Introduction

This is an exploration of the possibility that a viable response to the foreseen challenges of the globe and of human civilization may be of an unsuspected form. Whereas, at the time of writing, the focus is on the extreme urgency of constraining global warming and climate change, there is every reason to suspect that whatever is agreed may be inadequate to the challenge (Remedial Capacity Indicators Versus Performance Indicators, 1981).

The radical Plan B that is already in the pipeline is some form of geoengineering, recognized by many as fundamentally flawed and likely to engender more problems than it purports to remedy -- aside from obscuring the stars and achieving a form of regression to the "Dark Ages" (Geo-engineering Oversight Agency for Thermal Stabilization (GOATS), 2008). The possibility of a Plan C, involving any constraint on population explosion is vigorously opposed, notably through deliberate efforts to suppress any consideration of it (Institutionalized Shunning of Overpopulation Challenge: incommunicability of fundamentally inconvenient truth, 2008).

Following the engendered financial bubble and its disastrous collapse in 2008, the credibility of international institutions and models of governance (with their leading proponents) has been undermined, possibly irredeemably (Credibility Crunch engendered by Hope-mongering: "credit crunch" focus as symptom of a dangerous mindset, 2008). This is confirmed by the astounding inability to attribute responsibility for the disaster or to institute appropriate reform (beyond token gestures) -- in contrast with the widespread return to "business as usual". Existing leaders, and those who emerge to replace them, increasingly demonstrate fundamental flaws -- as evidenced by their malfeasance, whether suspected or cause for indictment (Abuse of Faith in Governance: Mystery of the Unasked Question, 2009).

The challenge to the credibility of any global collective initiative is increasingly recognized as the Achilles Heel of remedial possibilities (Recognizing the Psychosocial Boundaries of Remedial Action, 2009). This is ignored or denied by "positive thinking" and "bright-siding" (Barbara Ehrenreich, Bright-Sided: how the relentless promotion of positive thinking has undermined America, 2009).

A major stumbling block to new responses is the manner in which categories are "frozen" and set in stone, effectively as memorials to the mindsets of various authorities. This severely inhibits consideration of alternative possibilities and ensures their condemnation (Framing the Global Future by Ignoring Alternatives: unfreezing categories as a vital necessity, 2009; Remedies to Global Crisis:...
"Allopathic" or "Homeopathic"? Metaphorical complementarity of "conventional" and "alternative" models, (2009).

The window of opportunity explored here is the ability of individuals and groups to reframe their cognitive heritage – notably considerations otherwise neglected or framed as "externalities" (of which the Wikipedia entry provides numerous concrete examples). Ironically the actual collective capacity to respond to substantive global challenges tends also to be understood as an externality (Recognizing the Psychosocial Boundaries of Remedial Action, 2009). This reframing potential is understood as irrespective of any institutional or conventional considerations -- especially since such institutions and their mindsets are themselves categories, whose significance all are free to reframe and reinvent. However regrettable, this tendency is already evident in the increasingly widespread use of narcotic and other substances to render life experience tolerable -- or in the voluntary adoption of unconventional belief systems.

Given the emergent crises, and those foreseen, conventional insights have proven themselves unable to deliver in response to dire need -- no more than "too little, too late" (Emergence of a Global Misleadership Council, 2007). As such they are of increasingly marginal value to "my world".

Individual motivation: vain hopes in response to global crisis

With respect to the current "extreme crisis" said to be facing humanity -- and any hope of survival of human civilization -- is useful to note the cautionary words of the authors of Freakonomics: a rogue economist explores the hidden side of everything (2005), in launching their follow-up study (Steven Levitt and Stephen Dubner, SuperFreakonomics: global cooling, patriotic prostitutes, and why suicide bombers should buy life insurance, 2009).

As quoted by Oliver Burkeman (Asking people to reduce their carbon emissions is a noble invitation, but as incentives go, it isn't a strong one, The Guardian, 12 October 2009):

"Behaviour change is hopeless," Levitt says. "It's just completely pointless to think that you're going to get six billion people, the poorest people around and the richest people around, to work together, when every individual person has no impact on the problem. That's a fundamental issue that economists have thought about, and recognised the hopelessness of, for hundreds of years... One thing we know is that I'm not going to sacrifice, materially, my own life, to help an anonymous person in Bangladesh who might not even have been born yet, when I know that there will be no help for that person anyway." Calling on people to reduce their carbon emissions, the authors write, "is a noble invitation. But as incentives go, it's not a very strong one."

It can also be argued that carbon emissions are merely one manifestation of a more generic human "emissions problem" to which attention is appropriate but unlikely (Conversion of Global Hot Air Emissions to Music: Aesthetic transformation and instrumentalization of vaporware, 2009).

A more realistic appreciation of individual motivations, especially in the case of younger generations, would recognize the cognitive investment in music, game-playing, design, sport, sex and mind-changing drugs. The first two, at least, offer as yet unexplored approaches to behaviour change in relation to governance (Playfully Changing the Prevailing Climate of Opinion: climate change as focal metaphor of effective global governance, 2005; A Singable Earth Charter, EU Constitution or Global Ethic? 2006). Will any climate change agreement achieve memorability through being singable? Also apparent is the conventionally deprecated engagement with humour (Humour and Play-Fullness: essential integrative processes in governance, religion and transdisciplinarity, 2005).

A tardy mainstream response to such preoccupations of the young may in future endeavour to wrap conventional thinking in public relations spin through use of such devices to achieve the desired behaviour change. The disconnect will be only too apparent -- whatever claims are made to the contrary. Missing will be any understanding of the cognitive engagement implied by the study of Jacques Attali (Noise: the political economy of music, 1985). Attali noted the manner in which the organization of favoured styles of music pre-figures emergent styles of organization and governance more appropriate to changing circumstances of civilization.

Typically if music is used in association with conventional conferences, deliberating on matters of governance, it takes the form of classical music. For example, for the most recent gathering of the Club of Rome was held in the Amsterdam Musikgebouw -- with a classical music concert in the evening. This is also the practice of the Club of Budapest. The European Union had Beethoven's Ode to Joy as its anthem. As noted by Attali, current efforts of governance are still desperately endeavouring to apply those styles of hierarchical organization and harmony to circumstances characterized by a significant degree of chaos and unpredictability. They are bound to fail, if only through their inappropriateness as perceived by those who dance to more recent tunes -- best exemplified by Lordi, the masked demonic winner of the 2006 Eurovision Song Contest. No account is taken of insights from the complexity sciences.

"On the requirement to embrace error"
(Donald N. Michael, Learning to Plan and Planning to Learn, 1997)

More bluntly, future-responsive societal learning makes it necessary for individuals and organizations to embrace error. It is the only way to ensure a shared self-consciousness about limited theory on the nature of social dynamics, about limited data for testing theory, and hence about our limited ability to control our situation well enough to be successful more often than not.
Information vs Outformation

Much has been said about the emerging knowledge-based society, especially in the light of the only too evident explosion in information. This evolution poses its own dramatic challenges for the individual in endeavouring to navigate that context. These were framed in an early project of the United Nations University on Information Overload and Information Underuse (IOIU), curiously without written trace. Elsewhere the challenge for society has been framed in terms of an emerging "memetic singularity" (Emerging Memetic Singularity in the Global Knowledge Society, 2009). It necessarily has dramatic implications for any simplistic hopes for global governance.

Emergent characteristics of knowledge-based society: The "brutal" reality of this turbulent context may notably be characterized by:

- inability to "keep up" with new knowledge that might otherwise be held to be relevant, despite:
  - sophisticated search engine facilities
  - sophisticated classification systems
  - sophisticated automated personalization, tagging and notification of emergent knowledge
- communication and comprehension lags:
  - exposure to domains of knowledge and insight which call for an investment in relatively lengthy (and resisted) learning processes in order to comprehend their significance
  - unpredictable, and possibly extensive, lags in the dissemination of information (if is not partially or completely suppressed)
- collective engendering of ignorance at a greater rate than knowledge -- given the incapacity to respond effectively to the latter
- necessity to develop a degree of competence in dealing with some knowledge even though superficially or inadequately understood
- severe reduction in attention span to enable:
  - a minimal degree of response to a highly dynamic context
  - protection from over-exposure to information assumed to be irrelevant
- memetic closure:
  - to new information and insights
  - through defensive depreciation of unfamiliar or inaccessible knowledge as non-essential
  - through cultivation of exotic jargons as a preferred mode of communication, notably associated with unconventional interweavings of insights
- knowledge possessiveness, whether:
  - in the form of protective intellectual copyright or secrecy on the part of others
  - in efforts (possibly mistaken) to protect insights (possibly painfully acquired) which:
    - promise some competitive advantage
    - are vulnerable to over-exposure to an unsympathetic environment
- misappropriation of intellectual property, whether through inadvertent or deliberate appropriation:
  - of what others consider "their" property
  - by others of what one considers one's own property
- encroachment and colonisation of (one's) cognitive space by disciplines, belief systems, etc through:
  - assertive definition and freezing of categories by those claiming authority
  - condemnation of alternative interpretations, possibly with severe sanctions on their advocates
- increasing uncertainty regarding the validity of information due to:
  - dissemination of erroneous information for commercial or other reasons
  - emergence of criticism of information/knowledge as being erroneous
  - indications of an unconfirmable degree of information filtration and effective censorship
- weariness and wariness with regard to conventional understandings of meaningful "knowledge"
- opportunities for creative engagement, formulation of insights and reframing notions of ownership of them
- increasing tendency to repetitive, "empty" declarations and speech-making
- embodiment of evolving knowledge in rigid procedures and institutions

Such phenomena are evident in various ways in emergent features of the knowledge society:

- output of search engines in response to queries
- engagement with social networking sites (FaceBook, etc) and micro-networking (Twitter, etc)
- copyrighting of academic texts, especially those subject to peer review and commercial distribution
- classification of documents as secret by governments (in the "national interest") or corporations (to protect "commercial interests"), as confidential by intergovernmental organizations (to protect "national sensitivity") -- or simply as "secret" by secret societies
- administrative incapacity to process information, notably when solicited in consultative democratic processes (Considering All the Strategic Options: whilst ignoring alternatives and disclaiming cognitive protectionism, 2009).
- systemic analogues to diseases of the body (Memetic and Information Diseases in a Knowledge Society: speculations towards the development of cures and preventive measures, 2008).

