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Alternative view of segmented documents via Kairos

4 April 2010 / Draft

Adaptive Hypercycle of Sustainable Psychosocial Self-organization designing a mapping of a Chinese metaphorical pattern language

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Introduction

This is specifically concerned with further possibilities of mapping the interrelationships between the set of conditions of change identified and encoded by the 64 hexagrams of the Chinese classic known variously as the *Book of Changes*, the *I Ching*, the *Yi Jing* or the *I Ging*. The argument has been introduced in an earlier paper (*System Dynamics, Hypercycles and Psychosocial Self-organization: exploration of Chinese correlative understanding*, 2010). This suggests the possibility of a rich formal representation of system dynamics with which poetic metaphor has been fruitfully associated to enable widespread comprehension

The point was further made there that, in the light of developing understanding of complex systems, the pattern of interlinked "changes" effectively constitutes a hypercycle. Enabling comprehension of such a hypercycle could prove fundamental to comprehending the essence of sustainability in the face of emerging turbulent psychosocial conditions. This challenge is intimately related to that of the need to navigate the adaptive cycle with which they are associated. The case for recognizing an adaptive cycle has been made by the *Resilience Alliance* and by Thomas Homer-Dixon (*The Upside of Down: Catastrophe, Creativity, and the Renewal of Civilization*, 2006).

The merit of the set of Chinese encodings of change conditions, as discussed previously, is its claim to comprehensiveness and relevance to governance -- at a time when the influence of China on global policy-making is increasing dramatically. Its widespread appeal is clearly also to be appreciated in a period of alienation from conventional faith in governance and authority in their various forms (*Abuse of Faith in Governance*, 2009)

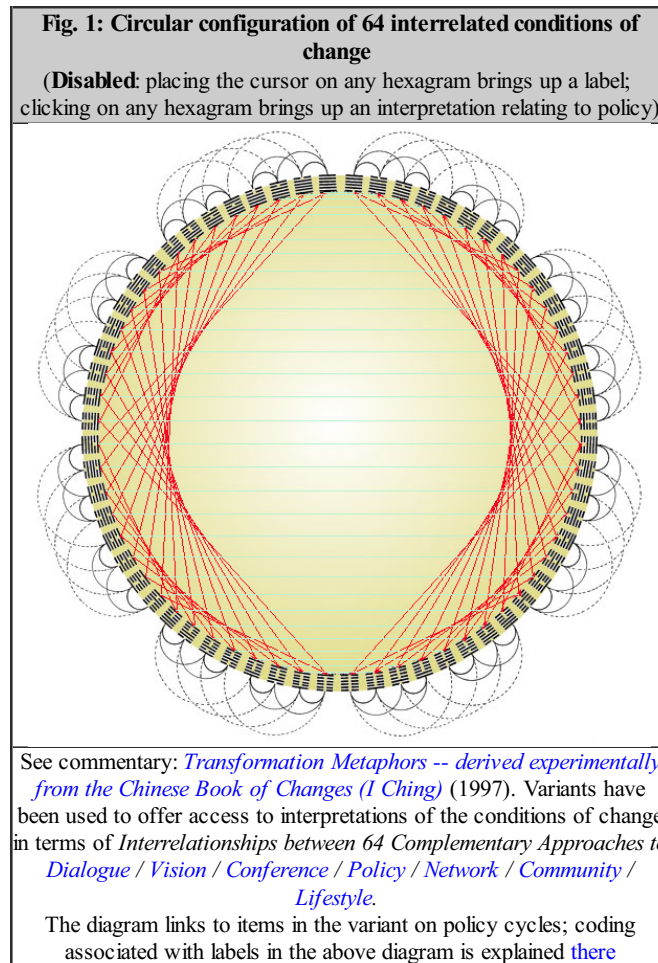
The argument explores how the *Fibonacci spiral* might be used to configure the relationship between the conditions of change -- and facilitate understanding of them. There is the possibility that such design properties might enhance psychoactive engagement with the patterns of change, for reasons previously presented (*Topology of Valuing: psychodynamics of collective engagement with polyhedral value configurations*, 2008). Such a combination of imagery responds to the challenge of combining the developmental dynamic of the spiral with the invariance of the pattern of changes as a whole. It is in this sense that the result has the potential of increasing the accessibility of insight into the nature of any adaptive hypercycle and its significance for sustainable psychosocial organization.

Specific conclusions are drawn with respect to global governance communication -- especially as reflected in the architecture of conference venues, notably in the anticipated innovation of a *semantic web* environment appropriate to a global knowledge-based society.

Choice of mapping metaphor: circular

The challenge of mapping cannot be fruitfully understood as one of foreclosing prematurely on any particular pattern -- as is well-

illustrated by the many experiments in mapping the globe through a variety of "projections". An **earlier experiment** used the following **circular configuration** of the hexagram conditions with 384 links around and across the circle. The psychosocial dynamics implied by that circle offer one insight into the possibility that the *I Ching* may be fruitfully understood as a hypercycle (as mentioned in the introductory paper).



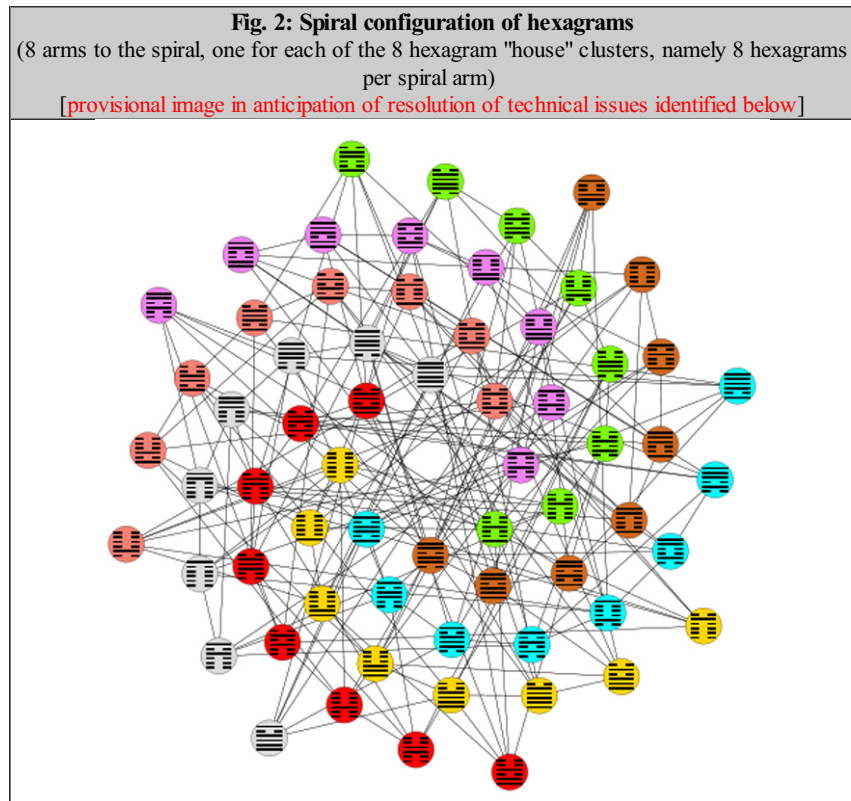
As indicated in the introductory paper, the choice below is to use the widely-known traditional circular configuration of 8 trigrams -- the *BaGua* -- through which the 64 conditions are traditionally clustered into "houses". The originality in the resulting map (Fig. 2, below) lies in "stacking" the conditions of each house around the central 8. However, rather than stack them radially, as was shown in the introductory paper, the choice made below was to allow each individual "stack" to constitute the arm of a spiral.

