12 October 2015 | Draft

Weather Metaphors as Whether Metaphors

Transcending solar illusion via a Galilean-style cognitive revolution?

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Introduction

The argument here follows from that made separately with respect to the possibility of understanding the challenge of climate otherwise (*Enhancing Strategic Discourse Systematically using Climate Metaphors: widespread comprehension of system dynamics in weather patterns as a resource*, 2015). In a period of notably shambolic global governance, that argument was presented in anticipation of the significance of the UN Climate Change Conference (Paris, November 2015). The argument was developed further through the technical demonstration of movements relative to one another of geometrical objects in three dimensions (*Psychosocial Implication in Polyhedral Animations in 3D: patterns of change suggested by nesting, packing, and transforming symmetrical polyhedra*, 2015).

As the latter title indicates, the objects in question are understood as carriers for distinctions in discourse expressed metaphorically, notably with respect to climate. Climate itself is understood there as encompassing its tangible experience in nature as well as the widespread use of climate and weather metaphors to distinguish intangible psychosocial phenomena.

The point is usefully made in the wordplay between ***weather*** and ***whether***, given the manner in which decision-making is so extensively determined by weather -- notably with respect to catastrophic conditions framed by weather metaphors. A degree of semantic convergence is also implied in use of "well-weathered" with reference to those exhibiting experience in the survival of problematic circumstances.

Beyond recognition of their value in advertising, as yet to be explored is the potential implication of such "strategic homophones" for decision-making. This might be further illustrated with respect to any quest for harmony in the Middle East dependent on the interplay between ***peace*** and ***piece*** -- as might be articulated through rhyme in poetic terms, for example (cf. Denis Drieghe et al, *Strategic Effects in Associative Priming with Words, Homophones, and Pseudohomophones*, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 2002).

The point of this argument is made most succinctly in visual terms through the technical demonstration exploring four distinctive animations (in the annex):

- Relative movement of nested Platonic polyhedra: pumping and rotation
- Decomposition and recomposition of a toroidal polyhedron -- towards vortex stabilization?
- Packing and unpacking of 12 semi-regular Archimedean polyhedra
- Rotation and pumping of nested Chinese "puzzle balls" as symbolizing "worlds-within-worlds"

The following argument is essentially a commentary on the implications of the relationships between these four seemingly disparate models presented as distinctive animations. As a proof of concept exercise, the presentation is effectively an annex to this paper and that with respect to climate metaphors as a key to decision-making.

Is it possible that global governance could be explored as being currently constrained by a degree of equivalence to autism -- a blinkered form of dynamic pattern recognition? This is especially evident in its remarkable pursuit of particular short-term obsessions to the exclusion of longer-term, more contextual considerations, as exemplified by the current refugee crisis (Behzad Yaghmaian, *Migration Crisis: how to break the cycle of death and amnesia*, *The Globalist*, 5 October 2015).

In an argument stressing a more cyclic perspective, this short-term focus recalls the policy adage of George Santayana: ***Those who cannot remember the past are condemned to repeat it***. This understanding is strangely echoed by the recognition of President Obama in his response to the most recent school shooting in the USA (*Oregon college shooting: Angry Obama says response to shootings has become too routine*, *CBC News*, 1st October 2015). Such failure to learn -- on a global scale -- is evident in the repeated military strategic failures in the Middle East.

How is the credibility of proposed remedial action in response to climate change to be determined in the light of recent revelations regarding systematic abuse of regulatory measures by one of the most esteemed multinational corporations -- Volkswagen, as a distinguished founding member of the UN Global Compact?

How to assess the environmental impact of unregulated emissions by millions of vehicles? How to reconcile such abuse with the exorbitant remuneration accorded to those responsible? Is the pattern consistent with that in the banking community, or by the widespread sexual abuse by clergy?

The question raised by the argument is whether it is time for another "cyclic revolution" of which that instigated by Galileo offers a highly insightful metaphor regarding the relationship of local, global and universal. Metaphorically the need for such a "revolution" in thinking is indicated by continuing assumptions regarding the movement of the Sun -- exemplified by reference to *sunrise* and *sunset*. This is suggestive of entrapment in relation to "cognitive suns" of which the Sun is then a convenient metaphor (*Psychosocial Implication of Without Within: enjoying going solar for oneself*, 2014).

The concern is of relevance given the widespread tendency to seek and frame values, solutions and models in both "global" and "universal" terms. The repetition to which Santayana refers can then be related to the insight of policy scientist Geoffrey Vickers: ***A trap is a function of the nature of the trapped***. The cycle-blind are therefore to be understood as trapped in a form of stasis through the mistaken belief that their known universe revolves around their own worldview.

The conflicts of society are then more readily explored through recognition that contrasting worldviews derive from their adherents effectively inhabiting different worlds revolving around different suns -- possible only visible to others as the remotest of stars. In this sense humanity may well have already migrated to the stars in ways which remain to be understood.

In the light of the emerging insights from physics regarding a multiplicity of "curled up" dimensions, there is the further question as to whether "climate change" may have unsuspected cognitive implications of which increasing social unrest may be an early indicator -- with the dangerous rise in global temperatures and sea levels needing to be understood otherwise (*Climate of Change Misrepresented as Climate Change: insights from metaphorical confusion*, 2008; *Disastrous Floods as Indicators of Systemic Risk Neglect*, 2011).

Envisioning dynamic patterns

Polyhedral models: In the light of the proof-of-concept exercise, the concern here is with the use of symmetrical polyhedral forms as a means of holding the experience of patterns of coherence (as variously understood) and the dynamics between them. Extensive commentary on the relevance of this possibility is presented in that earlier document. The elements by which such objects are constructed can notably be understood as markers for distinctions, with the philosophical resonances of any calculus of indications (George Spencer-Brown, *Laws of Form*, 1969; Francisco Varela, *A Calculus for Self-Reference*, *International Journal of General Systems*, 1975).

The concern follows from that framed with respect to the geometry of thinking as variously framed (Buckminster Fuller, *Synergetics: explorations in the geometry of thinking*, 1975/1979; Arthur M. Young, *The Geometry of Meaning*, 1976), and as discussed separately (*Geometry of Thinking for Sustainable Global Governance: cognitive implication of synergetics*, 2009).

The argument here initially focuses separately on the dynamics of nested polyhedra in the case of the 5 Platonic solids (as intimated by Johannes Kepler), the 64-edged toroidal drilled truncated cube, the 13 Archimedean solids, and Chinese "puzzle balls". The focus is on visual depiction of such dynamics as memory aids and as a stimulus to imagination, as previously argued (*In Quest of Mnemonic Catalysts -- for comprehension of complex psychosocial dynamics*, 2007). Each of the four examples has fundamental symbolism traditionally associated with the forms, however these may now be relevant to the current challenges of psychosocial organization and its governance.

Impaired strategic vision: The emphasis on dynamics is usefully framed by comparison with restoration of sight to blind children in India by Project Prakash. As argued by its founder Pawan Sinha:

> We've learned that motion information is a powerful force. As these children see how things move in the world, it provides the brain with a tremendous amount of information about how to distinguish objects, backgrounds, foregrounds and so on. Dynamic information is a powerful cue for visual learning -- and may be the fundamental process that helps the brain make sense of a very complex world... When you interact with a dynamic world, you need to know more than just what's happening at a given moment -- you need to anticipate how it might change in the next moment so you can take the right actions. We proposed a new

> theory of autism, called the predictive impairment theory, or the magical world theory. Our hypothesis is that people with autism may have reduced ability to predict what will happen next, making the world chaotic and overwhelming. (*Given the gift of sight and insight will follow*, *New Scientist*, 15 September 2015)

The early point of Harold Lasswell with regard to policy makers could be made for all those not numerate, within and outside the research community:

> Why do we put so much emphasis on audio-visual means of portraying goal, trend, condition, projection, and alternative? Partly because so many valuable participants in decision-making have dramatizing imaginations ... They are not enamoured of numbers or of analytic abstractions. They are at their best in deliberations that encourage contextuality by a varied repertory of means, and where an immediate sense of time, space, and figure is retained (*The Transition Toward More Sophisticated Procedures*. In: *Computers and the Policy-making Community; Applications to International Relations*, 1968)

Despite widespread use of the vision metaphor, is there a case for acknowledging -- at least in metaphorical terms -- that strategic global governance is currently "visually impaired" in its confused and fragmentary comprehension of dynamics, as may be variously discussed (*Dynamic Transformation of Static Reporting of Global Processes: suggestions for process-oriented titles of global issue reports*, 2013; *From Statics to Dynamics in Sustainable Community: navigating through chaos by playing on polarities as attitude correctors*, 1998)? Is it even possible that global governance could be explored as currently constrained by a degree of equivalence to autism -- or even with characteristics of Alzheimer Syndrome?

Collective amnesia: As argued with respect to *Societal Learning and the Erosion of Collective Memory* (1980), is there not a striking parallel between the many attempts by the UN Secretary General to communicate to world society the urgency of our present situation and the following fictional account by Doris Lessing of an analogous situation with respect to the encounter of a "galactic development officer" and a decision-maker on a developing planet?

> To say that he understood what went on was true. To say that he did not understand -- was true. I would sit and explain, over and over again. He listened, his eyes fixed on my face, his lips moving as he repeated to himself what I was saying. He would nod: yes, he had grasped it. But a few minutes later, when I might be saying something of the same kind, he was uncomfortable, threatened. Why was I saying that? and that? his troubled eyes asked of my face: What did I mean? His questions at such moments were as if I had never taught him anything at all. He was like one drugged or in shock. Yet it seemed that he did absorb information for sometimes he would talk as if from a basis of shared knowledge: it was as if a part of him knew and remembered all I told him, but other parts had not heard a word. I have never before or since had so strongly that experience of being with a person and knowing that all the time there was certainly a part of that person in contact with you, something real and alive and listening -- and yet most of the time what one said did not reach that silent and invisible being, and what he said was not often said by the real part of him. It was as if someone stood there bound and gagged while an inferior impersonator spoke for him. (*Re: Colonised Planet 5 - Shikasta*, 1979, pp. 56-57).

Interrelationship and potential significance of four polyhedral models

Carriers of integrative understanding: In the consideration here on spherically symmetrical forms, the argument is that these may serve to a higher degree as carriers of understanding -- otherwise held to be fragmented and disorganized, as previously discussed (*Spherical Configuration of Categories -- to reflect systemic patterns of environmental checks and balances*, 1994). This is consistent with the remarkable philosophical review of orbs, globes and spheres by Peter Sloterdijk (*Globes*, 2014), as providing new understanding of the current crisis of globalization. Essentially the original integrative inspiration of the intangible dimensions of orb and sphere -- as implied by the noosphere, and to a degree by dome -- is now essentially obscured by the geopolitical and economic tangibles of the globe, as widely represented and understood.

Spheres, orbs and the process of globalization: A remarkable philosophical framework is offered from a historical perspective by the magnum opus of Peter Sloterdijk (*Globes*, 2014) -- the second volume of a trilogy on *Spheres*. This is achieved by highlighting the original integrative inspiration of the intangible dimensions of orb and sphere -- as in noosphere -- now essentially obscured by the geopolitical tangibles of the globe, as these are widely represented and understood. The manner in which this is implied in the experience of domes is of relevance -- especially given their value in religious architecture.

For example, little is otherwise said of the understanding of axiosphere, as variously explored (Leonid Stolovich, *On the Concept of 'Axiosphere'*; Maria Lebedko, *Axiosphere: the linguistic representation of value concepts in American and Russian cultures*, *American Studies International*, 41, 2003, 1/2; Arkadiusz Dudziak, *The Role of Created Anthropological Situations in Forming the Axiosphere of Audiovisual Social Advertising*). Of relevance is a chapter on *The Overman and the Evolutionary Axiosphere* in the study by William Plank (*The Quantum Nietzsche: the will to power and the nature of dissipative systems*, 2001).

As described, *Spheres* is about "spaces of coexistence", spaces commonly overlooked or taken for granted that conceal information crucial to developing an understanding of the human and hence a deeper understanding of globalization. Sloterdijk analyzes spheres where humans try but fail to dwell and traces a connection between vital crisis (e.g., emptiness and narcissistic detachment) and crises created when a sphere shatters.

Globalization in an historical context: In reviewing the evolution of morphological models of orb and globe, Sloterdijk argues that all previous statements about globalization have suffered from shortsightedness. For him, globalization begins with the ancient Greeks, who represented the whole world through the shape of the orb. With the first circumnavigations of the earth, the orb was replaced by the

globe. This second globalization is currently giving way to the third, as the general virtuality of all conditions leads to a growing spatial crisis -- framed by the fuzziest understanding of sphere of interest, sphere of influence, sphere of action or sphere of concern.

