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Quest for a "universal constant" of globalization? questionable insights for the future from physics

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Annex C of *Engendering Invagination and Gastrulation of Globalization* (2010)

Introduction

This annex is a speculative development of arguments in the [main paper](#) (where [references](#) are listed). As noted there it is based on assumptions regarding isomorphism associated with general systems research. More specifically it is based on an assumption regarding pattern recognition, stated there as:

... with respect to any one domain of human preoccupation, the capacity and requirement for relatively complex [pattern recognition](#) (and the associated degree of abstraction) may well correspond to that which is required and applicable in another domain. Rather than imply a controversial direct relation between the two domains, this highlights the determining role of human cognitive capacity with respect to emergence and use of abstract patterns as adaptable tools. It also suggests that failure to apply subtler emergent cognitive tools, in other domains faced with challenging dynamics, may signal dysfunctional development between domains.

This assumption does not deny the further possibility that there may be a more fundamental relationship between cognition and any reality treated as external, following the arguments detailed below.

"Globality" in relation to a "Cosmic" number?

The arguments of the main paper merit reconsideration within the context of long-standing challenges. These are highlighted by the improbable collaboration between psychoanalyst [Carl Jung](#) and physicist [Wolfgang Pauli](#) in co-authoring (*The Interpretation of Nature and the Psyche*, 1955 -- including *Synchronicity: an acausal connecting principle* by Carl Jung, and *The influence of archetypal ideas on the scientific ideas of Kepler* by Wolfgang Pauli). This preoccupation is consonant with the later arguments of biologist [Gregory Bateson](#) (*Mind and Nature: a necessary unity*, 1979).

In an account of that collaboration, physicist [Arthur I. Miller](#) (*137: Jung, Pauli, and the Pursuit of a Scientific Obsession*, 2009, and *Deciphering the Cosmic Number: the strange friendship of Wolfgang Pauli and Carl Jung*, 2009) notes Pauli's extraordinary conclusion, as one of the most eminent physicists of the century, that:

- "even the most modern physics lends itself to the symbolic representation of psychic processes"
- that there are "deeper spiritual layers that cannot be adequately defined by the conceptual concept of time" (Miller, p. 162)

[How enlightening it would be to experience an encounter between *No Bull Laureate* Alan Sokal and *Nobel Laureate* Wolfgang Pauli. Would each accuse the other of being [not even wrong](#)?]

Miller introduces his study with a quote from Jung:

The no-man's land between Physics and the Psychology of the Unconscious [is] the most fascinating yet the darkest hunting ground of our times

Miller's account presents the context for the extraordinary continuing exploration by physicists (and especially Pauli) of the fundamental significance of the dimensionless **fine-structure constant** ($1/137$) -- typically called "137" -- namely the coupling constant characterizing the strength of electromagnetic interaction (and usually denoted by α). Might there be a "coupling constant" characterizing the strength of psychodynamic interaction with an "other"?

As the "cosmic number", the fine-structure constant "137" is recognized as fundamental to the organization of the physical universe -- to the extent that its integrity is comprehensible to the human mind. It is appropriate to ask whether there is an analogous dimensionless constant which is fundamental to the organization of any psychosocial form characterized by "globality" -- to the extent that its integrity is comprehensible to the human mind.

It has been argued that stable matter, and therefore life and intelligent beings, could not exist if the constant were much different. For instance, were α to change by 4%, stellar fusion would not produce carbon, so that carbon-based life would be impossible. What "constant" would disenable any analogous psychodynamic coherence?

Another account of the "archetypal" relationship between Jung and Pauli is provided by David Lindorff (*Pauli and Jung: the meeting of two great minds*, 2004).

Neglected "external" dimensions

Given the shared preoccupations of Jung and Pauli, what is extraordinary is that there is very little trace of five dimensions which might be considered appropriate to their quest, especially in the light of the preoccupations of deconstructionists:

- **comprehension**: the challenge of how the human mind is expected to encompass the complexities of their respective articulations, or those made in that mode by future scholars, is ignored. To the extent that it is addressed, it is associated with the expression of complexity through integrative symbols. But even though Jung engaged in lengthy psychoanalysis with patients and Pauli naturally expected those addressing the issues to have pursued a lengthy, elite course of education (commensurate with an associated degree of genius), no "comprehension factor" is taken into account (cf. *Forms of Presentation and the Future of Comprehension*, 1984).

