



laetus in praesens

Alternative view of segmented documents via Kairos

11 July 2010 | Draft

Strategic Embodiment of Time

Configuring questions fundamental to change

-- / --

Introduction

Association of narratives to WH-questions

Implication of "strategic time"

Engagement with time through movement

Embodiment of time

Correspondences from design

Concrete implication: Dome-of-the-Rock

Eliciting and deriving interest: financial and otherwise

Resonance, noonautics and wisdom

WH-Questions as derivative psychosocial constructs

Identity in time: sustainability and immortality

Sonification of cognitive resonance

Conclusions

References

Introduction

With respect to the global financial crisis, [Sohail Inayatullah](#) has presented a set of seven narratives derived by use of [Causal Layered Analysis](#) (*Multiple Narratives of the Futures of the Global Financial Crisis*, *Journal of Futures Studies*, 2010). The possibility explored here is that there are implicit questions associated with each of these foundational or generative narratives which could be considered in the light of the classical set of seven [WH-questions](#) (when, where, which, what, who, why, how).

This approach has previously been explored with respect to a set of "**essential**" issues identified, in his capacity as Rector of the global education network Ananda Marga Gurukula, by [Ac. Shambhushivananda Avadhuta](#) as being of fundamental concern to the **individual** (*Eternal Philosophy: Questions and Answers*, 2009). These were experimentally clustered in terms of those WH-questions (*Clustering Questions of Existential Significance* (2010). By comparison, the set identified by Inayatullah regarding financial issues might then be understood as "**existential**" issues fundamental to global governance of the **collective**. Both are concerned with **intangibles**, however tangible their implications. Both are curiously associated with the cognitive implication of **confidence**.

Such an exploration, in the case of the global financial crisis, might then be fruitfully linked to the possible conformality of the WH-questions to the seven types of catastrophe identified by catastrophe theory as previously considered (*Cognitive Feel for Cognitive Catastrophes: Question Conformality*, 2006; *Conformality of 7 WH-questions to 7 Elementary Catastrophes: an exploration of potential psychosocial implications*, 2006). This would then open the possibility of a new understanding of appropriate "interaction" between the narratives as also considered (*Interrelating Cognitive Catastrophes in a Grail-chalice Proto-model: implications of WH-questions for self-reflexivity and dialogue*, 2006)

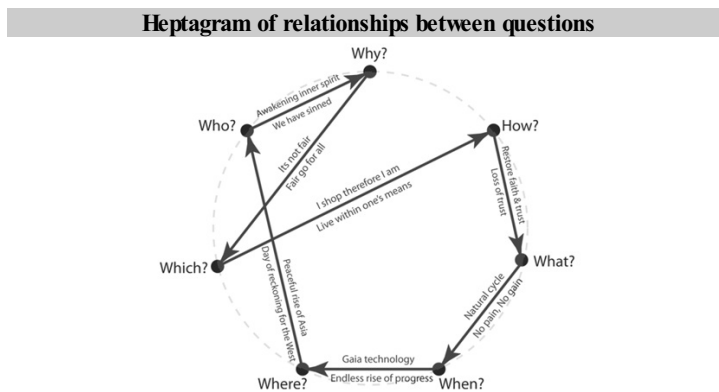
The following are therefore exercises in eliciting -- **tentatively** -- a more integrative framework for the seven narratives without seeking to comment on their selection or formulation. The purpose is to get a sense of the pattern of narratives as a whole rather than to focus on any one. This would then point to the possibility of a degree of resonance between the narratives such that the integrative framework could be understood as being a resonance hybrid dependent on all of them as alternatives variously held under different conditions and by different constituencies. **The concern is primarily to explore a method of representation and its mnemonic value to comprehensive understanding, namely the complementarity of disparate approaches to a seemingly desperate global challenge.** It follows from a separate exploration (*Ungovernability of Sustainable Global Democracy? Towards engaging appropriately with time*, 2010).

Association of narratives to WH-questions

An initial step is the association of the narratives distinguished by Inayatullah (2010) with WH-questions -- to determine (**tentatively**) primary and secondary questions for each. The tentative nature of the exercise calls for subsequent iterative "tuning" of the matrix of attributions (as a "fret"), at a later stage, in the light of the underlying significance of each narrative. There may well be several "tuning systems".

Association of narratives to WH-questions									
Attribution of WH questions to narratives ?							Narratives / Stories (characterizing phrases)	WH-questions?	
Where	When	What	Which	How	Who	Why		Primary	Secondary
	x	x	x	x	x		I shop therefore I am Live within one's means	Which	How
		x		x		x	Loss of trust Restore faith and trust	How	What
	x		x				Creative destruction / Natural cycle No pain, No gain	What	When
x	x						Day of reckoning for the West Peaceful rise of Asia	Where	Who
				x	x	x	We have sinned Awakening inner spirit	Who	Why
x				x		x	Its not fair Fair go for all	Why	Which
	x			x			Endless rise of progress Gaia tech	When	Where

There is then the possibility of treating each narrative as a line between the corresponding primary and secondary WH-questions. With the seven WH-questions as points around a circle, the lines could then be configured to form a heptagram -- which could be represented symmetrically or asymmetrically (as below). The connectivity might even be understood as oscillating between various configurations -- as a resonance hybrid.



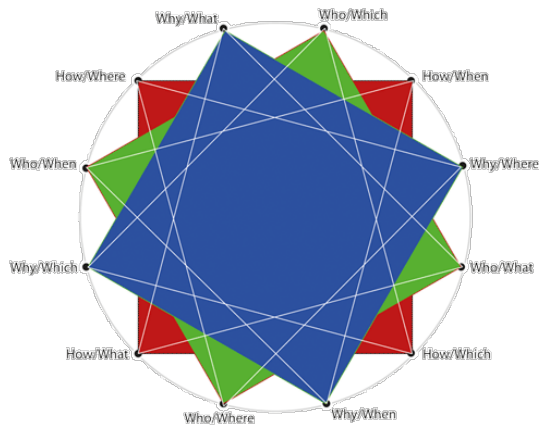
Another representation is possible by splitting the WH-questions into a set of 3 (triplicities) and a set of 4 (quadruplicities) -- with one narrative per question, preferably using the "primary" attribution above

Questions in relationship triplicities and quadruplicities					
Quadruplicities (squares)		Triplicities (triangles)			
Narratives	Where narrative	When narrative	Which narrative	What narrative	
Loss of trust Restore faith and trust	How narrative	How/Where	How/When	How/Which	How/What
We have sinned Awakening inner spirit	Who narrative	Who/Where	Who/When	Who/Which	Who/What
Its not fair Fair go for all	Why narrative	Why/Where	Why/When	Why/Which	Why/What
-	-	Day of reckoning for the West Peaceful rise of Asia	Endless rise of progress Gaia technology	I shop therefore I am Live within one's means	Natural cycle No pain, No gain

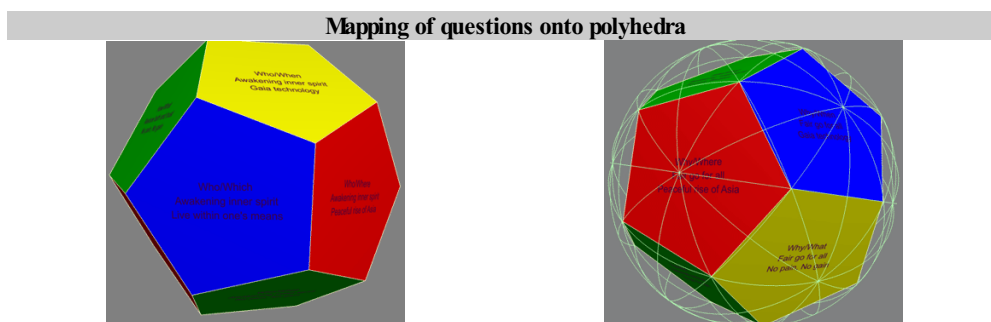
This could be displayed within a circle of 12 points (each being a combination of 2 WH-questions). Lines between the points then form:

- 4 triangles (triplicities): all **who, how** or **why** -- but each differently qualified by **where, when, which, what**
- 3 squares (quadruplicities): all **where, when, which** or **what** -- but each differently qualified by **who, how, why**

Circular presentation of questions in relationship triplicities and quadruplicities



In a further representational step, the 12 question combinations around the circle could then be distributed onto a symmetrical polyhedron of 12 faces (a **dodecahedron**), with the addition of the associated narrative in each case. The application used for this was *Stella Polyhedron Navigator*, as previously explored (*Polyhedral Pattern Language: software facilitation of emergence, representation and transformation of psycho-social organization*, 2008). Two different views are given below, one with great circles indicated. The colours are of no significance

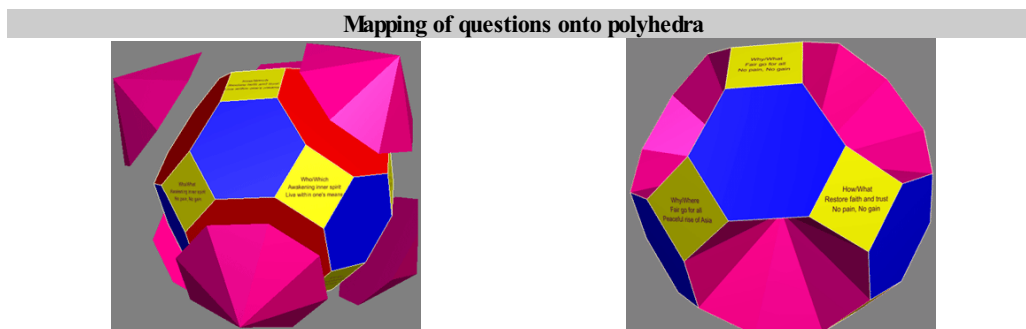


Of possible relevance, with the introduction of the evident 5-foldness, are then the five scenarios indicated by Inayatullah in relation to the seven narratives above (*Multiple Narratives of the Futures of the Global Financial Crisis*, 2010). These scenarios are:

1. Business as Usual - *plus ca change, plus c'est la meme chose*
2. Rise of Chindia and eventual creation of an Asian Union
3. The Quick and Long Road to Global Sustainability
4. Long Decline, Depression and More ... Potentially the End Game of Capitalism
5. A New Era

Rather than using the simplest 12-faced polyhedron (a **dodecahedron**), as above, other implications might be introduced by displaying the 12 question combinations on a more complex figure leaving sets of faces blank, as indicated below using a truncated cuboctahedron. The question combinations (with narrative) are displayed on the 12 square faces (yellow), significantly separated by a set of 6 octagonal faces (red) and 8 hexagonal faces (blue). These might be understood as indicative of the number and nature of the dialogue arenas through which the strategies associated with each narrative (worldview) need to be reconciled in order to achieve a global approach.

In the two variants below, as a further indication of the challenge of relating the narratives coherently, in one case the red faces are "augmented" (outwards) by separating a pyramidal form, and in the other those red faces are "excavated" (inwards) by a pyramidal cavity. The modifications are coloured mauve.



Implication of "strategic time"

The above approach might then be related to that variously explored with respect to a *Typology of 12 complementary strategies essential to sustainable development* (1998), to a *Typology of 12 complementary dialogue modes essential to sustainable dialogue* (1998) and to *Characteristics of phases in 12-phase learning / action cycles* (1998). These were all **tentatively** adapted and developed from Arthur Young's *Geometry of Meaning* (1978). [See also commentary on learning cycles in *Cycles of dissonance and resonance* (1998) and an

alternative table (*Patterning strategies: Patterning the resolutique*, 1995) based on clustering strategies and values].

Young's exploration evolved from consideration of the dimensions necessary to the control of a vehicle in three-dimensional space in the light of his insights as the developer of the **Bell helicopter (Model 47)**. The question is whether the challenges of global governance may to some degree be understood as usefully modelled by the control of a helicopter. Young subsequently became interested in the application of his insights (to what might be called "self-governance") through exploration of the operation of a "psychopter" -- the helicopter as the "winged self", a metaphor for the human spirit.

The above-mentioned adaptation of Young's framework to **complementary strategies** (reproduced below, without commentaries) has the merit of bringing in the **(inverse) time dimension** with regard to **various understandings of "growth"**: stasis / subsistence (T^0), rate of change / growth (T^{-1}); increasing rate of change / accelerating growth (T^{-2}); controlled growth / sustainability (T^{-3}).