The following representation (Fig. 2) has implicit in it a number of issues which may be considered both matters of concern and of potential significance:

- considerable importance is traditionally attached to the order of the *BaGua* configuration, of which two variants are distinguished: the Fuxi "Earlier Heaven" arrangement and the King Wen "Later Heaven" arrangement). The order of the latter arrangement (but not the orientation) is used in the mapping below. The possibilities of other arrangements are discussed separately (*Strategic Patterns in terms of Knowing, Feeling and Action*, 2009).
- similarly, considerable importance may be attached to whether the hexagram codes are to be read from bottom to top or from top to bottom (as with bar codes, for example). In the following diagram, the bottom-to-top interpretation is used in naming each hexagram and in offering links to documents explaining their significance for change. This issue is of greater significance in the earlier case of the circular representation of all the hexagrams for which the implications of the alternative "readings" are separately discussed (*Alternating between Complementary Conditions -- for sustainable dialogue, vision, conference, policy, network, community and lifestyle*, 1983).
- considerable importance is of course attached to whether any spiral is to be understood as rotating clockwise or counter-clockwise (terms ambiguously understood in this case) -- namely the issue of the **two forms** of the *swastika*, both widely-known to many cultures (notably most Hindu and Buddhist). Again any implications may depend on how the spiral is understood, however in the diagram below a clockwise rotation may be understood as portrayed.
- the graphic disposition of the hexagrams clearly requires careful thought on how the hexagrams are to be positioned along any spiral arm and the angle of orientation of the arm to the central circle. This is the question of ensuring minimum crossing of links and avoiding that their lines cross any of the hexagrams -- namely ensuring the "visibility" of each hexagram to the others, to the extent possible. This is further discussed below. Clearly the designs offering such mutual "visibility" are indicative of fruitful ways on which conditions of change can be configured in relation to each other -- avoiding situations in which any one condition is obscured or shadowed by another.

In a web environment there is of course every possibility of offering users the option to reconfigure any such map interactively in response to different preferences and insights. The technical constraints on the diagram as represented here are further discussed [below](#).

Choice of mapping metaphor: spiral



Technical considerations and deficiencies

Given the complexity of the above diagram (Fig. 2), it is clearly desirable to be able to generate it by computer program rather than engaging in a manual drawing process (an option initially explored and used in the introductory paper to illustrate the possibility). This is especially the case when the diagram is designed for web use and when it is appropriate to experiment with various designs. Prior to improvement in the spiral representation (discussed below), the following considerations can be mentioned:

- the simple algorithm initially used to provide a first approximation to spiral design and positioning is clearly defective in that a degree of asymmetry is evident -- hence the following discussion of a spiral metaphor, and notably the **Fibonacci spiral**
- the program used for Fig. 2 initially generates an SVG (**scalable vector graphic**) variant which is in principle ideal for such representation. Unfortunately the relationship between SVG and web browsers is constantly evolving and as such may be considered as unstable -- images produced by this route a few years ago may be unreadable, or variously inoperable, with evolution of certain web browsers (or their configuration)
- as a consequence of the constraint on SVG operation, the SVG variant was converted into a more stable conventional image format (JPG). This makes it possible (a) to associate hyperlinks with each condition and (b) to allow additional information to be displayed when the cursor is placed over any one condition. Unfortunately, again, web browsers are variously able to handle such features. Typically feature (a) is commonly available, whereas feature (b) is more dependably available with Internet Explorer. This may of course depend on how the browser is configured (if the user has the knowledge and the rights to do so). An alternative chosen was therefore to use javascript to open a window when clicking on any hexagram.
- it is of course the case that a far superior result could be achieved through other software (possibly PHP or a Java applet), although this poses particular challenges for integrating the diagram to the documents to which it is linked
- it is also possible that, in globally transforming the representation interactively, it could be explicitly related to other design metaphors, such as the circular mappings (as mentioned above)
- other experiments may be fruitfully undertaken with animations of the hexagram coding system (*Animation of Classical BaGua Arrangements: a dynamic representation of Neti Neti*, 2008; *Dynamic Exploration of Value Configurations: interrelating traditional cultural symbols through animation*, 2008).

Potential significance of a Fibonacci spiral formation

There are of course a variety of spiral forms that might be used in a configuration like Fig. 2 in order to maximize (or optimize) visibility of hexagram conditions to each other. In a web environment users might, as noted, be offered the possibility of dynamically shifting between those forms.

A further consideration in any design choice follows from the possibility of embedding in the design other mnemonic triggers, as previously argued (*In Quest of Mnemonic Catalysts -- for comprehension of complex psychosocial dynamics*, 2007). In the light of such

considerations:

- it is appropriate to recall the "solar" metaphor so important to governance of many cultures down the ages. Arguably "global" could benefit from a metaphor of equivalent significance at this time -- especially given the inability to manage changing climate as a result of global warming.
- the solar metaphor is of course also characterized in its depictions by "rays". It is potentially fruitful to use the "houses" as indications of "ways of knowing" -- configured to suggest an "eightfold way of knowing".
- a particular spiral recognized to be fundamental to the organization of nature, and to human design preferences, is that based on the **Golden Ratio** -- namely the Fibonacci spiral. Such proportions are notably fundamental to what is valued in "sacred geometry", if only its aesthetic qualities:
 - Ronald W. Neperud and Ronald C. Serlin report on its importance for children's design preferences (*The Fibonacci Sequence: proportional and semantic bases of children's aesthetic preferences, Studies in Art Education*, 1984).
 - Others report on the relevance of such forms for learning (J. Burg, A. Lausier and V. Strokanova, *Motivating Learning and Creativity With Fibonacci, Fractals, and Phi*, 2004).
 - A study by Marcel Danesi (*The Fibonacci sequence and the nature of mathematical discovery: a semiotic perspective, Sign Systems Studies*, 2005) looks at the serendipitous discovery of the Fibonacci sequence as the answer to a puzzle designed to illustrate the efficiency of the decimal number system as one of those episodes in human history which show how serendipity, semiosis, and discovery are intertwined. The author shows how the sequence has significant implications for the study of creative semiosis, since it suggests that symbols are hardly arbitrary products of human reason, but rather unconscious probes of reality.
- the spiral is of course widely valued as symbol, model and metaphor of psychosocial development. It is notably fundamental to the **spiral dynamics** associated with the **integral theory** of **Ken Wilber** and the AQAL quadrant system, as mentioned in the introductory paper (Don Edward Beck and Christopher Cowan, *Spiral Dynamics: mastering values, leadership and change*, 2005)

As noted above, there is a case therefore for exploring how the Fibonacci spiral might be used to configure the relationship between the "houses" of conditions of change. There is the possibility that such design properties might enhance psychoactive engagement with the patterns of change, for reasons previously presented (*Topology of Valuing: psychodynamics of collective engagement with polyhedral value configurations*, 2008). Such a combination of imagery responds to the challenge of combining the developmental dynamic of the spiral with the invariance of the pattern of changes as a whole. It is in this sense that the result has the potential of increasing the accessibility of insight into the nature of any adaptive hypercycle and its significance for sustainable psychosocial organization.

The importance of insights to be derived from order in nature has been highlighted by **Christopher Alexander** (*The Nature of Order*, 2003-4) and further explicated with regard to his current research (*Harmony-Seeking Computations: a science of non-classical dynamics based on the progressive evolution of the larger whole. International Journal for Unconventional Computing*, 5, 2009).

Alexander's current program was the subject of earlier commentary (*Harmony-Comprehension and Wholeness-Engendering eliciting psychosocial transformational principles from design*, 2010), itself expressed through the challenge of designing a "magic carpet" of relevance to governance (*Magic Carpets as Psychoactive System Diagrams*, 2010). A diagram such as that above might be understood as exploration of the possibility of a cognitive "magic carpet". As an approach to "braiding discourse" it may be seen as a response to the challenge of discourse in cyberspace (*Interweaving Thematic Threads and Learning Pathways: Noonautics, Magic carpets and Wizardomes*, 2010). Given Alexander's defining role with respect to design, of relevance to what follows is the focus of his current research on "geometric adaptation".

Framed as a cognitive design problem, in the light of the explorations of Christopher Alexander, a consideration is how to strike an interesting compromise between incorporating both symmetry and symmetry-breaking so as to enhance memorability and psychoactive engagement.

Fibonacci progression as a significant metaphor

A comprehensive visual introduction is available as a PPT (Nicole Doepkens, et al., *The Fibonacci Numbers and The Golden Section*).

