games by [James P. Carse](#) (*Finite and Infinite Games: a vision of life as play and possibility*, 1986) in which the objective is to ensure that game-playing has no closure through winning or losing. As reviewed by [Flemming Funch](#) (*Finite and Infinite Games*), this is described in the following terms:

There are at least two kinds of games: finite and infinite. A finite game is a game that has fixed rules and boundaries, that is played for the purpose of winning and thereby ending the game. An infinite game has no fixed rules or boundaries. In an infinite game you play with the boundaries and the purpose is to continue the game.

Finite players are serious; infinite games are playful. Finite players try to control the game, predict everything that will happen, and set the outcome in advance. They are serious and determined about getting that outcome. They try to fix the future based on the past. Infinite players enjoy being surprised. Continuously running into something one didn't know will ensure that the game will go on. The meaning of the past changes depending on what happens in the future.

Significant to recognition of the variety of cognitive functions brought into play in a game are the pieces on a classical 8x8 [chess](#) board. The significance can be discussed in relation to [go](#) as the Eastern counterpart played on a 19x19 board (*Sustainability through Magically Dancing Patterns: 8x8, 9x9, 19x19 -- I Ching, Tao Te Ching / T'ai Hsüan Ching, Wéiqí (Go)*, 2008)

As previously noted (*Strategy games as pointers to comprehension of multi-dimensionality*, 2006), games like chess and [go](#) are frequently associated with comments concerning the distinct "energy" or tensions characteristic of certain strategic conditions. A valuable description of this subtle perception is provided (in translation) by Michel Bruneau (*Dynamic Chess Classification -- Chess Theory*) which explicitly acknowledges how difficult it is to explain the meaning of "energy" in chess. The document distinguishes, and comments on, 7 game conditions: "Quick divergency", "Slow divergency", "Damped divergency", "Unstable", "Balanced", "xhausted", "Aborted".

Bruneau states that "chess energy" or "tension" is the result of various imbalances appearing on the chessboard during the unfolding of the game. Their brief description, in energy terms, of each condition -- as a discontinuity -- suggests an intriguing resemblance to geometrical descriptions of the 7 catastrophes. Their descriptions might be usefully refined by a chess-playing mathematician familiar with catastrophe theory. Such descriptions might also be usefully confronted with analogous descriptions by *go*-playing mathematicians (cf David H. Stern et al. *Modelling Uncertainty in the Game of Go*; Bruno Bouzy and Tristan Cazenave, *Computer Go: an AI oriented survey*, 2001).

Visual metaphors implying sensing (rather than simply seeing): The argument here is that the 3D image above is a step towards a surface with which metaphors of dynamics can be fruitfully associated -- suggestive of a vehicle and its driver in some way, and the "feel" the driver needs to cultivate in order to operate it. Some sense of the driver's relation to the vehicle, as implied by the image above, is offered by its comparison with the seating offered for the driver on the enneagram crossbar -- perhaps somehow enthroned or crouched.

This seating variously recalls that of a [ski lift](#) and some paragliding configurations. It is also reminiscent of that of a [fan boat](#) or of an ultralight plane. Other than the dimensions to which the drivers are necessarily sensitive, there is the sense in which the configuration is suggestive of the cognitive operation and design of the "psychopter" with which Arthur Young was ultimately concerned. This was inspired by his work on the helicopter and its control. With the circles indicative of rotor movement, how many "rotors" would be required for the stable operation of a "psychopter"? Especially interesting is the sense in which the above image is reminiscent of the manner in which an astronaut or pilot is encapsulated within a space capsule simulator (as mentioned above) -- again raising the question of the cognitive correspondence to the movements within such a simulator.

Such a capsule recalls the design of the time machine which featured so significantly in the science fiction film *Contact* (1997) based on the novel by [Carl Sagan](#). The early [conceptual design](#) of the device was based on one of the primary shapes in geometry, namely a [dodecahedron](#). Does this suggest how sustainable cognitive navigation might be imagined -- somehow "encased" within such a rotational dynamic?

Ironically the 3D image is potentially most suggestive of the biblical description of the [Chariot of Ezekiel](#) (*Ezekiel 10:14*). This has been the subject of extensive commentary, whether as a focus for traditional [Merkabah mysticism](#) or as an oft-cited instance of possible early visitation by extraterrestrials. Given the arguments and examples above, there is a case for imagining that the biblical description is a 3D presentation of a vehicle more appropriately understood in four or more dimensions. With respect to the above image, for example, the set of four circles lend themselves to consideration as the [ophanim](#) of that description. The circles might also be understood in some way as interlocking halos ***

Of some relevance to the argument here is the sense in which Ezekiel's report fails to take account of the possibility that his vision was more a reflection of his own condition as a charioteer than observation of some externality, as argued separately (*Radical Cognitive Mirroring of Globalization: dynamically inming the unquestioningly outed*, 2014). Expressed otherwise, the issue here is **how is the observer effectively transformed into the charioteer controlling an embodied vehicle.**

The cautionary strictures traditionally associated with Merkabah mysticism are of some relevance to forestalling premature closure on oversimplistic interpretation of the above image. These are usefully articulated in the relevant *Wikipedia* entry. From a cognitive perspective, also of some relevance is the relationship of such mysticism to the classical guide of [Maimonides](#) (*The Guide for the Perplexed*, ca. 1204) which was a direct inspiration for the influential economist [E. F. Schumacher](#) (*A Guide for the Perplexed*, 1977). Of more cynical relevance to those promoting social change initiatives, the circles recall the sense of being made to "jump through hoops" by manipulative authorities.