To the extent that comprehension is thus associated with time, no account is taken of the **communicability of insight**, specifically where this assumes a willingness to absorb insight from an "other" -- when most are already overloaded with information, even in their area of interest (*Social organization determined by incommunicability of insights*, 1995). The condition is exemplified by situations where a "proof" requires years to verify, because of its length and complexity.

- **self-reference**: both Jung and Pauli were well-documented "womanisers", and both had "problematic" relationships with "others", whether "significant" or otherwise. Yet there is little or any sense of the manner in which they, individually or together, took account of the "relationship factor". Their own problematic relationships with others of their professions are a matter of record. This is recognized as having been especially disturbing to the physicist David Bohm, for whom the fundamental breakdown in communication between Albert Einstein and Niels Bohr was especially significant. He recognized it as a failure pervasive in modern society, engendering dangerous fragmentation (Naomi Gryn, *David Bohm and Group Dialogue -- or the interconnectedness of everything*, *The Jewish Quarterly*, Autumn 2003, pp. 93-97).

The possibility of mapping and analyzing the dynamics of the system of "us-and-them" discourse, expected to engender insights for an adequate Theory of Everything, is excluded as irrelevant and meaningless to that theory (Edward de Bono, *I Am Right, You Are Wrong: from Rock Logic to Water Logic*, 1990).

The pattern of disparagement, deprecation, alienation and non-self-reference continues to be evident within and between disciplines. Also of relevance is the degree to which research is associated with a need for **attention** and "**re-cognition**" by significant others, whether through awards or the **naming** of theoretical constructs after the discoverer. Potentially more relevant, as evident in the case of Pauli, was the sense in which he recognized how his more integrative discoveries in physics were mirrored by increasing self-understanding. There is however no sense in which this self-referential factor should in any way be "designed into" elucidation of "universal", "cosmic" or "dimensionless" constants. (cf. *Engendering the Future through Self-reflexive Group Initiatives*, 2008; *Stepping into, or through, the Mirror: embodying alternative scenario patterns*, 2008)

- **imaginative attraction**: implicit in the life-long creativity of Jung and Pauli was a driving attraction (called an "obsession" by Miller) for advancement of insight in unusual domains. It might be called a "negentropic urge" through which more satisfying "truth" is associated with greater elegance and beauty. Although fundamental to innovation in many disciplines, how it conditions their mode of knowing is not factored into understanding of the methodology of those disciplines.

How are the dynamics of that attractor to be understood especially when it involves imaginative connectivity unforeseen by the conventions of the discipline -- boundary stretching and symmetry breaking? This is exemplified by the imaginative recognition of **correspondences** associated with the "moonshine" connectivity through which the Monster Group was discovered (*Potential Psychosocial Significance of Monstrous Moonshine: an exceptional form of symmetry as a Rosetta stone for cognitive frameworks*, 2007). Potentially more problematic are the generic consequences of such an "urge" in a resource-constrained, competitive society.

- **"ignorance"**: intriguing in the case of both Jung and Pauli is a seeming failure to allow for what is neglected or ignored --

possibly as being irrelevant -- by their respective modes of knowing. To some degree this is represented by Jung's consideration of the unconscious. But, more generally, they are unable to take account of what an "other" may know and prefer to consider of greater significance -- or of what goes "unsaid" or may be "unsayable" (*Global Strategic Implications of the Unsaid*, 2003). Their cognitive boundaries are defined -- effectively as "comfort zones" -- to enable them to apply their preferred methodologies. It is in this sense that a discipline may be understood as a cognitive device for defining other modes of knowing to be irrelevant or subsumed. As a definition of disciplinary "turf", this bears a curious formal resemblance to the proscriptions of the **Pauli Exclusion Principle** whereby no two electrons can have the same four quantum numbers, namely occupy the same "space". The consequences of such designed "ignorance" have been significantly addressed by Paul Feyerabend (*Conquest of Abundance: a tale of abstraction versus the richness of being*, 1999; *Against Method: outline of an anarchistic theory of knowledge*, 1975).