Robert Paterson (*Natural Scale: PHI and Our World*, October 2006) makes the point that:

... our problem is one of metaphor or design. We have fallen in love with a mechanical metaphor that worked quite well in a more simple world. But we seem to have reached a level of complexity where an approach that demands mainly knowns cannot cope.... I think it is clear that mechanical models cannot scale and remain competent in a complex world. So what do we see in nature as a shape that does scale in complex surroundings?... Nature has perfected over 14 billion years the most effective design for relationships. **Phi** drives all the best relationships to be found anywhere in the universe. Linked into Phi are the Fibonacci Numbers which express Phi as a curve.... If this is so -- then maybe PHI and Fibonacci will be at the heart of all organizational designs for space for humans that wish to reach their full development potential... It is my conjecture that PHI and Fibonacci will become the metaphor that will enable us to break free from the constraints of a mechanical metaphor and that it will become the core idea that will propel humanity forward and hopefully give us a chance of avoiding the fate of the dinosaurs.

As noted by Ronald L Holt, *The Golden Mean Spiral and the Merkaba*, Flower of Life Research, 2001):

This characteristic of the Fibonacci (always attempting to approximate the Golden Mean with greater accuracy) can be used as a metaphor for our human condition, which will help us gain deeper insights into the nature of spirituality. If the Golden Mean is used as a metaphor for spirit and the Fibonacci is used as a metaphor for physical incarnation (spirit incarnating into the physical

and attempting to perfect itself to the ideal), then metaphorically, our physical incarnation begins as a Fibonacci life form.

One blogger offers a critical comment relating to the use of Fibonacci in economics (*Cyclical Growth, Form and Fibonacci*, *The Psy-Fi Blog*, 24 September 2009):

Back in the 1930's [Ralph Nelson Elliot](#) developed a technique for forecasting market price movements which he, at some point, decided was based on the Fibonacci sequence. The [principle of the Elliot Wave](#) is that collective human psychology drives moves from mass optimism to mass pessimism and then back again. In Elliot's reconstruction the ebb and flow of the markets is done in an eight step process, five up and three down, ranging over timescales from minutes to a grand supercycle of multiple centuries. According to Elliot the Fibonacci numbers simply appeared out of his theory, although there's no known underlying principle to explain this. It's just the way the world works, presumably...

Another blogger usefully raises the question *Is the Fibonacci Progression another way of defeating the Hegelian dialectic?* (27 May 2005), noting:

The Hegelian dialectic is an automatic response mechanism engendered by empowering the polarities around us. Thus the dialectic also is a perpetual polarity generating machine that feeds itself. False creationism, where division is the end result and all for the sake of "creating" more polarities. This indeed is most frightening.

It is frightening in that it is replacing a more natural way of dealing with needs and thoughts (Life) uniformly. Life on Earth, nature in general, provides a more natural progression to higher growth than the dialectic model. This natural model is known as the Fibonacci Progression. At the end of the day we are seeing the Hegelian Dialectic expanding into ever more territory previously immersed in Fibonacci progressive growth. The Dialectic seeks to enslave and dismantle the Fibonacci progressions.

Meta-metaphor as illustrated by Fibonacci spiral construction

Of special relevance to any preoccupation with comprehension and governance of complex psychosocial system dynamics is the way in which construction of the Fibonacci spiral is itself an illustrative exercise about:

- isomorphism: namely the structural relationship between a system understood at one stage or level and as understood at another. In this sense it illustrates a central preoccupation of general systems theory -- if only as it determines human capacity to comprehend systems and impose an order on them (see also recent arguments of Jean Chaline, Laurent Nottale and Pierre Grou (*Des fleurs pour Schrödinger : la relativité d'échelle et ses applications*, 2009; Laurent Nottale and Charles Auffray. *Scale relativity theory and integrative systems biology: 2 Macroscopic quantum-type mechanics*, 2008)
- scaling of systems: as implied by the pattern of isomorphism and the common use of the [conch shell](#) to illustrate the Fibonacci pattern and its ubiquity in nature
- metaphoric relation between tenor and vehicle -- as a succession evident at any stage in the sequence of construction (discussed below)

It might be argued that the Fibonacci pattern is an archetypal metaphor -- a metaphor about metaphor, or better still about metaphor development from what has previously been developed as a cultural or cognitive artefact, namely metaphors building on constructs transformed into metaphors.

Given the widespread use of the conch shell as an illustration of the Fibonacci pattern, human understanding might then be understood as developing in "conch-shell mode". Appropriately Saroj Kumar Rath and P. C. Naik explore this from the perspective of its use as a musical instrument, notably used by priesthoods down the centuries (*Fibonacci Structure in Conch Shell*, *Current Science*, 2005). It is appropriate to note that [Fibonacci numbers](#) were first recognized in the work of the Sanskrit grammarian Pingala on the *Art of Prosody*. [Prosody](#) is the metre or basic rhythmic structure of verse in poetry, or the manner in which a composer assigns syllables to notes in the melody to which the text is sung -- both being important in ancient Indian ritual because of the emphasis on purity of utterance.

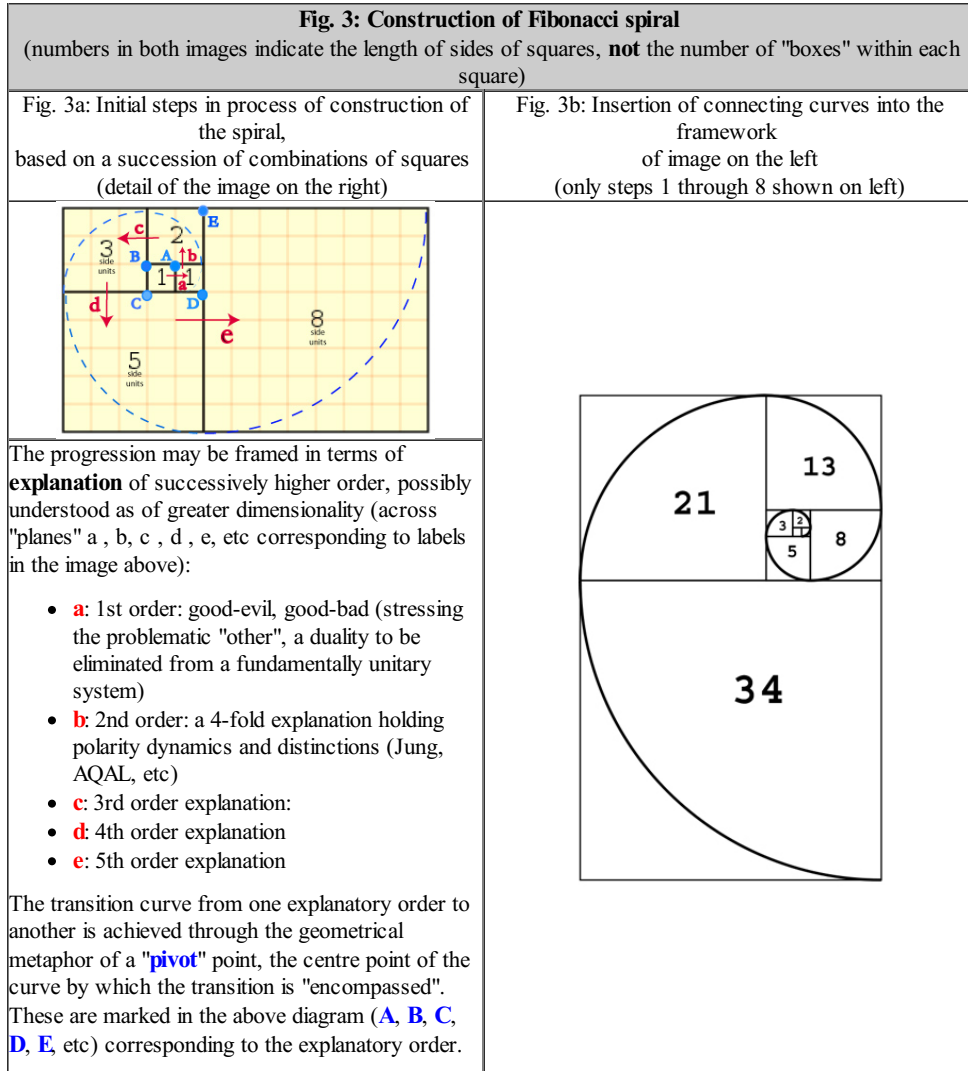
Development of cognitive artefacts from "vehicle" to "tenor"

In the case of metaphor a distinction is conventionally drawn between vehicle and tenor. The tenor is the subject to which attributes are ascribed. The vehicle is the subject from which the attributes are derived. As phenomena are reified and associated categories are defined, metaphor may draw upon older and more salient categories as a source of metaphor -- attributes are drawn from such "vehicles" and ascribed to the emergent category (the "tenor") as a means of defining it and rendering it comprehensible. A major psychosocial difficulty is associated with the manner in which some categories are framed as absolutes and necessarily "right", with others held to be inherently misconceived. There are many examples of such polarization with evident difficulty in bridging the dynamic between them and those perceived to be subscribing to one or the other.