Cognitive metabolism and metabolic pathways: The image in virtual reality is proposed as a means of supporting a sense of metabolic cycles -- understood in a cognitive sense. Arthur Young explicitly addresses the possibility of the "learning/action cycles" required to control a helicopter -- and, by extension, a potential psychosocial analogue he understood as the "winged self".

The literature on the various traditional patterns of insight -- termed "constellations" here -- typically identifies what may be understood as forms of cognitive metabolism, named otherwise. This is especially evident in the case of the enneagram and those associated with the Chinese classics (*I Ching*, *Ba Gua*, *Tai Xuan Jing*, *Wu Xing*). The *I Ching* offers an extensively articulated example, as separately discussed (*Transformation Metaphors -- derived experimentally from the Chinese Book of Changes (I Ching) for sustainable dialogue, vision, conferencing, policy, network, community and lifestyle*, 1997).

Although the subject of extensive commentary, disciplines and practice, yet to be further clarified is the nature of the flows and cycles with which cognitive metabolic pathways are associated. One traditional discussion uses the metaphor of [circulation of the light](#), as separately discussed (*Circulation of the Light: essential metaphor of global sustainability?* 2010). Of particular interest is the intuitive attraction of epics suggestive of such processes (*Emergent Integrity of a Configuration of Cognitive Cycles: a "Lord of the Rings"*, 2009) as they may prove to be of relevance to governance (*Cognitive Cycles Vital to Sustainable Self-Governance*, 2009).

Another approach is in terms of [conversation threading](#) -- as most obviously evident on the internet. Such threads pose the question of how a higher order of cognitive organization may emerge through their interweaving, interlocking and mutual entanglement, as separately discussed (*Interweaving Thematic Threads and Learning Pathways Noonautics, Magic carpets and Wizardomes*, 2010; *Spherical Configuration of Categories -- to reflect systemic patterns of environmental checks and balances*, 1994).

Understood by an individual at a common focus for a set of interwoven threads, how might these be experienced in cyclic terms as reframing the identity of that focus? How might this be understood in terms of emergence of a form of cyclic identity (*Emergence of Cyclical Psycho-social Identity: sustainability as "psychically" defined*, 2007).

Emergence of a higher order pattern language through constellations of entangled metaphors?

The domains with which strategically significant metaphors are associated can be usefully explored as a form of constellation. It is then appropriate to note how metaphors associated with one domain are borrowed by others -- suggesting that they communicate systemic insights and patterns otherwise unnamed. The following table is indicative of the process. It can also be considered indicative of the continuing struggle to offer collectively comprehensible images of subtle systemic dynamics transcending conventional language -- a form of [global sensemaking](#).

Qualitative constellations of metaphors used to label experiences in disparate domains							
	weather (climate)	nature (environment)	economy (finance)	astrophysics (stars, light)	reputation (credibility)	knowledge (information)	combat (military, sport)
"weather" storm tides, waves heat, cold sunny, cloudy	--		liquidity solid	darkness	waves, tides, winds (of opinion)	fog obscurity darkness	
"environment" growth fertile		-	fertile growth	stellar performance		fertility, cross-fertilization (creativity)	
"economy" performance efficiency			--	stellar success		"economic with the truth"	
"health" alive, dead				dead stars			
astrophysics			black hole	-	supernova, dead stars	shining star	
reputation	"in the cold"	sympathetic / hostile environment	beneficial	celebrity stars	-	"in the know", "out of the loop"	"knock them out", crushed
knowledge						-	
military							-
sex			business				

In a period in which widespread emphasis is placed on the rising temperature associated with climate change, it is appropriate to consider -- in the light of the above comparison -- the extent to which this may be usefully recognized as a metaphor for other forms of "heating".

This is most evident with respect to overheated economies, to social unrest, and to heated political and ideological discourse. Is there a danger of a "2 degree" rise in social unrest before the end of the century? Does climate change discourse distract from recognition of such phenomena which undermine consensus on effective response to it? (*Climate Change as a Metaphor of Social Change: systemic implications of emissions, ozone, sunlight, greenhouse and overheating*, 2008).

The process could be explored more systematically through patterns of correspondences with which credibility is variously associated (*Theories of Correspondences -- and potential equivalences between them in correlative thinking*, 2007).