Complementary strategies						
	"Positive"	Identifying Associating Recognizing	Responding Intending Engaging	Acting Effecting Changing Implementing	Ensuring Sustaining Maintaining	
	Symbol	A	B	C	D	
Knowledge Comprehension Framing Scoping ("head")	1	[L] Monitoring Balancing Evaluating Placing Studying Modelling Consulting Detecting Informing	[L/T] Adapting Accommodating Dialoguing Educating (<i>theoretical</i>) Caring (<i>in principle</i>) Protecting Planning	[L/T ²] Initiating Engaging Launching Undertaking	[L/T ³] Controlling Supervising Regulating Verifying	M⁰L
Concern Involvement Participation ("heart")	2	[ML] Acknowledging Recognizing Articulating Envisioning Publicizing Sensitizing	[ML/T] Desiring Warning Promoting Inciting Advocating Representing Protesting Appeasing Deploring Praying Stressing Calling for..	[ML/T ²] Directing Ordering Ruling Implementing (<i>admin.</i>) Administering Legislating Sponsoring Funding	[ML/T ³] Coordinating Managing Buffering Redistributing Reallocating	ML
Grounding Praxis ("walking the talk"; "guts"; "being there")	3	[ML ²] Reassuring Affirming Accepting Holding Empathizing Identifying with Celebrating Endorsing Praising Invoking Appreciating Remembering	[ML ² /T] Resolving Deciding Determining Threatening Instituting Demonstrating Training Exercising Negotiating Mediating Vowing Pledging	[ML ² /T ²] Achieving Grounding Enforcing Establishing Developing Intervening Protecting (<i>practically</i>) Prosecuting Conserving Revoking	[ML ² /T ³] Enabling Embodying Empowering "Educating" Maintaining Sustaining Capacity bld.	ML²
		T⁰	T⁻¹	T⁻²	T⁻³	Dim.
	"Negative"	Denying Misrepresenting Forgetting Desensitizing	Tokenism Lip-service Irresolution Demonizing	Malpractice Exploitation Domination	Mismanaging Disempowering Misallocating Non-complying	
	Psychological functions	Sensing (Touch)	Feeling (Sound; Rhythm)	Seeing (Sight)	Intuiting (Smell; Taste)	

The possible relationship between the set of WH-questions and Young's articulation (as adapted above) has previously been explored in some detail (*Functional Complementarity of Higher Order Questions: psycho-social sustainability modelled by coordinated movement*, 2004).

Again as an exercise, the information from the row and column header information from the above table can be applied to 12 faces of a polyhedron -- appended (for each case) to the corresponding information from the earlier polyhedral application above. The example on the left uses a **dodecahedron** (as earlier). That on the right uses the 12 square faces of a **small rhombihexahedron**, with the pyramidal and cubic "excavations" suggestive of the potential challenges and traps in their reconciliation -- or the advantages in separating (insulating) one from the other.

Mapping of questions onto polyhedra



Engagement with time through movement

Learning/action cycles: As discussed separately (*Functional Complementarity of Higher Order Questions: psycho-social sustainability modelled by coordinated movement*, 2004), the 12 conditions Young identifies as forming part of learning/action cycles, vital to the control of any vehicle, are quite distinctively meaningful cognitively -- especially to those with developed kinesthetic intelligence engaging in extreme sports and acrobatics. The mathematical representation he offers then serves primarily to clarify the pattern they constitute together and as a reminder that in controlling the vehicle it is necessary to be able to switch appropriately and skillfully between these conditions. Such clues from movement have been discussed separately (*Clues to Movement and Attitude Control*, 2002; *Navigating Alternative Conceptual Realities: clues to the dynamics of enacting new paradigms through movement*, 2002). The question is how such clues may be relevant in the collective case.

It is interesting to consider the 12 modalities as **12 distinct ways of engaging with time** -- complementary to one another. Each has particular geometrical / dynamic ("geodynamic") implications. Each implies a particular mode of cognition through which identity may be expressed and experienced. Given Young's focus on learning/action cycles, possibly to be associated with polyhedral great circles, this suggests the merit of exploring personal or collective "cyclic identity" (*Emergence of Cyclical Psycho-social Identity: sustainability as "psychically" defined*, 2007).

Spherical constraint: It is indeed convenient and fruitful to represent the set of 12 modalities as a polyhedral approximation to a sphere, emphasizing the integrative challenge of "re-membling" these modalities to enable a "global" response. However such an exercise highlights the fundamental issue as to whether the requisite integration, for "governance" of any vehicle, can be appropriately "contained" by a purely spherical understanding of globality -- however good the approximation.

This issue can be formulated otherwise, namely as to whether human collective viability can be ensured sustainably on a sphere. The question is of the same form as that of mathematician Ron Atkin (*Multidimensional Man: can man live in three dimensional space?* 1981).

This goes beyond enthusiasm for a flat Earth representation of globalization and the various fictional explorations by mathematicians with regard to two and three dimensions (Edwin A. Abbott's *Flatland: a romance of many dimensions* (1884), Charles Howard Hinton's *An Episode on Flatland: or how a plain folk discovered the third dimension* (1907), A. K. Dewdney's *The Planiverse* (1984), Ian Stewart's *Flatterland* (2001), and Rudy Rucker's *Spaceland* (2002). The 1884 novel has recently taken the form of an animated version (*Flatland*, 2007) to highlight the challenges otherwise. The flat Earth case for understanding globalization made by Thomas L. Friedman (*The World Is Flat*, 2005) has been critically reviewed elsewhere (*Irresponsible Dependence on a Flat Earth Mentality: in response to global governance challenges*, 2008).

Beyond "Flat Earth" understanding: There is then every possibility that it is cognitively impossible to live sustainably on a single sphere -- on which the pattern of 12 different engagements with time can only be represented by 12 "flat Earth" worldviews, configured together as a polyhedral approximation to the globality implied by sustainability. Whilst it can be argued that metaphorically the dynamics of Earth's patterns of weather and ocean currents suggest otherwise, as with the dynamics within the Sun itself, consideration can usefully be given to the arguments of mathematicians and astrophysicists. As a planet the Earth is not sustainable **in isolation** but rather through its dynamics **in relation** to the Sun and the Moon (at least). The Earth system is sustainable because it orbits and is orbited. "Globality" is not viable when understood in terms of the static geometry of a single sphere -- as is so commonly the manner of its representation.

Given the classic examples offered by mathematicians regarding how the fingers of a three-dimensional hand would appear within a two dimensional worldview (cognitively disassociated from the integrating three-dimensional hand), it is appropriate to consider that the apparent isolation of the bodies of the planetary system in three dimensions is equally "illusory", given their necessary association as a system in four dimensions -- in spacetime. The requisite dimensionality might call for yet further development of this argument.

Paradoxes of "cognitive fusion": The argument can be made otherwise by reference to the principal hope for sustainable energy resources for the longer term -- namely [nuclear fusion](#). Curiously the viability of this process is understood to be dependent on the [containment of plasma](#) circulating in a toroidal chamber. It is vital that the plasma be prevented from touching the containing walls of the reaction chamber -- which it would otherwise destroy. A spherical chamber was rejected for this purpose because of the impossibility of ensuring this separation.

The viability of a nuclear fusion reactor depends on appropriate management of the paradoxes (evident in fundamental physics) associated with the unusual properties of plasma (as a fourth state of matter) in its movement around the torus ([Complementarity and Self-Reflexivity: between nuclear fusion and cognitive fusion](#), 2006; [Dematerialization and Virtualization: comparison of nuclear fusion and cognitive fusion](#), 2006)

Toroidal movement: The toroidal pathway around which the plasma "circulates" -- although this notion is itself incompatible with the paradoxical reality -- might be fruitfully compared with the toroidal pathway traced by the Earth around the Sun. The capacity to comprehend the latter movement proved to be a major challenge over past centuries. In a sense when this movement operates sustainably, the Earth can benefit from the energy of the Sun. This energy benefit has yet to be achieved in the case of a nuclear fusion reactor.

Given that for many people the Sun still "rises over the horizon", it is questionable the degree to which this toroidal movement might be said to be a cognitive reality. It might then be said that corresponding cognitive challenges need consideration to achieve the sustainability that is supposedly the quest of current global strategies. Beyond the constraints of linear thinking, or those of [lateral thinking](#) -- or even those of ["voluminous thinking"](#) -- sustainability cannot be achieved by thinking "spherically", despite various transitional possibilities ([Spherical Accounting: using geometry to embody developmental integrity](#), 2004; [Spherical configuration of interlocking roundtables: Internet enhancement of global self-organization through patterns of dialogue](#), 1998; [Spherical Representation of Icosidodecahedral Net of Strategies](#), 1995; [Spherical Configuration of Categories to Reflect Systemic Patterns of Environmental Checks and Balances](#), 1994).

The slogan "[Think Globally, Act Locally](#)" -- much publicized on the occasion of the [United Nations Conference on Environment and Development](#) (Rio de Janeiro, 1992) -- is therefore profoundly misleading in terms of the geometric oversimplification implied there by "globally" -- and its systemic consequences. The point has been separately argued ([Configuring Globally and Contending Locally: shaping the global network of local bargains](#), 1992). Does acting "locally" imply acting as though the Earth was indeed "flat"? Such possibilities suggest the need to explore the adequacy of generative metaphors in the pursuit of global sustainability? ([Engaging with Globality: through cognitive lines, circlets, crowns or holes](#), 2009)

The case can be presented otherwise with reference to the dynamics visibly associated with a [smoke ring](#) -- a torus (as a geometric complexification of a sphere). The ring is dynamically sustainable where a typical sphere shows no indication of dynamic sustainability. A sphere cannot even "hover". Considering the electromagnetic fields required for operation of a nuclear fusion reactor, the principles ensuring the operation of a motor or dynamo also offer insights. As noted above, the Earth achieves a degree of sustainability of its natural systems through its movement along a toroidal pathway. Given common use of "motor" and "dynamo" as economic metaphors, achievement of global sustainability calls for cognitive analogues implied by such metaphors.

Toroidal connectivity: Toroidal reframing of the challenge of "globality" can also be fruitfully explored in the light of fundamental assumptions regarding the adequacy of representation of governance principles on a flat surface -- as declarations, plans, arguments, maps and the like (as in this document). In discussing these assumptions, Michael Schiltz contrasts use of a flat surface with use of a torus to achieve higher connectivity and self-reflexivity ([Form and Medium: a mathematical reconstruction, Image \[&\] Narrative](#), 6, 2003).

As a geometric complexification of a sphere, the argument may be associated with the tendency to present taxonomies in tabular or matrix form ([Comprehension of Requisite Variety for Sustainable Psychosocial Dynamics: transforming a matrix classification onto intertwined tori](#), 2006).

With respect to paradox, the geometric argument can be extended further with consideration of the cognitive implications of the [Möbius strip](#) and the [Klein bottle](#), addressing the illusions of an "underside" and of "inside vs outside" ([Intercourse with Globality through Enacting a Klein bottle](#), 2009). What then is the surface by which meaningful integrative discourse can be fruitfully associated and supported in engaging with globality? ([Metaphorical Geometry in Quest of Globality](#), 2009)

Embodiment of time

Understanding "growth": Following from the preceding paper, the question is whether the above arguments are indicative of new ways of engaging with time -- vital to future governance ([Ungovernability of Sustainable Global Democracy? Towards engaging appropriately with time](#), 2010). As noted above, the adaptation of Young's framework to [complementary strategies](#) has the merit of bringing in the **(inverse) time dimension** with regard to **various understandings of "growth"**, perhaps usefully distinguished as:

- T^0 (**stasis / subsistence**): framed pejoratively as "going nowhere" and therefore incompatible with the vital need for developmental growth, and therefore urgently to be superseded (except in the light of deprecated arguments for "zero growth" or in terms of "nostalgic" appreciations of traditional economic systems)
- T^{-1} (**rate of change / growth**): framed universally as the key to "development", and the accumulation of wealth, essential to a healthy viable society
- T^{-2} (**increasing rate of change / accelerating growth**): framed as to be even more appreciated in a competitive environment (and possibly even essential to outpace accumulating environmental challenges)
- T^{-3} (**controlled growth / sustainability**): framed (ideally) as the key to a healthy balance between growth and ensuring the continued viability of environmental resources. This may well be as elusive in practice as controlling nuclear fusion -- or achieving

the "cognitive fusion" appropriate to sustaining it.

These distinctions can be fruitfully considered in relation to those of [Xavier Sallantin](#) (*L'arithmétique de l'accord*) on four arithmetics associated with arithmetic construction forming part of *La Cyberscience de l'Univers, du Big Bang naturel au Big Bang culturel* (web-based update of *La science à la découverte du sens*, 1997).

Controlling "snakes": The argument above stresses the necessary complementarity between these approaches to time, articulating them further in the light of associated strategic (WH-) questions. Clearly it is the "control" modality that is cognitively and strategically the most challenging -- and the most difficult to render comprehensible in the face of unquestioning enthusiasm for rapid growth and its acceleration framed as keys to survival. In kinesthetic terms, it is the disciplined acquisition of the control modality which safely frames aerobatics -- otherwise most probably with disastrous consequences.

In the case of plasma in a fusion reactor, the technical challenge is very specifically one of control -- with the literature appropriately characterizing this metaphorically as controlling potentially disastrously writhing, snake-like instabilities. Somewhat ironically, the snake metaphor ("[snake in the tunnel](#)") has also been used with respect to governance of instabilities in the European monetary system.

What then is the nature of the corresponding cognitive control appropriate to "cognitive fusion"? There are of course many metaphorical and mythical indicators -- most notably the [Ouroboros](#) as the "snake biting its tail" (*Cognitive Fusion through Myth and Symbol Making: archetypal dimensions*, 2006). Achieving an Ouroboros-like condition is of course specifically the aim of controlling nuclear plasma in the toroidal chamber in order to achieve a sustainable fruitful reaction. It is possible that deep cultural memory may hold other such patterns of relevance to sustainable global governance (*Relevance of Mythopoetic Insights to Global Challenges*, 2009).

