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Circulation of the Light

Essential metaphor of global sustainability?

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Introduction

As one of the people upheld as having the most insight into the global financial system, [George Soros](#) has made use of alchemy as a metaphor in a widely commented study (*The Alchemy of Finance: reading the mind of the market*, 1988). This metaphor is central to the Taoist meditation practices of China as described, for example, by Lu K'uan Yü (*Taoist Yoga: alchemy and immortality*, 1970). The key process is described in terms of the metaphor "circulation of the light". This has notably been highlighted by [Carl Jung](#) and [Richard Wilhelm](#) with respect to a Chinese classic, *The Secret of the Golden Flower* (*Tai Yi Jin Hua Zong Zhi*). The Wilhelm translation is accompanied by a translation of another classic, the *Book of Consciousness and Life* (*Hui Ming Ching*) containing images indicative of the toroidal channel within which the "circulation of the light" takes place in that process.

Attention has previously been drawn to the correspondence between the preoccupation of the current global civilization with "sustainability" and that of the preoccupation with "immortality" of past civilizations lasting centuries (*Identity in Time: sustainability and immortality*, 2010). The question explored here is the extent to which the metaphor of the "circulation of the light" is indeed an essential metaphor for comprehension of global sustainability at this time. In addition to the particular use made of such an unconventional metaphor by Soros, the case for the more attentive exploration of such metaphors has been well made by Susantha Goonatilake (*Toward a Global Science: mining civilizational knowledge*, 1999), specifically with reference to those of Asian cultures whose economic role is becoming ever more apparent.

In that respect it is prudent to recall that the subprime crisis of 2008-2009 arose from widespread successful use of a risk-assessment formula, designed by a Chinese economist, which he himself noted very few people in fact understood (Felix Salmon, *Recipe for Disaster: the formula that killed Wall Street*, *Wired*, 17.03, March 2009). Expectations that conventional thinking will ensure "business as usual" in the coming decade have been most recently challenged by a study by the Rockefeller Foundation in association with the Global Business Network (*Scenarios for the Future of Technology and International Development*, 2010). One of its four scenarios characterizes the immediate future as the "doom decade".

Rather than explore the circulation metaphor from within an alchemical perspective, the concern here is the extent to which any such understanding of circulation is implicit in other processes and preoccupations, perhaps best to be understood as surrogates for an insight of essential psychosocial significance. The matter has previously been discussed from other perspectives (*Engaging with Globality: through cognitive lines, circlets, crowns or holes*, 2009; *Designing Cultural Rosaries and Meaning Malas to Sustain Associations within the Pattern that Connects*, 2000).

Might it be the case that sustainability -- and resilient navigation of the [adaptive cycle](#) -- are impossible if the cognitive implications of the "circulation of the light" are not internalised into individual and collective memory? The question follows from earlier explorations, notably with respect to historical time (*Adaptive Hypercycle of Sustainable Psychosocial Self-organization*, 2010; *System Dynamics, Hypercycles and Psychosocial Self-organization*, 2010; *Engaging Macrohistory through the Present Moment*, 2004).

Does civilizational collapse become probable when the resources of the cognitive geometry on which a civilization chooses to live are exhausted -- as an extension of the argument of [Jared Diamond](#) (*Collapse: How Societies Choose to Fail or Succeed*, 2005)?

Circulation of the light, its inhibition and its surrogates

The purpose here is to review processes in which some form of "circulation of the light" is embedded, or within which it is implicit -- and the extent to which this is variously associated with a sense of synergy, surprise, serendipity and synchronicity. The question in each of the following cases is how intangible experience and awareness relate to more tangible processes such that a degree of circularity is recognized. Additionally there is the question of how any transcendental recognition is inhibited by the tangible features of the process -- distracting surrogates displacing attention. Each of the following therefore constitutes an illustrative example potentially offering clues to the subtlety of what "circulates". The approach follows from the original arguments of [general systems research](#), now evolving into those of knowledge cybernetics (Maurice I. Yolles, *Knowledge Cybernetics: a metaphor for post-normal science*, *Cybernetics and Systems Theory in Management*, 2010).