It is within this context that there is concern from an environmental perspective with the tangibles of biosphere, hydrophere, geosphere, atmosphere and ionosphere, for example. Whilst great importance is associated politically with intangible spheres of influence, reference to "cultural sphere" is rare. One exception is the focus of the Max Planck Society (*Cultural Spheres: formations, transformations and interactions in a historical perspective*, 2010). There is widespread reference to cyberspace -- and even to hyperspace, a multidimensional hypersphere or a multiverse as the locus of increasing human interaction (Clifford A. Pickover, *Surfing Through Hyperspace: understanding higher universes in six easy lessons,* 2001; John D. Barrow, *The Book of Universes: exploring the limits of the cosmos*, 2012). However the integrative psychosocial nature of that space remains elusive -- in cognitive terms, as can be explored (*Hyperspace Clues to the Psychology of the Pattern that Connects*, 2003)

Understandings of the integrative "globality" of globalization can be challenged for that omission, despite references to global citizenship (*Future Generation through Global Conversation -- in quest of collective well-being through conversation in the present moment*, 1997). Hence the interest here in geometry as offering powerful insights into globality of psychosocial significance (*Metaphorical Geometry in Quest of Globality -- in response to global governance challenges*, 2009).

Cognitive order in space as order in cognitive space

Cognitive implications of the organization of space: With respect to Sloterdijk's concern, relevant author's cited (Critchlow, *Order in Space*, 1969; Fuller, *Synergetics: the geometry of thinking*, 1975; Alexander, *The Nature of Order*, 2003; Young, *Geometry of Meaning*, 1976) only imply the cognitive relevance of their arguments for the organization of space. Young is perhaps an exception, as with Critchlow's later work. Whilst Fuller is indeed famed for his work on domes, this does not translate into Sloterdijk's concern, as separately argued (*Geometry of Thinking for Sustainable Global Governance: cognitive implication of synergetics*, 2009). A similar point can be made with respect to Alexander's later consideration of *Harmony-Seeking Computations* (2009), as separately reviewed (*Harmony-Comprehension and Wholeness-Engendering: eliciting psychosocial transformational principles from design*, 2010).

The challenge was strangely highlighted by the slogan promoted at various UN Earth Summits: *Think Globally, Act Locally* -- which can be reframed in terms of its polyhedral implications (*Configuring Globally and Contending Locally: shaping the global network of local bargains by decoding and mapping Earth Summit inter-sectoral issues*, 1992). As implied by Fuller, polyhedra are indicative of contrasting styles or modalities of thinking globally.

Living in a cognitively "built environment": Unfortunately it can be argued that through conventional explanation, including the geometrical modality (however it may be admired), there is a sense in which it engenders a "built environment" in cognitive terms. This process is only too well echoed in the global proliferation of concrete structures. This occurs at a time when globality calls for thinking otherwise in order to engage more fruitfully with nature.

The nature of "otherwise" is highlighted by the extent to which engagement with the environment (through its development), reflects the mindset of building -- even when reframed as "gardening". There is little appreciation of skills which would render the hand of the "gardener" undetectable -- as cultivated to a degree in Zen temple gardens, for example.

Spherical configuration of concepts: As indicated in the introduction, beyond the technical proof of concept, **the interest of the various animations relates to their capacity to carry cognitive and symbolic content**. This is usefully illustrated in the case of the spherically symmetrical Platonic solids, each constructed with one of the regular polygons (triangle, square and pentagon). The point to be made is **the remarkable tendency to organize the categories of human endeavour in terms of sets of very limited size**, as discussed separately (*Representation, Comprehension and Communication of Sets: the role of number*, 1978; *Patterns of N-foldness: comparison of integrated multi-set concept schemes as forms of presentation*, 1980).

The issue meriting exploration is the degree to which appropriate combinations of such sets engender conceptual structures of higher order -- characterized by 3-dimensionality, as previously indicated (*Spherical Configuration of Categories -- to reflect systemic patterns of environmental checks and balances*, 1994). The Archimedean polyhedra suggest the possibility of unique combinations of 3-fold, 4-fold, 5-fold, 6-fold, 8-fold and 10-fold sets of categories -- with cognitive implications as yet to be explored.

It is then of interest the extent to which thinking, notably that distinguishing social groups, may be characterized by preferences for particular N-fold combinations of categories -- and an avoidance of other patterns. Curio sly significant is the fact that that globability can only be implied by spherically symmetrical polyhedra -- but to a greater degree by the semi-regular 12 Archimedean polyhedra than by the 5 Platonic polyhedra. In both cases it is the vertices which define that globality (or is defined by them).

A further peculiarity that has proven to be fundamental to the navigation of the globe min practice derives from the properties of the so-called Pentagramma Mirificum (*Global Psychosocial Implication in the Pentagramma Mirificum: glues from spherical geometry to "getting around" and circumnavigating imaginatively*, 2015). With respect to navigation of the psychosocial globe, the nature of the analogue remains to be explored.

Enabling comprehensibility of governance challenges

Mining evolving datasets: Another motivating thread in this exploration is the challenge of mining large sets of data on relationships as generally understood -- whether of perceived (world) problems, advocated (global) strategies, (integrative) concepts, or groups and individuals (*Eliciting Memorable Spheres and Polyhedra from Hyperspace Integrative connectivity of problems, strategies, themes, groups or people*, 2015). The extensive networks of such data are notably analyzed as a feature of the data sets of the online *Encyclopedia of World Problems and Human Potential*. The particular focus is on detecting loops relating seemingly disparate entities

(*Feedback Loop Analysis in the Encyclopedia Project*, 2000).

Considerable progress has been recently made in this respect by Tomas Fulopp and Jacques de Mévius (*Loop mining in the Encyclopedia of world problems*, 2015), as reported at the conference on Futures Studies Tackling Wicked Problems (Turku, 2015).

Loop interlocking: In the light of these efforts, the concern here is with the issue of how to render memorable and communicable the connectivity which emerges from such analysis. The concern is partially highlighted by possible responses to information overload (*Optimizing Web Surfing Pathways for the Overloaded: polyhedral insights from the travelling salesman problem of operations research*, 2015).

The further question is whether loop interlocking effectively takes particular polyhedral forms -- thereby enabling a higher order of comprehension of their systemic significance (*World Problem Loop Interlocks*, 2000). Such interlocking corresponds to the geometry of great circles in which spherically symmetrical polyhedra are embedded (*Eliciting Memorable Spheres and Polyhedra from Hyperspace: Integrative connectivity of problems, strategies, themes, groups or people*, 2015; *Spherical Configuration of Interlocking Roundtables: Internet enhancement of global self-organization through patterns of dialogue*, 1998).

Cognitive constraints in pattern recognition: Of further interest with regard to the capacity to recognize such patterns, notably through the symmetry of polyhedra, is the cognitive perspective offered by George Lakoff and Rafael E. Nunez (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2000).

The question is how do degrees of symmetry offer comprehension of higher orders of meaning, as challenged by such extremes as the so-called Monster Group which emerged from moonshine mathematics (*Potential Psychosocial Significance of Monstrous Moonshine: an exceptional form of symmetry as a Rosetta stone for cognitive frameworks*, 2007; *Dynamics of Symmetry Group Theorizing: comprehension of psycho-social implication*, 2008).

Distinction markers in discourse: As indicated in the introduction, another theme of relevance is the manner in which the lines -- characteristic of polyhedral edges -- can be used as markers of distinction, as in concern with a calculus of indications. Of interest is how any pattern of agreement and disagreement might be dynamically configured, as discussed earlier in relation to climate change (*Enhancing Strategic Discourse Systematically using Climate Metaphors: widespread comprehension of system dynamics in weather patterns as a resource*, 2015; *Crises framed by weather metaphors*, 2015).

Somewhat ironically, the dynamic configurations, explored in the case of the 64-edged drilled truncated cube, are reminiscent of the traditional manner in which the *I Ching* was consulted using a yarrow stick ritual (*Probabilities with coins and yarrow stalks*, 2015).

Meaninglessness? In the desperate quest for universal consensus, the challenge of climate change highlights the relation between comprehensibility and meaninglessness. This can be succinctly stated as: ***Unless it is comprehensible, it is meaningless -- most notably to the average individual.***

Science, like the religions it claims to supercede, is remarkable for its definitive articulation of meaning in its own terms. The claims made are especially remarkable for their assumed irrelevance of whether articulation is meaningful to the "ignorant", or to those variously cultivating beliefs held to be "erroneous" or "obsolete". Characteristically, these are regularly caricatured as "footloopery" by the *New Scientist* journal.

As with religion, science is also remarkable for framing the responsibility of government with respect to remedial action -- most obviously in the case of climate change. Virtually no attention is devoted to the reasons for which action is not effectively undertaken (*Recognizing the Psychosocial Boundaries of Remedial Action*, 2009). A notable reason is the systematic deprecation of the psychosocial sciences by the natural sciences and the tendency of the former to imitate the latter. Science of course has other priorities (*Challenges More Difficult for Science than Going to Mars -- or exploring the origins of the Universe or of Life on Earth*, 2014).

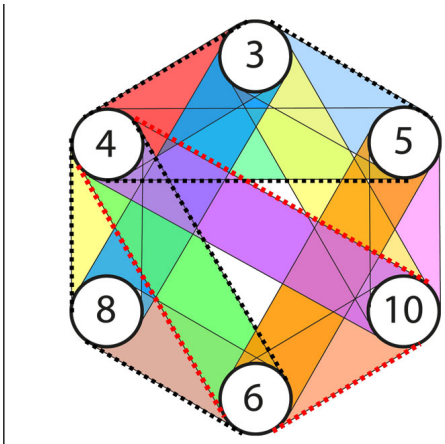
Unknown negligence: The challenge for governance is the manner in which science, like religion, negligently frames the unknown to its particular advantage. This takes the form of assertions that can only be challenged by those complicit in a mindset protective of its own status and methodology. The consequence is usefully framed in terms of the emergence of surprises, necessarily unforeseen and disruptive, as argued by Nassim Nicholas Taleb (*The Black Swan: the impact of the highly improbable*, 2007).

One defensive response pf governance is usefully highlighted by the notorious "poem" of Donald Rumsfeld in his capacity as US Secretary of Defense, regarding the unknown -- as discussed separately (*Unknown Undoing: challenge of incomprehensibility of systemic neglect*, 2008)

Viable collective discourse?

One of the merits of the 12-fold array of Archimedean polyhedra -- a focus of one animation -- is that it offers an encoding of patterns of categories and modalities through the combinations of polygons distinguishing them -- as experimentally indicated below. The strange (and highly controversial) challenge of the 13th is also potentially highlighted. The schematic is designed to suggest the contrasting forms of meaningful discourse possible due to 12 (or 13) preferences for concept clustering -- potentially to be understood in terms of memetic structure.

Schematic indicative of 2-fold mutuality in discourse (the 3-fold, shaded in table, is framed by dotted lines)	Polyhedra	Polygon type (and number/polyhedron)					
		3	4	5	6	8	10
	Truncations of octahedron						
	truncated octahedron (14 polygons)		6		8		
	cuboctahedron / vector equilibrium	8	6				



(14)						
truncated cuboctahedron (26)		12		8	6	
snub cube (38)	32	6				
rhombicuboctahedron (26)	8	18				
truncated cube / hexahedron(14)	8				6	
Truncations of icosahedron						
truncated icosahedron (32 polygons):			12	20		
icosidodecahedron (32)	20		12			
truncated icosidodecahedron (62)		30		12		12
snub dodecahedron (92)	80		12			
rhombicosidodecahedron (62)	20	30	12			
truncated dodecahedron (32)	20					12
Truncated tetrahedron (8 polygons)	4			4		
Total polyhedra with polygons of a given type	9	7	4	5	2	2

Metaphorically the patterns might perhaps be compared to reference to time signature in music, with its contrasting forms (3/4 time, etc) and the challenge of being "in tune" or "in sync". The table might be well be read as an indication that 9 of the 12 speak 3-speak, with only 2 speaking 10-speak -- with the challenging implications for integrative 12-speak (*12 Complementary Languages for Sustainable Governance*, 2003; *Enabling a 12-fold Pattern of Systemic Dialogue for Governance*, 2011).