Unsustainable understanding of reality: It is however intriguing that fundamental physics continues to be challenged by the inadequacy of its understanding of reality. This might be reframed as a recognition by the most sophisticated minds of the essentially unsustainable (and destabilizing) human understanding of reality as currently conceived. Intriguingly this derives in part from the dynamics between the disciplines (Nicholas Rescher, *Strife of Systems: an essay on the grounds and implications of philosophical diversity*, 1985; John Woods, *Paradox and Paraconsistency: conflict resolution in the abstract sciences*, 2002). All is seemingly not well with the human understanding of reality (*Beyond the Standard Model of Universal Awareness*, 2010).

The whole edifice of mathematics has of course been demonstrated to be based on questionable foundations through [Gödel's incompleteness theorems](#) -- subsequently celebrated by [Douglas Hofstadter](#) (*Gödel, Escher, Bach: an Eternal Golden Braid*, 1979). The strategic challenge of governance is of course evident in the degree of incompetence currently manifest in global leadership in responding to societal challenges as they are now framed (*Emergence of a Global Misleadership Council: misleading as vital to governance of the future?* 2007). Numerous criticisms of the management of the global financial crisis have been made.

There is therefore a case for exploring further the kind of radical reframing which is so delightfully characteristic of fundamental physics -- and about which society is so curiously indulgent, to the point of funding extremely expensive "big science" projects to further such reflection. As one example, the [Large Hadron Collider](#) might be seen as another "tail-biting" experiment in control, offering suggestive pointers to the cognitive challenge (*Dynamic Interrelationship of Symbols of Coherent Experiential Representation of Nonduality (DISCERN)*, 2008). It might be considered extraordinary, in a period of significant global starvation and bloody conflict, that "big science" should pride itself on its focus on the origins of the universe, and dispatching spacecraft to other planets, without an iota of capacity to apply the quality of such thinking to global governance -- presumably a challenge of greater than mechanical complexity.

Despite the dramatic crises of the times, and those expected in a turbulent future, curiously there is no such investment in radical reframing of the cognitive challenges of governance -- other than in military terms, with Afghanistan as one testing ground. Indeed universities and think tanks might be understood as avoiding and repressing any such exploration (*Meta-challenges of the Future -- for networking through think-tanks*, 2005; *Tank-thoughts from Think-tanks: constraining metaphors on developing global governance*, 2003). The reception of Atkin's own thesis -- a study of communication patterns within his university -- is but one indication of the problem (*Combinatorial Connectivities in Social Systems: an application of simplicial complex structures to the study of large organizations*, 1977).

Hofstadter has emphasized the challenge to any personal sense of identity in a subsequent study (*I Am a Strange Loop*, 2007). In the emerging disciplines of knowledge cybernetics, cognitive cybernetics and cybersemiotics, the question is then the challenge of the embodiment of self-reflexivity -- and the implications for new forms of psychosocial organization and governance (*Consciously Self-reflexive Global Initiatives: Renaissance zones, complex adaptive systems, and third order organizations*, 2007).

"Doing nothing": There is an interesting challenge to comprehension of control in time (T^{-3}) in contrast with the appearance of stasis (T^0). As traditionally said of an emperor in classical China, his role as supreme governor was "to do nothing". When identity is primarily associated with growth (whether of the form T^{-1} or T^{-2}), stasis (T^0) may well be indistinguishable from control (T^{-3}). This is evident in critical discussion of "[zero growth](#)" strategies. The distinction is well made in the example of a toroidal smoke ring which might be cited as a case of "both-and" -- of control (T^{-3}) **and** the appearance of stasis (T^0). This is also evident in the case of the capacity of a helicopter to hover, namely not to go anywhere. It points to the dynamics associated with "tail-biting" and the technical challenge of nuclear fusion on which future global energy resources are expected to depend.

Time as an illusion: Pursuing the latest reflections in fundamental physics, it is now argued that time may itself be an illusion (Craig Callender, *Is Time an Illusion?*, *Scientific American*, June 2010).

Whilst comparatively simple arguments have been made regarding the illusory nature of economic "growth", the question is how can the distinct apparent forms of time be reframed to give fruitful meaning to such an understanding -- responding to the cognitive challenges which justify questioning the reality of time by physics.

Unreality of reality? What then is the nature of the reality, and the apprehension of it, within which the illusion of time becomes

apparent? Relevant to the argument above, the same issue of *Scientific American* draws attention to the most recent insights relevant to a [unified theory of physics](#) -- presumably to be appreciated as the quality of thinking relevant to any understanding of a "unified theory of governance". As noted by George Musser ("[Twistor](#)" *Theory Reignites the Latest Superstring Revolution*, *Scientific American*, June 2010), the [theory of twistors](#) and [string theory](#) have now been fruitfully associated in [twistor-string theory](#), through the initiative of [Edward Witten](#) (*Perturbative gauge theory as a string theory in twistor space*, 2004). Progress had previously been summarized by Roger Penrose (*Strings with a Twist*, *New Scientist*, July 2004) and Alok Jha (*Science String*, *The Guardian*, 20 January 2005). As noted by Musser:

Conventional wisdom held that spacetime geometry should fluctuate on quantum scales, altering how events relate to one another. But in that case, an event that was supposed to cause another may no longer do so, creating paradoxes such as those found in time-travel stories. In twistor theory, causal sequences are primary and do not fluctuate... Instead the location and timing of events fluctuate. But twistorians could not make this idea precise -- until string theorists showed that an event of ambiguous location and time is nothing more or less than a string.

Many physicists find it quite natural that spacetime would be derivative in the light of such insights. [Andrew Hodges](#) points out that we do not **perceive** spacetime directly; we **infer** that events happen in specific locations at specific times from the information that comes to us. He asserts: *This idea of points of spacetime as being primary objects is artificial*. Indeed, the concept of distinct positions and times breaks down because of the gravitational warping of spacetime and the notoriously spooky connections between quantum particles. But as Musser notes:

Theorists have yet to explain why, if spacetime is merely a construct, it nonetheless seems so real to us. It must somehow take shape much as life springs from inanimate matter. Whatever the process is, it cannot occur only on subatomic scales, because the concept of size must itself emerge. It should be evident on all scales, everywhere around us, if only we know how to look. [*emphasis added*]

What might this imply for sustainable global governance -- "if only we know how to look"? What might it imply for individual identity -- in time?

Comprehension of reality: A more sobering point is made by Musser to the effect that:

The emerging theory of spacetime is still very tentative and so mathematically dense that even those physicists directly involved admit they can barely follow what is going on.

It is deeply unfortunate that mathematicians have no capacity -- as mathematicians -- to factor "comprehension capacity" into consideration of how spacetime can be usefully defined. The effort towards doing so was a great merit of the above-mentioned work of Ron Atkin (1977, 1981). The question is who is expected to comprehend? What, how, where, when, which and why, are not irrelevant to governance of a sustainable system, as previously discussed ([Engaging with the Inexplicable, the Incomprehensible and the Unexpected](#), 2010; [Dynamics of Symmetry Group Theorizing: comprehension of psycho-social implication](#), 2008).

The challenge to such "looking" presumably lies in the cognitive implications of self-reflexivity, mirroring and inversion, namely the apparent "twistedness" with respect to habitual and conventional understandings of reality. The pattern is evident in the shift from "flat Earth" understanding to appreciation of the Earth as a sphere. Such twistedness may have a variety of implications as previously discussed ([Twistedness in Psycho-social Systems: challenge to logic, morality, leadership and personal development](#), 2004; [Engaging with Questions of Higher Order: cognitive vigilance required for higher degrees of twistedness](#), 2004). Curiously, but appropriately, such twistedness is fundamental to life and its reproduction ([DNA Supercoiling as a Pattern for Understanding Psycho-social Twistedness](#), 2004).

Correspondences from design

Looking: With respect to "looking", an excellent point of departure might be the work of [Christopher Alexander](#) on design and the nature of order ([A Pattern Language](#), 1977; [The Nature of Order: an essay on the art of building and the nature of the universe](#), 2003-4; [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). Their relevance, especially the latest work, has been separately discussed ([Harmony-Comprehension and Wholeness-Engendering: eliciting psychosocial transformational principles from design](#), 2010).

Comprehension: Also of relevance is the function of symmetry with respect to comprehension and appreciation of order, together with the nature of "correspondences" in enabling bridging equivalences to be recognized ([Theories of Correspondences -- and potential equivalences between them in correlative thinking](#), 2007; [Dynamics of Symmetry Group Theorizing: comprehension of psycho-social implication](#), 2008). The appropriateness of sustainability may itself pose challenges to comprehension ([Comprehension of Appropriateness](#), 1986)

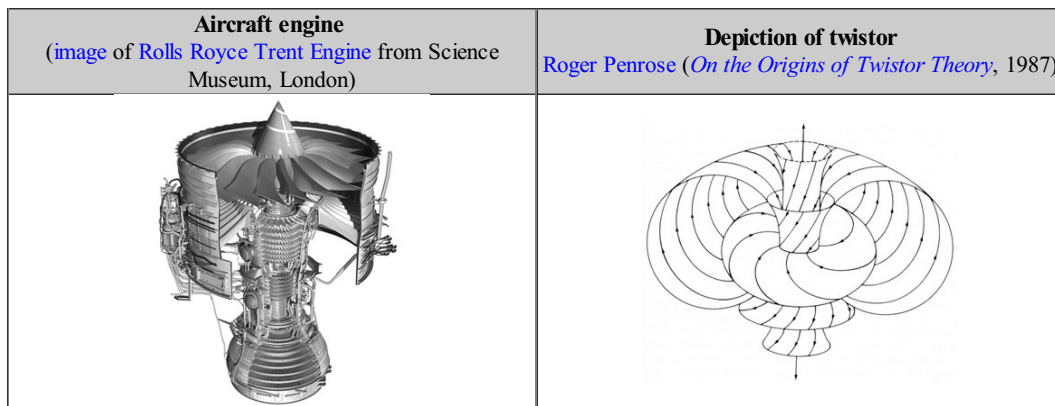
Isomorphism: In this respect it is interesting that a new application offered by web search engines is the identification of images of similar form however disparate their content -- through development of [pattern recognition](#) techniques. There is then a sense that significance is to a degree associated with form and pattern irrespective of content. As with [Marshall McLuhan](#), the "*medium is the*

message" -- at least to some degree. This insight is reflected in the concern with the significance of [isomorphism](#) in general systems research -- now presumably to be echoed in the application of cybernetics to knowledge systems and cognition.

It is in this sense that the following images are a fruitful provocation with regard to "looking". That on the right derives from a depiction of a twistor -- as a twisted torus -- by [Roger Penrose](#) (*On the Origins of Twistor Theory*, 1987) and reproduced in enhanced form by George Musser (*Scientific American*, June 2010). That on the left is of the latest aircraft engine. There is of course a question of their degree of isomorphism, but more relevant to this argument would be the functional implications of any such isomorphism.

Rather than any question of validity or truth implied by the juxtaposition of such depictions, the issue may be more whether the human brain is better able to frame their functional implications through them at this time. "Cutting edge" technology may be so precisely because it is at the frontier of human cognitive capacity (Robert Romanyshyn, *Technology as Symptom and Dream*, 1989). Fusion -- cognitive or otherwise -- may require geometry at the limits of comprehension. The twisted torus -- a twistor -- is especially appropriate topologically as a cognitive knot (*Intercourse with Globality through Enacting a Klein bottle*, 2009).

The imaginative capacity for the requisite mathematics highlights the issues explored by [George Lakoff](#) and [Rafael E. Núñez](#) (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2000). There would be tremendous irony to the possibility that the -- yet to be discovered -- principles of sustainable operation of nuclear fusion in a toroidal reactor would be necessarily isomorphic to a degree with comprehension of a twistor.



Poetry of form: Isomorphism has a technical meaning and precision in the systems sciences which would readily challenge the significance of any of modest degree, possibly labelling it as trivial. Design aesthetics however admits of looser comparability between forms as being of significance through the manner in which they echo one another to a degree -- even valuing variation. As noted by Willard Bohn (*Modern Visual Poetry*, 2001) in discussing "isomorphic operations":

Object and meaning are not opposed to one another any more than structure and meaning. while they represent different aspects of the semiotic process, they are intimately related. The poets themselves speak of "isomorphism" in discussing the complex interplay that exists between them. the relation between word and image is isomorphic, they explain, if the visual elements assume a form that is analogous to the verbal meaning. (p. 237)

He notes that parallel to form-subject isomorphism, there is space-time isomorphism which generates movement. Is there then a case for being attentive to the manner in which disparate forms, with which significance is distinctly associated (as with verses of a poem), may resonate with one other through a degree of isomorphism, suggesting higher orders of significance -- overtones of meaning? Larger implications may be held by associations amongst a set of poems, as is the case with any set of buildings of concern in large scale urban planning. With respect to the distinct global finance narratives identified by Inayatullah, as with those of the epic tale of *Lord of the Rings*, the question is the nature of what "binds" them (*Relevance of Mythopoetic Insights to Global Challenges: cognitive integration implied by the Lord of the Rings*, 2009).