This process serves to highlight how the more tangible "vehicle" is effectively "in-the-box" -- a linear category box interacting with similar boxes of the same explanatory order. Transcending their dynamics is enabled by the progressive contextual construction through introducing appropriate "curvature" -- using a metaphoric intangible to cross scales and give form to a larger cognitive whole. The non-linearity of metaphor is then a key to this process. As a metaphor of metaphor construction, this offers added significance to earlier arguments regarding the relevance of metaphor to governance (*Metaphors as Transdisciplinary Vehicles of the Future*, 1991; *Metaphor as an Unexplored Catalytic Language for Global Governance*, 1993; *From governing metaphors to governance through metaphor*, 1995).

Given the importance of the much-discussed transition to any new paradigm, a valuable metaphor is offered by the use of a spiral to enable such transitions by vehicle traffic. A **track transition curve**, transition spiral, or spiral easement, is a mathematically calculated **Euler spiral** fitted between a straight (also known as **tangent**) and a circular **curve** on a section of rail track or highway. Clearly such a perspective merits attention as offering a smooth cognitive transition "out-of-the-box".

The Fibonacci sequence offers a way of framing this situation and transcending it -- as illustrated by the following. The initial squares at the core of the image on the left (1 and 1) epitomize polarization -- reframed by the square with a side corresponding to their total (2=1+1). In this sense "2" becomes the metaphorical "tenor" whose attributes are derived from the dynamics between the "vehicles" ("1" and "1"). The progression continues with "3" as a metaphorical tenor for the categories that preceded it, and so on.



Of great interest is the nature of the cognitive process indicated by the box construction in the left hand image above. Recognition of the need for a larger context may be understood in terms of:

- reacting against the dysfunctionality and "traps" of the pattern of lower order
- recognizing the need for:
 - "ex-planation" to shift out of the plane in which lower order dynamics occur (as with calls for a new paradigm)
 - a "bigger box" (as cognitive container of sub-boxes) within which to handle the unresolved dynamics (the psychosocial "stuff") between category boxes at level(s) of lower order -- providing a framework to "hold" what "came before"
- discovering, through learning, a stereoscopic (or polyocular) perspective of greater "depth" from which:
 - mirroring of polarization becomes apparent and may be encompassed through "stepping into the mirror" (*Stepping into, or through, the Mirror: embodying alternative scenario patterns*, 2008)
 - **enantiodromia** is recognized, as exemplified by understanding of **moral equivalence** previously denied (*Psychosocial Energy from Polarization within a Cyclic Pattern of Enantiodromia*, 2007)

Fig. 4: Summary of implications					
games, personality types, team members and delegates enacting dynamics	explanatory order	process "category boxes"	interface for explanation	explanatory systems	alternative systems
0	0	1	0	"self-explanatory"	nonduality / apophysis
"good-guys" vs. "bad-guys" "us" vs "them"	1 (a)	1	1	2 (good-evil, believers-deniers)	-

				positive-negative)	
tennis, male-female, producer-consumer, etc	2 (b)	2	2	4 (Jung, AQAL, most conventional "models" using quadrants)	16 (MBTI)
bridge	3 (c)	6 (2x3)	3 (triadic)	9 (enneagram, Haskell/Wilken)	81 (<i>Tao Te Ching</i>)
enneagram types	4 (d)	15 (3x5) Alexander	5 (mindscapes)	(25)	(625)
chess (8x8 board)	5 (e)	40 (5x8)	8-fold	64 (<i>I Ching</i>)	(4096)
Wéiqí/Go (19x19 board)					
meeting delegations, seating arrangements, Dunbar's number					

It is appropriate to note that the formalizations of patterns, involving sets of larger sizes with more complex dynamics, are effectively anticipated in the form of games, recognition of distinct but complementary personality types (possibly recommended for management teams), size or number of delegations for meetings on complex issues. A degree of comprehension of the patterns is then achieved by "enacting" them as in some complex rituals. Of potential relevance is [Dunbar's number](#) as a theoretical cognitive limit to the number of people with whom a person can maintain stable social relationships. These are relationships in which an individual knows who each person is, and how each person relates to every other person. Proponents assert that numbers larger than this generally require more restrictive rules, laws, and enforced norms to maintain a stable, cohesive group. No precise value has been proposed for Dunbar's number, but a commonly cited approximation is 150. Of further interest are analogous constraints on the cognitive ability of certain patterns of "governance" to maintain "stable social relationships".

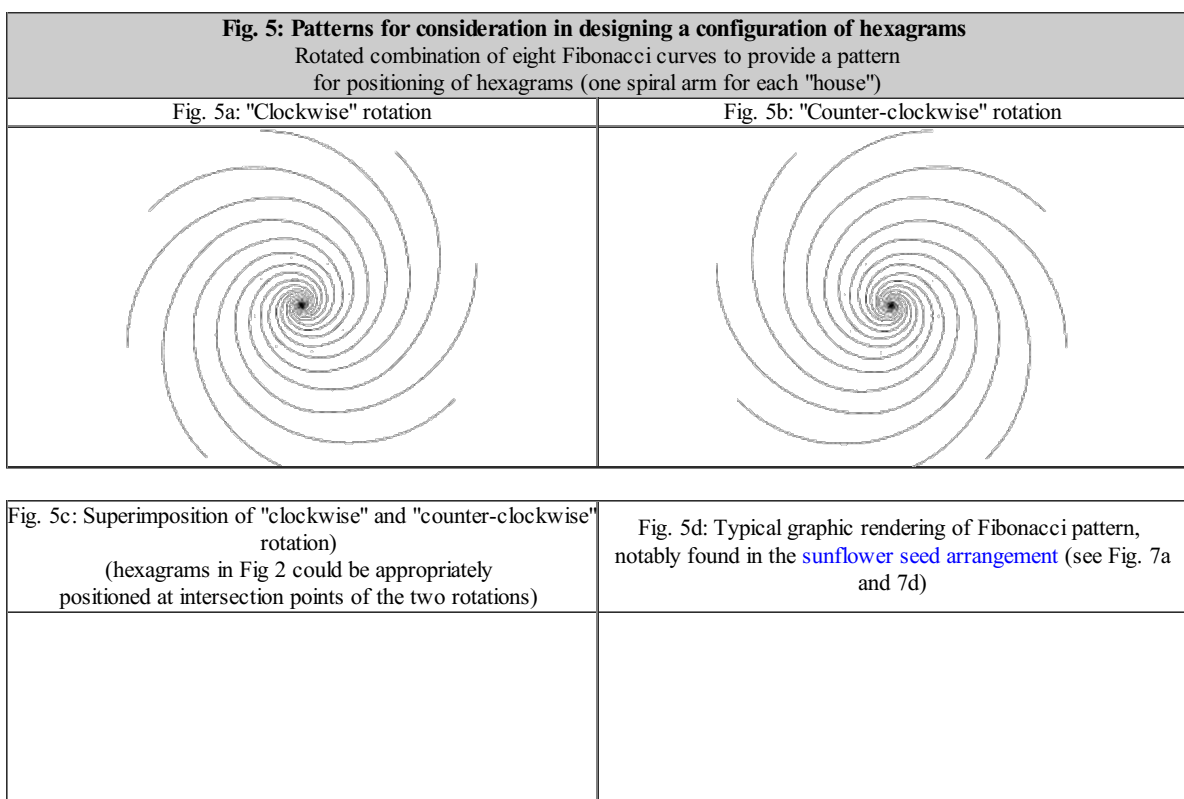
Aspects of these issues are explored in the following:

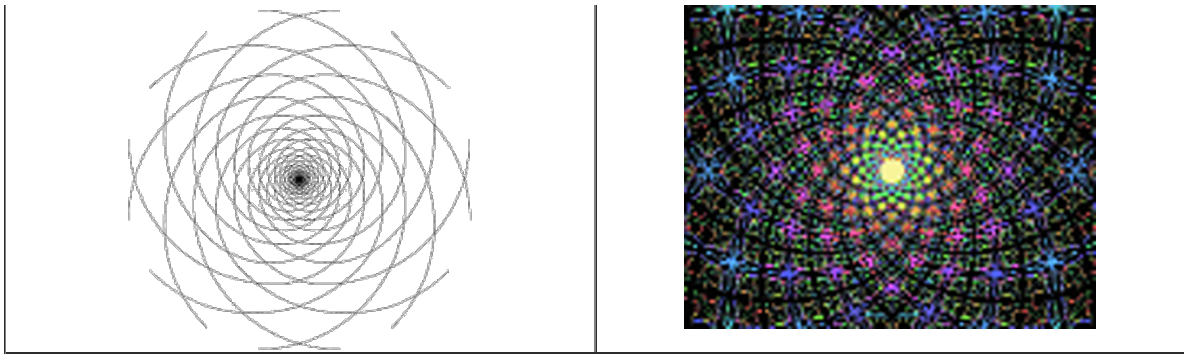
- [Sustainability through Magically Dancing Patterns 8x8, 9x9, 19x19 -- I Ching, Tao Te Ching / T'ai Hsian Ching, Wéiqí \(Go\), 2008](#)
- [Patterns of N-foldness Comparison of integrated multi-set concept schemes as forms of presentation, 1980](#)
- [Representation, Comprehension and Communication of Sets: the Role of Number, 1978](#)
- [Distinguishing Levels of Declarations of Principles, 1980](#)

The relationship between the first numbers, and especially the role of zero, has long been a matter of comment (John D. Barrow, *The Book of Nothing*, 2000; Brian Rotman, *Signifying Nothing: the semiotics of zero*, 1987; Raj Patel, *The Value of Nothing: how to reshape market society and redefine democracy*, 2010). Of relevance to governance is also the extent to which a central issue may be neglected, denied or otherwise omitted ([Lipoproblems: Developing a Strategy Omitting a Key Problem -- the systemic challenge of climate change and resource issues](#), 2009). Curiously this may be appropriately portrayed in a circular diagram ([Mapping the Global Underground: articulating Insightful Population Constraint Consideration](#), 2010). This mapping could well also benefit from a spiral design.

Combining Fibonacci spirals

In relation to a spiral presentation of hexagrams in Fig. 2 (above), several possibilities may be explored of combining Fibonacci curves to constitute "solar rays", as suggested by the following.





Of interest with regard to the co-occurrence of several hypercycles is the work of Kazumasa Oida (*The Birth and Death Processes of Hypercycle Spirals*, 2002)

Comprehending the psychosocial hypercycle through an interplay of metaphors

Comprehension dynamics: A central question with respect to any "map" is how it is to be used. How are people expected to engage with it? It is one thing to make conventional assumptions about such a map and navigation in accordance with them. However there is a problem if these assumptions are misleading. The map may be more like an instrument, such as a piano. Its directional possibilities may require that it be appropriately operated -- namely through how it is played. Its usefulness may be intimately associated with the melodies that can be played. Like a radar, the instrument is only of value if it is operational and the information can be appropriately interpreted.

Should diagrams Figs 1 & 2 then be understood as instruments -- like harps -- whose utility derives from the skill with which they are "played"? This is the case with the *luopan* (the *Feng Shui* "compass") Given the evident links in the above diagrams, should these be understood like the strings on a stringed instrument? Indeed, as with any conceptual or strategic "model", is its value dependent on the skills of the player rather than with the elegance of its design?

Polarity dynamics: The fundamental issue, at the core of the challenges of governance, is the polarity variously played out and associated with:

- **hope vs despair:** with every "positive" artifice offered to increase hope and avoid dealing with despair and "negativity" -- exemplified by the syndrome of the glass "half full vs half empty" (*Credibility Crunch engendered by Hope-mongering: "credit crunch" focus as symptom of a dangerous mindset*, 2008; *Being Positive and Avoiding Negativity: Management challenge of positive vs negative*, 2005)
- **solutions vs problems:** with the pursuit of solutions and the avoidance (even the denial) of problems (*Lipoproblems: developing a strategy omitting a key problem*, 2009)
- **assertions vs contradictions:** with the elevation of assertions to the level of being unquestionable and the marginalization of those who note contradictions
- **belief vs unbelief:** most obviously evident in the case of religion, but recently and dramatically echoed in the framing of climate change
- **right vs wrong:** despite the gray areas and compromises so typical of practical action
- **certainty vs uncertainty:** notably of concern in risk management (*Unknown Undoing: challenge of incomprehensibility of systemic neglect*, 2008)
- **agreement vs disagreement:** with the focus on the desirability of consensus at all costs (as so evident in the case of climate change) with the necessary demonisation of unbelievers and deniers -- and the failure to recognize the need or the possibility of "polysensus" (as discussed [below](#))
- **opening vs closing:** as articulated by [Orrin Klapp](#) (*Opening and closing: strategies of information adaptation in society*, 1978)

The workings of this polarity at the global level have been remarkably demonstrated by the climate change debate. Encoding such a polarity, as is done with the *yin* and *yang* symbols, enables it to be reframed in the richer context of the set of hexagrams mapping the transformative conditions of change. The design of the hexagrams, as a coding system, offers an explicit means of representing different combination of such polarities. The coding offered by the hexagrams -- with their unbroken and broken lines (as with the black and white keys on a piano) -- allows the metaphor to be explored further. The *BaGua* structure enables eight fundamental conditions to be appropriately encoded, as separately discussed (*Discovering richer patterns of comprehension to reframe polarization*, 1998).

However, as illustrated by a piano keyboard, the question is whether any "map" of value to governance will only "work" if there is the knowledge and expertise to "play" it like a musical instrument (*Polarities as Pluckable Tensed Strings: hypercomprehension through harmonics of value-based choice-making*, 2006). The navigational value, and the ability of the map to "transport" its users, may be intimately associated not only with the ability to play the instrument but also with the dynamics and harmonies of the melodies played. The possibility has been explored in relation to the aesthetics potentially fundamental to sustainable governance (*Aesthetics of Governance in the Year 2490*, 1990; *Magic Carpets as Psychoactive System Diagrams*, 2010).

Comprehension of appropriateness: Such a musical metaphor highlights the contrast between efforts to use binary decision-making by governance in order to achieve psychosocial "harmony" through the process of "harmonisation" (so typical of European Union strategic language). A musical metaphor makes it remarkably clear that "harmony" does not emerge from "unity" alone but requires an aesthetically integrated variety. Theories of harmony notably make use of an octave of eight pitches -- widely recognizable -- related to those in other octaves by doubling or halving the pitch frequency. Many forms of harmony may be expressed by playing combinations of notes within

an octave. It is recognized that transformation amongst the hexagrams of the *I Ching* entails eight major shifts, paralleling the musical octave, with the transition to the next scale marked by the house metaphorically associated with Joyous or Lake (Allen Pittman and Marnix Wells, *Walking the I Ching: the linear Ba Gua of Gao Yi Sheng*, Blue Snake Books, 2008).