Each mode of speaking then suggests the existence of 3-fold, 4-fold, etc cognitive windows on reality". Any process of "truncation" is then of particular significance. These are the "voices" of global discourse (*Enactivating Multiversal Community: hearing a pattern of voices in the global wilderness*, 2012). Multi-part singing offers a particular clue to how these may work together.

An interesting absence from the symmetry of the schematic suggests the problematic nature of 5/8 discourse -- as might characterize that between "the Pentagon" and those of "alternative persuasion". Reliance is then required on the mediating function of complementary modes. As the totals suggest, the highest preference is for clusters of 3, with few favouring 8 or 10 (and with those notably associated with the more complex polyhedra).

Exploiting the metaphor, it is appropriate to recognize that the Nobel Knights, who might be appropriately gathered together at any round table, can typically not afford to be seen by their admirers to be seated with the others (*Implication of the 12 Knights in any Strategic Round Table*, 2014).

Recognition of correspondences, parallels and symmetries

Parallelism: As noted with respect to the drilled truncated cube, perspectival parallelism was provisionally used to limit transformations to patterns of lines between which this obtained -- recognizing the manner in which the transformations then followed a distinctive cycle according to the type of transformation within the polyhedron. Whilst geometrical parallelism can be readily recognized in its more obvious forms, it is less evident how this can be determined systematically. Fortunately the Stella Polyhedron Navigator identifies parallels, as depicted above.

Detection of correspondences and parallelism is of importance in a number of information-related domains (Brian Walshe, et al, *A Comparison of Complex Correspondence Detection Techniques*, 2012; Dominique Ritze, et al, *A Pattern-based Ontology Matching Approach for Detecting Complex Correspondences*, 2009; Alberto Apostolico, et al, *Parallel Detection of all Palindromes in a String*, 1993; Zai-Sheng Wu, *Parallel Detection of Protein and Nucleotide Sequences*, 2011).

There is an extensive literature on parallelism and parallel detection in relation to computer applications, whether to increase efficiency or to avoid inefficiencies (Sungpack Hong, et al, *Technical Report: On Fast Parallel Detection of Strongly Connected Components (SCC) in Small-World Graphs*, 2013; Ken Kennedy, et al, *Maximizing Loop Parallelism and Improving Data Locality via Loop Fusion and Distribution*, 1993).

Cognitively parallelism can be explored in terms of correspondences, notably as in aesthetic associations, as well as resonance effects understood in musical terms (*Theories of Correspondences -- and potential equivalences between them in correlative thinking*, 2007; *Openness and Closure in Pattern Language Geometry versus Resonance*, 2012; *Complementarily of Qualitative Distinctions in Resonance*, 2013).

Of relevance to this argument is the question of how parallels between qualitative information derived from multiple senses reinforce each other to enable some form of cognitive fusion. Whilst this is relevant to individual cognition, it has implications for group decision-making -- and ultimately for the coherence of operations of a global brain however that is envisaged.

Of interest is the argument of Wilson Harris (*Adversarial Contexts and Creativity*, *New Left Review*):

> The detection of parallels woven into the evolving weave and cycle of fiction can be exciting in its illumination of profoundest unity of the human spirit.

Animation commonality: cubes and 12-foldness: Of particular interest is the commonality between the four disparate animations, and the significance variously associated with them. This is evident with respect to the cube central to all of them and the pattern of 12-foldness characterized by it and otherwise. As discussed separately, it is profoundly curious that society attributes particular significance

to 12-foldness (*Checklist of 12-fold Principles, Plans, Symbols and Concepts: web resources*, 2011). **** K insert polyhedra

This is especially evident in the organization of round tables and juries. This proclivity can be explored with respect to global governance (*Eliciting a 12-fold Pattern of Generic Operational Insights: Recognition of memory constraints on collective strategic comprehension*, 2011; *Imagining Attractive Global Governance: questioning possibilities and constraints of well-boundedness*, 2013; *Enabling a 12-fold Pattern of Systemic Dialogue for Governance*, 2011).

The pattern of course has its highly valued symbolic echoes (12 Apostles, 12 Imams, 12 Tribes of Israel, the Gods of Olympus, transformed into those of imperial Rome). **Missing from such widespread appreciation is any sense (beyond indicative myth) of the distinctive dynamics between those so assembled**, as discussed separately (*Implication of the 12 Knights in any Strategic Round Table*, 2014; *Generic Reframing of the 12 Tribes of "Israel"*, 2009).

Viewpoints enabling pattern recognition, comprehension and memorability

It could be considered remarkable that a tragically divided society should be characterized by contrasting "points of view" or "viewpoints" -- offering distinct perspectives, as in the case of global strategic issues like climate change.

However the most remarkable feature of this condition is the total lack of capacity to consider the perspectival geometry implied by such multiple viewpoints. Interest is limited to declaration that alternative viewpoints are simply misguided, if not dangerously so -- possibly even a threat to collective security.

Learnings associated with distinguishing sets of viewpoints: The process of elaborating models in three dimensions offers unexpected learnings, as proved to be the case for those in the annex to this paper. 3D software is designed to enable user manipulation of any model -- exploring a wide variety of points from which it may be viewed. *Viewpoints are typically the most important mechanism for an author to suggest scene navigation to a user* (*X3D Scene Authoring Hints*). The communication challenge is to build into the display a set of viewpoints which are most striking and of greatest potential interest to circumvent user impatience with unfamiliar software.

The model building process thus offers a remarkable metaphor of that with respect to any conceptual or strategic model. From how many perspectives can a model be fruitfully viewed?

Viewpoint insights from architectural modelling: The question has been remarkably explored from a non-geometrical perspective through the open source TRAK methodology interrelating 22 viewpoints. is a general enterprise architecture framework for systems engineers. The 22 architecture viewpoints are grouped into 5 perspectives. Each viewpoint belongs to a single perspective and specifies a singleview(type). Each viewpoint specifies what sets of types of architectural description element and relationships (tuples) can appear.

The architectural description element types and relationships are specified by the TRAK metamodel. The 5 perspectives are: enterprise (3 viewpoints), concept (5), procurement (3), solution (7), and management (4). The set of viewpoints is contrasted with those of other methodologies -- DODAF 2.0 (with 52 views/models), MODAF 1.2.004 (47 views) and NAF 3.1 (49 subviews).Although such methodologies have an architectural bias, curiously they seemingly make no use of 3D software to address the challenge of distinguishing and interrelating viewpoints. Rather as with systems development generally, they make use of 2D systems diagrams.

Viewpoint insights from virtual reality modelling: The models explored in the annex offered the opportunity to identify a set of viewpoints of the patterns of animations associated with relatively simple polyhedral geometry -- using well-developed 3D software and technical norms for specifying viewpoints in virtual reality.

Having spent many hours many hours endeavouring to adapt such well-defined techniques to produce 8 viewpoints of the corners of a simple cube (through to its centre), the author is obliged to conclude that the challenge of providing a coherent set of viewpoints for any conceptual model is not as obvious as it may seem, or be claimed to be.

Viewpoint definition: The parameters that may be used in defining a viewpoint in virtual reality thus merit exploration as indicative of constraints in defining viewpoints of any model. As pure geometry, the three axes (X,Y and Z) and the three rotations (yaw, pitch and roll) are together referred to as the six degrees of freedom. Location and orientation of objects in 3D space are determined by these six pieces of information, as separately indicated (*The Virtual Reality Modeling Language*, 1996; *The Annotated VRML Reference Manual*, 1997). The parameters used therefore include:

- ***position***, in terms of the X, Y and Z coordinates, although it is noteworthy that contrasting coordinate systems may be used. For example the coordinate system of the Virtual Reality Modelling Language is different from the MATLAB and Aerospace Blockset coordinate systems. VRML uses the world coordinate system: the y-axis points upward and the z-axis places objects nearer or farther from the front of the screen. Understanding the coordinate system is important when you interact with different coordinate systems.
- ***orientation*** determines the direction at which the user is looking. The technical descriptions of this seemingly simple concept are of the greatest obscurity. It is described as specifying "*a rotation relative to the default orientation which points along the Z axis in the negative direction*". In other words: "*In the default position and orientation, the user is on the Z-axis looking down the -Z-axis toward the origin with +X to the right and +Y straight up*".

Implications for viewpoints associated with strategic perspectives: In metaphorical terms the issue is then how any observer is to be understood as variously positioned within a "coordinated" framework. More problematically, even though located at a well-defined position within that framework, how best to define the direction of observation? This may well include an orientation that does not include the model in question. The issues are obvious with respect to models readily appreciated or deprecated as "left-wing", "right-wing", "abstract", or "concrete". The example of a dog looking at the owner's pointing finger, rather than in the direction pointed, comes

to mind.

Curiously editing facilities in virtual reality does not provide a remarkable degree of assistance in resolving issues combining position and orientation -- especially for ill-informed model developers. In the seemingly simple situation of de terming viewpoints of a cube centered at the origin, learning included exposure to the extremes of a *View Position Orientation Prototype* and a suggestion to use a standard following formula from spherical geometry.

Of further potential relevance to defining and distinguishing viewpoints in psychosocial situations, the technical specifications also include:

- ***centerOfRotation***: specifies center point about which to rotate a user's eyepoint under certain conditions of navigation
- ***fieldOfView***: the preferred minimum viewing angle from the viewpoint in radians. Small field of view roughly corresponds to a telephoto lens, large field of view roughly corresponds to a wide-angle lens. Inappropriate use of this parameter may result in considerable distortion of perspective.
- ***jump***: specifying whether transition to this viewpoint is instantaneous or by smooth adjustment from any another viewpoint
- ***set_bind***: specifying whether the viewpoint is to be considered primary in any set of viewpoints, beyond superceding any default viewpoint
- ***description***: a means of offering users a distinctive description of the viewpoint in contrast with others
- ***DEF***: whereby a unique name by which this viewpoint may be referenced in the navigation of the model

It is striking to recognize that so little effort is made to benefit from this articulation to enable more fruitful navigation of psychosocial models. How are the "viewpoints" of this at any strategic round table to be distinguished whether by those seated there or by those seeking to comprehend their debate?

Viewpoint touring patterns: Virtual reality viewers also tend to offer the facility of exploring the predefined viewpoints by stepping sequentially through the set. The set can therefore be structured as a tour. This suggests further possibilities of organizing the viewpoints in a pattern such as to enable some form of higher order meta-systemic reflection. The question is the insight to be derived from that pattern as a whole -- as suggested by the techniques of programmed learning. Curiously touring through a set of "viewpoints" is a major feature of tourism -- with the cognitive challenge of how that experience can be meaningfully integrated, especially if some of the views are unusual.

The TRAK meta-model of 22 viewpoints of a project then suggests the question of how any touring pattern can be most fruitfully organized and how this might apply to a global strategy in response to climate change. In that case, in contrast to the 64-edged drilled truncated cube, these might be mapped onto the limited number of 22-edged polyhedra (sphenocorona, augmented hexagonal prism). Polyhedral mapping also suggest consideration of sets of vertices as potential viewpoints from which other viewpoints within the pattern could be viewed. Again a limited number of unusal structures could be explored as a source of integrative insight, namely duals of the 22-faced parabiaugmented dodecahedron, metabiaugmented dodecahedron, and great dodecahemicosacron.

Cognitive implication in configurations of cycles of correspondences

Recognition of dynamic patterns: The current emphasis on recognition of significant viewpoints and patterns of interest is curiously on the stasis and invariance implicit in both cases. However cognition is remarkably sensitive to recognition of dynamic patterns, most notably exemplified through the aesthetics of music, song and poetry. This has encouraged exploration of sonification of data streams by the natural sciences, most notably astrophysics and particle physics.

This capacity -- even in the most scientifically "ignorant" -- is readily recognized in the striking animations of parallelism (as presented in the annex). These point to the possibility of comprehension of higher degrees of complexity -- potentially of the requisite complexity for governance in responding to so-called wicked problems in cybernetic terms.

There is an appropriateness to the possibility that recognition, comprehension and memorability of higher degrees of complexity should be more widely enabled through music, song and poetry (***). This follows from their use to this end in many traditions (including the religious) -- but only to the most limited and deprecated degree in science (** pathways).

Contradiction inherent in "global plans": The fundamental implication is that any "global plan" may be as much a contradiction in terms as as a "spherical plane". Initiatives of **global governance cannot be successfully implemented through any one plan** -- as indicated by the multiple planar projections proposed to enable adequate comprehension of globality (*List of map projections*). In this respect it is curious to note the importance given by Buckminster Fuller to the Dymaxion Map (with animation) based on the the cuboctahedron, one of the semi-regular Archimedean polyhedra. The advantage claimed for this copyrighted projection was the relative lack of global distortion compared to that of other projections.