The situation is exemplified in the case of policy-makers at the highest level in the requirement that they be "briefed" -- or "debriefed". Ironically this is indeed a process of reducing complexity to its briefest form -- no matter the degree of complexity. Some are known to require that information be summarized on a file card or in a paragraph. As General Montgomery famously said: Don't attempt to make
Evidence to date suggests that means that might supposedly enable such phenomena to be bypassed are themselves rendered unfeasible by those very phenomena (Coherent Policy-making Beyond the Information Barrier: circumventing dependence on access, classification, penetration, dissemination, property, surveillance, interpretation, disinformation, and credibility, 1999). It is unclear that any "semantic web" will address these challenges effectively, or simply exacerbate them. John Freeman (The Tyranny of Email, 2009) argues that the modern tools of electronic communication that are meant to connect us are actually driving us further apart, fragmenting attention spans into "a thousand tiny fragments".

This context gives rise to a form of memenic speciation, somewhat analogous to that of biological speciation. It manifests in the form of the cultivation of selective tastes and preferences for information and its presentation (Epistemological Challenge of Cognitive Body Odour: exploring the underside of dialogue, 2006). Distaste for some epistemological "odours" then inhibits fruitful intercourse with such "others" ("Human Intercourse" "Intercourse with Nature" and "Intercourse with the Other", 2007; Us and Them: relating to challenging others, 2009).

**Encountering the Global Expertise of any Other in the Knowledge Universe**

Fictional description of the poignant encounter of a a leading representative of a "developing" planet with a "development specialist" from an advanced galactic culture.

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. (Doris Lessing, Re: Colonised Planet 5 - Shikasta, 1979, pp. 56-57).

**Shifting semantic and epistemological ground**

More fundamentally the "ground" might be said to be shifting (or dematerialising) in ways that undermine any "meaningful" objective consideration of the emerging situation. As noted from a Russian perspective by Sergey A. Stroev (Crisis in the Post-industrial Age: welcome to role-play, Global Research, October 2009), there is a new meaning to the term "information", in that it actually takes the problem beyond the consideration of the meaning of this information:

If within the industrial modernist paradigm information is understood as a kind of knowledge, now it has found a kind of independence from meaning. Meaning is now transferred into the domain of purely subjective and even arbitrary interpretations.... Of course, such a postmodern interpretation of the language as a play on words, autonomous from any meaning, can be seen as an exaggerated metaphor... However, it reflects a very real crisis.... Hence the conclusion: the distinction between information and misinformation has disappeared. The truth or falsity of information cannot be evaluated given the transition of social existence to the information world. In the postmodern world a linguistic sign refers only to itself, and the meaning of the text are not in this text, but in the context of its reading. The same can be said about information....

For Stroev, typically people are now focused on rapid and superficial browsing of information:

All that requires concentration and attention is rejected. A modern man is not inclined to think; he either grasps the idea, or skips it and goes to the next. There's no time to stop and go into something. The flow of information is moving too fast. The speed of perception and response to information are inversely proportional to the depth and criticality of its perception. The openness to assimilation of the new has its reverse side in the rapid purge of memory reserves from the old....

He adapts quickly, grasps easily, and catches useful fractions of information in a continuous flow of information noise. He quickly adapts to the new and is not burdened by the load memory of the old. He is dynamic, mobile, and communicative, never hitched upon anything, does not complicate his life with philosophical questions and deep feelings, is not tied down to any place, family, permanent work, or circle of communication.

Such considerations point to a fundamental transformation in the role of knowledge in society, in how society is understood, and in how the individual chooses to define anything within that context (including herself or himself). It becomes a question of what is understood to be the knowledge universe and how navigation of it is understood and undertaken. The increasing importance of Twitter has been a highly visible exemplification of understandings of swarm intelligence, notably its enabling of swarm-like behaviour reminiscent of the early studies of "boids" dynamics and flocking (Dynamically Gated Conceptual Communities: emergent patterns of isolation within knowledge society, 2004).

**Malleable realities**

Ironically the implications of these changes for global governance were heralded by the neocons of the Bush regime in the USA, as discussed elsewhere with respect to the "Re-cognition of reality" (2009). The Bush regime made a radical distinction between "faith-based" and "reality-based" decision-making at the highest level, as noted in a much-cited article by Ron Suskind (Without a Doubt, The New York Times, In The Magazine, 17 October 2004) regarding an exchange with an aide in the decision-making circle of President Bush:

More than three points or you will confuse others -- and you will certainly confuse yourself. Curiously such "points" now take the form of "bullet points". Policy is now presented to the public through "briefings".

"Human Intercourse" "Intercourse with Nature" and "Intercourse with the Other", 2007; Us and Them: relating to challenging others, 2009.

The aide said that guys like me were "in what we call the reality-based community," which he defined as people who "believe that solutions emerge from your judicious study of discernible reality." I nodded and murmured something about enlightenment principles and empiricism. He cut me off. "That's not the way the world really works anymore," he continued. "We're an empire now, and when we act, we create our own reality. And while you're studying that reality -- judiciously, as you will -- we'll act again, creating other new realities, which you can study too, and that's how things will sort out. We're history's actors... and you, all of you, will be left to just study what we do."

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<td>Insights from &quot;many years into the future&quot; by Doris Lessing</td>
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One of the things we now know was true for everybody, but which each of us thought was evidence of a stubbornly-held originality of mind, was that we apprehended what was going on in ways that were not official. Not respectable... But the truth was that every one of us became aware at some point that it was not from official sources we were getting the facts which were building up into a very different picture from the publicised one... Attitudes towards authority, towards Them and They, were increasingly contradictory, and we all believed that we were living in a peculiarly anarchistic community. (p. 8)

Yet for all of us there were moments when the game we were all agreeing to play simply could not stand up to events: we would be gripped by feelings of unreality, like nausea. Perhaps this feeling, that the ground was dissolving under our feet, was the real enemy... or we believed it to be so. Perhaps our tacit agreement that nothing much, or at least, nothing irrecoverable, was happening, was because for us the enemy was Reality, was to allow ourselves to know what was happening. (p. 20).

**Outformation and enactivism**: It is quite possible that this "creative malleability" is the core issue of the sustaining psychology required for sustainable development and for sustainable patterns of consumption. This raises the issue of who is now empowered to think of themselves as "we", as previously discussed (Declaration of Universal Independence: delinking from detachment through radical questioning, 2009). The adaptive cognitive process might be described as "outformation" through which reality is imaginatively created or "enactivated" -- as explored in the literature on enactivism. It might be seen as a characteristic of certain communities, some pejoratively labelled as sects for that reason (Imaginal Education: game playing, science fiction, language, art and world-making, 2003; Social Experiments and Sects: beyond category manipulation by advocates and opponents, 1997). Such creative use of language by some communities, in order to empower themselves, has been studied through the methodology of appreciative inquiry.

As discussed previously (Recognizing the Psychosocial Boundaries of Remedial Action: constraints on ensuring a safe operating space for humanity, 2009), the challenge is evident at the time of writing in the response to the issue claimed to be the "most important problem facing humanity", namely the "urgent" focus of the United Nations Climate Change Conference (Copenhagen, 2009):

- the "proof" of climate change, on which there is claimed to be a global consensus of serious scientists, is contested by other scientists whose qualifications and motivations are then variously contested
- the credibility of climate change campaigners is contested to the point that increasing proportions of any population challenge the urgency of global warming -- a process exacerbated by the missionary/religious fervour of those same campaigners
- it is recognized that politically there is little if any chance of a "legally binding agreement" emerging from Copenhagen; emphasis has been switched to the possibility of a "politically binding agreement" -- which might be said to be only of value for public relations purposes as an indication of what might have been done (if, as always, other matters did not have to be given higher priority)
- it is clear that various vested interests are exerting pressures to bring about the erosion of credibility -- if only to "save face" in their failure to enable a viable agreement

Clearly the nature of incontrovertible "proof" is now questionable, whether it be "weapons of mass destruction", Y2K, terrorism, swine flu, climate change, or other challenges yet to emerge. Within mathematics, for example, the 15,000-page "proof" of the so-called enormous theorem raises questions about the meaning of proof, its credibility, the possibility of its comprehension -- and whether it justifies collective action. This has not prevented heavy investment in big physics projects in pursuit of phenomena -- such as the God particle -- as elusive (and subject to illusion) as those calling for belief by religions (and considered laughable by science). Parallels might even be found between the application of funds and intelligence to detection of blackholes and al-Qaeda.