Why is it so readily assumed that appropriateness is comprehensible with conventional mindsets, as previously discussed (*Comprehension of Appropriateness*, 1986)?

Spatial reinforcement: Given the deep cognitive commitment to linear and cubic modes of organization -- in domains ranging from grid planning to accountancy's management of collective confidence through spread sheets -- it is important to note the traces of any eightfold cognitive organization. The cube does indeed have eight corner points and it is through these that a relation to a spherical/global form is possible, namely the circumsphere.

Arguably a more complete engagement with globality is associated with the eight-faced octahedron. This spatial language raises the question of how architecture reinforces or undermines the possibility of the cognitive complexity supportive of psychosocial self-organization (*Metaphorical Geometry in Quest of Globality -- in response to global governance challenge*, 2009). How might the configuration of the eight clusters of hexagram "houses" be most usefully "planned" -- given the design considerations of Christopher Alexander and his current preoccupation with "geometric adaptation" in pursuit of "harmony".

Isophors: Kathleen Forsythe (*Isophor: Poiesis of Experience*, Center for Systems Research, 1986), in a paper to a meeting of cyberneticians, argues:

Analogy and its poetic expression, metaphor, may be the "meta-forms" necessary to understanding those aspects of our mind that make connections, often in non-verbal and implicit fashion, that allow us to understand the world in a whole way.

Forsythe uses the term isophors for isomorphisms experienced in the use of language. They are distinct from metaphors in that they are experienced directly. With the isophor there is no separation between thought and action, between feeling and experience. The experience itself is evoked through the relation. She suggests that the experience of one thing in terms of another, the isophor, is the means by which we map domain to domain and that our consciousness of this meta-action, when we observe ourselves experiencing this, lies at the heart of cognition. She has postulated the development of an epistemology of newness in which learning is the perception of newness and cognition depends on a disposition for wonder leading to this domain of conception-perception interactions.

She argues that the notion of metaphor is commonly understood to mean the description of one thing in terms of another. This notion presupposes an objective reality. This objectivity may be questioned and if, as suggested by Humberto Maturana (*Autopoiesis, Structural Coupling and Cognition*), objectivity is placed in parenthesis:

... we can begin to appreciate clearly the role we play in the construction of our own perception of reality. for this reason, the notion of the experience of one thing in terms of another, the isophor, suggests that it is this dynamic constructing ability that involves conception and perception -- unfolding and enfolding, that this gives rise to the coordination of actions in recursion which we know as language.

The creative dweller in the labyrinthine "cognitive conch shell" of its own making is "trapped" in a self-reflexive process of providing ever more encompassing explanations for the totality of previous explanations of lower order -- providing a Theory of Everything inclusive of all previous Theories of Everything of which the latest becomes yet another catalyst for a more exclusive articulation (a cognitive analogue to [Moore's Law?](#)).

Global governance communication

Irrespective of the insight achieved with respect to global governance, a fundamental challenge is how it is to be communicated to those who are expected to comprehend the insight and subscribe to the actions proposed. Conversely, a major issue for governance is to gather insight from the unforeseen arenas in which it may emerge.

Ironically the [conch shell trumpet](#) is recognized as one of the oldest instruments of sound propagation -- known since Neolithic times -- and therefore one of the antecedents of the natural trumpet by which people were gathered together by their leaders -- or as a means of warning the leaders from afar of imminent danger. Ironically again, the conch shell has also long been used as a hearing aid (or hearing trumpet) for those in need of such assistance. In both cases it is the geometry of the shell which magnifies sound. Modern hearing devices actually fit into the outer ear bowl -- known as the [concha](#).

With respect to the above argument however there is a cognitive analogue regarding the accessibility of knowledge (notably in contrast to information) through an analogue to the amplification offered by the conch shell:

- the function of the configuration of mnemonic aids in rendering an insight from authorities comprehensible to wider publics may be enabled by a Fibonacci-style geometry.
- the capacity of a Fibonacci-style geometry to capture distant insights and warning signals and to compress such information into meaningful knowledge
- the capacity of those at a distance from places of (global) authority to use a means of transmitting (local) insight such that it can reach such authorities

Such cognitive analogues take account of the cognitive diversity associated with the "open end" of the shell geometry:

- the need for incoming insight from a variety of sources to be appropriately subject to a reduction in complexity ("stepped down") to a form enabling a central decision to be made in the process of governance. This may typically be a binary decision well indicated at the core of that spiral geometry. It is appropriate to note that the *I Ching* hexagrams were specifically elaborated in response to provide a context for binary decision-making.
- the reverse process is also of relevance, namely the manner in which a binary decision from any authority is transformed into a variety of meaningful forms with which members of a wider population may variously engage.

As with modern megaphones and amplifiers, telecommunications makes use the wave guidance offered by of conch-style [horn antenna](#) for certain functions. However the cognitive analogue in processing multi-sectoral information is not assisted by any analogous process - - although it might be argued that computer applications using [Fibonacci heaps and tree structures](#) are indicators of such possibilities.

A more general argument can however be made. Policy-makers speak frequently of the need for "vision", without their being any question of having their own (cognitive) "eyes" tested for any possible need for corrective lenses, despite being demonstrably challenged in their capacity to "see", whether long-distance or short-distance. It can be similarly argued that policy makers may need hearing aids to compensate for difficulties in "hearing" of various kinds -- again frequently noted..

Beyond the extensive commitment to electronic surveillance, governance and decision-making in a complex society may require cognitive "hearing aids" -- potentially configured according to the geometric principles of the conch shell to facilitate interpretation of the volumes of insight available and expressed, whether by the governors or by the governed..




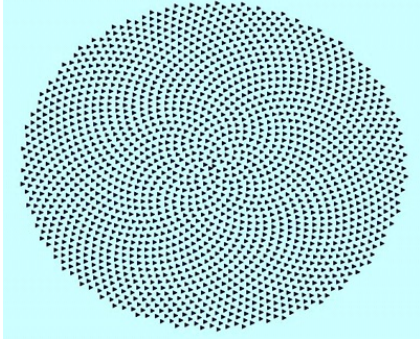
Fig. 6: Organization of insight processing appropriate to global governance?	
Fig. 6a: European Parliament (Strasbourg)	Fig. 6b: United Nations General Assembly (New York)
	

Fig. 7: Possible alternative pattern of representative global insight organization and dissemination -- appropriately inspired by the Golden Mean?	
	
<p>Fig. 7a: Sunflower showing organization of seeds (Flower Patterns and Fibonacci Numbers, Mathematics and Knots, U.C.N.W., Bangor, 1996 - 2002; S. Douady et Y. Couder, <i>La physique des spirales végétales</i>, La Recherche, janvier 1993)</p>	<p>Fig. 7b: Fibonacci Numbers and Nature: Why is the Golden section the "best" arrangement? 2009 by Ron Knott Schematic layout of a sunflower from an Excel spreadsheet with a slider to alter the turns-per-seed on an interactive chart to show to enable recognition of the best distribution of 2000 seeds on a seedhead.</p>

Towards an appropriate architecture of global conference communication

It is of course the case that governance at any level of society tends to be organized through meetings, whether summits, mega-conferences, congresses of various kinds, parliaments, roundtables, or other events through which people are brought together -- to "confer". Equivalents of every form are increasingly developed in web environments.

Confrontational seating: In an effort to optimize communication, curiously the architecture of meetings -- specifically the seating arrangements -- may echo some of the design considerations above. Ironically the coding elements from which hexagrams are constructed -- *yang* and *yin* as symbolized by "unbroken" and "broken" lines -- can be recognized in "confrontational" seating arrangements in which "government" (in power) and "opposition" (in minority) are placed opposite each other, as in the Westminster parliamentary architecture.

Circular seating: The confrontational arrangement is frequently deprecated in favour of circular seating, typically concentric circles of seating, as in major intergovernmental institutions. A "pie-chart" approach may be taken to distinguish majority from minority factions (reflecting statistical and accounting representations). A segment of the pie may be omitted for the moderating authorities and speakers.