Minimally this suggests the need for multiple interlocking plan(e)s, as discussed separately (*Spherical configuration of interlocking round tables: Internet enhancement of global self-organization through patterns of dialogue*, 1998). Such interlocking can be most readily understood in cyclic terms -- through the cycles fundamental to the geometry of spherically symmetrical polyhedra.

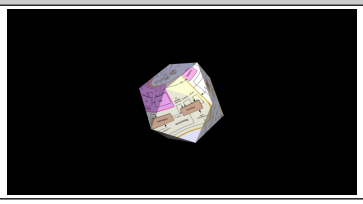
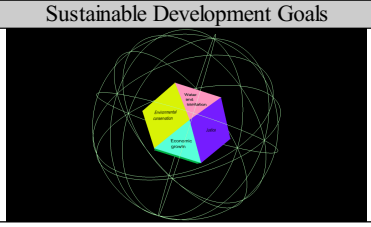
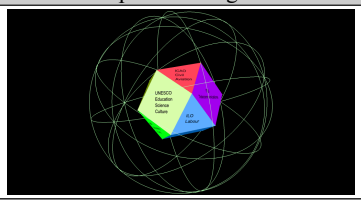
Minimizing systemic distortion through cuboctahedral global mapping: Fuller had considerable interest in world government in relation to resource management -- later embodied in a World Game, but originally recognized through a spaceship metaphor (*Operating Manual For Spaceship Earth*, 1968).

No consideration seems however to have been given to the possibility that **the 14 faces of the cuboctahedron could be used to map a set of 14 sectoral "plans"** (each necessarily "2-dimensional" in perspective), together deemed essential to global governance. Through the coordination it offers, the polyhedral mapping then serves as a means of minimizing the global distortion associated with the individual

plans (each claiming misleadingly to be global in scope).

The widely disseminated animation of the Dymaxion Map -- between planar and global perspectives -- could therefore be used as a provocative indication of the currently missing global mapping of systemic issues in a variety of domains, as previously argued (*Mind Map of Global Civilizational Collapse: why nothing is happening in response to global challenges*, 2012).

Suggestive use of the Dymaxion mapping style for global systems integration
(animations prepared with the aid of Stella Polyhedron Navigator)

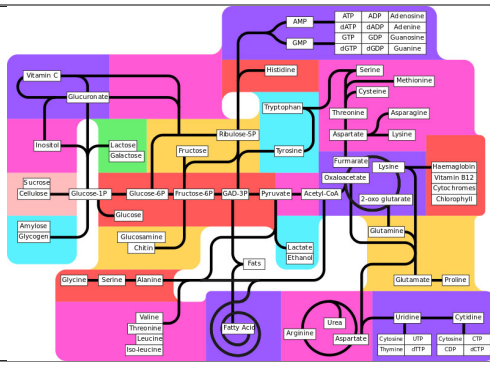
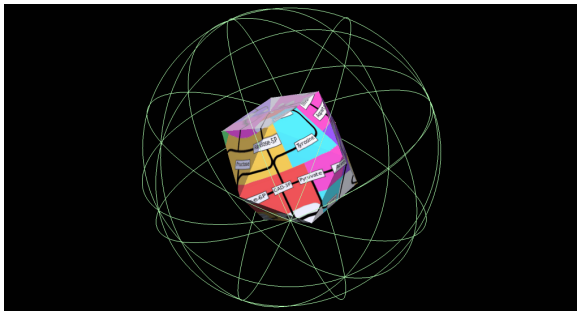
TRAK Meta-model	Sustainable Development Goals	UN Specialized Agencies
		

This is especially relevant at a time in which Sustainable Development Goals are being reframed as a successor to the Millennium Development Goals. -- with recognition of the links to issues of climate change having been specifically recognized. As previously, the goals are however understood as disparate and systemically unrelated -- being presented as what amounts to a "laundry list". As of August 2015, there were 169 proposed targets for these goals and 304 proposed indicators to show compliance. This minimally ordered complex of recommendations recalls those of articulated in the 700-page *Agenda 21* (1992) by an earlier summit.

Little attention seems to have been accorded to remedial capacity indicators (*Remedial Capacity Indicators Versus Performance Indicators*, 1981). As noted above the issue is highlighted by the systemic circumvention of regulatory procedures by one of the most esteemed multinational corporations -- long upheld as an example to others (Stefan Bössner and Harro van Asselt, *Tainted Fahrvergnügen: what the Volkswagen scandal tells us about achieving climate and clean air goals*, *The Huffington Post*, 10 October 2015). Other manufacturers have now been shown to emit significantly more pollution than in regulatory tests (Damian Carrington, *Four more carmakers join diesel emissions row*, *The Guardian*, 9 October 2015).

Cyclic reframing: This argument implies what could be understood as a cyclic revolution through which collective and individual identity is reframed more fundamentally in cyclic terms (*Emergence of Cyclical Psycho-social Identity: sustainability as "psyclically" defined*, 2007). More provocatively, it could be said that human cognitive has an implicit understanding of such cycles, as evident from the pattern of major metabolic pathways -- to be significantly contrasted with those derived from metabolic network modelling.

Metabolic pathways

Standard map of Metabolism pathways (partly labeled) by Fred the Oyster. Licensed under CC BY-SA 4.0 via Commons.	Metabolic pathway map suggestively projected onto a cuboctahedron
	

Beyond dimension and dissension to tridimensionality and...? Curiously there is extensive reference to dimensions and dimensionality, but with little consideration of tridimensions and tridimensionality -- even though three dimensions are most commonly recognized, notably by science. The table above is also indicative of the strategic importance of "three-speak", explored more generally in terms of triangulation (*Triangulation of Incommensurable Concepts for Global Configuration*, 2011).

This focus on dimensions merits careful attention at a time when the UN Climate Change Conference is especially preoccupied with ensuring that CO2 emissions go "***down***" globally in order to ensure that currently "***rising***" global temperatures go "***down***". Many global initiatives are focused on ensuring that particular indicators go "***down***" (child mortality, starvation, violence, substance abuse, etc) and that others go "***up***" (literacy, conservation, etc).

There is of course fundamental disagreement retarding such matters -- strangely characterized by ***di***vision, ***di***ssension, and ***di***lemma. In the quest for consensus these are considered fundamentally regrettable -- despite token recognition of the value of ***di***versity. Any reference to the value of ***di***alectics, as one key to informed ***di***scourse and ***di***alogue is marked by disapproval as characterizing a deprecated political philosophy.

Given the challenge of climate change, why is any concern with tridimensions the focus of so little attention? It is however striking to note the preoccupation of various initiatives under that banner -- most notably that with a focus on resilience.

Science empowers its own unconstrained preoccupation with multidimensionality -- extending to the identification of the fundamental

symmetry of the so-called Monster Group defined in terms of 196883-dimensions. Such abstract dimensionality is strangely divorced from any cognitive experience, notably that of 3-dimensionality (up/down, forward/backward, right/left). This is especially curious in that such higher dimensionality is variously claimed to be fundamental to the nature of the reality within which humans live and move and have their being -- and with which it could be usefully assumed they have an especially fundamental cognitive engagement.

The point to be stressed is that **comprehensibility and memorabilia require human recognition of pattern -- to which science is sensitive only in theory, but not in practice**. Reliance on scientific methodology with respect to the strategic preoccupations of governance -- as in the case of climate change -- fails to benefit from new insights into the comprehensibility which would render credible in practice the global strategies of requisite complexity.

- poems / refrain / reinforcement
- cyclic revolution
- global plan(e) vs interlocking plan(e)s -- paper
- cant do global with a plan -- as indicated by the variety of planar projections proposed

Cyclic dimensions and dimensions as cycles? The presentation of the drilled truncated cube animation (annex) relied initially on the the role of parallelism. However this enabled only a degree of comprehensibility and memorabilia. The further step was the recognition that the animation of parallelism could be understood and represented as interlocking cycles. Memorable comprehensibility of higher degrees of order could thus be explored through cycles -- patterns of cycles.

This raises the question as to whether dimension is not more fruitfully understood experientially in cyclic terms -- up-and-down, coming-and-going, left-and-right, now-and-then. The theoretical appreciation of the dimensional extension of up or down to infinity, for example, is appropriately constrained by the sense that in practice "what goes up, must come down" in an inherently cyclic process -- as with going to the left or to the right. In this sense dimensions merit appreciation as cycles rather than as static abstractions.

Cyclic experience: This re framing also gives a degree of experiential reality to the feedback loops characteristic of systemic organization -- and the challenge of wicked problems. Furthermore, this re framing enables such cyclic loops to be explored as wheels with all that may then imply. Loops as wheels? Such a cyclic revolution in cognitive terms then suggests new ways of thinking about so called vicious cycles -- as in the case of violence. It raises the question as to whether the focus on "breaking" such cycles is necessarily the most fruitful (*Dysfunctional Cycles and Spirals: web resources on "breaking the cycle"*, 2002). Could strategic "round tables" be more appropriately understood as "wheels" -- consistent to a degree with the symbolism of Rotary International and its associated Inner Wheel Club, or that of Round Table?

Everyone is thus free to imagine themselves as the driver of a cognitive vehicle in which they are seated -- effectively in the "hot seat", if not a "holy seat" on which they are enthroned. The metaphor offers the further suggestion of the ability to control remotely an unmanned vehicle, whether a model airplane or a drone. Any experiential disconnect is highlighted by the this framing. As with the Pope, one's conscience can be understood as a "back seat drivers"

Of interest, in the light of the preoccupation of fundamental physics with 10 to 26 dimensions, is where and how these extra dimensions are located. For physics this is explored in terms of compactification (Matt Williams, *A Universe of 10 Dimensions*, *Universe Today*, 10 December 2014). In string theory, compactification is a generalization of Kaluza-Klein theory. It tries to conciliate the gap between the conception of our universe based on its four observable dimensions with the ten, eleven, or twenty-six dimensions which theoretical equations lead us to suppose the universe is made with. For this purpose it is assumed the extra dimensions are "wrapped" up on themselves, or "curled" up on Calabi-Yau spaces, or on orbifolds. The issue is how this might be recognized in comprehension by ordinary minds as is further discussed below

Models: M-theory as indicative of meta-modelling potential?

11 to 26 dimensions? This argument can be understood as about models and how reality is modelled -- especially the strategic reality of climate change at this time. The obvious difficulty arises from the multiplicity of systemically unrelated models, the elusive significance of any potential meta-model, and the challenging complexity of the models deemed to be the most adequate for purposes of explanation.

Beyond the complexity of the many models now elaborated -- including the TRAK approach to meta-modlelling (cited above) -- there is the ultimate meta-model of physics known as M-theory notably elaborated from 1995 by Edward Witten. This followed a period in which physicists looked to eleven-dimensional supergravity in the hope that it might provide an elusive superunified theory superceding the focus on supergravity. M-theory notably describes supermembranes and superfivebranes, subsuming string theories, with 11-dimensional supergravity as a lower limit (M. J. Duff (Ed.), *The World in Eleven Dimensions: supergravity, supermembranes and M-theory*, 1999). It claims to unify all consistent versions ofsuperstring theory.

String theory is of course beyond the comprehension of most, although all are encouraged to believe in its meaningfulness as an explanation regarding the reality in which they live. The various superstring theories take that explanation to a new level -- beyond which lies M-theory. Although a complete formulation of M-theory is not known, the theory should describe two- and five-dimensional objects called branes. It is purportedly approximated by 11-dimensional supergravity at lowenergies. M-theory is not complete, but the underlying structure of the mathematics has been established and is in agreement with all the string theories. Furthermore, it has passed many tests of internal mathematical consistency.

As described by *Wikipedia*, in everyday life, there are three familiar dimensions of space: height, width and depth. Einstein's general theory of relativity treats time as a dimension on par with the three spatial dimensions; in general relativity, space and time are not modeled as separate entities but are instead unified to a four-dimensionalspacetime. In spite of the fact that the universe is well described by four-dimensional spacetime, there are several reasons why physicists consider theories in more dimensions. In some cases, by

modeling spacetime in a different number of dimensions, a theory becomes more mathematically tractable, and calculations can be performed by which general insights can be more readily gained. In string theory, spacetime is ten-dimensional, while in M-theory it is eleven-dimensional. Bosonic string theory envisages 26 dimensions. There is consderable international investment in experimental reactors, as at CERN, in order to explore such understanding -- and therefore meriting speculative exploration in its own right (*Dynamic Interrelationship of Symbols of Coherent Experiential Representation of Nonduality (DISCERN)*, 2008).