There is continuing debate on the "poetry of architecture" and on "poetry in architecture" within both disciplines, and more broadly regarding the nature of poetry in design (John Ruskin, *Poetry of Architecture -- or the architecture of the nations of Europe considered in its associations with natural scenery and national character*, 1880; John Hollander, *The Poetry of Architecture*, *Bulletin of the American Academy of Arts and Sciences*, 1996; Bernard E. Morris, *Poetry of Design*, 2003). The theme is evoked in relation to sustainable environmental design. As noted by Pablo Castro (*OBRA's Beijing Greenish Manifesto*, 20 May 2008):

Any technical consideration, such as an effort towards an environmental "sustainability", can become the vehicle of poetry in architecture. As a matter of fact, technical considerations often become the main source of architectural poetry by fostering a dramatic conflict between desire for architectural freedom and limited availability of resources. The felicitous resolution of such conflict is the golden standard of architectural quality and beauty, and to be achieved requires the adoption of a holistic approach towards design.

Implicit in such recognition is the more general question of the nature of the poetry of form and its relevance to the process of giving meaning to the pattern of relationships between the seemingly disparate and far less tangible forms of the cognitive realm as considered here. For example, the biologist/anthropologist Gregory Bateson, in explaining why "we are our own metaphor", pointed out to a conference on the effects of conscious purpose on human adaptation that:

One reason why poetry is important for finding out about the world is because in poetry a set of relationships get mapped onto a level of diversity in us that we don't ordinarily have access to. We bring it out in poetry. We can give to each other in poetry the access to a set of relationships in the other person and in the world that we are not usually conscious of in ourselves. So we need poetry as knowledge about the world and about ourselves, because of this mapping from complexity to complexity. (Cited by Mary Catherine Bateson, 1972, pp. 288-9)

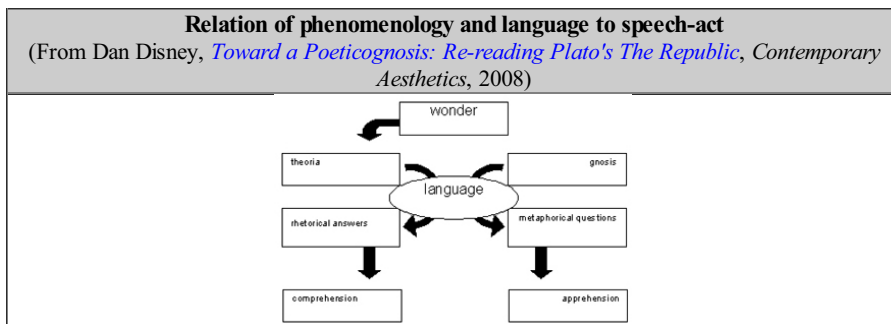
As discussed separately, there is a potential relationship of fundamental significance between the [poiesis](#) of poetry and the [autopoiesis](#) that is of primary concern to the complexity sciences (*Voice of the Matchmaker: poetry-making and policy-making*, 1993). Suggestions have been made for such exploration, as with that of Voula Mega, as research manager at the European Foundation for the Improvement of Living and Working Conditions, prior to the conference *Myth of the City*:

I do believe that planning systems need to improve the imaginative capacity to envisage a better future. I also believe that each citizen can be a little poet and contribute to the planning system if there is a context of effective participation and co-decision... [poets] can contribute in enhancing the enlightening abilities of planners (who in continuation will enhance the context and substance of citizen's participation (*Link Poetry and Planning*, 1995).

Aspects of the challenge have been well-addressed by Dianna Hurford (*Breaking the Line: integrating poetry, polyphony and planning practice*, 2001). How to apply such recognition to the divisive challenges of governance of sustainability? Is there a hidden complementarity between seemingly incompatible modes of knowing, as partly explored by Dan Disney (*Toward a Poeticognosis: Re-reading Plato's The Republic*, *Contemporary Aesthetics*, 2008) who argues:

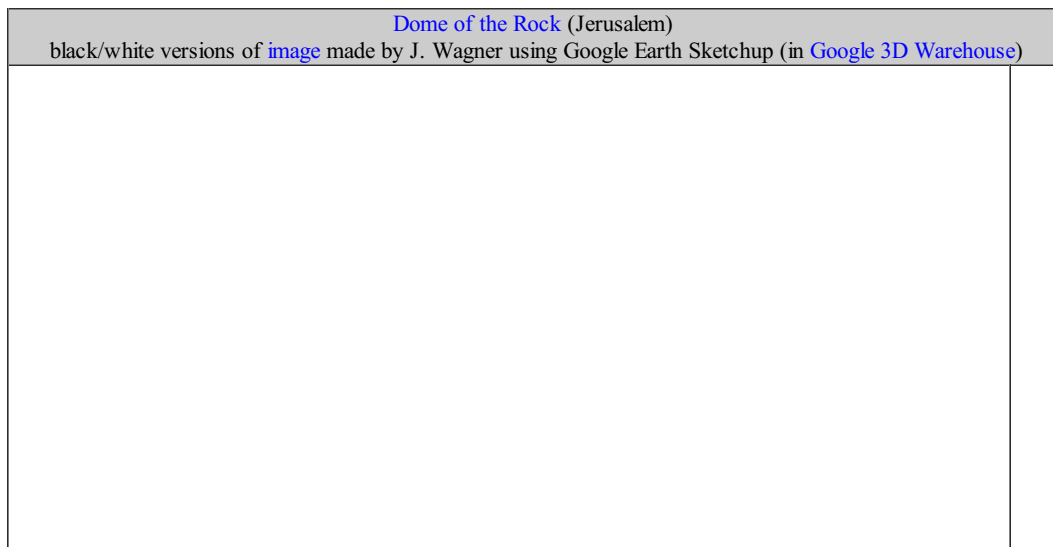
I contend that the thinking-into-language of philosophers is based in *theoria*, comprehension, and a resulting closure of wonder. I contrast this with the processes of poets, who I show to be moving thought into language via *gnosis*, apprehension, and a phenomenology opening onto inexhaustible wonder.

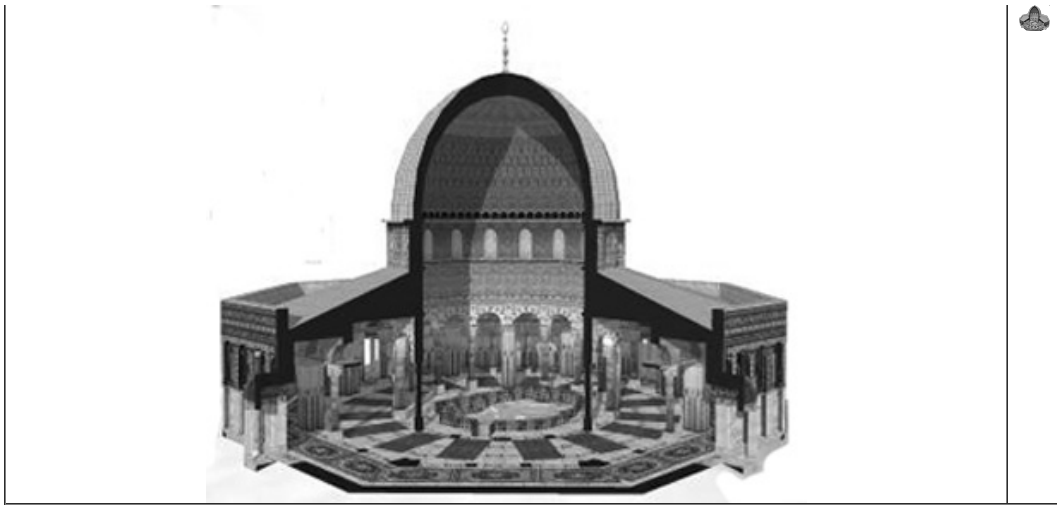
He illustrates this by the following figure, allowing him to raise the question as to what kind of response to wondering is *gnosis*, then, if it is not the *theoria* that produces philosophical comprehension?



Concrete implication: Dome-of-the-Rock

Sacred temples: In that same spirit, the images above may be provocatively compared to the cutaway images below of the [Dome of the Rock](#) -- the oldest Islamic building in the world -- on the Temple Mount in Jerusalem. Temple domes of other religions offer similar patterns. The question is whether there is an intuitive collective understanding of the reality embodied in such architecture -- echoing that hypothesized by physicists.





Requisite craziness: What justifies such juxtapositions and the questions they might raise? Succinctly put, it is ever more evident that **the quality of thinking and organization currently associated with processes of governance and sustainability are inadequate to the challenge.** The cognitive timidity in the face of the radical reframing possibly required is unworthy of a civilization "reaching for the stars" and potentially dependent on fusion energy. The latter is famously dependent on the craziest "[Theories of Everything](#)", as illustrated by the much-quoted statement by Niels Bohr in response to Wolfgang Pauli: *We are all agreed that your theory is crazy. The question which divides us is whether it is crazy enough to have a chance of being correct. My own feeling is that it is not crazy enough.* To that Freeman Dyson added:

When a great innovation appears, it will almost certainly be in a muddled, incomplete and confusing form. To the discoverer, himself, it will be only half understood; to everyone else, it will be a mystery. For any speculation which does not at first glance look crazy, there is no hope! (Innovation in Physics, *Scientific American*, 199, No. 3, September 1958)

The unresolved, centuries-long strife between religions, most notably associated with Jerusalem in past decades, highlights the complete failure to apply to such situations understandings of requisite complexity, now highly developed in other domains -- as separately argued (*And When the Bombing Stops? Territorial conflict as a challenge to mathematicians*, 2000; *Reframing Relationships as a Mathematical Challenge: Jerusalem as a parody of current interfaith dialogue*, 1997).

Could the challenge of dialogue, with and between the "crazy" perspectives of religions, be fruitfully seen in this light? (*Guidelines for Critical Dialogue between Worldviews*, 2006; *Generic Reframing of the 12 Tribes of "Israel"*, 2009). Can their only too apparent differences be reconciled through polyhedra?

Investment in this possibility might offer more hope than seeking crudely to eliminate and demonize insights that may, in some as yet unknown way, be vital to the future creativity and diversity of humanity. It is also naive to assume that religion itself can be "eliminated", as currently recommended by scientists of the highest authority in the light of their own belief system -- however unquestionable (given the eternal verity it constitutes). The continuing implication of belief systems in governance is widely acknowledged (*Future Challenge of Faith-based Governance*, 2003).

Are the ongoing failures of global governance to be understood as a result of being "sensible" and "reasonable", namely a failure to consider appropriately insights beyond cognitive and procedural comfort zones? The crowdsourcing of suggestions in response to the BP Gulf of Mexico oil spill offers a valuable case study (*Enabling Collective Intelligence in Response to Emergencies: illustrated by the case of deep oil spill containment*, 2010). Given the extraordinary emphasis on patenting any selected remedies, as a source of revenue, what possibility is there of detecting those with extraordinary skills capable of engendering remedies that are "crazy enough"? The case of [Srinivasa Ramanujan](#) is sobering in that respect (*Minding the Future: a thought experiment on presenting new information*, 1980).

Jerusalem, and the Dome-of-the-Rock, therefore offer a worthy focus for a theory that needs to be "crazy enough" -- in contrast to efforts to apply to it thinking of a quality already readily comprehensible in the [Megalithic Period](#). Whilst a [timeshare](#) approach is well practiced by animals around waterholes in the wild (and by Christian denominations in the [Holy Sepulchre](#) in Jerusalem), there is surely a case for exploring any possible degree of isomorphism with the more recent developments of spacetime theory and technology. Failure to do more than apply binary logic to complex systems is evident at the time of writing in the tragi-comic dynamics within the Christian Anglican community regarding homosexuality and the role of women in the priesthood (*Church of England faces crisis as Synod rejects concession on women bishops*, *The Guardian*, 10 July 2010). This is matched by the official initiative of the Catholic Church to recuperate those disaffected in pursuit of its own superior understanding of the transmundane and the need to avoid the fundamentally "theologically flawed" understanding of other faiths. Praying together is held to carry the risk of syncretism.

Signatures and "morphic resonance"? If such structures retain their function as strange attractors in deep cultural memory -- over millennia -- this does indeed suggest a capacity to catalyze a form of "cognitive fusion".

Whilst the architecture on its own -- however sacred -- may not reflect, as an externality, a degree of complexity equivalent to the latest theoretical insights, it should be remembered that such structures are "cognitively operated" through the rituals practiced therein. It is the combination of architecture with the dynamics of ritual which may be to a degree isomorphic with twistors, for example, especially to the extent that they are cognitively embodied (*Existential Embodiment of Externalities*, 2009). An argument can also be made for the

isomorphism of temples with space rockets (*Entering Alternative Realities -- Astronautics vs Noonautics: isomorphism between launching aerospace vehicles and launching vehicles of awareness*, 2002).