The unfortunate implication is that the failure to design in the recognition that any "Theory of Everything" emerging within such constraints only encompasses what is relevant within a particular worldview. The situation is exemplified by "conceptual gerrymandering" in elaborating global strategy, notably in relation to overpopulation (*Uncritical Strategic Dependence on Little-known Metrics*, 2009). Such considerations are of course challenged by more recent recognition by cosmologists of **dark matter** and **dark energy** -- effectively an exemplification of ignorance. But how do these correspond to Jung's above-mentioned reference to the "darkest hunting ground of our times"? Is there a case for integrating "re-cognition" of a "netherworld" (*Designing Global Self-governance for the Future: patterns of dynamic integration of the netherworld*, 2010).

- **incompleteness**: whilst recognizing the progressive advance of knowledge, the formulation of any theory is typically (and often arrogantly) presented as complete without integrating into it the probability of its subsequent replacement or reformulation by the future -- as a consequence of "**scientific revolutions**". The acknowledgement of this probability is left to the external context of the process within which the theory emerges -- itself unacknowledged by that theory. Formulations therefore exemplify premature **closure** and the inadequacies this may imply (Hilary Lawson, *Closure: a short History of Everything*, 2002).

Despite the illusions of completeness and closure, it is readily assumed that any evidence-based theory now formulated could well maintain its significance for the rest of eternity. In the meantime most are obliged to live within the unexplained reality of a world (of incomplete explanation and partial understanding) -- represented through illusory forms of completeness to disguise those inadequacies -- with little recognition that partial knowledge is characteristic of globality as it is experienced. Despite the incompleteness theorems of Gödel, any objective truth discovered becomes an "object" -- a product of past discovery -- rather than a process of emergence of insights open to the future.

In Pauli's case, as a physicist, it might be said that the degree of his "re-cognition" of such neglected dimensions is evident in his statement (quoted by Miller) to the effect that:

What is decisive for me is that I *dream* about physics as Mr. Jung (and other non-physicists) *think* about physics. Every time I have talked to Mr. Jung (about the "synchronistic" phenomena and such), a certain spiritual fertilization takes place.

As with the long-secret alchemical priorities of Isaac Newton, seemingly these dimensions are assumed to be "external" to any conventional consideration of the "universal" when, particularly in the case of "globalization", they may well be fundamental, especially if "externalities have to be cognitively embodied in some way, as separately discussed (*Existential Embodiment of Externalities: radical cognitive engagement with environmental categories and disciplines*, 2009). Curiously consideration of such "externality" may be evident to a degree in the respective contributions of Jung and Pauli to their co-authored publication (*The Interpretation of Nature and the Psyche*, 1955) and in the light of their shared acknowledgement of the well-documented, and highly problematic, "**Pauli effect**".

Is an adequate "Theory of Everything" an integrative form of "globality" and associated "globalization"? **Is it really held to be possible to envisage a "global" knowledge society -- comprehensively ordered by some "Theory of Everything" -- in which the educational challenges of comprehension, self-reference, imagination, ignorance and incompleteness are somehow "external" -- as with those of "copyright", discussed above?**

Fundamental physics, as practiced, is seemingly totally irrelevant to the challenges of globalization (and "proud" of it), except through the provision of more energy to sustain more-of-the-same expansion of the "blastosphere", hopefully to new "islands of stability" (as argued in the main paper).

Harmonics of "globalization": a universal constant?

There is a long tradition across cultures of interest in the **music of the spheres** (*musica universalis*). Whilst is not usually thought to be literally audible, it has been understood as a harmonic and/or mathematical and/or religious concept (Jamie James, *The Music of the Spheres: music, science and the natural order of the universe*, 1993). This was a preoccupation of Kepler (David Plant, *Kepler and the Music of the Spheres*). As noted above, its archetypal nature provided a focus for the study of Wolfgang Pauli (*The influence of archetypal ideas on the scientific ideas of Kepler*, 1955).