Curiously it might be said that the emergence of a global knowledge-based society is associated with an emerging degree of recognition of an analogue to Kurt Gödel's incompleteness theorems of mathematical logic. These state that any effectively generated formal theory in which all arithmetic truths can be proved is inconsistent -- hence any such consistent formal theory that can prove some arithmetic truths cannot prove all arithmetic truths. In mathematical philosophy these are widely regarded as showing that the programme to find a complete and consistent set of axioms for all of mathematics is impossible. As the fundamental study of relationships, the analogue suggests that inconsistencies and contradictions are to be expected between the variety of modes of knowledge, variously "incredible" to one another in their efforts at integrative framing of reality -- whether or not these sustain any "clash of civilizations". Hence the dramatic challenge of self-reflexivity (Douglas Hofstadter, Gödel, Escher, Bach: an Eternal Golden Braid: a metaphorical fugue on minds and machines in the spirit of Lewis Carroll, 1979; Hilary Lawson, Reflexivity: the post-modern predicament, 1986; George Lakoff and Mark Johnson, Philosophy In The Flesh: the embodied mind and its challenge to western thought, 1999).

**Evanescent "facts"**: The surprise for climate change scientists is that their "facts" are not taken as seriously and unquestionably as they believe is justified by the "evidence" as presented by Al Gore's *An Inconvenient Truth* (2006). Their surprise derives in part from the manner in which they exclude any consideration of the psychosocial context in which "facts" are given credibility (*An Inconvenient Truth -- about any inconvenient truth, 2008*).
As a "belief system", climate change science is effectively trapped in the pattern of which science had previously accused religion -- with the huge irony that appeals are now being made on behalf of science to religion (Suzanne Goldenberg, Al Gore's Inconvenient Truth sequel stresses spiritual argument on climate, The Guardian. 2 November 2009). Those disparaged as scientifically "ignorant" are now called upon to "believe" (and fund) in a manner only too reminiscent of the practice of priesthoods in relation to the ignorant masses. Carbon trading might even be compared with the deprecated sale of indulgences (Global Market in Indulgences: extending the carbon trading model to other value-based challenges, 2008). In the UK, belief in climate change has now been given the same legal status as religious belief (Judge rules activist's beliefs on climate change akin to religion, The Guardian, 3 November 2009).

Perhaps a greater irony is that no appeal is made to religions with regard to the challenge of overpopulation -- ignored by climate change science as a primary, and continuing, driver of global warming and resource depletion (Root Irresponsibility for Major World Problems: the unexamined role of Abrahamic faiths in sustaining unrestrained population growth, 2007).

As noted by Stroev (Crisis in the Post-industrial Age: welcome to role-play. Global Research, October 2009):

The collapse of scientific world picture, of the authority of theory and the cult of accumulating "objective facts" as a self-sustaining activity still remains in the framework of positivism, that is, the modernist concept, though already reflecting its decline and the crisis of modernist paradigm in general. However, the crisis, generated by the implementation of this concept, becomes a source of a post-modern coup, already denying the very notion of the "objective fact". Indeed, as any intellectual content in a scientific work is emasculated, this work is increasingly becoming a formal sign (or a stream of formal signs) signifying, in accordance with the paradigms of postmodernism, only itself. If truth is only an agreement of the scientific community, then a scientific fact is what this community recognizes as a fact that under the currently adopted internal rules of social interaction. And a scientific article is also only a formal sign, denoting its rating under the arbitrary and conventional rules of social interaction of this community, and not correlating with any transcendent reality in relation to this social interaction.

The point might have been made by science about religion. More generally it raises the question of the status of what is considered a "fact" across the disciplines with their respective cognitive filters. How indeed might this evolve through future cognitive revolutions and be understood differently as a characteristic of distinct global sub-cultures? As religion has shown, a "fact" in that context is quite different from how science now asserts it to be -- beyond question in both cases. Science does not however allow for the possibility that what is recognized as a "fact" may itself be understood quite differently in decades (or centuries) to come -- as suggested by the more radical insights of fundamental physics. Is it a "fact", that a "fact" will be understood in the distant future as it is within any currently favoured epistemological framework? Is this tantamount to colonizing the cognitive future?

Irrespective of any analogue to the incompleteness theorems, as argued elsewhere (Abuse of Faith in Governance: Mystery of the Unasked Question, 2009):

Authorities are now in the very problematic situation that if they have the power of misrepresentation, it becomes impossible for them to prove that they are not using it as a means of concealing abuse. This becomes even more evident with the appointment of so-called "independent" commissions of inquiry -- whose mandates and composition are carefully "gerrymandered" to fabricate the desirable authentication of the authoritative position desired. Unfortunately authorities are no longer in a position to demonstrate that this is not the case.

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**Le Chatelier’s Principle**

Reformers, critics of institutions, consultants in innovation, people in sort who "want to get something done", often fail to see this point. They cannot understand why their strictures, advice or demands do not result in effective change. They expect either to achieve a measure of success in their own terms or to be flung off the premises. But an ultrastable system (like a social institution)... has no need to react in either of these ways. It specialises in equilibrial readjustment which is to the observer a secret form of change requiring no actual alteration in the macro-systemic characteristics that he is trying to do something about (The cybernetic cytoblast - management itself: Chairman’s Address to the International Cybernetics Congress, September 1969).

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Communication "surface": As discussed previously (Beyond the plane: form and medium in terms of the calculus of indications, 2006), there is a strong case for challenging assumptions regarding the adequacy of conventional presentations of information and "facts" on a plane surface, as with linear text and two-dimensional images. Such a challenge may well be vital to any more adequate engagement with environmental crises (Comprehension of Requisite Variety for Sustainable Psychosocial Dynamics: transforming a matrix classification into intertwined tori, 2006).

In contrast to the plane surface of a simple matrix, a torus (for example) holds an interesting position in the discussion of the relationship between form and medium as fundamental to advanced theories of communication. This notably featured in the work of Niklas Luhmann (Die Gesellschaft der Gesellschaft, 1997) as discussed by Michael Schiltz (Form and Medium: a mathematical reconstruction, Image [&] Narrative, 6, 2003) in relation to the calculus of indications of George Spencer-Brown (Laws of Form, 1969/1994). Schiltz notes that form/medium is "the image for systemic connectivity and concatenation", as described by Humberto Maturana and Francesco Varela. As Schiltz remarks (using the term "fact"):

The fact that men have for centuries used a plane surface for writing means that, at this point in the text, both author and reader are ready to be conned into the assumption of a plane writing surface without question. But, like any other assumption, it is not
However, in the context described above, such possibilities are only to be taken "seriously" and considered worthy of development by those who find them more credible and prefer them to other realities.

**Emergent transformation possibilities:** The radical cognitive transformation underway might be compared to: the evolutionary circumvention of the constraints on oxygen transfer between that of insect respiratory systems and respiratory systems of mammals; to the fall of the dinosaurs; or to the replacement of the Neanderthals by the Cro-Magnon (as previously discussed in *Authentic Grokking: emergence of Homo conjugens*, 2003).

The question is how to render sufficiently "compact" the insights of value to cognitive thrival and how the integrity of any turbulent global context is then to be understood and navigated. Increasingly thrival may be a matter of focusing on whatever form of coherence is cognitively nourishing, avoiding:

- wasted effort to persuade others of the merit of a given perspective
- any quest for collective consensus
- existential regret at the lack of consensus

The challenge might be framed as how to enable "meta-travel" through knowledge space however it proves appropriate to configure it. Hence the focus below on metaphor (*Metaphors as Transdisciplinary Vehicles of the Future*, 1991). Stroev, for example, comments on the emerging insights and role of "netocrats".

Related possibilities are illustrated by the following:

- *Transforming Static Websites into Mobile "Wizdomes": enabling change through intertwining dynamic and configurative metaphors* (2007)

**Individual motivation: radical possibilities in response to global crisis**

Curiously there is a separate focus on the problematic conditions of the globe (as external to the individual) and on the problematic conditions for individuals (most notably in the form of the internal conditions of stress, depression and the need for compensatory measures).


As underlying aspects of reality, the complementary notions of internal and external vary within differing disciplinary contexts. In general, internality refers to a common or shared space, while externality refers to being on the outside of such a space. In simple terms, the reality and experience of unity or integration is the embodiment of internality, and the reality and experience of separation or disunity is the embodiment of externality....

Externality in and of itself is not some evil thing anymore than the separation of a newborn from its mother is a negative phenomenon. On the contrary, the externalization aspect of birth is a natural part of the growth process. However, should the newborn be neglected through a failure to provide a common space of nurturing support, externality has gone too far and autism can be the tragic result.