Given a degree of requisite "craziness", how to recognize catalysts for the much sought "new thinking" and its comprehension (*In Quest of Mnemonic Catalysts -- for comprehension of complex psychosocial dynamics*, 2007)? A test case is offered by the much-cited reception by John Maddox, senior editor of *Nature*, of a book by Rupert Sheldrake (*A New Science of Life: the hypothesis of morphic resonance*, 1981). In an editorial famously entitled *A book for burning?* Maddox asserted:

Sheldrake's argument is an exercise in pseudo-science. Many readers will be left with the impression that Sheldrake has succeeded in finding a place for magic within scientific discussion - and this, indeed, may have been a part of the objective of writing such a book (*Nature*, September 1981)

On the question of whether "crazy enough" is to be interpreted as "magic", it is appropriate to note one of Arthur C. Clarke's three laws: *Any sufficiently advanced technology is indistinguishable from magic*. One question raised by Sheldrake's *morphic resonance*, and "magic", is how recognition of a pattern in one domain triggers or elicits recognition of a pattern in another -- especially if the application to the new domain offers comprehension of a higher degree of order.

Of relevance to such considerations is the theory of signatures with its long history of recognition of functional equivalence in the light of a degree of isomorphism. Curiously the theory of signatures, as with that of correspondences and equivalences, has both a traditional symbolist variant (the *Doctrine of Signatures*) and a current mathematical variant (homology, etc), with many of the considerations of the former appropriated into the latter, as previously discussed (*Theories of Correspondences -- and potential equivalences between them in correlative thinking*, 2007).

The *Doctrine of Signatures* remains an inspiration to homeopathy, necessarily deprecated from an allopathic perspective -- reflecting the manner in which cognitive capacity to respond to crises is currently handicapped (*Remedies to Global Crisis: "Allopathic" or "Homeopathic"?* 2009). For example in his review, Bradley C. Bennett (*Doctrine of Signatures: an explanation of medicinal plant discovery or dissemination of knowledge? Economic Botany*, September 2007, pp. 246-255) notes its fundamentally mnemonic nature, much-valued in traditional cultures. It might be inferred that a modern variant of that doctrine is associated with the emerging discipline of *biosemiotics* (Timo Maran, *Mimicry: towards a semiotic understanding of nature*, *Sign Systems Studies*, 29, 1, 2001). Whilst "mnemonic" may be somewhat disparaging in this context, it should not be forgotten the degree to which theoretical and practical discoveries -- even in physics -- are dependent on "mnemonic" triggers of the most mundane form.

Especially curious with respect to "signatures" is the universal assumption that individual identity can be established and confirmed by a "signature" -- notably with respect to financial transactions. This assumption is reinforced by a panoply of laws and administrative requirements, as well as concerns relating to "identity theft". It might be asked how it is so readily assumed that the subtlety of human identity is captured by such a simple graphic sign -- whilst recognizing that extensive use is made of graphology to infer the attributes of identity from that sign.

"Techno-semiotics" and intentionality: Whilst "biosemiotics" is accepted as a discipline, of potentially greater relevance to the above argument is the role of "techno-semiotics" -- on which, as such, there are as yet few references, despite the relevance of the aforementioned study of Robert Romanyshyn (*Technology as Symptom and Dream*, 1989). The topic is more commonly framed as *semiotics of technology*. Especially relevant to the semiotic implications of technology is the extent to which semiotics itself has been transformed, as noted by Per Aage Brandt (*Semiotics*, 2000):

There is however a new way of understanding the notion of sign, this time with reference to intention rather than to experienced external events... But the notion of intention is obscure, isn't it? Not entirely... it corresponds to volition: mental preparation for some act to perform, or for reacting to something, or both, or for refraining from acting, or for having others act in our place, or having others refrain from acting, and so on. We imitate and interrupt each other in any dialogue or interhuman exchange (intercourse). Therefore, volitive contents incessantly become meanings.

In this case the question is the cognitive implication of technology, as intentionality, namely how the dissemination and use of particular technologies affects the manner in which individuals apprehend reality -- of their own intention or through that of the producer of the technology.

The issue has of course been extensively explored in relation to human-computer interaction and internet technology. Reference is commonly made to people "booting up" in the morning, namely becoming conscious on awakening. Many more inferences may be explored (*Computer Use as Philosophy in Operation: metaphors of the inner game*, 2003). Might it be said that people live ever in hope of downloading a bug-free identity upgrade from the Manufacturer to which they subscribe (rather than from the deities of the Abrahamic religions)? Especially fascinating are the implications for cognitive operations -- "editing reality" -- offered by the multitude of options in applications like *Photoshop*. Of relevance is the recent concern expressed regarding a cover photograph of *The Economist* from which those accompanying Barack Obama (inspecting the BP oil spill) had been inappropriately deleted (*Economist Defends Photoshopping Obama Cover*, *The Huffington Post*, July 2010).

Given these considerations, hypothesizing significance to a degree of isomorphism between the Dome of the Rock and a twistor may not even be "crazy enough".

Eliciting and deriving interest: financial and otherwise

Interest: As noted in the introduction, "confidence" is implicated both in individually essential preoccupations and in those associated with the existential challenges of the collective, at least with respect to the global financial system. Curiously this may also be said of "interest". Clearly interest rates are a major factor with respect to the global financial crisis.

There is however a degree of ambiguity to what individuals experience as being of "interest" -- whether in the case of the financial system or otherwise. For those without the capacity to invest financially, the opportunities in which they can invest their personal energy and attention are of continuing concern. Even for those with no financial worries, and deriving appropriate interest from their financial investments, exposure to boredom is of major concern. Financial opportunities may indeed offer exciting possibilities.

More generally however are the sources of excitement to be derived beyond such income. These may of course be intimately related to services offered (for payment) as a feature of recreation and entertainment. Of course in an increasingly commodified world the question is the degree to which non-financial interests are displaced by financial interest.

Curiously, arguments have long been made against financial interest understood as **usury** -- namely interest on loans, especially when considered unreasonable. The question is then whether there is a corresponding form of unreasonable non-financial interest. Examples worth exploring might include: disaster tourism, *schadenfreude*, voyeurism.

Sustaining interest in the face of boredom: Despite the many possibilities for cultivating interest, for many -- especially for the young, the alienated and the elderly -- the threat of boredom is a major concern. Whilst "interest" (financial or otherwise), is a matter of continuing and explicit concern to many, notably through cultivating "attraction", this is not the case with respect to boredom. Boredom might be said to be a "lipoproblem" around which strategies are designed, whilst ignoring its "negative potential" (*Lipoproteins: developing a strategy omitting a key problem*, 2009).

Yet it might well be said that it is the tendency to boredom (*ennui*) -- as a form of "cognitive entropy" -- which motivates much economic and other activity, as a means of warding it off through the quest for "cognitive negentropy". Consumption, stimulated by advertising, is readily to be understood from this perspective. On this quest change of any kind may be sought and welcomed for this reason -- even if it is directly associated with problematic consequences for society or the environment, or for the individual concerned.

In such a context the dynamics of sustainability must necessarily counteract any tendency to boredom which would otherwise destabilize the sustainable condition. **As currently conceived, sustainability may well be inherently boring and be for that reason unachievable.** Boredom is then the ultimate indicator of (un)sustainability.

Curiously the challenge of boredom is common to the cognitive pathologies of meditation practice and to the hyperactive behavioural disorders of increasing concern. Distraction from concentration and continuity is then experienced as a relief. Dysfunctional collective activity may be understood in the same light -- undermining any capacity to ensure the disciplined continuity of programmes on which sustainability depends. Change of government is often said to be simply due to the desire of voters for a change -- for something different.

Sustaining attractiveness and excitement: To the extent the boredom is only addressed indirectly, there is the possibility that many social processes depend on forms of alternation between contrasting conditions or modalities in order to sustain interest. This is evident in the case of changing governments, serial "reorganization" of programmes, avoidance of commitment in relationships, dependence on a variety of cultural activities, and the like. The success of cultural activities and happenings depends on their capacity to elicit a sense of "excitement" -- also the descriptor of a process in fundamental physics. Financial opportunities are commonly presented as being exciting as a means of attracting investors.

Governance itself might be seen as an exercise in managing boredom, whether through triggering "interesting" crises -- including insubstantial enemies -- or promoting games and attractive possibilities for the future (*Terror as Distractant from More Deadly Global Threats*, 2009; *Promoting a Singular Global Threat -- Terrorism: Strategy of choice for world governance*, 2002). This is consistent with the Roman practice of constructing circus arenas wherever their empire expanded (*Panem et circenses*).

The question can be asked of any governance institutions -- such as the G8/G20 or the United Nations agencies -- as to when they last engendered a strategy that was held to be "exciting" by those expected to support it and fund it. Implicit in democratic change of regime is also the sense in which such change both corrects excesses of the outgoing regime and explores previously neglected potential. The sustainability of development might then be understood as dependent on cycles of alternation (*Policy Alternation for Development*, 1984). Crop rotation offers a valuable metaphor (*Sustainable Cycles of Policies: crop rotation as a metaphor*, 1988).

The challenge is most immediately evident in dialogue and the efforts to avoid boredom (*Sustainable Dialogue as a Necessary Template for Sustainable Global Community*, 1995; *Patterning Archetypal Templates of Emergent Order: implications of diamond faceting for enlightening dialogue*, 2002). Governance as currently conceived may significantly involve "bored meetings".

This concern might well be considered central to engendering integrative theories and frameworks. Initially they may well be experienced and upheld as the epitome of beauty and elegance, as explicitly stated with respect to the rich patterns of symmetry of many mathematical discoveries. Experience of them may subsequently fail to attract and hold interest for some -- as a consequence of pattern habituation and a quest for insights of higher potential. Others may continue to retain their interest and enthusiasm -- perhaps for deprecated alternatives.

The engagement with a fundamental theory (of everything) then becomes a demonstration of unsustainability in the light of their multiplicity (John D. Barrow, *New Theories of Everything*, 2008). Exploration moves on through time to more interesting possibilities, but without being able to design that process (and the disagreements it spawns) into the next theory -- as highlighted by the above-mentioned arguments of Rescher (1985) and Woods (2002). This failure might be considered somewhat equivalent to the earliest "slash and burn" policies that have proven to be the essence of unsustainability. The focus is on the theoretical product not on the theorizing process and engagement with it.

Gambling and casino capitalism: In a period of global civilization in which collective confidence is based on speculative investment, as identified by Susan Strange (*Casino Capitalism*, 1997), it is questionable whether the way forward should require that arguments be "true" or inferences "correct". The case made by statistician Vasily V. Nalimov with regard to a probability theory of truth merits consideration (*Realms of the Unconscious: the enchanted frontier*, 1982). Physicists are after all free to indulge in an Uncertainty Principle without considering the possible relevance of a more general variant applicable to psychosocial systems (Garrison Sposito, Does a generalized Heisenberg Principle operate in the social sciences? *Inquiry*, 1969).

With respect to gambling as such, the *Special Report on Gambling* (*The Economist*, 10 July 2010) notes that the legal gambling market totalled \$335 billion globally of which two thirds came from lotteries and casinos -- despite dismal odds against success, such as one in 176 million. However nearly half of the population of the USA, and over two thirds of that of the UK, bet on something in 2007. Such enthusiasm, together with the sobering odds, highlight a disposition to risk taking which bodes ill for collective action on global disasters where people effectively bet on them not occurring. It would be naive to expect rational, rather than irrational, response to potential disaster.

Whether in the form of speculative investment or gambling, it is clear that there is a strange mix of risk taking with an imagined prospect of success -- highlighted by the subprime mortgage crisis. It constitutes a mix of interest, (faith-based) confidence and play -- together with a degree of pretence at seriousness.

Playful elegance and infinite games: A case may be made for the role of play as a means of sustaining interest in the process, most obviously evident in the imagination elicited in games and especially as a means of counteracting dysfunctional gameplaying (*Imagining the Real Challenge and Realizing the Imaginal Pathway of Sustainable Transformation*, 2007; *Playfully Changing the Prevailing Climate of Opinion: climate change as focal metaphor of effective global governance*, 2005). Provocatively it might be asked whether the essence of sustainable development is the creation of arenas more conducive to more interesting forms of play.

Gameplaying is notably appreciated as attractive and interesting for the skillful elegance demonstrated -- or potentially to be acquired. As separately argued, qualities of playful elegance may be fundamental to engendering sustainable integrative frameworks (*Enacting Transformative Integral Thinking through Playful Elegance*, 2010). As mentioned there, it may only be through the playful dynamic amongst participants at an integrative event that a transcendental meta-perspective can emerge. How best to look at more creative understandings of "games that participants play" -- following the inspiration of *transactional analysis*, as separately explored (*Cardioid Attractor Fundamental to Sustainability: 8 transactional games forming the heart of sustainable relationship*, 2005).

A strong case, relevant to integrative discourse, has been made regarding infinite games by James P. Carse (*Finite and Infinite Games: a vision of life as play and possibility*, 1994).

Resonance, noonautics and wisdom

Emergence of a sustainable integrative framework, following from the previous argument, then bears an intriguing resemblance to the challenge of cognitive fusion -- illustrated by the metaphor of the requisite technology for sustainable nuclear fusion (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006).