Requisite "dimensions" for global governance? If such are the advantages of M-theory -- with its requisite complexity -- it has to be asked what equivalent meta-models are explored with respect to global governance. Are equivalents to CERN, held to be engaging seriously with such complexity, to be recognized in large-scale simulations like the Living Earth Simulator Project (FuturICT)? How are their efforts to reconcile the multiplicity of theories of relevance to governance to be compared with the degree of reconciliation sought via M-theory? Especially intriguing are the insights expected from Watson -- the IBM artificial intelligence facility currently marketed? Its relevance with respect to issues of global governance and interfaith discourse, as may be speculatively explored (*Superquestions for Supercomputers: avoiding terra flops from misguided dependence on teraflops?* 2010).

A more vitally fundamental consideration is the issue of the comprehensibility of any such reframing, especially for those required to mandate global governance or to believe in the articulations of authority in managing their own survival in any increasingly challenging environment. If 11 or 26 dimensions are required for an adequate explanation of physical reality, what should any individual or group expect of an analogue of comparable adequacy? **Why is it so readily assumed that physical reality is more complex than psychosocial reality?**

How should "dimensions" then be understood in the reality of daily life -- about which physics claims such authoritative understanding in terms of 11-plus dimensions? There is of course the further factor that physics is far from having exhibited remarkable capacity to reconcile differences between the perspectives of its various competing schools of thought in practice. This might otherwise have been a valuable indication to those obliged to live in a world tragically marked by conflicting perspectives.

Elaborations of the set of 17 Sustainable Development Goals (or the 15 Millennium Development Goals which preceded them), suggest a degree of credibility in an 11-plus dimensional reality -- but with little effort to articulate or comprehend their co-ordination.

Should any analogue to "M-theory" for governance be understood in terms of "millennium", "metaphor", "meta", or in more formal terms? (*Sustaining Higher Orders of Policy Consensus through Metaphor: towards a new language of governance*, 1992; *Higher Orders of Inter-sectoral "Consensus": clarification of formal possibilities*, 1991; *Requisite Meta-reflection on Engagement in Systemic Change? Fiat, fatwa and world-making in a period of existential radicalisation*, 2015).

Exposure to dimensional complexity requiring belief by the incompetent? If those esteemed by society to exhibit intellectual competence of the highest order choose to articulate models based on 4-plus dimensions, how are those lacking that competence to frame their engagement with higher orders of the reality within which they are assumed to move and have their being? (*Engaging with Questions of Higher Order: cognitive vigilance required for higher degrees of twistedness*, 2004).

Given the relatively limited numbers collectively acknowledged to have such competence, there is a remarkable tendency to dissension between those who do ((Sean Carroll, *The Most Embarrassing Graph in Modern Physics*, 17 January 2013). At what stage **is it appropriate for those of lesser competence to elaborate their own models** -- in forms which enable comprehension which they find meaningful, however deprecated by their betters? The fundamental issue is then the credibility of those models to those who believe in them -- whatever the degree to which they may be deprecated as inappropriate, misguided or ill-informed, as notably charged by Alan Sokal (*Fashionable Nonsense: postmodern intellectuals' abuse of science*, 1999).

The argument can be taken further by associating it with the case for freedom of opinion, as articulated in the Universal Declaration of Human Rights. How is an opinion to be distinguished from a model -- by those for whom it frames reality, possibly unquestionably? Of related relevance is the role of time, considered so fundamental by physics. The half-life of facts and models is relatively limited (Samuel Arbesman, *The Half-life of Facts: why everything we know has an expiration date*, 2012), Why then should the modelling role of opinions be deprecated for their sustainability over time, or the manner in which they may be challenged from other perspectives? Physics is remarkable for giving credibility to the existence of entities of unimaginably short duration.

Collective dependence on belief: The issue of required belief goes beyond that made by science, and is traditionally exemplified by religion. The conflicts between religions, and those within them, call into question the authority they variously claim, and their deprecation and condemnation of those who do not subscribe to any particular set. As with the failure of interdisciplinary discourse, that of interfaith discourse offers an indication of the reality within which many are called to survive meaningfully in a time of crisis and catastrophe.

This pattern of authoritarian mindsets is of course echoed in political discourse with respect to global governance, as is notably evident in the case of issues which cannot be effectively discussed or "put on the table" without risk to careers and credibility (*Global Strategic Implications of the "Unsaid"*, 2003). In the case of climate change, this is most evident with respect to overpopulation, as discussed separately (*United Nations Overpopulation Denial Conference: exploring the underside of climate change*, 2009; *Lipoproblems: Developing a Strategy Omitting a Key Problem the systemic challenge of climate change and resource issues*, 2009)

Curiously the integrative insight of M-theory is framed as the epitome of a science which is totally unable to accept that others may have analogous modes of appreciation -- as with respect to homeopathy, astrology, or radical Islam (or radical Christianity). For science these are held to be "not even wrong". Typically that view would be reciprocated from alternative viewpoints.

Is the very existence of M-theory, and the significance accorded to it, indicative of the subtle nature of any meta-model with which people may well engage on their own terms -- whether consciously or unconsciously?

Arrogance as an analogue to gravity -- equally fundamental and mysterious

Gravity as a preoccupation of physics: Physics has devoted considerable attention to the mysterious role of gravity in the universe. It remains a mystery, although M-theory addresses the challenges of so-called supergravity.

The attention is exemplified by the work of John Archibald Wheeler on geometrodynamics -- an attempt to describe spacetime and associated phenomena completely in terms of geometry and forms of curvature. The term is a contraction of "gravitational electromagnetic entity of which the smallest was determined to be a toroidthe size of the Sun, but much more massive. As an extension of Einsteinn's theory of relativity, Wheeler elaborated the concept of a wormholeto describe hypothetical "tunnels" inspacetime, an understanding of the Universe as a wave function, as well as that of gravitational collapse (cf Carlos Pinheiro and F. C. Khanna, *Some Comments on Wheeler De Witt Equation for Gravitational Collapse and the Problem of Time*, 2011). More general significance has already been attributed to this perspective by philosophy (Adolf Grünbaum, *Geometrodynamics and Ontology*, *The Journal of Philosophy*, 1973).

Arrogance in psychosocial systems: Little attention is however accorded to arrogance in psychosocial systems, and specifically with respect to that associated with the promoters of particular models in which others are called to believe. A valuable exception with respect to arrogance and "cultural gravity" is extensively discussed by Rajiv Narang and Devika Devaiah (*Orbit-Shifting Innovation: the dynamics of Ideas that create history*, 2014). Another with respect to business cycles -- recalling the understanding of gravitational collpase -- is that of Michael Farr (*Avoiding the Arrogance Cycle: Think You Can't Lose, Think Again*, 2012). It has been a concern since its articulation as hubris in Ancient Greece (Ariston, *On Arrogance*; Michael Dewilde, *Hubris: The Psychological and Spiritual Roots of a Universal Affliction*; Valerie Tiberias and John D. Walker, *Arrogance*, *American Philosophical Quarterly*, 1998)

Of curious relevance to this argument is a commentary on a proposed revision by the American Physical Society of its 2007 statement on climate change (Arthur Smith, *The Arrogance of Physicists*, 13 October 2009). He remarks:

> But sometimes that arrogance and self-assurance and collection of intuitions lead us, or at least a few of us, astray. We forget that there are other smart people in the world, who have been thinking about their limited problem for a lot longer and perhaps have a deeper understanding than we give them credit for. We jump in with our simplified models and ideas and then wonder why they don't find them helpful. Or we too deeply trust the intuition of a colleague who has been often right before or who we trust for other reasons, but in a particular instance has not put in the effort to properly understand the problem, and ends up only embarrassing themselves, and us by association.

Arrogance undermining global initiatives: Associated issues of egotism are only a matter of anecdote in explaining the problematic failure of promising initiatives to reconcile conflicting perspectives. As an example of current relevance with respect to the Middle East, of the much awaited address by Vladimir Putin to the current General Assembly of the United Nations, *The Economist* chose only to cite:

> I am urged to ask those who created this situation: 'Do you at least realise now what you have done?' But I'm afraid that this question will remain unanswered, because they have never abandoned their policy, which is based on arrogance, exceptionalism, and impunity. (3 October 2015)

There is of course little difficulty in assembling equivalent accusations of arrogance with respect to the leadership of other countries and religions -- and between them. This is of particular relevance in the case of the USA and Israel:

- *We, the people of Israel, will pay for Netanyahu's arrogance* (*The Jerusalem Post*, 4 March 2015)
- *Silent Arrogance: Netanyahu at the UN* (*Foundation for Middle East Peace blog*, 1 October 2015)
- *Mysterious and 'arrogant' Vladimir Putin seeks Russia's return to status of world superpower* (*National Post*, 4 March 2014)
- *U.S. foreign policy founders on ignorance and arrogance* (*The Japan Times*, 27 March 2015)
- *Obama, Arrogance and the Entitlement Mentality* (*Patriot Update*, 5 June 2013)
- *A Perception of "Vatican Ignorance or Arrogance"* (*The Catholic Legate*, 13 October 2009)
- *Vatican Cites Obama's 'Arrogance' as He Moves to Fund Abortions Around the World* (*CNSNews*, 24 Janary 2009)

The fundamental role of this mindset therefore merits careful attention -- notably with respect to why it receives so little in the study of international relations, with some exceptions (Nancy Snow, *The Arrogance of American Power: what U.S. leaders are doing wrong and why it's our duty to dissent*, 2007; ángeles Figueroa-Alcorta, *The Arrogance of Universal Democracy*, *International Relations Blog*, 20 February 2013; J. William Fulbright. *The Arrogance of Power*, 2011). **The role of arrogance in the failure of the previous climate change summit is noteworthy** -- at least in the light of one assessment (Richard Black, *Copenhagen Climate Summit Undone by 'Arrogance'*, *BBC News Online*, 16 March 2010).

Systemic equivalence: However labelled, the resemblance of arrogance in functional terms to gravity (even to "supergravity"?) could well be explored and articulated with a corresponding degree of sophisticated insight. Given the devastating disruption of climate change, there is a case for exploring the argument articulated by Christopher Bamford:

> The critical situation that human beings face today as a consequence of the dominance of abstract, calculative thinking may be traced to the fundamental rift that places the human subject "inside", over against a world that is "outside". By this ancient wound the world has been desecrated. Despoiled of but utilitarian significance, extinction faces it.... More bluntly stated: since **egoism is the arrogation of all meaning and value to oneself**, we may say that everything hangs on the ability of human beings to overcome their egoism and meet the world in its true being. This egoism is but nihilism in by another name. Egoisim/nihibilsm

> has stripped the world of its qualities and rendered it meaningless. It has quite simply killed it. (Georg Kühlewind and Christopher Bamford, *Stages of Consciousness*, 1984) *[emphasis added]*

It is for example striking that arrogance may well be associated with possession of what is framed as intellectual property or cultural property -- an extension of the framing of the physical reality of "real estate". That association can be speculatively explored (*Einstein's Implicit Theory of Relativity -- of Cognitive Property? Unexamined influence of patenting procedures*, 2007). Clarifications of **the nature of gravity therefore offer a valuable lens through which to gain insight into the role and operation of arrogance**.

If Einstein was able to conclude that the familiar force of gravity is no more than the curvature of space-time. how does such an insight translate with respect to the gravity of an issue (a "grave matter")? The unreasonably "arrogant" identification with property -- even when framed as "human nature" or just "being human" -- might well be understood as engendering a form of curvature contrasting with the linearity claimed for conventional logic. Timeless Euclidean logic embedded in Riemannian spacetime geometry? How might the following oft-cited summary of general relativity be understood with respect to what "matters" in psychosocial terms: ***matter tells spacetime how to curve, and curved spacetime tells matter how to move***.

Arguably it is the very manner of deprecation of arrogance which is more useful than any futile regret regarding the existence of gravity. Missing are analogues to the subtle insights sought by physics in that regard. As famously declared by Karl Marx: *philosophers have interpreted the world, the point however is to change it*. The question remains as to what this might mean.

Gravity as a metaphor: Curiously "gravity" is used metaphorically in qualifying issues of governance. Thus climate change is currently a matter of considerable gravity for many (although seemingly not for the majority of the US Republican Party, for example). Declarations and statements in that regard may be made with gravity. Speakers on the matter may be appreciated because of their *gravitas*. Is arrogance to be recognized as characteristic of *gravitas* of leadership?