Of interest is the extent to which any insight into "globality", engagement with it, or enactivation of it, is usefully understood through harmony. This is potentially crucial given the widespread accessibility of music and appreciation of it -- its **comprehensibility** in contrast to the often alienating representations of "globality" through text, mathematics or geometry.

The possibility can notably be explored in the light of the work of **Ernest McClain** (*The Myth of Invariance: the origins of the gods, mathematics and music from the Rg Veda to Plato*, 1976; *The Pythagorean Plato*, 1978; *Meditations through the Quran*, 1981). He

stresses the role of invariant ratios defining pitches and tones and their significance for ancient cosmology (*Musical Theory and Ancient Cosmology*, 1994). With respect to the argument here, McClain has produced a valuable summary (*The Harmonic Series as Universal Scientific Constant*, 2010). He indicates:

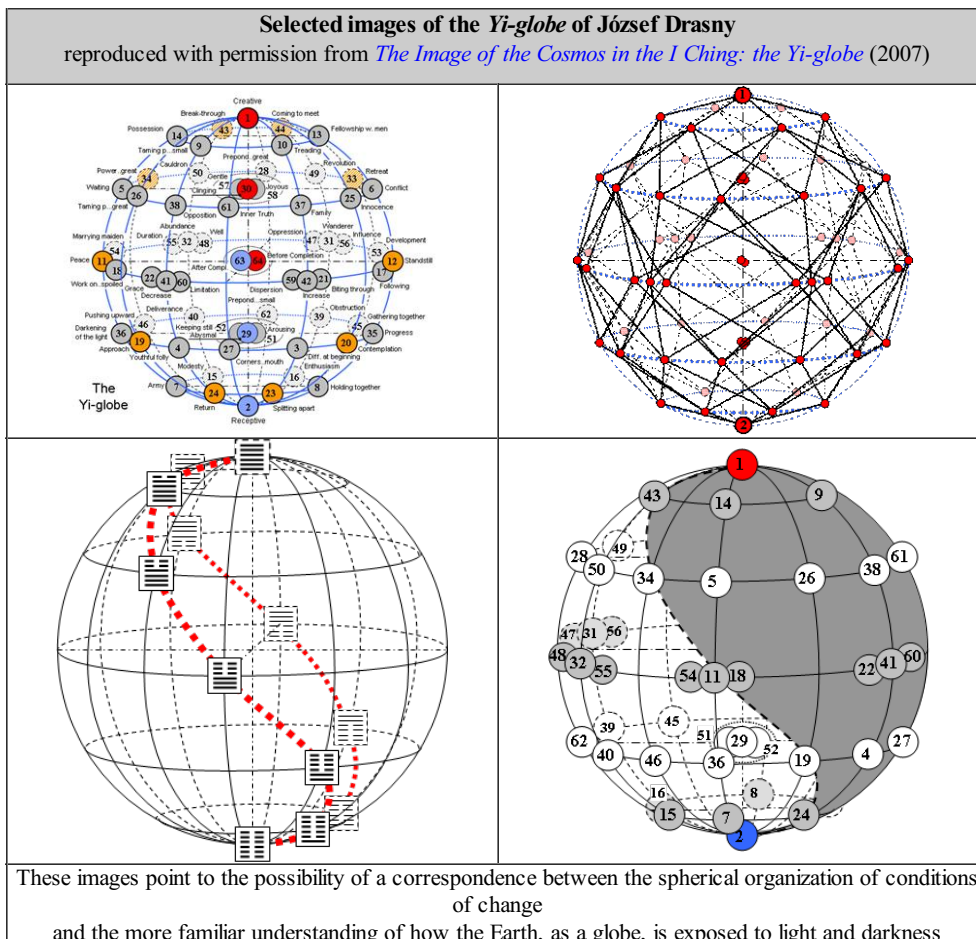
Modern education emphasizes the *harmonic series* as establishing the *natural* foundation of quantification (numbered *partials* function as divisors of monochord string length), and so it is presented first as a common reference. Everything that follows concerns its colorful mythologizing in narrative allegory....What we hear as a 'musical' tone turns out to be, on physical analysis, a 'manifold' of partials with varying proportions of the total energy, so that hearing is always influenced by invisible and normally inaudible forces, a 'magic' beyond our control except as, in performance, we become the magicians. Thus sound functions as the greatest clue to psychic 'interiority' without ever fully disclosing its secrets.