The circular distribution of hexagrams in Fig. 1 (above) exemplifies this approach as an ideal in which all are equally seated at a roundtable. The lines of communication, and even the possibility of communication, of course increase (exponentially) with the number of seats. A notable experiment was conducted in Berlin in 2006 by [dropping knowledge](#) -- a [Table of Free Voices](#) -- seating 108 people of wisdom at such a round table. However there is little sensitivity to the challenges and possibilities, despite the efforts of the [Global Sensemaking Network](#) and the widely available technology (*Complementary Knowledge Analysis / Mapping Process*, 2006).

The exponentially increasing disadvantages of a "roundtable", as needs for representativity increase, suggest the merit of other design metaphors to ensure appropriate evocation and movement of insight -- as previously argued (*Considering All the Strategic Options -- whilst ignoring alternatives and disclaiming cognitive protectionism*, 2009; *Framing the Global Future by Ignoring Alternatives: unfreezing categories as a vital necessity*, 2009; *Spherical Configuration of Interlocking Roundtables: internet enhancement of global self-organization through patterns of dialogue*, 1998). However roundtables of any size have their own poorly recognized problematic psychosocial processes (*Pattern of Meeting Participant Roles: shadowy 'roundtable' hidden within every meeting*, 1993).

Consensual decision-making: The question raised here is whether the spiral organization explored in Fig. 2 (above) offers pointers to more appropriate modes of meeting organization, especially in terms of the evocation and communication of insight. Whereas conventional modes have an inbuilt bias towards "consensus" and "agreement", even if imposed by a majority, consideration needs to be given to architecture which allows for a diversity of perspectives and modes of knowing reflecting the requisite variety required for the governance of complex systems (*Strategic Challenge of Polysensorial Knowledge bringing the "elephant" into "focus"*, 2008). In a sense conventional approaches are premature in foreclosing on decision-making -- a "mousetrap mindset" exemplifying "executive" decision-making -- which is not supported in practice by those effectively excluded from any decision made in this way.

Is there a mode distinct from the "consensual decision-making" advocated by many indigenous peoples and promoted by intergovernmental bodies like UNESCO, (eg Cowasuck Band of the Pennacook-Abenaki People, *The Consensual Decision-Making Process*, 2010; Stephan Hartmann, Carlo Martini and Jan Sprenger, *Consensual Decision-Making Among Epistemic Peers*, 2009)? Of current relevance is the assertion by the Director of the Social Science Department at the National Centre for Policy Research (Kabul), that one of that country's particularities is the presence of tribes whose decision-making procedure is based on consensus of the council members, called *shura* or *jirga*. Participation in these councils, which rule all aspects of society, is determined by the members' age and therefore transcends all levels of society. Breaking with the consensual decision-making process "would be tantamount to individual and collective suicide" (UNESCO, *Promoting democracy in post-conflict societies - a challenge for the Byblos Centre*, Newsletter: a world order based on human rights and democracy, April-June 2004).

Polysensual decision-making: Rather than a potentially oversimplistic contrast between majority vs "consensual" decision-making, it might be asked whether there is place for a spectrum of other "polysensual" decision-making modes. The articulation of binary possibilities through the pattern of hexagrams both encodes such a spectrum and highlights the nature of "polysensus" -- potentially intrinsic to any hypercycle necessary for psychosocial self-organization.

The musical theory of harmony is suggestive in this respect, notably with respect to the potential of **polyphony as a metaphor for democratic discourse** (*All Blacks of Davos vs All Greens of Porto Alegre: reframing global strategic discord through polyphony?* 2007; *A Singable Earth Charter, EU Constitution or Global Ethic?* 2006). As a form of "polysensus", those documents make reference to the decision-making processes widely promoted by [Edward de Bono](#) (*Six Frames for Thinking about Information*, 2008; *Six Action Shoes*, 1991; *Six Thinking Hats*, 1985). In this sense the "houses" of Fig. 2 might be understood as representing eight different "voices", rather than six, however such numbers may relate to the [theory of multiple intelligences](#) ([Howard Gardner](#), 1983) -- presumably fundamental to "polysensual decision-making".

Given the comprehensive range of conditions of change encoded by the set of hexagrams and their transformational interrelationships, these suggest a need to reflect such necessary psychosocial complexity in appropriate conference and cognitive "architecture" -- whether tangible or virtual.

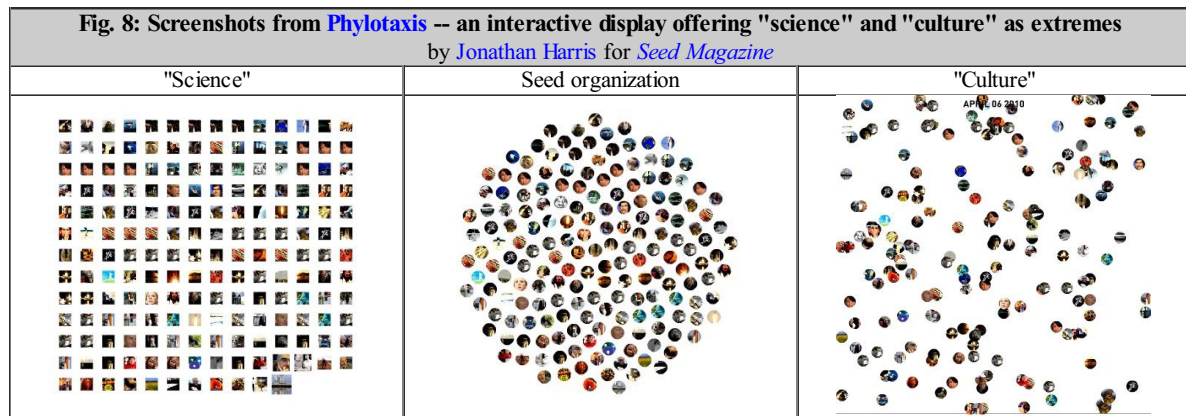
Spiral seating: Ironically, whilst a "solar" metaphor is often echoed in circular seating arrangement, the disposition of seeds in a sunflower -- a widely-cited example of the Fibonacci spiral -- offers greater practical design indicators regarding communication geometry and "packing". This underlies the approach of Fig. 2. This might well be contrasted with questionable efforts to ensure communication in a circular configuration ("around" and "across"), in the architectural packing of "open office" environments, or in metaphorical reference to "desks". Provocatively a "sunflower seed-packing metaphor might be indicative of more appropriate approaches to both "interpretation" and "dissemination". As noted with respect to the sunflower (in the relevant [Wikipedia entry](#)):

The florets within the sunflower's cluster are arranged in a [spiral pattern](#). Typically each floret is oriented toward the next by approximately the [golden angle](#), 137.5°, producing a pattern of interconnecting spirals where the number of left spirals and the number of right spirals are successive Fibonacci numbers. Typically, there are 34 spirals in one direction and 55 in the other; on a very large sunflower there could be 89 in one direction and 144 in the other. This pattern produces the most efficient packing of seeds within the flower head.

It might be asked what quality of communication is considered the desirable outcome of conventional assembly seating in a (semi-)circular form -- especially when the numbers are in the hundreds (as in Fig. 6). What is understood as "effective" with such a design? Arguably it is the capacity of a "speaker" to address the assembly and be visible. A spiral format might enable other modes of communication between participants more consistent with eliciting and communicating insight between "representatives". Again insights might be sought in the value of that spiral form to the sustainability of plant life (references cited for Fig. 7a).