The complexity of the phenomenon is indicated by the degree of conflation between unquestionable assertion, determinism and arrogance in relation to "science", "security / threat", "health", and "deity", for example. Curiously claims made in each case may be given legitimacy in legal terms as puffery through which belief and confidence is elicited, however misleadingly (Naomi Oreskes and Erik M. Conway, *Merchants of Doubt*, 2010)

As with the physical analogue, such gravity is readily understood in relation to catchment areas, most notably with respect to marketing and the social sciences. Their analysis may well be made in terms of gravity models. More intriguing is the sense in which those associated with such domains seek proactively to extend them, as is evident in the case of proselytizing by religion, efforts to promote science as a universal belief system, and security preoccupations with whole system dominance. "Science" may thus inveigh against homeopathy as having no basis in evidence -- in curious contrast to its appreciation of 11-dimensional M-theory, for which no concrete proof is available.

Operational implications: Associated with arrogance, there is a posture, possibly informed by doctrinal obligation, to "convince" everyone -- recalling the strategic declaration of Julius Cesar: *veni, vidi, vinci*. In the case of Christianity, this takes the form of the Great Commission (*Matthew 28:18-20*) and associated understanding of the Church militant and Church triumphant. The framing may be made as an obligation to eliminate error amongst those susceptible to it or the threat from those adhering to any such misguided alternative understanding

The echoes with respect to governance are evident in the much-quoted declaration of Margaret Thatcher: *There Is No Alternative* (TINA). Echoes of this are evident in the framing of the global war against terror and the threat of ISIS. Failure to subscribe to the associated beliefs may be cause for assassination -- whether in career or physical terms. There is huge irony to the fact that the "terror" systematically sustained in the USA by the gun lobby -- as frequently evident from gun-related violence -- is carefully framed as totally unrelated to terrorism, as with the incidence of intimidation associated with organized crime and corruption. Who are the the "fellow travellers" of terrorism in the USA?

Understanding models otherwise -- as centres of "gravity"

Varieties of model: It is curious that the term "model" is so widely used in ways which suggest a degree of cognitive commonality to the implied framing. Whilst physics and related disciplines have their particular models (abstract models, mathematical models) which may be a focus of attention through model theory, people have extensive familiarity with models understood otherwise:

- *vehicle models* are readily distinguished, even by those of an early age (in the case of automobiles). Newer models are frequently announced and anticipated. The media focus extensively on their comparative advantages, as with the Top Gear programme, or the innovative re-engineering and personalization of automobiles characteristic of some cultures. The preoccupation extends to motorbikes, rollerblades, and the like. Particular implications follow from the fact that such models may be driven or ridden -- with the greatest enthusiasm.
- *clothing models*, are also the focus of considerable attention in many sectors of society -- again with concern regarding their obsolescence and the merits of newer designs. The importance of model in this domain is exemplified by referring to those who exhibit such designs as models. Implications naturally follow from the fact that such models may be worn and cast off -- donned and doffed.
- *model dwellings*, to which many aspire as embodying eco-technical efficiency -- and within which they hope to dwell and to identify as "home"
- *computer models*, as are characteristic of the simulations fundamental to analysis of climate change
- *solid models*, as are evident in art, architecture, and engineering prototypes
- *behavioural models*, as in the case of role models as variously valued by different cultures

- *strategic models*, as modes of operation through which organizations may improve a process
- *business models*, valued in corporate governance
- *mental model*, understood as the thought process about how something works
- *economic models*, treated as basic to informed governance

The deprecation of older models as obsolete, as with the horse-and-cart, highlights the more general question of which models people are able to use in the absence of resources to upgrade and maintain their models. With this is the related issue of the dissemination of information, and access to it, regarding the existence of the newest models -- especially if there are constraints on this process other than cost.

Ironically there is the strange pleasure some derive from the experience of obsolete models (antique cars, ancient computer games, rituals of the past, etc). The meaningful coherence offered in this way is a reminder of that offered by stories and story-telling. As vehicles through which experience is articulated and navigated they are models in their own right. Of particular relevance is then the recognition of traditional sets of complementary stories, typically articulated through animals

- *Jataka Tales of the Buddha*: these 547 stories are meant to teach the values of self-sacrifice, honesty, morality and other didactic values.
- *Panchatantra*: this Hindu collection of stories about relationships between animals (known in Europe as the *Fables of Bidpai*) serves as a manual for the conduct of a prospective ruler and is widely used by parents in guiding children towards values in human life, since each story has a moral.
- *Aesop's Fables*: over 655 European tales are in this collection, each with an associated moral.
- *Br'er Rabbit* stories
- *Mulla Nasrudin*'s tales, many of which involve animals.

As discussed separately these "models" suggest another way of engag with features of the environment (*Life-skill Learning from Animal Shareholders and Collaborators: cognitive opportunity for engaging radically with a complex world in crisis*, 2014).

Fables have been notably used as a vehicle for systems thinking by Russell Ackoff (*The Art of Problem Solving: accompanied by Ackoff's Fables*, 1978; *Ackoff's Fables: irreverent reflections on business and bureaucracy*, 1991) who also developed (with Herbert J. Addison and Sally Bibb) what might be recognized as a negative or shadow variant in the form of a set of 100 management f-laws of bad leadership and misplaced wisdom typically surrounding management in organizations (*Management f-Laws: How Organizations Really Work*, 2006). Together with sets of fables, as a means of *reframing connectivity through metaphor* in systemic terms, these merit analysis with respect to the global management of climate change, as argued separately (*¿ Higher Education 8 Meta-education ? Transforming cognitive enabling processes increasingly unfit for purpose*, 2011).

"My Model" as "The Model": Of particular relevance to this argument is extension of any possession of an articulated model, through identification with it, to the strategic understanding of "my way" -- or "our way" in the case of a collective -- or even "the way". Extremes are evident in the case of Adolf Hitler (*Mein Kampf*), Edward Goldsmith (*The Way: an ecological worldview*, 1992), or the Biblical declaration *I am the way*. Politicians seeking leadership roles, as with Donald Trump, may be explicit in this respect.

In such a context, people are clearly free to articulate their own models of reality and of their identity within it (whether or not these are communicated to others). The process can be appreciated or regretted in tendencies to radicalisation (*Radicalisation of Existence and Identity: recognizing the global emergence and influence of daimonic dynamics*, 2015). When this takes the form of metaphor, the argument of Kenneth Boulding is especially relevant:

> Our consciousness of the unity of self in the middle of a vast complexity of images or material structures is at least a suitable metaphor for the unity of group, organization, department, discipline or science. If personification is a metaphor, let us not despise metaphors -- we might be one ourselves (*Ecodynamics; a new theory of social evolution*, 1978)

Modelling hazards: The complex process of identification with a model can be related to the argument regarding arrogance in the light of the points made below by Matthew Melko (The Hazards of System Building, *Main Currents in Modern Thought*, 1969):

1. You identify with your system. It cost you blood to build it, and if it is attacked, it is your blood that is being shed.
2. You cannot tolerate tentativeness, suspension of judgment, or anything that does not fit the system.
3. You cannot apprehend anyone else's system unless it supports yours.
4. You believe that other systems are based on selected data.
5. Commitment to systems other than your own is fanaticism.
6. You come to believe that your system entitles you to proprietorship of the entities within it.
7. Since humour involves incongruity and. your system explains all seeming incongruities, you lose your sense of humour.
8. You lose your humility.
9. You accept all these points -- insofar as they apply to builders of other systems.
10. So do I. (P.S. I hope I believe in the cult of fallibility)

Cognitive gravity implied by models: This argument suggests that a functional analogue to gravity is associated with a worldview and the significance with which it is imbued by its adherents or practitioners. As such it exerts a degree of influence on those in neighbouring communication space -- whatever its (arrogant) claims with respect to its wider influence within the universe of knowledge as a whole.

Such a world is fruitfully to be understood as embedded in spacetime understood in psychosocial terms. As a matter of significance (adapting the insight of general relativity), it determines how such spacetime is curved, whilst that curvature determines how that world can move within the larger context

This understanding is complicated by recognition that there are many worldviews. Greater subtlety follows from the many-worlds interpretation of quantum mechanic, or the multiverse understandings of astrophysics. It is intriguing to note a degree of correlation at this time between the discovery of nearly 2000 exoplanets circling other suns and the range of proposals (imaginatively cultivated) that humanity should seek to escape the problems of the planet and colonize them. So framed, it might be asked how many "worldviews" are currently recognized -- and why they are not presented in some form of *WikiModel*, or *WikiMyWay*.

The metaphor lends itself to further complexification in that a major challenge in the recognition of other worlds is the climate from within which such recognition is sought. Much is made of clouded skies and light pollution in inhibiting such discovery -- as well as the resources urgently required to construct the devices by which they may be detected. Even sighting a local sun may however already be a challenge, as with the requirement that viewing distant worlds may depend on night viewing. Climate change may further inhibit such detection from many parts of a world.

Galilean revolution: As noted above, the conflation of local, global and universal perspectives and frameworks usefully recalls the conditions under which the "revolutionary" heliocentric insights of Galileo were promoted half a millennium ago -- and held to be so heretically problematic in relation to the geocentric worldview maintained as fundamental by the Catholic Church. As suggested in the introduction, that Galileo Affair offers a metaphorical lens through which to explore the current cognitive challenge. The very existence of "other worlds" may then be precisely a question of belief. Are innovative model builders of larger scope now to be recognized as "Galileos" -- whose views are necessarily perceived as a threat to any "Church"? The declaration of the Islamic Caliphate in 2014 could be seen in this light, as with its condemnation from the perspective of what could be recognized as a "caliphate of normality" articulated by the "international community" through negotiation of secretive trade pacts (*The Final Leaked TPP Text is All That We Feared*, *Electronic Frontier Foundation*, 9 October 2015).

Given the manner in which individuals and collectives dwell within their worlds and worldviews, i**t is appropriate to ask to what extent they share a sun with those "on a different planet", or whether others are already better understood as dwelling on exoplanets in the light of other suns**.

Animations exploring such planetary orbital dynamics of worldviews are presented separately (*Transcendent Integrity via Dynamic Configuration of Sub-understandings? Interactive orbital animations of world views using data-driven documents (d3.js)*, 2015). The examples include world religions, philosophies, natural science, global governance community, ruling global elites, cultural modalities, cognitive modalites and environmental conditions fundamental to climate change. Earlier approaches to an orbital configuration were inspired by that articulated for the Houston Manned Spacecraft Center, and depicted as the outline of a "world system", of an "intergovernmental system", and of an "international NGO system" (*Matrix Organization and Organizational Networks: next step in inter-organizational relationships*, 1971).

The long-standing misunderstanding between the Abrahamic religions merits exploration in terms of this metaphor -- especially in the light of the claims and counterclaims by their radical fundamentalists, and the bloody conflicts to which these continue to lead. Such an exploration is also of relevance in relation to the radically contrasting preoccupations of environmental-conservationists and economic-developers -- currently playing out with respect to climate change.

Somewhat ironically, the "central issue" is comprehension of the nature of the "sun" in relation to which they "move" and the implications for the worldview through which their distinctive identies are thereby defined. Given the violence that lack of greater insight engenders, that any such framing is not explored more intensively is itself to be understood as a systemic factor rather than a matter of regret, as separately discussed (*Mathematical Theology: Future Science of Confidence in Belief*, 2011).

Cognitive combinatorics, combinatricks and compactification in symbols?

Comprehensible patterns: A model can be usefully understood as a nexus of complexity -- as a comprehensible configuration. Fundamental to its design are the number-constrained patterns through which it is ordered. As is evident, there are constraints on the human cognitive capacity in rendering any configuration credible unless those numbers relate to sets of a very limited size. Most obviously this is determined by the much-cited insight of George Miller (*The Magical Number Seven, Plus or Minus Two: some limits on our capacity for processing information*, *Psychological Review*, 1956).

These insights are further evident in the work of George Lakoff and Rafael Núñez (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2000). As noted above, the consequences are evident in the organization of "models" in a wide variety of domains (*Representation, Comprehension and Communication of Sets: the role of number*, 1978; *Patterns of N-foldness: comparison of integrated multi-set concept schemes as forms of presentation*, 1980).

The commentary here focuses on animations of polyhedra as indicative of model organization. This follows from consideration of polyhedral combinatorics, with respect to the cognitive implications of the travelling salesman problem of operations research (*Optimizing Web Surfing Pathways for the Overloaded*, 2015). That branch of mathematics studies the problems of counting and describing the faces ofconvex polyhedraand higher-dimensionalconvex polytopes. A model could be considered a device to minimize cognitive overloading. In terms of memory, combinatorics could be fruitfully understood as "combinatricks", namely the mnemonic tricks whereby complexity of dimension greater than the "magical number" can somehow be comprehended. Combinatricks might even be considered the art of pattern recognition and remembrance.