In the case of economics, internality and externality need to be brought to bear on theory for a balance to be achieved, but in a direction that is different from that of physics. Bacon in his *New Organon* pointed out how "theory spinning" without systematic involvement with the external world would only hinder scientific progress....

Summing up, I have outlined the structure of a possible balance between two forms of wealth. Instead of the unbalanced structures of internalist simplicity and externalist complexity, I put forward the idea of internalist complexity and an externalist simplicity, with the latter predicated upon the former. These two possibilities of balance must be consciously sought, but they can only be realized by giving free range to the full gamut of human potential. In this regard, it is important to recognize that the present system of unbalanced externalist complexity does not offer such freedom.

The question here is the adaptation of such understanding to environmental preoccupations -- in terms of the wealth that they represent, both externally and internally.

"Re-cognition" of the environment: Various authors have addressed the possibilities of a radically different mode of engagement with the environment. These would seem to be fundamental to any expectation of a more fruitful response to global challenges, especially those currently framed as associated with climate change.

The process of ceasing to attribute unquestioning belief in authority, or to the views it promulgates, is analogous to that of non-acceptance of a monetary token -- a feature of the current financial crisis (and the unprecedented hyperinflation of Zimbabwe). It is of
course intimately related to the processes of disaffection, apathy and alienation through which many (especially the young) already manifest their lack of respect for those who claim authority and expect respect. It has a long political tradition in anarchism, now framed as dangerous extremism (worthy of criminalization by the forces of "law and order"). The view has been extensively articulated by Paul Feyerabend (Against Method: outline of an anarchistic theory of knowledge, 1975/1988) in support of his study of cognitive deprivation (Conquest of Abundance: a tale of abstraction versus the richness of being, 1999).

As discussed elsewhere (Dysfunctional disengagement from abundance, 2008), in an epoch strategically focused on the scarcity of resources, the cognitive challenges and delights of engaging with abundance have been highlighted by a number of other authors and by the deep ecology and ecosophy movements:

- Steven M. Rosen, Topologies of the Flesh: a multidimensional exploration of the lifeworld, 2006; Dimensions of Apeiron: a topological phenomenology of space, time, and individuation, 2004;
- Salle McFague, Life Abundant: rethinking theology and economy for a planet in peril, 2000;
- Felix Guattari, The Three Ecologies, 2000

The issue might be framed in terms of the "psychological disconnect" from the environment in all its forms -- a potentially dysfunctional (if not pathological) form of objective detachment, overcompensating for potentially dysfunctional (if not pathological) forms of subjectivity. This was the argument of indigenous people, as extensively documented for the United Nations Environment Programme by Darrell A. Posey (Cultural and Spiritual Values of Biodiversity, 1999).

Such arguments have perhaps been most succinctly summarized by Jennifer Gidley (The Evolution of Consciousness as a Planetary Imperative: an integration of integral views. Integral Review, 5, 2007), notably to the effect that:

However, the growing awareness of a potential planetary crisis has highlighted the significance of finding new ways of thinking, if humankind is to move through our current complex challenges. This critical imperative appears to be mobilizing researchers from a wide range of disciplines to broaden the notion of evolution of consciousness beyond its biological bounds.

Rosen, for example, highlights the manner in which the richness of psychosocial engagement with the world has been completely undermined by formal discourse -- an "eclipse of the lifeworld" in his terms. Ironically, in a period of sensitivity to the challenges of "resources" and "energy", this view is echoed by other authors with respect to a lost sense of "abundance". Abram observes that the concealment of the sensuous realm of pre-Renaissance experience was less lucidly focused than the mode of awareness that succeeded it. However, the decisive separation of subject and object did indeed serve the interest of creating sharper understanding, a greater capacity for reflection and intellectual achievement; in that way it helped to fulfill humankind's potential.

Cognitive implications for survival: In his most recent study, Jacques Attali (Survivre aux Crises, 2009), argues that individuals can escape a crisis in better condition than they entered it. However the necessary prerequisite is to understand the logic and course of events, to make use of new knowledge accumulating in many domains, to depend only on oneself, to take oneself seriously, to become an actor in one's own destiny, and to adopt audacious strategies of personal survival. (pp. 15-16)

Attali was the controversial first president of the European Bank for Reconstruction and Development, and lead author of the official Rapport de la Commission pour la libération de la croissance française (January 2008), known as the Rapport Attali -- which subsequently exemplified the unpredictability of the future in failing to allow for the financial collapse later that year. He stresses the importance of recognizing the "vertiginous reality" that: our sociopolitical systems are doing nothing, absolutely nothing to avoid the threats facing the survival of individuals, enterprises, nations, and humanity itself.

Worse still, Attali argues, despite what they claim in order to reinforce their legitimacy, they have no reason to do anything effective since they feed off the vitality of those living in their systems. Under these circumstances it becomes pointless to await this or that general reform. The opportunity lies in reconceiving oneself and in the vigilant association with allies -- rather than in depending uncritically on boundless optimism. The key lies in extreme lucidity with regard to oneself and a focused desire to determine one's own raison d'etre, whether in the short-term or the longer-term. It is not just a question of conserving what has been achieved but may involve going beyond existing patterns of order. Nor is it just a question of preserving a sense of personal integrity but may well require exploring a variety of possibilities. (pp.19-20).

<table>
<thead>
<tr>
<th>Principles of Crisis Survival</th>
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<tbody>
<tr>
<td>Jacques Attali (Survivre aux Crises, 2009, pp. 22-24; 146-165)</td>
</tr>
<tr>
<td>• respect for oneself, for thrival rather than just survival;</td>
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<tr>
<td>• living intensively, even if it requires sacrifice, given that time is the scarce resource;</td>
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<tr>
<td>• empathy for others and their perspectives, whether ally or potential enemy;</td>
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<tr>
<td>• resilience in response to the variety of potential crises;</td>
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<td>• creativity, notably in the transformation of uncontrollable crises into opportunities;</td>
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<tr>
<td>• ubiquity, notably the ability to reinvent oneself in response to persistent crises and to embody any associated ambiguity;</td>
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<tr>
<td>• revolutionary capacity, under the threat of extreme circumstances, namely to dare anything, negating the prevailing rules of the game whilst maintaining one's self-respect (thus linking back to the first principle).</td>
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</table>
Radical re-engagement: Related themes have been addressed in a commentary on the Encyclopedia of World Problems and Human Potential (Post-crisis Opportunities: in quest of radical coherence, 1995). Such an existential attitude can also be articulated as a "declaration" (Declaration of Universal Independence: delinking from detachment through radical questioning, 2009). More appropriate is the recognition of the kind of shift in identity from a "centre of gravity" focused on an essentially static understanding of invariant identity to one centred on a dynamic, notably a cycle (Emergence of Cyclical Psycho-social Identity: sustainability as "psychically" defined, 2007). Associated modes of knowing may also be challenged and reframed, as explored through the metaphor of "grokking" (Authentic Grokking: Emergence of Homo conjungens, 2003).

Any such articulations need to be considered in the light of arguments for their essential inadequacy, inappropriateness or incommunicability -- and the necessity of "unsaying" (Being What You Want: problematic kataphatic identity vs. potential of apophatic identity? 2008).

Metaphors as cognitive catalysts and vehicles

In such an information context the question is how personally to engage effectively with the environment and how to enable more effective engagement with an environment in crisis. The mishmash of mutually contradictory information and views about climate change is an indication of the challenge.

The opportunity explored here involves the adaptation of a principle of martial arts. It uses understanding (of understanding) of the environment as a means of engaging with the environment in radical new ways. However the argument is that it is prudent to assume that ways of engaging with the environment are constrained by patterns evolved over millions of years of which humans are unlikely to be especially conscious (John Ralston Saul, The Unconscious Civilization, 1995). The argument is then that the implicit cognitive order - - whose potential emergence into awareness is the source of widespread hope for an essentially unconscious civilization -- is intimately associated with patterns in the natural world, as some form of isomorph (Gregory Bateson, Mind and Nature; a necessary unity, 1979).

Would that be surprising? Why should it be expected that completely new cognitive patterns are emerging if the viability of existing ones has yet to be meaningfully recognized and challenged? One example of this is the number of profound and highly complex breakthroughs in physics that have been triggered by patterns in the natural world -- interpreted metaphorically.

Consideration of such a possibility has a long tradition in mimesis, appropriately contrasted with declarative diegesis. In even closer association with nature is the process of biological mimicry. Biomimicry is an ancient concept that has acquired recent credibility in science. It examines nature, its models, systems, processes, and elements with the purpose of emulating or taking inspiration from them to solve human problems sustainably. Scientific and engineering literature describes biomimetics as the process of understanding and applying biological principles to human designs -- the focus of the journal Bioinspiration and Biomimetics.

The approach in what follows explores the cognitive implication of the behavioural patterns of humanity in engaging with the environment. In that sense it goes beyond bioinspiration or biomimetics. It uses the conventionally engendered categories as metaphors as a means of encoding complex patterns of information in a manner which enables more ready psychoactive engagement.