What seems to be required, as a process, is some form of circulation of strategic attention amongst a set of complementary conditions. This may be as applicable in the case of the individual (possibly in meditation) or collectively through a pattern of policy cycles (*Towards Another Order of Sustainable Policy Cycles: insights from the I Ching*, 1990). The relation between these conditions is then appropriately described as a form of resonance with the resultant structure being a resonance hybrid -- benefitting from molecular resonance (as with benzene) as a metaphor. (*Resonances between Challenging Psychosocial Change Initiatives: selected web resources*, 2006)

The previously mentioned possibilities of noonautics may then be explored further (*Towards an Astrophysics of the Knowledge Universe? from astronautics to noonautics*, 2006; *Noonautics: four modes of travelling and navigating the knowledge universe?* 2006).

In this sense the nature of what is valued as wisdom -- as a strange attractor of higher dimensionality and order -- may be a strange embodiment of time, a process as much as a condition or a perspective. It implies a pattern of movement between contrasting perspectives thereby offering depth, consistent with "polyocular vision", as argued by Magoroh Maruyama (Polyocular Vision or Subunderstanding? *Organization Studies*, 25, 2004, pp. 467-480). The most extensive formalization of such possibilities, incorporating the challenges to comprehension, may indeed derive from Chinese insights, as separately explored (*Tao of Engagement -- Weaponised Interactions and Beyond: Fibonacci's magic carpet of games to be played for sustainable global governance*, 2010).

WH-Questions as derivative psychosocial constructs

Curiously it would appear that neither science, religion nor governance "question" how questions arise. They are taken as givens to which appropriate response is urgently required.

Implication for "knowledge space": There is therefore a case for reviewing how questions, in any of these instances, relate to the development of this argument and any more radical approach to spacetime and cognition -- especially with respect to assumptions regarding the implications of any answers, or the promises of answers to come:

- **when:** it is readily assumed that answers will emerge sometime (as with a theory of everything, or a viable approach to governance), or have already emerged (as with religions and their historical origins, or classical political/economic theories). These take little account of answers unrelated to such a conventional sense of time, especially when there are obscure references to perspectives beyond time (possibly eternal) with which few are able to engage effectively. Also relevant is the assumption that a more adequate answer can be readily communicated worldwide -- given global communication facilities -- without recognizing

the lags inherent in the process of it being found meaningful "on the ground" by more than a few. The possibility of instantaneous communication ignores the many other calls on the attention of individuals and collectivities.

- **where:** it is readily assumed that answers emerge somewhere (as in the quest for a theory of everything in various competing institutional contexts), or have already emerged (as with competing religions and their various geographical origins). These take little account of answers unrelated to such a conventional sense of place and its associated perspectives, especially when geographically focused answers imply a special (and possibly presumptuous) sense of "universality" with which few are able to engage effectively. Universal relevance may be contested from a local perspective, whether or not an answer formulated elsewhere can be successfully communicated to other locations where it is claimed to be relevant.
- **what:** it is readily assumed that an "answer" is recognizable and comprehensible within the framework within which the question is asked. This assumption is the subject of a much-cited quote by Albert Einstein and is deliberately challenged by the nature of questions taking the form of a Zen koan. In the absence of any new paradigm, the recognized answer to challenges of governance may then be caricatured as a more effective "arrangement of the deckchairs on the Titanic". Proponents of an answer vigorously proposed may well be met with the question "so what?".
- **which:** it is readily assumed that "the" answer supercedes previously extant answers and is a natural focus for (universal) agreement (possibly for all time) -- eliminating answers thereby framed as inadequate, together with their associated contradictions and conflicts. As such the answer eliminates the need for choice. It is necessarily the right choice. Any other is regrettable, possibly requiring its forceful elimination. Such elimination is typically opposed in the light of perspectives necessarily held to be erroneous or misguided.
- **how:** it is readily assumed that discovering an appropriate answer can be achieved through existing disciplines, methodologies and procedures. This takes no account of the extent to which the latter may effectively inhibit such a discovery process. Current search for answers is typically handicapped by this constraint -- exacerbated by firm convictions of appropriateness, encouraging the marginalization of alternative approaches. But "how" may also assume the acquisition of skills enabling comprehension of the answer -- possibly requiring an extended period of time, as with comprehension of insights into spacetime by physicists (as mentioned above). The time and resources to acquire such skills may be inaccessible to most of those who are expected to engage with such answers.
- **who:** it is readily assumed that answers will be discovered by a well-identified individual or collective and that any action implied will be welcomed and undertaken by all. Such identification may be considered a prerequisite for consideration and acceptance of the answer as "authoritative". All are then expected to subscribe to the validity of the answer. The nature of "identity" in the case of both discoverer and "all", and how it is to be understood (or itself called into question), is assumed to be irrelevant. This raises the question of "who cares?" -- and of who can be made to care
- **why:** it is readily assumed that any justification for the question follows from the logic of external challenges and priorities -- unadulterated by internal, existential preoccupations, namely the paradoxical implication of self-reflexivity.

Framed in this way, the questions imply the need for a subtler understanding of "knowledge space" and communication within it -- recognizing that any such understanding is necessarily subject to the same constraints. In principle this should be fundamental to knowledge cybernetics and cybersemiotics in any consideration of the meaningfulness of an answer and the role of ignorance in a global society in which the generation of knowledge in one context automatically ensures the generation of commensurate ignorance wherever that knowledge cannot be appreciated. More problematic is the degree to which knowledge in one context is reframed as intellectual property accessible to others under restrictive conditions (*Dynamically Gated Conceptual Communities*, 2004, *Future Coping Strategies: beyond the constraints of proprietary metaphors*, 1992).

"Cognitive container": Revisiting the circular and spherical diagrams above, with questions variously associated with the circumference or circumsphere, it is perhaps useful to understand the ambiguity of the different kinds of WH-questioning process in each case as "defining" a container. They variously inhibit the contents of that container from coming (dangerously and destructively) in contact with its walls -- as explained in the case of nuclear fusion. The container may of course only be viable if understood as toroidal - with an associated movement.

It is with the contents of the container that "identity" and "sustainability" are then to be fruitfully associated -- at the nexus of the questioning process(es). Using the alchemical metaphor, the container functions as a form of *athanor* and the contents as *alkahest*.

In the light of the twisted torus -- twistor -- metaphor, self-reflexivity comes paradoxically into play in relation to the structure and boundary of the "container". Understood in terms of a Klein bottle, it has neither "inside" nor "outside" implying a paradoxical relation to any sense of "otherness". It would be delightful to believe that the archetypal university could aspire to function as such a container -- as separately explored (*Towards a University of Earth?*, 2010). More sobering is the possibility that humanity will be framed as inherently boring, and lacking in self-awareness, by extraterrestrials until this is evident (*Self-reflective Embodiment of Transdisciplinary Integration (SETI): the universal criteria of species maturity?* 2008). The taoist imagery is helpful in recalling that cognitive assumptions of insideness and outsideness are themselves to be called into question in relation to the individual.

Framed in this way, of concern is the nature of the communication process within knowledge space:

- Who communicates what to whom -- how, when and where? Is the intention to cultivate an exclusive community of those who subscribe to the truth communicated (*Dynamically Gated Conceptual Communities*, 2004)? Or is the intention to persuade

everyone of a truth to be recognized -- perhaps by any feasible means -- "targets" to be acquired in fulfillment of a mission (*Missiles, Missives, Missions and Memetic Warfare: navigation of strategic interfaces in multidimensional knowledge space*, 2001)? *Veni, vidi, vinci*?

- What is communicated? Is it appropriate to compare the significance of the most fundamental discoveries to which physicists and mathematicians aspire to the detection of the most violent phenomena in the universe (whether in the form of very high-energy gamma-rays or supernova)? How significant are these experienced to be by the population at large, if they are aware of them at all? Is the significance of any future theory of everything then to be compared to such a distant supernova? Might a magical new strategy for sustainable development be necessarily equally irrelevant to most?
- How does intellectual property constrain dissemination and use of innovative responses to civilizational challenges? This is especially relevant with the ACTA treaty currently under negotiation with the intention of restricting the current freedom of the internet. Such constraints reinforce the effective inaccessibility of knowledge for which there is a cost, in addition to the effort of following multiple hyperlink trails to distant sources and downloading relevant documents.
- Which insights are selected by whom as being meaningful or irrelevant? To what extent do search engines, with their algorithms and commercial constraints, effectively "groom" users and constrain the elaboration of innovative worldviews?
- Why communicate in such a context?

It is curious the universal assumption that universal communication of a universally meaningful insight can be achieved -- or that this is desired by those on the receiving end. Or that this is fundamental to sustainable global governance. There a strong case for calling any such assumption into question, together with potentially oversimplistic assumptions concerning individual identity and universal values (*Beyond the Standard Model of Universal Awareness*, 2010). Needless to say, paradoxically, the merit of doing so needs also to be called into question. The space within which such discourse is possible might then be of great "interest" -- to some.

"Law of Requisite Simplicity": Within this context for comprehension of connectivity and coherence, and their credible communication, is it not appropriate to consider that the the cybernetic **Law of Requisite Variety** -- vital to governance as the principle of the **Good Regulator** -- calls for a complementary "Law of Requisite Simplicity". This might then be recognized as an equally vital principle of Good Governance -- and its necessary comprehension by the governed. How might this be distinguished from the **Occam's Razor**, the **KISS Principle**, or **Parsimony** -- in the light of **Crabtree's Bludgeon**:

No set of mutually inconsistent observations can exist for which some human intellect cannot conceive a coherent explanation, however complicated.

The challenge is evident in the unthinking use of particular formulae in support of governance, as separately explored (*Uncritical Strategic Dependence on Little-known Metrics: the Gaussian Copula, the Kaya Identity, and what else?* 2009). Such metrics constitute dangerous oversimplifications. There is every possibility that innovative new insights may be expressed through such devices. What then constitutes an accessible articulation of the subtlest insight? Did cultures of the past, surviving centuries rather than decades, make use of aphorisms, tales and myths to that end (*Relevance of Mythopoeic Insights to Global Challenges*, 2009)?

Such questions are relevant when it may be assumed that sophisticated insights into global governance will be readily acceptable. Such an assumption fails to take account of the educational levels achieved in an exploding population. In addition to insightful reframing of **literacy** and **functional illiteracy**, *Wikipedia* offers a sobering *List of countries by literacy rate*. More generally, however, is the question of what anyone is ignorant and how that impacts on approval on global governance initiatives.

Identity in time: sustainability and immortality

History may find it as extraordinary that a decades-old global civilization should have developed an obsession with "sustainability" -- as extraordinary as is now held to be the obsession with "immortality" of Chinese and Egyptian empires that lasted centuries, and were considered at that time to be eternal in many respects. This is curiously echoed in both cases with an obsession with overcoming impotence and sustaining sexuality -- so evident with the extensive promotion of aphrodisiacs on the web, to a greater extent than any other "remedy".

There is a continuing preoccupation with personal identity, manifest both in terms of existential problems and aspirations for self-esteem. These are echoed at the collective level. In both cases any challenge may be held as "insulting", thereby offering unquestionable justification for what may indeed be a violent response. For the individual, including leaders and the most eminent, a further consideration may be one of "legacy" -- of "leaving one's mark". This may be institutionalized through awards, memorials (even presidential libraries), and other devices. Members of the **Académie française** are also known as "*Immortels*". Within religious frameworks such preoccupations may be reframed in terms of an afterlife or reincarnation.

As extensively reported in the business section of the global edition of *The New York Times*, "the quest for immortality gets a modern tweaking by Silicon Valley minds" (14 June 2010). This reflected the preoccupations of some at the **Singularity University** on the NASA campus. There is expectation that in the near future, following a **technological singularity**, a superior intelligence will dominate and life will take on an altered form -- unpredictable and incomprehensible at this time -- in which human beings and machines will effortlessly merge, rendering death itself a thing of the past. How this will relate to a more predictable "memetic singularity" remains to become apparent (*Emerging Memetic Singularity in the Global Knowledge Society*, 2009).

Perhaps even more curious is the extensive review by *The Economist* (*Methuselah's mixture*, 24 July 2010) of a recent study of progress in research on ageing (David Stipp, *The Youth Pill: scientistis at the brink of an anti-ageing revolution*, 2010). As ever, its wealthy readers are necessarily sensitive to the challenges of benefitting from accumulated wealth hereafter. As introduced in the review:

For as long as people have been growing old, they've been wishing they didn't have to. *The Epic of Gilgamesh*, one of the most ancient works of literature, chronicles the eponymous hero's quest for eternal life. Most religions offer an attenuated version of immortality in which some fuzzily defined soul endures even after the body has died. Medieval alchemists hunted in vain for the rejuvenating Philosopher's Stone; industrial-age quacks got rich off their patent elixirs. Today, cosmetics companies dance around truth-in-advertising laws to imply that their creams and lotions can keep the years at bay.