The argument for exploring harmonic relations, as a means of rendering comprehensible (and engaging) complex global strategies, has been developed separately (*A Singable Earth Charter, EU Constitution or Global Ethic?* 2006). In a period when over one trillion dollars has been expended fruitlessly in a "battle for hearts and minds" in Afghanistan, the development of the **drone** offers a totally appropriate musical caricature of the inspirational value of the "martial music" deployed in that arena (*Poetic Engagement with Afghanistan, Caucasus and Iran: an unexplored strategic opportunity?* 2009; *Strategic Jousting through Poetic Wrestling*, 2009). Exploiting the caricature, it might be said that in the quest for "harmony", the capacity to allocate resources to eliciting insights from music has proven to be totally absent. Aside from an unprecedented demonstration of arrogant military incompetence, the future may see the focus on "drone" deployment as a demonstration of ignorance of rhythm and tone by a civilization that is effectively "**tone deaf**". NATO might be further caricatured as "No Adequate Tonal Operacy". This has become more curious when such insights might have been relevant to an elegant exist strategy.

Correspondence between blastosphere and spheroidal *I Ching*?

The main paper notes recognition that during embryogenesis the **blastosphere** numbers some 2^7 -- following the initial cell division process. Such cells, especially following invagination, are recognized as having a "fate" in terms of their future differentiation and the forms to which they will variously contribute. **Cell fate determination** is a current preoccupation of developmental biology -- especially given the possibilities of **stem cell** research.

It is therefore intriguing that a fundamental representation of the patterns of change and distinction, namely the Chinese *I Ching* binary coding system, should be based on 64 hexagrams, namely 2^6 . Although the hexagrams can be represented for convenience in **circular form**, of greater potential significance in relation to any correspondence with the blastosphere is the spheroidal representation of **József Drasny**, as shown below -- and previously reproduced separately (*Designing Global Self-governance for the Future: patterns of dynamic integration of the netherworld*, 2010). The relationships are at least suggestive of the psychodynamic tensions which might correspond to the biomechanical tensions basic to the development of the blastosphere.



Number games and speculations

The question of how sets of holons are configured (to form other, more general, holons) is summarized elsewhere with examples (*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 following table endeavours to "confront" various ways of approaching the spheroidal coherence of a psychodynamic analogue to the biomechanical pattern constraints in the blastosphere. The early prime number combinations are potentially significant in relation to harmonics and the capacity to hear such distinctions (as emphasized in the work of Ernest McClain mentioned above). They are also relevant in relation to the structure of regular polyhedra -- and the capacity to recognize the patterns associated with them. Both might however ensure that many rows in the table were "dropped" as basically irrelevant. The columns relating to data on social network size, notably in online communities, are necessarily approximate. Viable sizes, as noted in the [discussion of the Dunbar number in Annex B](#), may be highly dependent on the investment in "grooming" -- or its equivalent in intellectual discourse.

Any numerical constraint may be a matter of probability, with some "numbers" being more probable -- as suggested by the "magic numbers" of the periodic table. [Jean-Claude Perez](#) has proposed a simple numerical formula computing the number of elements within every period, modelling the entire structure of the periodic system (*Mendeleiev Periodic Table Prediction Equation*, 1997-2008; *Codex Biogenesis; les 13 codes de l'ADN*, 2009). This could be interpreted as an approach to predicting patterns of "globality".