Method of image development as a learning process

The process of elaboration of the virtual reality image above was born of various degrees of ignorance, incomprehension and incompetence. From this basis it is of some interest how others might be empowered to explore, design and interact with structures in virtual reality. The most fundamental lesson is associated with the contrast between the relative ease and clarity of representation in 2D, and the relative difficulty of spherical geometry -- despite its greater correspondence to experiential reality. This has strategic implications.

The virtual reality modeling language (VRML) has evolved through VRML97 to a new standard X3D. This evolution has created the usual issues of compatibility between installed browsers, operating systems and readily available plugins -- as well as the emergence of alternative interfaces. One of the great advantages of the simpler earlier variants has been the ease with which files could be prepared and modified using simple text editors.

Given the earlier experience (with virtual reality (as noted above), some insight is to be gained from the stages involved (for the author) in successfully depicting an enneagram within an icosahedron:

Image editing: initial use of a simple text editor, given the relative simplicity of the icosahedron and positioning the enneagram within it.

- this enabled use of legacy browser plugins to view the result
- an immediate constraint was determining coordinates for the icosahedral vertices. [These are not as readily available as might be assumed, and tend to be associated with copyrighted materials]
- once found, it became apparent that VRML posed a problem (given the author's minimal expertise) in constructing lines of adequate thickness to facilitate visibility
- the alternative adopted was to export a suitable icosahedron from [Stella Polyhedron Navigator](#) (using its VRML export feature). [This application had previously been used, with the assistance of its developer, to provide animations in 3D of clusters within the

zodiac ***]

- this did not provide an elegant solution to the problem of constructing enneagram lines of adequate thickness within the icosahedron. [Multiple parallel polylines were required]
- using a simple text editor, a further constraint arose from the management of nested structures within the file, and the difficulty of validation -- despite the relative simplicity of the coding
- a decision was made to use an open source editor for the new X3D format ([X3DEdit](#)) -- importing the file from the earlier VRML format -- in order to benefit from a well-structured interface and powerful validation facilities [but avoiding any attempt to use a fuller range of X3DEdit features].
- the edited file was then exported into the older VRML format, for which viewers are more readily available. [Use was eventually made of the [H3DViewer](#), which is not a plugin]
- within the X3DEdit application it became relatively easy to rewrite more simply the code structure exported from Stella -- in order to increase flexibility and enable further development [Thicker lines were produced by extrusion of cylinders of minimal diameter]
- a particular difficulty with VRML and X3D is that curves, circles and spheres must be defined by multiple straight lines. [A circle of adequate thickness was therefore defined by extrusion of a cylinder of minimal height]

Positioning circles: the circles indicated on the image above are primarily those through selected vertices of the icosahedron:

- although well-defined by equations, given the coordinates, the geometric inability of the author to reconcile the properties of the circle with the orientation of the set of vertices in each case -- within the constraints of the virtual reality modelling language -- meant that a much more cumbersome manual approach to circle fitting was attempted with only limited success
- this eventually necessitated use of a Cartesian coordinate X3D widget ***to provide guidance in the spherical positioning of individual circles
- the resulting imperfections are evident in the image, then to be understood as a "proof of concept" for a "work in progress" [Greater expertise is required in combining spherical geometry with the X3D language]

Distinguishing elements: there is clearly a need to distinguish features with which cognitive significance can be associated (whether vertices, lines or circles) using colour, size, thickness and transparency:

- it is particularly significant to note the constraints on distinctions between colours -- whether in terms of the technicality of colour definition ([RGB colour](#) combinations), the maintenance of distinctions in printed versions, or the capacity of the eye to distinguish colours for purposes of wider communicability.
- for this reason, the simplest range of colours was used in combination with size, notably in the case of vertices
- a design choice was made to pair circles, identically coloured

Viewpoints: the process of viewing virtual reality scenes allows "viewpoints" to be pre-defined, enabling users to shift from one point to another, via a menu of named viewpoints whilst using a viewer):

- the approach taken was to associate each of the 12 vertices with a viewpoint, in addition to defining other views of patterns within the structure.
- the default viewpoint defined was that which enabled the somewhat elusive enneagram structure to be seen -- as it is typically recognized in 2D depictions
- 4 ? human faces?

Optional additional features: various additional features could be associated with the image

- animation / rotation
- spheres on circles
- embedding
- inner sphere? = intersection
- inner icosahedron / icosahedron / dodecahedron -- transformations: Bucky, I Ching / Hygei, Alexander
- drilled cube, cubocta
- Szilassi

Interactive possibilities: both classic VRML and the X3D upgrade provide for interactive possibilities whereby the user can modify the image -- beyond simply switching between viewpoints and rotating the structures as a whole. These become more feasible in X3D and its Java extension ([X3JD](#)). Possibilities include: resizing, recoloring, additional structures (icosahedron, inner sphere, enneagram, faces on cylinders with top/bottom attributes, circle (through vertices and tangential), other circles, wireframe rendering

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