Just as a challenge in developing essential mineral supplements is to transform them into a biologically digestible form, so the challenge might be said to be the transformation of frozen categories into a psychologically accessible form. It is assumed that the perceived "problems" may also be fruitfully transformed by such metaphorical reframing (Metaphors as Transdisciplinary Vehicles of the Future, 1991; Opportunity: Reframing problems as metaphors, 1995; Recontextualizing Social Problems through Metaphor, 1990).

Since the crucial emphasis is seen to be individual psychoactive engagement with environmental challenges, the use of metaphor extends to personalization and embodiment, following the insights of:

- Kenneth Boulding: Our consciousness of the unity of the self in the middle of a vast complexity of images or material structures is at least a suitable metaphor for the unity of a group, organization, department, discipline, or science. If personification is only a metaphor, let us not despise metaphors - we might be one ourselves. (Ecodynamics; a new theory of social evolution, 1978).
- Gregory Bateson:
  - We are our own metaphor (Mary Catherine Bateson, Our Own Metaphor: a personal account of a conference on the effects of conscious purpose on human adaptation, 1972);
  - The pattern which connects (all living creatures) is a meta-pattern. It is a pattern of patterns. It is that meta-pattern which defines the vast generalization that, indeed, it is patterns which connect. (Mind and Nature; a necessary unity, 1979).
- George Lakoff and Mark Johnson: Philosophy In The Flesh: the embodied mind and its challenge to western thought (1999)

The exercise in the following section builds on previous efforts and arguments in the light of the insights of such authors.

<table>
<thead>
<tr>
<th>Personal Globalization (2001)</th>
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<tbody>
<tr>
<td>Conceptual prosthetics and surrogates</td>
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<td>Conceptual traps and Ponzi schemes</td>
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<tr>
<td>Globalization of experience</td>
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<td>Conceptual de-regulation</td>
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<td>Conceptual dimensions of globalization</td>
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<tr>
<td>Reflecting the environment</td>
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<tr>
<td>Recognizing the &quot;cultural rainforests&quot; of the globalized person</td>
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<tr>
<td>Sets of operational concepts in collective enterprises</td>
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<td>Sets of animal appendages</td>
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</table>
Animal movement and conceptual exoskeletons  |  Endangering species by rationalizing the environment
Dynamic coordination of sets in movement  |  Memetics as the under-explored analogue to genetics
Indigenous insights  |  Memetic engineering: a Western discovery?
Animal locomotion: example of walking as a cognitive metaphor  |  Memetic engineering: an Eastern practice?
Shapeshifting  |  Neurobiological clarification
Insights into shapeshifting from collective behaviour  |  Memetic engineering: Western magical arts?
Conceptual endoskeleton vs Conceptual exoskeleton

**Psychology of Sustainability:**

- Embodying cyclic environmental processes (2002)
  - The "pattern that connects"
  - Transcending between realities
- Elusiveness of sustainability
  - Transcending amongst a set of complementary alternatives
- Environmental learning
  - Reality, relativity and relativism
- Contemporary ironies of sustainability
  - Cycles sustaining reality frameworks
- Sustainability and spin
  - Behavioural attractors and sustainable development
- Openness and closure
  - Breaking dysfunctional cycles
- Sustainability of collective initiatives -- and the dependence on spin
  - Breaking dysfunctional spirals: sustainability and the torus
- Spinning an alternative
  - Conscientious research and development

**My Reflecting Mirror World:**

  One way of framing this approach is to consider the environment as a form of mirror
- Challenges to governance of my world
  - Rainmaking in Joburg: making my Rio+10 worthwhile
- Problems of my world
  - Mirrors of my world
- Reframing my "overpopulation" problem
  - Configuring the mirrors of my world
- Organizing my world
  - Governance through metaphor
- My management failure
  - "Sustainable development": configuring divergent understandings
- Context
  - Self-possession and governance

**Self-reflective Embodiment of Transdisciplinary Integration (SETI):**

  But rather than a purely reflective mirror, a more fundamental cognitive challenge is the psychoactive engagement with the mirror -- possibly even as a criterion of a higher order of intelligence
- Mirror self-recognition and environmental mirroring
  - "UFOs"?
- SETI: a "universal" criterion for species maturity?
  - Contact with extraterrestrials?
- Dimensions of a "SETI" criterion?
  - Cognitive challenge: resolving the problematique
- Lexical category trap
  - "Torturing the Sphinx": Militarized intelligence vs Sustainable quality of livelihood
- "Universal" indication of indication?
  - "Terrestrial extras"?
- Multidimensional indication through transcendence of "pointing"?
  - SETI: Shadowy Extreme of Transformative Implication?
- Experiential dimension
  - SETI: comprehension
- Cultural clues to SETI comprehension

**Stepping into, or through, the Mirror:**

- Embodying alternative scenario patterns (2008)
  The metaphor may also be used to suggest the cognitive need to "step through" such a mirror
- Urgent relevance
  - Requisite catalytic effect
- Remedial capacity indicators
  - Polysensual pattern-breaking
- Avoidance processes
  - Virtuality as the ultimate illusion?
- Lack of self-reflexivity in the face of speculative flattery
  - Game-playing and facilitation
- Cognitive glass ceiling
  - Seizing the moment

**Looking in the Mirror -- at Josef Fritzl?**

- Global conditions on reflection (2009)

- Reflective TV screens?
  - Habitation to participation in such actions
- Cognitive dissociation
  - How? When?
- Structural violence
  - Why? Who? Which?
- Celebration of agreement and togetherness?
  - Future perspective?
- Confirmation of purity -- a healthy catharsis
  - Speculative anticipation

**Being the Universe: a Metaphoric Frontier**


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**Exploration of "inner games": polarization, agriculture, construction, mining**

Biology has explained how ontogeny replicates phylogeny, namely how the process of embryonic development of a mammalian species is patterned after the evolution of that species through earlier forms. This insight suggests several other possibilities that call for reflection

Supposing "psychogeny" -- namely psychological development -- also replicates phylogeny in some way during the process of maturation. After all, humans have a variety of organs of the brain, some of which are characteristic of the earliest animals. It has been argued that some of our behaviours derive necessarily from the functioning of those brains.

In the light of the above, the processes and intentions of reflection may be explored in the light of different clusters of metaphor. In a knowledge-oriented society, these metaphors are especially relevant in relation to information organization and processes.

The underlying cognitive challenge is intimately related to how polarization in its many forms is handled. The question is how to develop a cognitive domain with the "poles" and "pillars" of strategic principles. This "dilemma" has been considered separately (Configuring Conceptual Polarities in Questing: metaphoric pointers to self-reflexive coherence, 2004) through three clusters.
What is special interest is the sense in which what is “mined” in this way is impoverished and denaturing that person’s worldview and poisoning cognitive worldview of the “miner.” “Strip mining” and the exploitation -- and by the Navaho and weaving together a metaphor of geography of place into a unique mythic story. (a process insights require investment that those insights insightful metaphors Susantha Goonatilake “Mining” Winter, 2007)

Stress Given experience with The intimate cognitive relationship and animal husbandry? Is there a biodiversity, and the same is true of gardening (cf Diane Dreher, the Inner Frisbee. It is however significant that for a variety of sports, emphasis has been placed on the "inner game", whether as a key to success in the outer game or as an experience of significance in its own right (cf the Inner Game of: Tennis, Golf, Frisbee, Chess, Poker, Billiards, Fencing, Go, Sumo, Skiing). The insight has been adapted to competitive economic activity (cf the Inner Game of: Business, Investing, Wealth, Work, Management, Trading, Entrepreneurship, Selling, Prospecting). The same is true of gardening (cf Diane Dreher, Inner Gardening: A Seasonal Path to Inner Peace, 2002, and notions of an "inner garden", or a "secret garden").

Such widely accepted insights point to the need for exploration of an "inner-game" of environmental "externals" such as recycling, biodiversity, and the like. Given the degree of recognition of gardening as an "inner game", might this be fruitfully extended to agriculture and animal husbandry? Is there a sense in which current consideration of agriculture is akin to the deprecated "slash and burn" stage? The intimate cognitive relationship to gardening is echoed in that to home construction.

Given experience with such "inner game" psychological expertise and its wider application to "stress" (Tim Gallwey, The Inner Game of Stress, 2009), there is a case for exploring its application to engagement with environmental stress. It may indeed be that an alliance with religion will facilitate this (Adi Setia, The Inner Dimension of Going Green: articulating an Islamic deep-ecology, Islam and Science, Winter, 2007)

"Mining": The approach explored here is in itself one of "mining", in the light of one interpretation of the remarkable arguments of Susantha Goonatilake (Toward a Global Science: mining civilizational knowledge, 1999). His focus is mining the range of cultures for insightful metaphors -- notably highlighting the riches of the cultures of South East Asia in that respect. "Mining" is then appropriate in that those insights have effectively been locked into layers of cultural geology, perhaps to be understood as crystallized or fossilized. The insights require investment and effort to extract.