The quest for global "sustainability" is appropriately related to such preoccupations at the collective level -- including analogues to the "Philosopher's Stone", "patent elixirs" and "cosmetics". The quest has been evident in ambitions for "eternal" empires, as in the case of the [British Empire](#), the [German Reich](#) (termed the *Tausendjähriges Reich*), an [American Empire](#) (given focus by the *Project for the New American Century*), and the mandates of various faith-based communities in anticipation of some form of [Armageddon](#) (*Spontaneous Initiation of Armageddon: a heartfelt response to systemic negligence*, 2004). Setting aside the subtleties of the worldviews of ancient civilizations, sustainability can be understood as a secular take on the "immortality" of the global civilization of humanity. Such civilization can of course be fruitfully reframed as a work in progress -- as suggested by the delightful, and much-quoted, Gandhian riposte. It would indeed be a "good idea". The likelihood of survival has been variously assessed (Thomas Homer-Dixon, *The Upside of Down: catastrophe, creativity, and the renewal of civilization*, 2006; Jared Diamond, *Collapse: how societies choose to fail or succeed*, 2005).

Ironically, as with "immortality", there is a question of what survives through time within a sustainability worldview. Humanity as currently known? Know-how -- to be inherited by another emergent and better adapted species, as previously explored (*Authentic Grokking: emergence of Homo conjugens*, 2003) ? Ecosystems of which humanity is an integral part? Culture? Mummies and architectural ruins -- for extraterrestrial tourists?

Thomas Homer-Dixon (2006) argues for the need to navigate the [adaptive cycle](#), understood as encompassed by a panarchy approach to governance -- implying a [panarchy cycle](#). (Andrew Curry and Hardin Tibbs, *From S-curves to Panarchy*, In: What Kind of Crisis Is It? *Journal of Futures Studies*, March 2010). Panarchy is the structure in which systems, including those of nature (e.g., forests) and of humans (e.g., capitalism), as well as combined human-natural systems (e.g., institutions that govern natural resource use such as the Forest Service), are interlinked in continual adaptive cycles of growth, accumulation, restructuring, and renewal (Lance Gunderson and C. S. Holling, *Panarchy: understanding transformations in systems of humans and nature*, 2001). What traversing such a cycle might mean for identity and governance is separately discussed (*Adaptive Hypercycle of Sustainable Psychosocial Self-organization*, 2010; *System Dynamics, Hypercycles and Psychosocial Self-organization: exploration of Chinese correlative understanding*, 2010).

How definitive is it appropriate to be in such a context with regard to individual (or collective) "identity" in time? As summarized by a recent compilation on the matter (Joseph Keim Campbell, et al., *Time and Identity*, 2010):

The concept of time and identity seem at once unproblematic and frustratingly difficult. Time is an intricate part of our experience -- it would seem that the passage of time is a prerequisite for having any experience any at all -- and yet recalcitrant questions about time remain. Is time real? Does time flow? Do past and future moments exist?... Indeed, questions about the metaphysics of persistence [of identity] take on many of the complexities inherent in philosophical considerations of time.

There are of course many answers on offer. However it is not clear that those that are "unproblematic" (clock time, identity cards, etc) do more than paper over the cracks associated with issues that are "frustratingly difficult".

The compilation avoids reference to classical worldviews -- such as those of the Egyptians and Chinese -- whose cultures were impregnated by such preoccupations. There is therefore a case for noting the strong argument regarding the future influence of non-Western cultural metaphors on global civilization that has been developed by Susantha Goonatilake (*Toward a Global Science: mining civilizational knowledge*, 1999). The widely recognized impact of South-East Asian cultures on global economies merits a degree of humility and open-mindedness with regard to such a possibility.

What traces exist of the centuries of reflection on time and identity in those cultures? For example, the implications of the classical Chinese taoist text known as the *Book of Changes* (*Yi Jing*) have been explored elsewhere (*Documents relating to Patterns of I Ching / Tao te Ching*). But what is to be made of the perceived interrelationship between Taoism, immortality and alchemy -- given their importance in that culture (Lu K'uan Yü, *Taoist Yoga: alchemy and immortality*, 1970). These subjects are of course individually deprecated by the Western worldview from which insightful guidance on sustainable global governance has for so long been awaited. Curiously, whilst physicists are now free to declare that time is an illusion and derivative -- even though unable to understand the matter adequately -- cultures which explored such possibilities millennia ago are considered unworthy of attention. Their economic emergence could be considered a healthy wakeup call, especially if they are likely to derive further competitive advantage from their traditional insights -- as argued by Goonatilake. Curiously again, alchemy is readily used by one of the most successful global financiers, [George Soros](#) (*The Alchemy of Finance*, 1988).

In the light of the argument above regarding both the possible functional implications of isomorphism and a desirable "Law of Requisite Simplicity", to what extent are the following two sets of images indicative of the cultivation of insights regarding the nature of the toroidal movement discussed above? These well-known images from classical taoist alchemy are the subject of extensive commentary by Carl Gustav Jung and Richard Wilhelm with respect to *The Secret of the Golden Flower* (*Tai Yi Jin Hua Zong Zhi*).

The Wilhelm translation is accompanied by a translation of the *Book of Consciousness and Life* (*Hui Ming Ching*) containing the second set of images more strongly indicative of such toroidal circulation and its relation to a central "chamber". The first is a classical image of the Buddha in which the symbolic elements carry considerable detail -- for those who explore them. The second is part of a set of images indicative of stages in the alchemical process of the "circulation of the light", clarified in the pathways in the subsequent images,

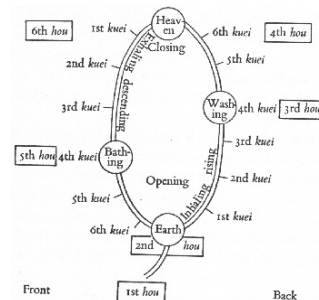
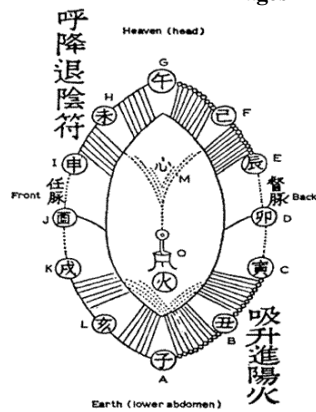
and separately discussed (*Circulation of the Light: essential metaphor of global sustainability?* 2010).

Do such images constitute a decomplexification of the cognitive subtleties otherwise understood as associated with their preoccupation? As such are they a valuable communication compromise between understandings of the constraints of a Law of Requisite Variety and of a Law of Requisite Simplicity?

Images indicative of circulation of the light



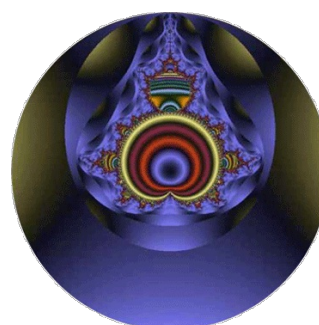
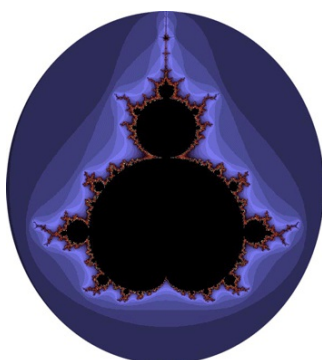
Images indicative of circulation of the light



Whilst associated insights are readily deprecated from perspectives that are unable to learn from the extent of investment in them, their possible relevance may be more apparent in the light of Western exploration of the so-called [Mandelbrot set](#) and visual renderings of it as presented below. Mathematically it is a set of points in the [complex plane](#), the boundary of which forms a [fractal](#). It is a feature of [complex dynamics](#).

The visual renderings of the Mandelbrot set have attracted considerable attention -- perhaps because they embody a fruitful compromise between the cybernetic Law of Requisite Variety and a possible Law of Requisite Simplicity. They enable cognitive engagement with the boundary between order and chaos. But whilst exploration of the Mandelbrot set has been related to the financial system, its potentially wider applications have yet to be fruitfully explored (*Sustainability through the Dynamics of Strategic Dilemmas -- in the light of the coherence and visual form of the Mandelbrot set*, 2005; *Psycho-social Significance of the Mandelbrot Set: a sustainable boundary between chaos and order*, 2005).

The renderings below were generated through readily available software (*Xaos*) offering extensive interactive exploration of the detail of the fractal images. The images are presented vertically here (a software option) to be consistent with the widely-known [Buddhabrot rendering](#) initiated by [Melinda Green](#) in 1993.



Do such arguments suggest the value of considering how individuals and global civilization are embedded in time in ways of relevance to

the governance of sustainability, as previously explored (*The Isdom of the Wisdom Society: Embodying time as the heartland of humanity*, 2003)? Does the metaphor of "timeships" offer a fruitful complement to preoccupation with "spaceships" (*Embodying a Timeship vs. Empowering a Spaceship*, 2003)? Does death result from exhausting the cognitive geometry on which an individual (or a civilization) chooses to live -- as an extension of the argument of Jared Diamond?

Sonification of cognitive resonance

How is any message relating to sustainable development to be "heard" worldwide? Writing at the time of the [Football World Cup](#), it is clear that such gameplaying meets a requirement of a Law of Requisite Simplicity, whilst incorporating an adequate degree of Requisite Variety -- capable of eliciting and holding widespread interest. The fascination with controlled movement of a (polyhedral) point in a binary context calls for recognition of its symbolic status in world imagination (*Understanding Sustainable Dialogue: the secret within Bucky's Ball*, 1996). More striking is the extent to which it was felt appropriate to accompany the patterns eliciting interest with sound -- that of the [vuvuzela](#) -- in a country whose president's appeal to its citizens was notably his ability to dance. Elsewhere the significance of the event was emphasized by the use of horns. Together these factors are acknowledged to achieved more for collective identity in many fragmented countries -- such as Spain -- than more conventional processes.

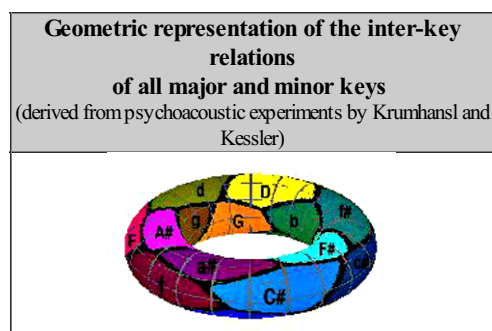
The suggestion above with regard to a Law of Requisite Simplicity as a necessary complement to the cybernetic Law of Requisite Variety (vital to governance) is reinforced by the arguments for [sonification](#). The case for so doing has long been made to enhance the capacity to detect patterns in astrophysical data and has just been extended to render comprehensible phenomena signalling the existence of fundamental particles at the [Large Hadron Collider](#) (LHC) facility, a 27 km circumference [high-energy particle accelerator](#) (Pallab Ghosh, *God particle signal is simulated as sound*, *BBC News*, 22 June 2010). Sonification is the auditory display of data otherwise beyond the range of the human senses or their capacity otherwise to resolve -- as explored by the [International Community for Auditory Display](#) on behalf of the US National Science Foundation (*Sonification Report*, 1997).

Expressed differently, what is the cognitive value to society of a theory of everything -- or a strategy of governance of the global financial system -- that is so complex that few have the capacity to comprehend it? The dangers have been explored with respect to complex metrics (*Uncritical Strategic Dependence on Little-known Metrics*, 2009). The Law of Requisite Variety is intimately related to the principle of the Good Regulator. But how then to reconcile complexity with simplicity in governance? The challenge is more evident in a situation of information overload and information underuse (a programme of the United Nations University) and the possibility of a memetic singularity (*Emerging Memetic Singularity in the Global Knowledge Society*, 2009). It in this context that the role of the simplifications of faith and its symbols becomes evident -- whether those of religions, of science (for those obliged to believe in it), or those embodied in other widely appreciated cognitive devices, such as horoscopes.

There are a number of initiatives offering musical renderings of the Mandelbrot and its features -- [Mandelbrot music](#) (Nick Didkovsky, *MandelMusic: a musical sonification of the Mandelbrot Set*; Phil Thompson, *Gingerbread: Mandelbrot Music Generator*, 2008).

Might there be a form of sonification capable of rendering comprehensible the relevance of **all** the narratives identified by Inayatullah as **well as** their complementarity? The possibility has been developed more generally (*A Singable Earth Charter, EU Constitution or Global Ethic?* 2006). Possibilities have been stressed with respect to the connectivity offered by poetry (*Poetic Engagement with Afghanistan, Caucasus and Iran*, 2009; *Ensuring Strategic Resilience through Haiku Patterns*, 2006). The limitations of the vision metaphor central to governance have been noted in relation to the possibility of polysensorial insights clearly essential to survival of many species over time (*Strategic Challenge of Polysensorial Knowledge: bringing the "elephant" into "focus"*, 2008).

Especially interesting, in the light of the above argument, is research indicating the toroidal cognitive organization of the harmonic connectivity of tones. A piece of music moves around in this space [more]. The results of psychoacoustic experiments by C L Krumhansl and E J Kessler (*Tracing the dynamic changes in perceived tonal organization in a spatial representation of musical keys*, *Psychological Review*, 1982) of the inter-key relations of all major and minor keys can be represented geometrically on a torus -- as shown by Benjamin Blankertz, Hendrik Purwins and Klaus Obermayer (*Constant Q Profiles and Toroidal Models of Inter-Key Relations* -- *ToMIR*, 1999) in the following image.