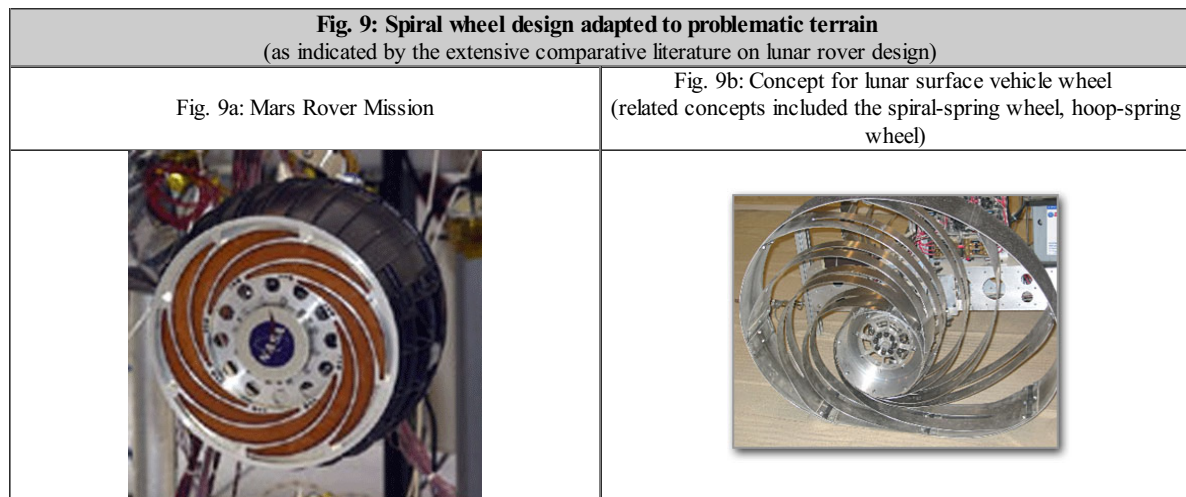
Braiding discourse: Whilst spiral forms may offer architectural challenges in conference venues, such design challenges are readily met in virtual environments in which communication protocols and tagging can be arranged with considerable flexibility (*The Challenge of*

Cyber-Parliaments and Statutory Virtual Assemblies, 1998). The design challenges of Fig. 2 are one example of those of "braiding discourse" as previously discussed (*Interweaving Thematic Threads and Learning Pathways: noonautics, magic carpets and wizzdomes*, 2010). The question is what will the future expect of the global organization of insight in the governance of an emerging knowledge society -- currently exemplified by aspirations for a semantic web (*Aesthetics of Governance in the Year 2490*, 1990). It would be interesting to gain insight into the relative complexity of conference communication from a systems, or knowledge cybernetics, perspective -- as compared with the systemic complexity of plants whose survival would appear to have been dependent on use of spiral forms. Put differently, the question might be what is it that apparently does not "work" in key global conferences on which navigating the future would appear to be so dependent? The question has been highlighted by the proposed use of the AQAL/Spiral Dynamics approach in a conference on climate change, as previously discussed (*State of the "World Forum" vs "State of the World" Forum: challenge of reflexivity*, 2009).



Cyclic adaptive resilience

Given the initially stated concern with resilience and navigation of the adaptive cycle, it is appropriate to take account of necessary engineering design innovations in response to the need to navigate the unusual conditions of potentially problematic terrain on the Moon or Mars. One such concept is a flexible spiral wheel which deflects under load and torque, creating a larger contact area and thus more traction than a rigid wheel in a lunar-like terrain (NASA [Lunar Surface Mobility Components](#)). In the case of the [Mars Exploration Rover Mission](#) (Jet Propulsion Laboratory), the buggy is designed with special wheels. Each wheel has a unique spiral flexure pattern that connects the external part of the wheel with the spoke to absorb shock and prevent it from transferring to other parts of the rover.



The question is what is to be learnt from such mechanical design considerations in response to dynamic stresses that might have their analogues in the configuration of strategic preoccupations of governance essential to adaptive resilience -- as suggested in relation to the cognitive configuration of the hexagrams in Fig. 2. The literature on lunar rover design specifically recognizes the exceptional challenge of the terrain and the conditions. Such thinking might well inspire thinking regarding the need for any new cognitive "vehicle" to navigate the unusual conditions of governance in the future -- including expectations of the unexpected. Briefly put, does governance need a "new set of wheels"? What does "extra-planetary" imply in cognitive terms?

The designs depicted in Fig. 9 suggest that the transformation "links" or "pathways" indicated between the hexagrams of Fig. 2 should be considered not simply as connecting tension elements (cybernetic transmission "lines") but also as having inherent resilience (as with the elasticity of rubber), capable of responding flexibly to "positive" and "negative" forces. Also of interest, offering a related design metaphor, is the increasing recognition of the [spiral pump](#), especially [recessive spiral pumps](#) based on the Fibonacci spiral. It has also been hypothesized that the Golden Ratio may represent the mathematical basis for hand-heart development so as to achieve optimal form and function (Jason Yongsheng Chan, et al, *The Golden Ratio Optimizes Cardiomelic Form and Function*, 2009).

Of further interest is the extent to which the challenges of traction in potentially challenging terrain offer insights into possible ways of framing individual identity, as suggested in the introductory paper (*Emergence of Cyclical Psycho-social Identity: sustainability as*

"psychically" defined, 2007).

Hypercyclic stability?

The design challenges of the above extra-planetary vehicles also suggest the merit of reflecting on the task of any driver, especially where there is a need to compensate for features of the design which render the vehicle less than stable. If a hypercycle is indeed to be recognized as a valuable way of understanding strategic challenges in navigating the adaptive cycle, then how the "driver" (of the set of interchanging conditions mapped by Fig. 2) achieves this can be helpfully focused by how distinct kinds of vehicles are used:

- **monocycle** (unicycle): if the governance challenge is understood as dealing with a single hypercycle, then riding a monocycle clearly highlights the level of skill required in maintaining balance. Aspirations to global governance might indeed be fruitfully compared with endeavouring to operate a monocycle -- with limited possibilities to learn, other than by failing. On the other hand framing the challenge in terms of a single hypercycle may not be the most fruitful.
- **bicycle**: the ability to maintain balance is clearly readily learnt in this case. Far less evident is the actual learning process and the difficulties in acquiring that skill. If the challenge of global governance is to be compared with acquiring such skills then of further interest is what indeed might the two cycles be? Are such "cycles" implicit in the typical political processes of government and opposition -- on which governance is expected to depend but which it is expected to transcend? The challenge of balance may then be compared with "alternation" between cycles, as previously explored (*Development through Alternation*, 1983; *Metaphors of Alternation an exploration of their significance for development policy-making*, 1984). It may also be compared to the cyclic process of walking (*Walking Elven Pathways: enactivating the pattern that connects*, 2006; *Transdisciplinarity-3 as the Emergence of Patterned Experience: transcending duality as the conceptual equivalent of learning to walk*, 1994). Even with a "mountain bike" the challenges of unsmooth terrain may be severe -- as with governance.
- **4-wheeled vehicle**: in such cases the problems of balance and stability are of far less significance -- when the vehicle is stationary. However difficulties clearly arise with respect to terrain, even with an "all-terrain" vehicle. Problems of balance are also evident when travelling at any speed -- particularly when there is a need to change direction. These factors are of course significant for governance in navigating the adaptive cycle.
- **multi-wheeled vehicles**: designing in response to problematic terrain, and the need for load-bearing and traction, then raise the issue of how many wheels are appropriate and the distinction made between wheels used for direction only, those linked to the drive shaft (4-wheeled drive), and those whose function is primarily load bearing (notably as in [road trains](#)).

The issues of balance, terrain, and traction clearly have analogues in strategic governance -- meriting careful review in the light of insights from such design challenges. Traction is especially interesting given the need for cognitive engagement with the population expected to be "carried" or "moved" by any strategic initiative.

How many cycles, notably those linking the conditions encoded by the hexagrams, should be understood as interrelated through a hypercycle? A fruitful line of investigation may be the manner in which the cycles necessary for governance and sustainability can be "embodied" -- when the "driver" is integrated with the "vehicle", as implied by some symbolic interpretations of symbols of charioteers and their chariots, as in Hinduism (*Existential Embodiment of Externalities: radical cognitive engagement*, 2010). Such integration is clearly central to "hypercyclic management" in cellular biology (as mentioned in the introductory paper). But how is "hypercycle" to be comprehended, especially if it is potentially so vital to personal and collective governance in the future (*Hyperchange through Hypercomprehension and Hyperdrive: necessary complement to hypertext proliferation in hypersociety*, 2006)?

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