However the argument here goes further. It suggests that such "mining" can be usefully understood as a form of cognitive appropriation -- a process of making "mine". Echoes of this are to be found in the process of land nám, a term coined by Ananda Coomaraswamy (The Rg Veda as Land-Nama Book, 1935), to refer to the Icelandic tradition of claiming ownership of uninhabited spaces through weaving together a metaphor of geography of place into a unique mythic story. This territorial appropriation process, notably practiced by the Navaho and the Vedic Aryans, was further described by Joseph Campbell (The Inner Reaches of Outer Space: metaphor as myth and religion, 1986):

Land nám ("land claiming or taking") was [the Norse] technical term for this way of sanctifying a region, converting it thereby into an at once psychologically and metaphysical Holy Land.... Land nám, mythologization, has been the universally practiced method to bring this intelligible kingdom to view in the mind's eye. The Promised Land, therefore, is any landscape recognized as mythologically transparent, and the method of acquisition of such territory is not by prosaic physical action, but poetically, by intelligence and the method of art; so that the human being should be dwelling in the two worlds simultaneously of the illuminated moon and the illuminating sun. (p. 34)

Within this metaphor, given the patterns of operation of the "mining industry", there is then the question of staking claims and their exploitation -- and the challenge of "stakeholders". There is also the matter of the destructive impact on the environment, notably through "strip mining" and the use of toxic chemicals in the extraction process. However these impacts are then very much restricted to the cognitive worldview of the "miner". They are largely invisible to others except to the degree that they are recognized by them as impoverishing and denaturing that person's worldview and poisoning their environment.

Of special interest is the sense in which what is "mined" in this way is held to be of collective value, as with gold and precious stones. What is it possible to "mine" in this way that is of collective significance and a valued basis for exchange?
Understood in this way, the process of "mining" is one of taking radical possession of what is to be found in the cognitive world -- of making it one's own. The issue is then the nature of any sense of possession and of the exclusive right one has to it as property -- as cognitive property over which one takes ownership. Intimations of this cognitive appropriation are to be found in relation to intellectual property and copyright. The problematic features of this are evident in the claims variously made for an insight as being "mine", notably in disputes over provenance and priority. They suggest other ways of understanding the knowledge universe (Einstein's Implicit Theory of Relativity -- of Cognitive Property? Unexamined influence of patenting procedures, 2007).

More interesting is the sense in which an insight becomes "mine" to the extent that I can comprehend it -- or "get it". In this sense an insight cannot be exclusively possessed as is the case with assumptions made about so much intellectual property. In a multidimensional context, an insight is necessarily not exclusively possessed in the way in which this is so readily assumed to be the case with respect to two-dimensional and three-dimensional claims to property. Those who "mine" it, comprehending it for themselves, appropriate it for themselves. Such appropriation does not exhaust the capacity of the insight to be "mined" by others -- as noted with respect to knowledge, if not for information.

Such issues point to interesting questions about the nature of any insight, the identity of the "miner" and the manner of the "miner's" "possession" of that insight. This is the question of the process of engagement and disengagement from an insight -- whether the mnemotechnics of remembering and dis-remembering, or the process of cognitive attachment and detachment that is a basic feature of some spiritual disciplines. These may well imply a form of dynamic, of cyclic identity and of alternation between possession and dispossession (Emergence of Cyclical Psycho-social Identity: sustainability as "psyecically" defined, 2007).

Any insight is then usefully to be understood as of a lower dimensional order than the process through which it is periodically taken up ("mined") to be subsequently abandoned. The higher dimensional context in which this process takes place may lie beyond any conventional comprehension, possibly one of existent unknowing or ignorance as celebrated in the unsaying of apophatic discourse (Being What You Want: problematic kataphatic identity vs. potential of apophatic identity? 2008).

Exploration of possible reframing: illustrative problem sets

The above approach has been explored in more detail with respect to a range of ways of engaging with sets of preoccupations (see Annex A: Degrees of Cognitive Engagement with Interrelated Global Categories (2009).

Rethinking Rubik's Cube: a mnemonic device for ways of knowing and engagement?

The content of the above examples poses the fundamental challenge of how one might choose to order it -- to relate what is distinguished. Rather than freezing such a set of categories into a static framework, there is the possibility of focusing on the possible design of a cognitive "device" offering a variety of ways of holding together any pattern of insights -- if only as a mnemonic device.

In this exploration, it is not necessary to address the concrete feasibility of any device. The purpose here is to suggest the value of thinking about the design of such a device and how it might be used, especially with respect to cognitive engagement (perhaps a meta-Denkmodell). The more general argument for mnemonic devices has been made elsewhere (Metaphorical Geometry in Quest of Globality -- in response to global governance challenges, 2009).

Rubik’s Cube (3x3x3) offers a suggestive point of departure (given that technical patents exist for mechanical versions from 4x4x4 to 11x11x11). As a device it demonstrates a key feature of attractiveness and uptake. As of January 2009, 350 million cubes had been sold worldwide making it the world's top-selling puzzle game and best-selling toy. Possibilities for such a device include:

- given the variety of such devices that the 3x3x3 version inspired, consideration could be given to the use of a:
  - a 4x4x4 variant (Rubik’s Revenge, or Master Cube)
  - a 5x5x5 variant (Professor’s Cube)
  - a 6x6x6 variant (V-Cube 6)
  - a 7x7x7 variant (V-Cube 7)
  - a 8x8x8 variant only exists in a virtual form
- use of other variants, notably based on polyhedra other than the cube:
  - tetrahedron (Pyramorphix, Pyraminx, BrainTwist)
  - octahedron (Skewb Diamond)
  - dodecahedron (Megaminx, Alexander’s Star, Skewb Ultimate, Pyraminx Crystal)
  - icosahedral (Impossible, Dodec)
  - n-dimensional virtual versions (Magic 4D Cube, Magic 5D Cube, Magic 120-cell)
  - sphere (Rubik’s 360)
- attribution of symbols to surfaces (possibly with adhesive, coloured stickers):
  - colours, as in the original Rubik’s Cube and many variants
  - numbers, as in the Sudoku Cube (1-9), of which there are 12 types, or its 4x4x4 variants
  - raised symbols allowing tactile recognition of faces (Braille Rubik's Cube)
  - symbols of cultural significance (Tamil symbols)
  - combination of colours and symbols (0s, Xs and dots) (Qubami)
  - customized patterns or promotional symbols on the various faces
  - keyboard symbols
  - film shot imprints
  - Rubik’s Cube of Ecology (developed by Heiner Benking)
  - tactile variants (Tooch Rubik’s Cube, using six different materials: metal, wood, textile, stone, rubber, and plastic, engaging users to use their senses; Blind Man’s Cube / Metal Rubik’s Cube)
Also of relevance is the sense in which the "solution" is not necessarily a single pattern (or colour), as is commonly assumed, but may be one of many patterns (Andrew Olson, *Making Patterns with Rubik's Cube*, 2009).

**Investing significance in mnemonic aids**

There is a heavy investment in binary and polar representation, especially in relation to strategic thinking. This is most evident in the proclivity for "pillars", "poles" and "axes" with little sense of how they might be interlinked or configured (*Coherent Value Frameworks: Pillar-ization, Polarization and Polyhedral frames of reference*, 2008). Any individual "pillar" then tends to be associated with a particular form of *silo thinking* or *tunnel vision*. As "columns" of a cognitive matrix, the absence of the necessary transversal, transdisciplinary, lateral function then becomes apparent in the absence of cross-fertilization.

*Rubik's Cube* points to one alternative possibility, notably in the form of the *Eco-Cube*, as proposed by Heiner Benking. Of relevance to such thinking is the work on an *Ekistics Grid*, as originally proposed by *C. A. Doxiadis*, and developed by the *World Society for Ekistics*. That grid is an aid to ekistics as the science of human settlements (*Ekistics and the Ekistic Grid*, 2006).

The issue is highlighted in electronic communications by the common metaphor of a topic "thread" -- but without any consideration of how multiple threads might be woven together into an appropriately designed "carpet" (or "garment") in order to be of any use. Subject categories may however be designed into the form of a two-dimensional matrix -- used to order international organizations, their problems and their strategies (*Integrative Matrix of Human Preoccupations*, 1982). In a matrix of "threads", inspired by the periodic table, the columns are primary subjects and the rows range from the concrete to the abstract. The matrix only then constitutes a form of cognitive "carpet".