This is consistent with the application of the topological theory of [orbifolds](#) to music by Dmitri Tymoczko (*The Geometry of Musical Chords*, *Science*, 2006). The theory offers links to the work on comprehension (mentioned above) by Ron Atkin (1977) through simplicial complexes. It also links to curves characteristic of catastrophe theory, to the paradoxical forms of the Mobius strip and Klein bottle, and more generally to the definition of "orbihedron", the simplicial analogue of an orbifold. Will this prove to be a form of cognitive Rosetta stone of relevance to sustainable development and resilient navigation of the adaptive cycle? Ironically, [Andrew Hodges](#), as one of the physicists seeking to give diagrammatic form to twistors (through twistor diagrams) provides links from his website to "twistor music" -- although it is not apparent whether such music facilitates their comprehension.

Mention was made above of the integrative function of the aesthetics of play. It is therefore of interest to note, with respect to sustainability over time, the remarks of [George Rochberg](#) (*The Aesthetics of Survival: a composer's view of twentieth-century music*, 2004):

Any discussion of duration in music must necessarily probe the nature of duration itself, particularly as it relates to human experience. Without even the most limited understanding of the relationship between duration and existence, it becomes virtually impossible to comprehend how music becomes the living, dynamic, artistic embodiment of time; for music's great power over all men fundamentally derives from the engagement of the sense of duration in the listener, perceived as motion, as movement, as the occurrence of successive events which culminate in a sense of fullness of experience, of a sonorous content whose passage in time is rich and meaningful. (p. 61)

In this context, of interest in the Vedic tradition are two of the attributes of the major deity [Shiva](#): *Kalamurtih* ("Embodiment of Time") and *Natesah* ("Lord of Dance"). This is especially relevant in the light of the epistemological arguments of [Antonio de Nicolas](#) (*Meditations through the Rg Veda*, 1978) regarding the use of languages based on tone in his study of the four complementary conceptual languages of the *Rg Veda* considered necessary to hold the complexity of insights and experience. His explorations were associated with the musical theory of [Ernest G. McClain](#) (*Myth of Invariance: the origins of the gods, mathematics and music from the Rg Veda to Plato*, 1976). For de Nicolas:

Therefore, from a linguistic and cultural perspective, we have to be aware that we are dealing with a language where tonal and arithmetical relations establish the epistemological invariances....Language grounded in music is grounded thereby on context dependency; any tone can have any possible relationship to other tones, and the shift from one tone to another, which alone makes melody possible, is a shift in perspective which the singer himself embodies. Any perspective (tone) must be 'sacrificed' for a new one to come into being; continuity, and the 'world' is the creation of the singer, who shares its dimensions with the song.

In ancient times, the infinite possibilities of the number field were considered isomorphic with the infinite possibilities of tone...Rg Veda man, like his Greek counterparts, knew himself to be the organizer of the scale, and he cherished the multitude of possibilities open to him too much to freeze himself into one dogmatic posture. His language keeps alive that 'openness' to alternatives, yet it avoids entrapment in anarchy. It also resolves the fixity of theory by setting the body of man historically moving through the freedom of musical spaces, viewpoint transpositions, reciprocities, pluralism, and finally, an absolutely radical sacrifice of all theory as a fixed invariant. (Antonio de Nicolas, *Meditations through the Rg Veda*, 1978, p. 57)

As with the work of McClain, such arguments are given further significance by the recent discovery of [Jay Kennedy](#) (*Plato's Forms, Pythagorean Mathematics, and Sticheometry, Apeiron: a journal for ancient philosophy and science*, 2010) of the use by Plato of a regular pattern of symbols to give his books a musical structure (*Manchester historian deciphers hidden 'Plato Code'*, *BBC News*, 29 June 2010).

Conclusion

The epistemological implication of the "sonification argument" of de Nicolas is clearly that consideration be given to the narratives of Inayatullah as "languages" individually incapable of strategically "grasping" and holding the complex challenge of global governance. Each such worldview needs necessarily to be "sacrificed" under certain conditions. It is together that they function as a resonance hybrid whose sustainable connectivity over time might be better intuited through music.

The argument is appropriately concluded with reference to the above-mentioned insights of [Douglas Hofstadter](#) (*Gödel, Escher, Bach: an Eternal Golden Braid*, 1979) -- and the possibility that global conversation supportive of sustainable development calls for an as yet unexplored form of "braided discourse" separately discussed (*Interweaving Thematic Threads and Learning Pathways: noonautics, magic carpets and widdomes*, 2010). If the most fundamental theoretical developments are elicited and promoted by society in partial response to the quest for its existential survival, the title of Hofstadter's subsequent study (*I Am a Strange Loop*, 2007) might be fruitfully adapted as ***I (and my sustainable development) am (and am not)***:

- ***a strange loop*** -- as argued with respect to the adaptive cycle, Möbius strip or cyclic identity (*Emergence of Cyclical Psycho-social Identity: sustainability as "psychically" defined*, 2007).
- ***a Klein bottle*** -- as argued with respect to participative engagement with the environment (*Intercourse with Globality through Enacting a Klein bottle*, 2009) and the continuing challenge of any "other" (*Us and Them: relating to challenging others*, 2009)
- ***a fractal*** -- as argued with respect to the complex plane and the Mandelbrot set (*Psycho-social Significance of the Mandelbrot Set: a sustainable boundary between chaos and order*, 2005)
- ***a standing wave*** -- where the "illusory" appearance of static invariance inhibits recognition of an inherent dynamic, whether with respect to any "loops", "bottle" or fractal

These, together with the twistor and the orbifold, are appropriately understood as geometric progressions beyond making "points", and developing "lines" of argument, within closed "circles" -- relevant to the design of the cocoon within which the noosphere is navigated (*Metaphorical Geometry in Quest of Globality*, 2009). There is an irony to the degree of isomorphism between the twistor (as depicted above), speculative cutaways of the "flying saucers" of UFO literature, and the mythological flying devices of Vedic literature (known as *Vimanas*, and including chariots, temples and palaces). Given the imaginative cognitive role in each case, with various implications of "light", these frame the possibility of a radically different understanding of "enlightened" identity, its transportation through knowledge

References

Christopher Alexander:

- Notes on the Synthesis of Form. 1964 [[summary](#)]
- A Pattern Language. Oxford University Press, 1977 [[summary](#)]
- The Timeless Way of Building. Oxford University Press, 1979 [[summary](#)]
- The Nature of Order: an essay on the art of building and the nature of the universe. Center for Environmental Structure, 2003-4. [[summary](#)]
- 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 [[text](#)]
- 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 [[text](#)]

Ron Atkin:

- Combinatorial Connectivities in Social Systems: an application of simplicial complex structures to the study of large organizations. Basel, Birkhäuser, 1977
- Multidimensional Man: can man live in three dimensional space? London, Penguin, 1981 [[review](#)]

Gregory Bateson. Mind and Nature; a necessary unity. New York, Dutton, 1979

Mary Catherine Bateson. Our Own Metaphor: a personal account of a conference on the effects of conscious purpose on human adaptation. Knopf, 1972

John D. Barrow. New Theories of Everything. Oxford University Press, 2008

Benjamin Blankertz, Hendrik Purwins and Klaus Obermayer. Constant Q Profiles and Toroidal Models of Inter-Key Relations -- ToMIR. 1999 [[text](#)]

Willard Bohn. Modern Visual Poetry. University of Delaware Press, 2001

Robert Neil Boyd. Rodin Coils [[text](#)]

Joseph Keim Campbell, Michael O'Rourke and Harry S. Silverstein (Eds.). Time and Identity. MIT Press, 2010

James P. Carse. Finite and Infinite Games: a vision of life as play and possibility. Ballantine Books, 1994 [[summary](#)]

Antonio de Nicolas:

- Habits of Mind: an introduction to clinical philosophy. Authors Choice Press, 2000
- Meditations through the Rg Veda. Shambhala, 1978

Clarisse Sieckenius de Souza. The Semiotic Engineering of Human-Computer Interaction. MIT Press, 2005

Jared Diamond. Collapse: How Societies Choose to Fail or Succeed. Viking Books, 2005 [[summary](#)]

Kathleen Forsythe. Isophor: Poiesis of Experience. Center for Systems Research, University of Alberta, 1987 (Working Paper No. 87-2)

Susantha Goonatilake. Toward a Global Science: mining civilizational knowledge. Indiana University Press, 1999

Lance Gunderson and C. S. Holling. Panarchy: understanding transformations in systems of humans and nature. Island Press, 2001,

John Hollander. The Poetry of Architecture. *Bulletin of the American Academy of Arts and Sciences*, 49, 1996, 5, pp. 17-35 [[abstract](#)]

Thomas Homer-Dixon. The Upside of Down: catastrophe, creativity, and the renewal of civilization. Knopf. 2006 [[summary](#)]

Dianna Hurford. Breaking the Line: integrating poetry, polyphony and planning practice. University of Victoria, 2001 [[text](#)]

Yosef Jabareen. A Knowledge Map for Describing Variegated and Conflict Domains of Sustainable Development. *Journal of Environmental Planning and Management*, 47, 2004, 4, pp. 623-642

Sohail Inayatullah:

- Multiple Narratives of the Futures of the Global Financial Crisis, *Journal of Futures Studies*, 14, 2010, 3, pp. 109-127 [[text](#)]
- The Causal Layered Analysis (CLA) Reader: theory and case studies of an integrative and transformative methodology. Tamkang University Press, 2004

Alexander Kranjec and Laraine McDonough. The implicit and explicit embodiment of time. *Journal of Pragmatics*, 2010 [[doi](#)]

C. L. Krumhansl and E J Kessler. Tracing the dynamic changes in perceived tonal organization in a spatial representation of musical keys. *Psychological Review* 89(4), 1982, pp. 334-368

George Lakoff and Rafael E. Núñez. Where Mathematics Comes From: how the embodied mind brings mathematics into being. Basic Books, 2000 [[summary](#)]

Michael Lockwood. *The Labyrinth of Time: introducing the universe*. Oxford University Press, 2005

Ernest G. McClain:

- *Myth of Invariance: the origins of the gods, mathematics and music from the Rg Veda to Plato*. Nicolas-Hays 1976
- *The Pythagorean Plato: prelude to the song itself*. Nicolas-Hays 1978
- *Meditations Through the Quran: tonal images in an oral culture*. Nicolas-Hays 1981

Bernard E. Morris. *Poetry of Design*. In: *Taking Measure: the poetry and prose of X.J. Kennedy*. Susquehanna University Press, 2003

Vasily V. Nalimov. *Realms of the Unconscious: the enchanted frontier*. ISI Press , 1982

Roger Penrose. *On the Origins of Twistor Theory*. In: *Gravitation and Geometry*, a volume in honour of I. Robinson. Bibliopolis, 1987
[[text](#)]

Nicholas Rescher. *Strife of Systems: an essay on the grounds and implications of philosophical diversity*. University of Pittsburgh Press, 1985

George Rochberg. *The Aesthetics of Survival: a composer's view of twentieth-century music*. University of Michigan Press, 2004

Robert Romanyshyn. *Technology as Symptom and Dream*. Routledge, 1989

John Ruskin. *Poetry of Architecture -- or the architecture of the nations of Europe considered in its associations with natural scenery and national character*. 1880 [[text](#)]

Xavier Sallantin. *La science à la découverte du sens*. Aubin. 1997 [[text](#)]

Rupert Sheldrake. *A New Science of Life: the hypothesis of morphic resonance*. Park Street Press, 1981

Ricardo Silvestre. *Induction and Plausibility: a conceptual analysis from the standpoint of nonmonotonicity, paraconsistency and modal logic*. LAP Lambert Academic Publishing, 2010

George Soros. *The Alchemy of Finance*. Simon and Schuster, 1988

Garrison Sposito. Does a generalized Heisenberg Principle operate in the social sciences ? *Inquiry* (Oslo, Universitetsforlaget), 12, (1969), 3, pp. 356-361

David Stipp. *The Youth Pill: scientistis at the brink of an anti-ageing revolution*. Current, 2010

Dmitri Tymoczko. *The Geometry of Musical Chords*. *Science*, 313, 2006, 5783, pp. 72-74 [[text](#)]

Robert Anton Wilson. *Quantum Psychology: how brain software programs you and your world*. New Falcon Publications, 1990

Edward Witten. *Perturbative gauge theory as a string theory in twistor space*, *Commun. Math. Phys.* 252, 2004, pp. 189-258 [[text](#)]

John Woods. *Paradox and Paraconsistency: conflict resolution in the abstract sciences*. Cambridge University Press, 2002

Arthur Young. *Geometry of Meaning*. Delacorte Press 1976 [[summary](#)]

Lu K'uan Yü. *Taoist Yoga - Alchemy and Immortality*. Rider and Company, 1970

Philip Zimbardo and John Boyd. *The Time Paradox: the new psychology of time*. Rider, 2008



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](#).

For further updates on this site, [subscribe here](#)