Although complex, the animations lend themselves to comprehension through recognizable patterns of symmetry -- notably with respect

to 8-fold and 12-fold organization. Their combination in patterns of symmetry provide "guidelines" for comprehension of greater complexity. Hence their embodiment in symbols that are upheld as of fundamental importance. There is of course the irony that these are evident in the organization of flowers, as highlighted by Keith Critchlow (*The Hidden Geometry of Flowers: living rhythms, form and number*, 2011).

Compactification: The challenge here however is one of enabling the remembrance of complex "weather patterns", as being indicative of the "whether patterns" of decision-making. The multidimensional complexity encompassed by physics, as necessary to requisite explanation, draws attention to compactification as the process whereby higher dimensionality is "curled up". The term is appropriate to the manner in which **complexity is curled up within meaningful symbols** -- readily accessible to comprehension. The succinct nature of the symmetrical polyhedra used in the animations highlights their role in the organized "packing" of concepts which can be associated with them in any mapping. The particular sphere packing offered by the cuboctahedron justifies its exploration as a means of comprehending widespread preference for 12-fold organization and symbolism, as noted above. As noted above, the argument can be extended to viewpoint configuration and packing.

The drilled truncated cube is especially interesting as a means of holding the decision-making complexity articulated traditionally in the 64 hexagrams of the *I Ching*. That pattern of 8x8 is of course held otherwise by the chess board. With respect to strategic governance, of which climate change is currently a major example, such patterns have long been considered as offering insights (*Sustainability through Magically Dancing Patterns 8x8, 9x9, 19x19 -- I Ching, Tao Te Ching / T'ai Hsüan Ching, Wéiq? (Go)*, 2008).

Aesthetics of grokking?: The challenge to comprehension can be framed otherwise in terms of how individuals or collectives can fruitfully "grok" the patterns within which they are immersed. The question can be framed speculatively in terms of how it might be imagined that a future human species might evolve to do so (*Authentic Grokking: emergence of Homo conjugens*, 2003). Engagement with a higher degree of complexity can be more specifically framed in terms of dynamics (*Emergence of Homo undulans -- through a "grokking" dynamic?* 2013). The latter speculation drew on the wave theory so fundamental to physics (*Being a Waveform of Potential as an Experiential Choice: emergent dynamic qualities of identity and integrity*, 2013; *Encountering Otherness as a Waveform -- In the light of a wave theory of being*, 2013).

Especially relevant is the manner in which widespread appreciation of music and song can be considered in terms of "combinatricks" for mnemonic purposes. The insights of Ernest McClain are particularly valuable with respect to such patterning (*Myth of Invariance: the origins of the gods, mathematics and music from the Rg Veda to Plato*, 1976). Music and poetry highlight the sensed value of pattern completion and satisfaction with "goodness of fit".

Rather than a climate change agreement taking the form of immediately forgettable text -- as with the 700-page *Agenda 21*, or recent articulations of development goals -- what are the possibilities for embodying it in a memorable epic, as separately argued (*A Singable Earth Charter, EU Constitution or Global Ethic?*, 2006)? Why not -- if "universal" acceptability and uptake are sought? Music can be readily recognized as the most engaging form of "M-theory" -- especially in rendering complex forms of harmony collectively comprehensible, to a degree which remains elusive with respect to global governance.

These arguments help to frame the question of enabling comprehension of the organized complexity implied by a meta-theory like M-theory with its 10 or 11 dimensions -- and possible extensions to 26 in string theory. What indeed would function as a Rosetta stone, or as a philosopher's stone, to reconcile the differences of a global civilization -- one with universal aspirations?

Model coherence of personal significance through perceived goodness of fit: What renders is claimed to render M-theory appropriate and acceptable as a theoretical construct is that "it all hangs together" to the satisfaction of those who understand it -- or who believe unquestioningly in those who do. This is reminiscent of the statement regarding a much more succinct relationship, namely the Euler identity in which the imaginary unit figures significantly.

$$e^{i\pi}+1=0$$

This equation has been named as the "most beautiful theorem in mathematics" (Robert P. Crease,*The greatest equations ever*, *PhysicsWeb*, October 2004). As discussed separately (*Reconsidering the imaginary unit (i) -- the "fudge factor" of science*, 2014), the much quoted comment with reference to that identity is that of Benjamin Peirce: *It is absolutely paradoxical; we cannot understand it, and we don't know what it means, but we have proved it, and therefore we know it must be the truth.*

Symbolism: Prior to developing the argument further, it is intriguing to reflect on traditional symbolism consistent with some such understanding. That of Ezekiel's wheeled Chariot (*Ezekiel* 1:10) is notably the particular focus of Jewish Merkabah mysticism. Seating within such a vehicle can also be explored in terms of the cybernetics of the enneagram, as discussed separately (*Representation of Creative Processes through Dynamics in Three Dimensions: global insight from spherical reframing of mandalas, the zodiac and the enneagram*, 2014; *Correspondences between Traditional Constellations and Pattern Languages: requisite simplexity for sustainable comprehension of complexity*, 2014).

A valuable challenge to the conventional abstractions of multidimensionality is the recently circulated video of a boy keeping a football in the air with his feet whilst solving solving a Rubik cube with his hands (*11-year-old boy solves Rubik's Cube while juggling football*, 2015). The cyclic movements needed to solve the latter are suggestive of the cognitive requirements to navigate a cognitive vehicle. The unusual integration of two dynamic processes has the advantage of setting the cognitive challenge of mulitdimensionality -- in practice -- within the context of game playing understood otherwise, as suggested by James Carse (*Finite and Infinite Games: a vision of life as play and possibility*, 1987).

Of even greater irony is the design of the stitching pattern on the conventional football, which is that of a truncated icosahedron -- one of the semi-regular Archimedean polyhedra featuring in the annexed animations. The future may recognize as curious the manner in which a

symmetrical pattern with implications for global governance is enthusiastically kicked around worldwide -- eliciting "universal"appreciation of the most skillful passing patterns in the quest of a goal. The irony extends to the worldwide governance of the game through FIFA and the corruption in which it is accused of being mired.

Whether metaphors for "universal" mobility enabled by cyclic pattern rotation

Models and "universal" mobility: Within this context, the challenge of exposure to models of reality elaborated in terms of the need for 10 to 26 dimensions, calls for the most careful consideration -- especially given their incomprehensibilty for a very high proportion of the global population. There is even a degree of irony to the fact that their comprehensibility is limited to proportions variously cited in relation to universal consensus or to discriminatory exclusion. That 97% are held to be in agreement with respect to climate change, and 99% perceive themselves to be the subject of exclusion, renders the possibility of global strategy highly problematic -- especially when the latter are expected to subscribe to the understanding and priorities of the former.

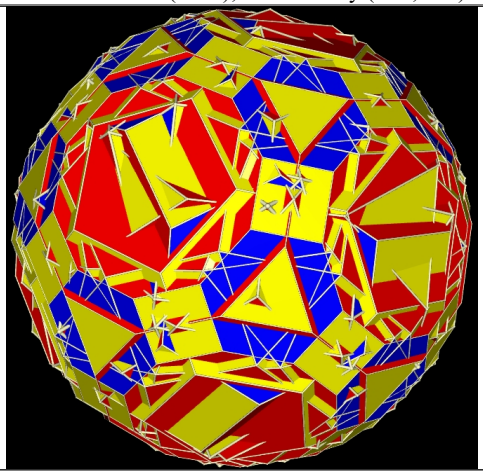
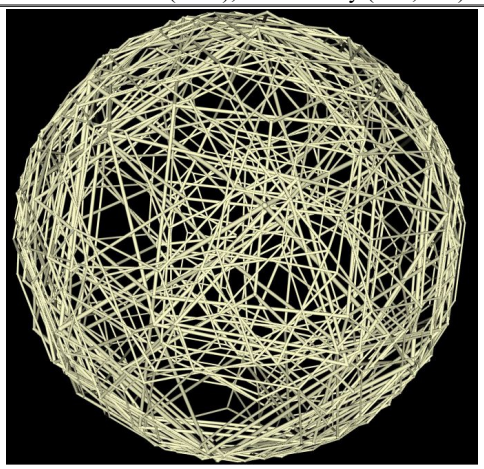
In these terms, the "universal" perspective which it is so widely assumed to be possible and desirable -- if not already articulated (requiring only belief) -- is as questionable as the geocentric view upheld by the Catholic Church at the time of Galileo. The response of authorities now maintaining any analogous view -- including that of M-theory -- is as dubious as that of the Catholic Church in the Galileo Affair. There is therefore a case for exploring previously unimagined cyclic dimensions with respect to any more fundamental solar analogue or to constellations of stars.

The issue would appear to be the meaning which any individual can give to 10 or more dimensions as a means of ordering daily life. What model of reality can an individual construct with such seemingly requisite complexity? How is such an M-theory to be constructed as a Meaning-theory -- or even a "ME-theory" of personal identity?

In this light, how to shift beyond a "geocentric" framework, transcending any particular "heliocentric" framework? Have many already moved to parts of the known universe with their locus and perspective framed by quite distinctive constellations?

Cyclic rotation of patterns: "wheels" and "propellers": For the individual, the sense of being embedded in cycles could be framed by any response to the question of the kind of wheeled vehicle in which the individual (as driver) can imagine to be seated. Physical vehicles offer metaphors for preliminary exploration -- whether in terms of riding a bicycle or driving an automobile. Popular imagination has been cultivated by exposure to the design of the pod framed by concentric spinning rings in the major movie *Contact* (1997).

The intuitive appeal is echoed in two of the polyhedral animations, most notably that of the Chinese "puzzle balls" -- embodying the 12 components of the cuboctahedral animation.

<table>
<tr><th colspan="2">Basis for exploring puzzle ball nesting using superposition of 12 Archimedean polyhedra
reproduced from Rotation and pumping of nested Chinese "puzzle balls" as symbolizing "worlds-within-worlds" (2015)
(polyhedra rendered with same radius and common centre; animations with expansion/contraction of polyhedra at different rates)</th></tr>
<tr><td>Faces non-transparent
Video animation (.mov); virtual reality (.wrl; x3d)</td><td>Wireframe version of image on left
Video animation (.mov); virtual reality (.wrl; x3d)</td></tr>
<tr><td>  </td><td>  </td></tr>
</table>

Models as powered cognitive vehicles: Further insight is offered by the challenging complexities of navigating a helicopter in three-dimensional space. The cyclic nature of the intangible dimensions of this process is extensively discussed in terms of learning/action cycles by Arthur Young (*Geometry of Meaning*, 1976). His insights derived from his role in the design of the Bell helicopter -- insights which he endeavoured to extend to the design of a psychopter, as separately discussed (*Interlocking cycles enabling psychopter operation*, 2011). The engagement with any such vehicle has been further developed through experience of piloting ultralight airplanes. Possible understandings are discussed separately (*Characteristics of phases in 12-phase learning-action cycle*, 1998; *Typology of 12 complementary strategies essential to sustainable development*, 1998).

Whilst the cognitive implications might be readily deprecated as of negligible significance, it is appropriate to note the insights from flight derived by Ludwig Wiggenstein, as discussed by Susan Sterrett (*Wittgenstein Flies a Kite: a story of models of wings and models of the world*, 2005).

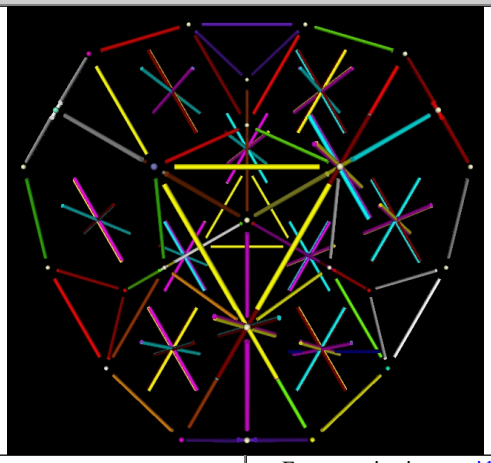
This argument then suggests consideration of the animated polyhedral configurations (in annex) as meriting exploration as cognitive vehicles of some kind. The case of the drilled truncated cube offers particular insights in that it is used as a means of mapping and

interrelating the transformations systematically identified and encoded by the *I Ching* as the Chinese *Book of Changes*. The polyhedral animation of these changes in cyclic terms implies a form of vehicle. The multiplicity of cycles noted further suggests that it is a vehicle capable of navigating a multidimensional space, perhaps to be understood in terms of hyperspace -- necessarily of more than three dimensions. Exploiting the helicopter/psychopter metaphor, the "wheels" then take the form of propellers.