Categories that could be associated with, or "designed into", any such cognitive device could then include:

- functions typical of distinct government agencies and their systems, or of university faculties
- associations to the function of a Rosetta stone relating distinct (incommensurable) cognitive languages
- functional systems of environmental categories at different levels of abstraction, as argued in the development of the *Functional Classification in an Integrative Matrix of Human Preoccupations* (1982), notably in the light of:
- degrees of psychological engagement with categories and their degrees of materialization or dematerialization (virtualization)
- mnemotechnical "compression", rendering insight in symbolic form, or with accompanying learning rhymes (or even melodies) in order to enable a degree of "hypercomprehension" (*Hyperacervation through Hypercomprehension and Hyperdrive -- necessary complement to proliferation of hypermedia in hypersociety*, 2006).
- a pattern language device (*Governance through Patterning Language: creative cognitive engagement contrasted with abstraction of responsibility*, 2006; *5-fold Pattern Language* -- proposed for inclusion in *Encyclopedia of World Problems and Human Potential*, 1984)
- mnemonic reminders of components of a "cognitive toolkit" for thrival, as suggested by traditional use of threaded beads (*Designing Cultural Rosaries and Meaning Malas to Sustain Associations within the Pattern that Connects*, 2000)
- there is much of interest to number theorists and the cognitive issues relating to number, as commentaries in *Wikipedia on Rubik's Cube* and its variants indicate (*Representation, Comprehension and Communication of Sets: the role of number*, 1978);
- the sets distinguished are held to be meaningful both in systems terms and in traditional patterns of categories promoted by philosophes and religions (*Navigating Alternative Conceptual Realities*, 2002). This suggests a degree of malleability to the articulation of such patterns or a degree of choice in opting for one rather than another.
- requisite set of elements for any viable agreement relating to the environment, notably *essential feedback loops governing the integrity of any envisaged system -- together with implications for both "recycling" and "recreation"*. Various mnemonic challenges, for mnemonic demonstration purposes, might include:
  - the mapping of molecules transformed through biochemical pathways onto such a device -- even associating "solutions" with the songs proposed in *The Biochemists Songbook*.
• highlighting healthy, tasty or balanced patterns and combinations such as dietary regimes, colours, ecosystem species (garden plants), music tracks
• combining a requisite variety of operating and thinking styles in organizational teams (Belbin Team Inventory, Six Thinking Hats, Six Action Shoes)

The adequacy of the two-dimensional display may however be challenged through consideration of the significance of a third dimension and the value of "curvature" (Metaphorical Geometry in Quest of Globality: in response to global governance challenges, 2009; Geometry of Thinking for Sustainable Global Governance, 2009; The Future of Comprehension: conceptual birdcages and functional basket-weaving, 1980).

The "third dimension" might then be usefully associated mnemonically with cognitive engagement with the elements of the two-dimensional array -- whether the most concrete or the most abstract. Rubik’s Cube of course offers such a third dimension.

Of particular relevance is a major collective exercise of the Institute of Cultural Affairs that effectively projected a three-dimensional array of psychosocial preoccupations onto a triangle in two dimensions (Jon and Maureen Jenkins, The Social Process Triangles, 2001). This offers an exceptional comprehensive model of societal dynamics.

![General framework of Social Process Triangles](image)

This form helps to highlight two forms of "externality" from the conventional focus on the economic system (lower-left vertex), namely the sociopolitical externalities (lower-right vertex) and those of any belief system (upper vertex). The financial crisis of 2008, following a period of faith-based governance, has indicated the limitations of any narrowly focused economic model -- especially given its social consequences and the ironically desperate efforts to rebuild "faith" and "trust" in the economic system. Curiously the Theory of Everything, much sought by physicists (and associated with the tangibles of the lower-left vertex), will necessarily not encompass the psychosocial externalities that provide the framework and financing for any such investigation. These are presumably to be understood as "Nothing" by the natural sciences (Import of Nothingness and Emptiness through Happening and Mattering, 2008).

The concern here is to ensure the association of varying degrees of cognitive engagement with any such third dimension -- beyond the descriptive "objectivity" and detachment of categories. In the databases of the Encyclopedia of World Problems and Human Potential (which used the above-mentioned two-dimensional integrative matrix), the "subjectivity" of understanding of modes of awareness was effectively "reduced" into conventional categories in the more abstract rows of that array. One approach, inspired by such degrees of subtler awareness, is to distinguish degrees of psychoactive engagement in terms of the following stages.

<table>
<thead>
<tr>
<th>Indicative degrees of psychoactive engagement</th>
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<tbody>
<tr>
<td>(Creative Cognitive Engagement Beyond the Limitations of Descriptive Patterning, 2006)</td>
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<tr>
<td>Stage 1: Enjoining</td>
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<tr>
<td>Stage 2: Exemplifying / Enabling / Empowering</td>
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<tr>
<td>Stage 3: Imaginative world-making</td>
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<tr>
<td>Stage 4: Enminding: environmental challenges as a reflecting mirror</td>
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<tr>
<td>Stage 9: Silence: the unsaid and the unsayable!</td>
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</table>

### Augmenting the psychoactive function of a mnemotechnical device

The technical possibilities already enabled in relation to variants of Rubik’s Cube indicate that many further possibilities are now feasible, whether using adhesive symbols, LEDs or virtually:

- user personalization of mnemonic symbols on each surface (images, numbers, keywords)
- loading predefined content (images, numbers, keywords) onto the set of surfaces via a wifi or infrared link from a PC (if the application is not integrated into an iPod or equivalent)
- switching content from one polyhedral variant to another (e.g., from 3x3x3 cube to 5x5x5 or to a dodecahedron)

The concern however is the engagement with patterns and pattern formation and the sense of meaning derived from them -- in
contrast with other presentations of insight that do not elicit an analogous sense of integration when the person has "got it". The focus here is on the psychological sense of satisfaction from engagement with a pattern and its completion. The argument is that it is such "satisfaction" which concerns with environmental "appropriateness" and "sustainability" need to elicit to a far greater degree.

The following are therefore indicative of contrasting examples which elicit some form of engagement.

**Circles of beads:** There is a worldwide cognitive investment in prayer beads (Designing Cultural Rosaries and Meaning Malas to Sustain Associations within the Pattern that Connects, 2000). They are used by practitioners of Islam, Roman Catholicism, Orthodox Christianity, Buddhism, Hinduism, Sikhism, and Bahá'í to count the repetitions of prayers, chants or devotions; they may also be used for meditation, protection from negative energy, or for relaxation (as with Kombolói or worry beads). Programmes for PDAs and mobile phones are available to duplicate the functions of a set of prayer beads. The options, as in the application One Play, may be adjusted for the various prayers and meditations commonly used, including specification of the number of prayer rounds and the number of prayers per round. In this respect the functions built into an existing application Virtual Rosary 5.2 are of interest. It provides a guide through the rosary, guiding exploration of mysteries, creeds, and associated prayers. It includes associated biblical quotes and other cues. It has an integrated midi player with several songs potentially associated with individual prayers. It can also display relevant iconic images and symbols.

**Implications:** Given the current appeal by Al Gore to religions regarding climate change, consideration could be given to the design of circles of memory beads as learning aids and reminders of the integrative functions of ecological cycles (Suzanne Goldenberg, Al Gore's Inconvenient Truth sequel stresses spiritual argument on climate, The Guardian, 2 November 2009). There may be a creative link between understandings of recycling and the use of circles of beads.

**Sudoku:** Numeric pattern identification through sudoku has acquired widespread popularity, whether or not the pattern is the common 9x9 grid offering 81 positions, across which numbers can be allocated -- typically to form a special type of Latin square. The possible pattern solutions of such puzzles have been the subject of detailed mathematical analysis, including variants with particular constraints. Sudoku has a historical relationship to the mathematics of the patterns of magic squares, long a focus of interest in various cultures which have attached fundamental symbolic significance to them. Both mathematically and symbolically such patterns point to possibilities of cognitive integration, as suggested in the case of the Tao Te Ching (9-fold Higher Order Patterning of Tao Te Ching Insights: possibilities in the mathematics of magic squares, cubes and hypercubes, 2003).

**Implications:** Given the cognitive significance traditionally attributed to magic squares, there may be ways to associate the recognition of patterns in sudoku with vital environmental feedback loops. The traditional importance of the subtle patterns of the Tao Te Ching to governance merits further investigation.

**Crossword puzzles:** The crossword might be considered an alphabetic variant of sudoku in which completion of the pattern follows from a set of clues. The addition of words into free positions is constrained in relation to a pattern of filled positions. The size of the grid may vary, although typically greater than those of sudoku. Scrabble might be considered in relation to crosswords.

**Implications:** One teaching site already offers crosswords on: Environmental issues, Air quality, Water quality, Environmental disaster, Energy, Recycling. Another site offers an Environmental Awareness Crossword. Clearly there may be many possibilities for increasing their complexity and sophistication. Another site offers insights into deep ecology (Ecology Crossword Puzzles)

**Haiku:** This particular style of Japanese poetry has a worldwide following across languages, notably following an early interest of the Secretary-General of the United Nations Dag Hammarskjöld, who intermingled prose and haiku in his only book Vägmärken (Markings, 1963). Such a poem consists of 17 moras (or on), in three metrical phrases of 5, 7, and 5 moras respectively. Haiku are traditionally associated with their composition by those about to die (notably Zen monks and kamikaze pilots) as an expression of the pattern of their life. As an integrative articulation of a complex cognitive insight, they can also be understood as of significance to strategic intentionality (Ensuring Strategic Resilience through Haiku Patterns: reframing the scope of the "martial arts" in response to strategic threats, 2006).

**Implications:** Today the ancient haiku ideal of being at one with nature takes on a new and more urgent significance. Patricia Donegan (Haiku Mind) writes: Perhaps we can learn to think like a cricket, a rainforest, a river or a coral reef... This is the heart of deep ecology. The practice of writing haiku is a way of thinking and being in nature - a deep way to practice deep ecology. There may be the possibility of a collection of haiku interrelated such as to encompass a full range of environmental themes and the links between them.