The column relating to polyhedra is associated with previous exploration of "polyhedral governance" (*Towards Polyhedral Global Governance: complexifying oversimplistic strategic metaphors*, 2008; *Polyhedral Pattern Language: software facilitation of emergence, representation and transformation of psycho-social organization*, 2008)

Juxtaposition of constraining patterns of potential relevance to "global" organization (purely indicative and tentative)										
Prime number factors					Social network size (Dunbar, 2003)	Ultima Online guild size freq. (Allen, 2004)	Regular polyhedra features (total: faces+vertices+edges)	Periodic table of elements: "magic numbers": nucleons (electrons)		
2	3	5	7	Total						
2	-	-	-	2	2% (0-24)	13 (ca. 2)	14 (tetrahedron)	2 (2)		
-	3	-	-	3						
2x2	-	-	-	4						
-	-	5	-	5						
2	3	-	-	6						
-	-	-	7	7						
2x2x2	-	-	-	8						8
-	3x3	-	-	9						(10)
2	-	5	-	10						
2x2	3	-	-	12						
2	-	-	7	14						
-	3	5	-	15						
2x2x2x2	-	-	-	16						
2	3x3	-	-	18						(18)
2x2	-	5	-	20						20
-	3	-	7	21						
-	-	5x5	-	25	4.6% (25-49)	37 (ca. 45)	26 (cube, octahedron)			
-	3x3x3	-	-	27						
2x2	-	-	7	28						28
2	3	5	-	30						
2x2x2x2x2	-	-	-	32						
-	-	5	7	35						
2x2	3x3	-	-	36						(36)
2x2x2	-	5	-	40						
2	3	-	7	42						
-	3x3	5	-	45						
2x2x2x2	3	-	-	48						
-	-	-	7x7	49						
2	-	5x5	-	50	9.3% (50-74)	61 (ca 68)	50 (cuboctahedron)	50		
2	3x3x3	-	-	54						(54)
2x2x2	-	-	7	56						
2x2x2x2x2x2x2	-	-	-	64						
2	-	5	7	70						
2x2x2	3x3	-	-	72						
-	3	5x5	-	75						74 (tuncated octahedron and

Because all these numbers are related, any formula for 137 in terms of the Golden Ratio can be rewritten in terms of Fibonacci and Lucas numbers, though whether this is anything more than merely **abstruse relationships between certain numbers** is not clear. (p. 256) (emphasis added)

On the other hand that it was precisely such "abstruse relationships" -- even termed "**moonshine**" by mathematicians" -- which resulted in the discovery of the (then totally unexpected) connection between the monster group and modular functions. As discussed separately, the issue is what "correspondences" of this nature are to be considered credible under what conditions (*Theories of Correspondences -- and potential equivalences between them in correlative thinking*, 2007)? Given the "universal" importance attributed to the discovery of the **Monster Group** -- appropriately to be considered the most fundamental form of "globality" -- the question for non-mathematicians is its relevance to the challenges faced by a global society (*Potential Psychosocial Significance of Monstrous Moonshine: an exceptional form of symmetry as a Rosetta stone for cognitive frameworks*, 2007).

Conclusion

Physics may indeed be currently a victim of "abstruse relationships" -- with the potential exception of musical harmony -- and largely irrelevant to the challenges of "globalization". However, given Pauli's statement "*even the most modern physics lends itself to the symbolic representation of psychic processes*", a case can be made for exploring "reinterpretations" of the psychosocial significance of the most challenging current applications of physics:

- **International Thermonuclear Experimental Reactor (ITER)**: reframed as separately argued (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006)
- **Large Hadron Collider (LHC)**: reframed as separately argued (*Dynamic Interrelationship of Symbols of Coherent Experiential Representation of Nonduality (DISCERN)*, 2008)

Crazy enough?

Physicists proudly refer to the much-quoted statement by Niels Bohr in response to Wolfgang Pauli:

"We are all agreed that your theory is crazy. The question which divides us is whether it is crazy enough to have a chance of being correct. My own feeling is that it is not crazy enough."

To that **Freeman Dyson** added:

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

The question with regard to the much-sought "new thinking" with respect to "global governance", and the "governance of globalization, is whether any theory is "crazy enough" -- as may well be essential.



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