Since cycles may be understood as potentially bidirectional, of further interest is the recognition that the stability of some helicopter designs may depend on counter-rotating propellers and coaxial counter-rotating rotors. The animations of the drilled truncated cube illustrate such possibilities, allowing such cycles to be separated or combined.

Regarding round tables and other quests for wisdom, the manner in which the 12-fold insight figures in that configuration (and the other animations), can be considered as a curious approximation to the 11-plus dimensionality of physics. Rather than the classical paradox of a house of many mansions (*John 14:2*), it might be as appropriate to recognize that: *My round table has many sides* -- some with holes in them, consistent with speculative development of the point (*Is the World View of a Holy Father Necessarily Full of Holes? Mysterious theological black holes engendering global crises*, 2014). Are blindspots a necessary feature of any model claiming "universal" significance?

The animations invite exploration of how changing (and interrelating) the rates of the various cycles in the animations offer insights regarding cognitive implication in the embodiment and navigation of such a vehicle. The slowest rates recall the meditative role of mandalas in contrast to the wheel/propeller implications of the faster rates. It raises the question of the rate required for "take-off", "ascent" and "escape".

Screen shot of rendering of cyclic movement of parallels in drilled truncated cube	
	
Slower variant as video animation (.mov); access to X3D variant	Faster variantion as video animation (.mov); access to X3D variant

Deriving energy from rotating polarity: In a spirit of technomimicry, the emphasis of the "rotation" and "pumping" animations suggests the possibility of using these configurations as a means of further imaginative exploration in the light of the fundamental electromagnetic innovations of the past century (*Representation of Creative Processes through Dynamics in Three Dimensions*, 2014). These implications derive from an exploration of the creativity of Nikola Tesla (*Reimagining Tesla's Creativity through Technomimicry: psychosocial empowerment by imagining charged conditions otherwise*, 2014). Of relevance to understanding of globality, there it took the form of a separate section (*Insight into global dynamics through Tesla's focus on the sphere*, 2014). Of similar interest, is the manner in which some animations recall the experiments of Tesla on rotating magnetic fields, with the possibility that the fundamental relation between positive and negative that he explored could be fruitfully reframed in a psychosocial context

There it was suggested that Tesla's renowned creativity might be fruitfully explored in the light of technomimicry, as illustrated by that of Arthur Young and as separately discussed (*Engendering a Psychopter through Biomimicry and Technomimicry: insights from the process of helicopter development*, 2011).

Cognitive fusion and the design of nuclear fusion reactors: In the case of the drilled truncated cube, as a form of torus, can the patterns of movements be organized to ensure the kind of stabilization currently explored with respect to the toroidal design of the experimental nuclear fusion reactor which is the focus of the ITER international project? The potential cognitive significance is explored separately (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006).

Much can be said about a pattern of 64 conditions of change, and represented statically, as in system diagrams and traditional mandalas (Lama Anagarika Govinda, *The Inner Structure of the I Ching: the Book of Transformations*, 1981). Exposure to visual renderings of the dynamics of such movement facilitates other insights. Especially intriguing are the possibilities of modifying the relative rates of such movements, given the manner in which the structure is toroidal.

E pur se Muove? This is the phrase attributed to the Italian mathematician, physicist and philosopher Galileo Galilei (1564-1642) -- after being forced by the Catholic Church, within the context of the Galileo affair, to recant his claims that the Earth moves around the Sun rather than the converse.

The above argument raises the question as to what individuals and groups are free to imagine as moving otherwise in the light of an analogous cognitive revolution. Of greater relevance is the manner in which the vehicle for such movement may have quite distinctive

cognitive implications for the navigator -- embodying it in ways which may only be intuited rather than subject to premature closure.

Recalling Galileo is curiously appropriate at a time when, in response to the challenge of climate change, the Catholic Church has engendered an Encyclical *Laudato Si'* (*Praise Be to You*). As argued separately, this too is notable for its asystemic rigidity regarding cyclic processes engendering climate challenges (*Systemic Inadequacies of the Environment Encyclical*, 2015). In its praise for the individual, the title does however imply an understanding of movement which may well correspond to the "universal" mobility offered by cognitive vehicles, as argued above.

It is profoundly curious that such intuitions may be most readily suggested by familiarity with climate and weather patterns (cyclones, tides, etc) and the associated metaphors they offer, most notably with respect to decision-making -- namely whether to adopt one course of action or another. It is in this sense that authoritative preoccupation with climate change may come to be recognized as mistakenly "geocentric" when a "heliocentric" perspective is more appropriate. Conventional preoccupation with climate change can then be seen as obscuring the nature of the changing decision-making climate with which people are obliged to engage for their own survival -- especially in a context of scepticism and deprecation.

Whether rising worldwide social unrest suggests that "climate change" may have unsuspected cognitive implications remains to be seen. It may indeed require that the dangerous rise in global temperatures and sea levels be understood otherwise as powerful metaphors of negelected processes.

References

Russell L. Ackoff. Ackoffs Fables: irreverent reflections on business and bureaucracy. Wiley, 1991

Russell L. Ackoff, Herbert J. Addison and Sally Bibb. Management f-Laws: how organizations really work.Triarchy Press, 2006

Christopher Alexander:

- 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]

Samuel Arbesman. The Half-life of Facts: why everything we know has an expiration date. Current, 2012

John D. Barrow. The Book of Universes: exploring the limits of the cosmos. W. W. Norton, 2012

W. R. Bion. On Arrogance. *International Journal of Psychoanalysis*, 39, 1958, 2-4, pp. 144-6

Richard Black. Copenhagen Climate Summit Undone by 'Arrogance'. *BBC News Online*, 16 March 2010 [text].

Arthur L. Caplan. Professional Arrogance and Public Misunderstanding. *The Hastings Center Report*, 18, 1988, 2, pp. 34-37 [abstract]

James P. Carse. Finite and Infinite Games: a vision of life as play and possibility. Ballantine Books, 1987

Bob Catley. Hegemonic America: the arrogance of power. *Contemporary Southeast Asia*, 1999, pp 157-175.

Kenny Coventry, Thomas B. Christophe, Thorsten Fehr, Berenice Valdes-Conroy and Manfred Herrmann. Multiple Routes to Mental Animation: language and functional relations drive motion processing for static images. *Psychological Science*, 2013, 8, pp. 1379-1388 [text]

Keith Critchlow:

- The Hidden Geometry of Flowers: living rhythms, form and number. Floris Books, 2011
- The Mystery of Flowers: the sacred geometry of plants. *Resurgence*, 272, May/June 2012
- Order in Space: a design source book. Thames and Hudson, 2000
- Islamic Patterns: an analytical and cosmological approach. Inner Traditions, 1999

Robin S. Dillon. Arrogance, Self-respect and Personhood. *Journal of Consciousness Studies*, 14, 2006, 5-6, pp. 101-126

Denis Drieghe and Marc Brysbaert. Strategic Effects in Associative Priming with Words, Homophones, and Pseudohomophones. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 28, 2002, 5, pp. 951-961 [abstract]

M. J. Duff (Ed.). The World in Eleven Dimensions: supergravity, supermembranes and M-theory. Taylor and Francis, 1999

Michael Farr. Avoiding the Arrogance Cycle: Think You Can't Lose, Think Again. Rowman and Littlefield, 2012

C. D. Froggatt, H. B. Nielsen (Ed.). Origin of Symmetries. World Scientific, 1991

J. William Fulbright. The Arrogance of Power. Random House, 2011

R. Buckminster Fuller with E. J. Applewhite:

- Synergetics: explorations in the geometry of thinking. Macmillan, 1975 [text]
- Synergetics 2: explorations in the geometry of thinking. Macmillan, 1979 [text]

- Operating Manual for Spaceship Earth. 1968 [summary]

Andrew Griffith. Policy Arrogance or Innocent Bias: resetting citizenship and multiculturalism. Lulu.com, 2013

Adolf Grünbaum. Geometrodynamics and Ontology. *The Journal of Philosophy*, 70, 1973 21, pp. 775-800

J. Hoey. The Arrogance of Science and the Pitfalls of Hope. *Canadian Medical Association Journal*, 159, 1998, 7, pp. 803-804.

Yasushi Kajikawa. New Models of Synergetics Topology and their Reciprocal Space-filling Transformations. *Science on Form: Proceedings of the First International Symposium for Science on Form*, KTK Publishers, 1986 [text]

K. J. Ko and Z. J. Huang. Arrogance can be a Virtue: overconfidence, information acquisition, and market efficiency. *Journal of Financial Economics*, 84, 2007, 2, pp. 529-560 [abstract]

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

Martin Landau and Donald Chisholm. The Arrogance of Optimism: notes on failure avoidance management. *Journal of Contingencies and Crisis Management*, 3, 1995, 2, pp. 67-80 [text]

Harold D. Lasswell. The Transition Toward More Sophisticated Procedures. In: Davis B. Bobrow and J. L. Schwartz (eds), *Computers and the Policy-making Community; applications to international relations*, Prentice-Hall, 1968, pp. 307-314

Janie Leatherman and Julie A. Webber. Charting Transnational Democracy: beyond global arrogance. Palgrave Macmillan, 2005

J. Mack. The Politics of Species Arrogance. In: *Ecopsychology: restoring the earth, healing the mind*, Club Books, 1995

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

William V. Mayer. The Arrogance of Ignorance: ignoring the ubiquitous. *American Zoologist*, 24, 1984, 2, pp. 423-431

George Miller. The Magical Number Seven, Plus or Minus Two: some limits on our capacity for processing information. *Psychological Review*, 63, 1956, 2, pp. 81-97

Rajiv Narang and Devika Devaiah. Orbit-Shifting Innovation: the dynamics of Ideas that create history. Kogan Page Publishers, 2014

Rachel Perkins and Parimala Moodley. The Arrogance of Insight? *B J Psych Bulletin*, April 1993

Clifford A. Pickover. Surfing Through Hyperspace: understanding higher universes in six easy lessons. Oxford University Press, 2001

William Plank. The Quantum Nietzsche: the will to power and the nature of dissipative systems. iUniverse, 2001

Stanley B. Silverman, Russell E. Johnson, Nicole McConnell, and Alison Carr. Arrogance: a formula for leadership failure. *The Industrial Organization Psychologist*, 50, 2012, 1, pp. 21-29 [text]

Peter Sloterdijk:

- Bubbles: Spheres Volume I: Microspherology. Semiotext(e)/MIT Press, 2011 [contents]
- Globes: Spheres Volume II: Macrospherology. Semiotext(e)/MIT Press, 2014 [contents]
- Schäume: Sphären III: Plurale Sphärologie. Suhrkamp Verlag, 2004 [contents]

George Spencer-Brown. Laws of Form. Allen and Unwin, 1969

Susan G. Sterrett:

- Wittgenstein Flies a Kite: A Story of Models of Wings and Models of the World. Pi Press, 2005
- Models of Machines and Models of Phenomena. *International Studies in the Philosophy of Science*, 20, 2006, 1, pp. 69-80.

Matthew Syed. Black Box Thinking: the surprising truth about success. John Murray, 2015

Nassim Nicholas Taleb:

- The Black Swan: the impact of the highly improbable. Random House and Penguin, 2007 [summary]
- Antifragile: Things That Gain from Disorder. Random House, 2012 [summary]

Valerie Tiberias and John D. Walker. Arrogance. *American Philosophical Quarterly*, 35, 1998, 4, pp. 379-390 [abstract]

Francisco J. Varela:

- A Calculus for Self-Reference. *International Journal of General Systems*, 2, 1975, pp. 5-24 [text]
- The Extended Calculus of Indications Interpreted as a Three-valued Logic. *Notre Dame Journal of Formal Logic*, 20, 1979, pp. 141-146

Steven Weber and Bruce W Jentleson. The End of Arrogance: America in the Global Competition of Ideas. Harvard University Press, 2010

Bernard Weisberger . The Great Arrogance of the Present Is to Forget the Intelligence of the Past. *American Heritage*, 41, 1990, 6, pp.

96-101.

Forrest Wood. The Arrogance of Faith: Christianity and race in America from the colonial era to the twentieth century. Northeastern University Press, 1991

Arthur M. Young:

- The Geometry of Meaning. Delacorte Press, 1976
- The Reflexive Universe: Evolution of Consciousness. Delacorte Press, 1976