**Gambling machines:** In terms of popular attraction, it is appropriate to note the degree of engagement elicited by gambling machines such as those variously known as slot machines, fruit machines or one-armed bandits. These depend on the chance outcome of matching patterns of visual symbols. A match (and the associated reward) is typically signalled by a set of tones.

**Implications:** Given the irony that, as "fruit machines", the symbols used already have a minimum of environmental significance, there are clearly possibilities for "greening gambling" such as to enhance environmental insight -- a potentially significant initiative in casinos on Native American land.
Rhymes and jingles: These are of considerable significance in learning (especially rote learning), as mnemonic aids to remembering and in establishing brand recognition. Custom jingles are typically widely used in advertising, whether simply as melodies or with accompanying rhymes.

Implications: The challenge is to develop non-trivial rhymes and jingles capable of holding patterns of environmental complexity from an early age. The rote learning of multiplication tables is an indication (Times Tables Games; Memorise the Times Tables). Of particular interest are the patterns associated with learning multiplication in presentations of the Vedic Square.

Jigsaw puzzles: As illustrated by using images on the surfaces of Rubik's Cube, instead of simple colours, an aesthetic pattern results from solving the puzzle.

Implications: The question is the nature and succession of jigsaw puzzles that would progressively facilitate deep learning of ways of engaging with the environment.

Symbols and symmetry: These remain central in many cultures as a means of holding and communicating fundamental sets of values. The role of polyhedral symbols has been discussed separately (Topology of Valuing: psychodynamics of collective engagement with polyhedral value configurations, 2008). Of particular significance is the range of such symbols -- of greatly varying complexity -- and the possibility of associating a variety of content to their faces, edges or vertices (In Quest of a Strategic Pattern Language: a new architecture of values, 2008; Polyhedral Pattern Language: software facilitation of emergence, representation and transformation of psycho-social organization, 2008).

"Cognitive toolkit" permitting identification and "holding" of integrative patterns

Clearly a wide range of quite different cognitive content could be presented with such mnemonic features -- whether with a secular, philosophical, ecological or survivalist focus -- as a "cognitive toolkit". They might well have a remedial role to play with those facing memory loss (as with Alzheimer's disease). Given the repetitive content of political declarations and speeches, they might also have a function as a substitute for prompts, speech-writing and elaboration of press releases -- in a society faced with rapid erosion of collective memory (Societal Learning and the Erosion of Collective Memory, 1980).

In relation to engagement with the environment, the question is how such devices might work to enable learning about vital patterns and systemic feedback loops -- vital both to the psychological well-being of the individual and to society, understood as intimately entangled. They point to the possibility of their mutual reinforcement as suggested by the following summary.

<table>
<thead>
<tr>
<th>Indication of mutual reinforcement of feedback loops</th>
</tr>
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<tbody>
<tr>
<td>Pattern detection and completion</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Circlets of beads</td>
</tr>
<tr>
<td>Sudoku puzzle</td>
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<tr>
<td>Crossword puzzle</td>
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<tr>
<td>Haiku</td>
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<tr>
<td>Gambling machine</td>
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<tr>
<td>Rhymes and jingles</td>
</tr>
<tr>
<td>Jigsaw puzzle</td>
</tr>
<tr>
<td>Symbols</td>
</tr>
</tbody>
</table>

The above table shows the interrelationship between pattern detection (notably through the challenge of puzzle completion) that could be used to highlight essential feedback loops or a degree of balance associated with the solution. Any solution as a form of strange attractor tends to offer a sense of surprise, achievement and aesthetic satisfaction. The aesthetic economy of an elegant solution renders it memorable and sustains psychoactive engagement. This is also evident in melodies, potentially associated with recognition of patterns -- combining the roles of The Biochemists Songbook, and jingles. Associated functions are evident in verbal patterns, as with haiku, crosswords and advertising jingles. Polyhedral symbols offer a means of integrating combinations of patterns through symmetry.

Of particular interest is the degree of complexity associated with any form of pattern completion. Clearly higher degrees of complexity may be vital to any comprehensive integrative pattern whilst lower degrees of complexity may be vital as fundamental building boxes for further insight. Hence the potential of the periodic table of chemical elements as a metaphor for learning and ways of knowing, as argued elsewhere (Periodic Pattern of Human Life: the Periodic Table as a metaphor of lifelong learning, 2009; Periodic Pattern of Human Knowing: implication of the Periodic Table as metaphor of elementary order, 2009).

It is interesting to note the use of a variant of the Rubik Cube as a means of interrelating the chemical elements in a puzzle (Tetrahedral twist: chemistry puzzle and teaching device, United States Patent 6361324, 2002), given recent insight into the possibility of a tetrahedral structure to that "table" (Valery Tsimmerman, Finally, the perfect arrangements of the elements is found, 2008).

This suggests the possibility of "lifting" psychoactive engagement out of the psychosocial category in the two-dimensional Social Process Triangles presentation (above) in order to form a tetrahedron. A degree of implicit engagement in even the most tangible category of nature is then more appropriately and explicitly reflected through that third dimension. Representing such psychoactive engagement in that third dimension also usefully contrasts explicitly the ethical descriptors in the two-dimensional triangle with the existential experience of "being" ethical, "holding" a value, "upholding" a principle, "commitment" to a cause, "insight" and "creativity", "intentionality", or the recognition of "potential" (Entelechy: actuality vs future potential, 2001). The adequacy of limitation to a third
Jacques Attali: review

David Abram. The quest for a lost song or one yet to be discovered. As stated on the cover offering the possibility of such resilience catastrophe, creativity, and the renewal of civilization

A strong argument has been made for resilience to significance reach the

For de Nicolas: "The embodiment of Rg Vedic man was understood... as an attention in a period when "nobody

The emphasis in the preceding sections on technique, and mnemotechnical devices, tends to obscure the essential nature of creative psychoactive engagement that is the source of any radical cognitive coherence. The contrast is illustrated by that between poetry-making and subsequent appreciation of the poem made -- a contrast with strategic implications (Poetry-making and Policy-making: arranging a marriage between Beauty and the Beast, 1993). The contrast is well-illustrated by Jiddu Krishnamurti (Empty Techniques):

Creation comes first, not technique, and that is why we are miserable all our lives. We have technique -- how to put up a house, how to build a bridge, how to assemble a motor, how to educate our children through a system -- we have learned all these techniques, but our hearts and minds are empty. We are first class machines; we know how to operate most beautifully, but we do not love a living thing,... creativeness is not found through technique. If you have something to say, you create your own style; but when you have nothing to say, even if you have a beautiful style, what you write is only the traditional routine, a repetition in new words of the same old thing.

So, having lost the song, we pursue the singer. We learn from the singer the technique of song, but there is no song; and I say the song is essential, the joy of singing is essential. When the joy is there, the technique can be built up from nothing; you will invent your own technique, you won't have to study elocution or style. When you have, you see, and the very seeing of beauty is an art.

As suggested earlier, song offers a valuable cognitive contrast to the conventions of linear text. It integrates many of the dimensions of the above table -- a reason for its value in many cultures. But the contrast to which Krishnamurti points is even more strongly emphasized in the words of Antonio de Nicolas with regard to language with its epistemological basis in tonal relationships (Meditations through the Rg Veda, 1978). He distinguishes four "languages" in the Rg Veda by their intentionality: images and sacrifice, existence, embodied vision, and non-existence. Such efforts to show the functional significance of sacrifice in relation to social integration need attention in a period when "nobody is willing to sacrifice" advantages acquired under the present systems in crisis.

For de Nicolas: "The embodiment of Rg Vedic man was understood... as an effort at integrating the languages of Asat, Sat and Yagna to reach the dhih, the effective viewpoint, which would make these worlds continue in their efficient embodiment". The unique feature of the approach is that it is grounded in tone and the shifting relationships between tone. It is through the pattern of musical tones that the significance of the Rg Veda is to be found:

Therefore, from a linguistic and cultural perspective, we have to be aware that we are dealing with a language where tonal and arithmetical relations establish the epistemological invariances... Language grounded in music is grounded thereby on context dependency; any tone can have any possible relation to other tones, and the shift from one tone to another, which alone makes melody possible, is a shift in perspective which the singer himself embodies. Any perspective (tone) must be "sacrificed" for a new one to come into being; the song is a radical activity which requires innovation while maintaining continuity, and the "world" is the creation of the singer, who shares its dimensions with the song. (p. 57)

A strong argument has been made for resilience to adapt to a turbulent environment (Thomas Homer-Dixon, The Upside of Down: catastrophe, creativity, and the renewal of civilization, 2006). The challenge for the individual in the quest for the radical coherence offering the possibility of such resilience is to become the "singer" (within that integrative metaphor) rather than to engage in a desperate quest for a lost song or one yet to be discovered. As stated on the cover of the Whole Earth Catalog: There is no need to put it together, it already is together. But the challenge is how to see it so, to "re-member" it through embodying it, thereby enactivating it.

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