Confidence and trust: Typically confidence within a collectivity is not understood as a dynamic process. It either exists to a degree or it does not. But, as in financial transactions where money is fundamentally a token of confidence, the latter may also be considered as circulating. The increase in confidence of one in the reliability of transactions with another has knock on effects through which confidence is built within a network of individuals or institutions. Confidence may then also be understood as circulating through such transactions.

The challenge of confidence, and "rebuilding of trust", was recognized as fundamental to recovery from the credit crisis of 2008-2009. The role of confidence and its circulation is, however, more explicitly recognized at the community and neighbourhood level through [local exchange trading systems](#) (LETS).

In a degraded situation, notions of confidence in their subtler sense may be obscured by focus on financial tokens -- with which very little confidence may be consciously associated. Given the recognition that money "circulates", the question is how the confidence of which it is a token may also be understood as "circulating". The early American president, [James Madison](#), is widely quoted as declaring: *The circulation of confidence is better than the circulation of money.*

Ball games: A contrast is often made between playing to win (through scoring points, each requiring that a new phase of the game be initiated) and "keeping the ball in play". The latter process may also be interrupted by "dropping the ball" or allowing it to go outside the field of play. When the ball is kept in play, it may be circulated amongst players of one side -- who have gained and maintained possession. Reference is made to the "spirit of the game" in which circulation occurs between both sides, and winning or losing are of secondary significance. The circulation is then consistent with the infinite games described by James P. Carse (*Finite and Infinite Games: a vision of life as play and possibility*, 1994).

How is the circulation of confidence and trust associated with patterns of movements of the ball amongst team members and between teams? Are other patterns possible? It is curious, for example, that no experiments are made with four teams playing simultaneously -- with the additional two teams playing "across" the direction of the first two, possibly with a second ball.

Dialogue: For the dynamics of dialogue to work, there must necessarily be a continuing process of exchange, notably amongst a group of people. It is the "point" that is "kept in play", although reference may be made to the "ball" being in another's court. As with ball games, the circulation may be terminated by point scoring, gamesmanship, or going "over the line". The dialogue may be appreciated when the "energy is raised" by the process, rather than being "lowered" or "drained" -- to the point of boredom. Valued processes may include repartee and humour. A dialogue may well be described as "enlightening".

A distinction may be made between the one-dimensional emphasis on "making a point" (as in bullet point presentations designed to impact on a target audience) and processes of indirection through which others are enabled through the dialogue to articulate a point in their own terms. This contrast may be compared to that between simpler forms of [cue sports](#) and the difficulties of [three-cushion billiards](#). Little effort is made to analyze "passing patterns" in contrast to this concern in augmenting efficacy in ball games.

Although much is made of creating a "safe place" for fruitful dialogue, how is trust elicited and circulated? Reinforced by eye-contact? Through social networking facilities? As discussed below with respect to "circulation of ideas" Dialogue may be explored as a pattern fundamental to sustainable development (*Sustainable Dialogue as a Necessary Template for Sustainable Global Community*, 1995; *Interweaving Thematic Threads and Learning Pathways*, 2009).

Flirtation and courtship: A much-valued variant of dialogue is recognized in the process of flirtation in which "light" of a different nature is subtly circulated between those engaged in the process -- possibly evolving into courtship. Flirtation may be recognized and valued as a social interaction process in some cultures, as in France, whilst being challenged as inappropriate in others. Charm may be valued as a catalyst, as in dialogue more generally.

Rumour circulation: This process is of course widely recognized and a focus of attention. It clearly performs functions valuable to the coherence of a community and its adjustment to changing internal and external circumstances. Given its problematic characteristics, the extent to which it ensures the "circulation of light" is another matter as variously noted (David Piff, *Unofficial information and rumour in the Bahá'í community*, *Bahá'í Studies Review*, 8, 1998). The financial crisis resulted in a review of rumours and their circulation (Australian Securities and Investments Commission, *Responsible Handling of Rumours*, September 2009; US Financial Industry Regulatory Authority (FINRA), *Origination and circulation of rumours* -- Regulatory Notice 09-29; Bingham McCutchen, *Managing Rumors Without Chilling Legitimate Communications*, 18 March 2009).

Joke circulation: A remarkable feature of the internet is the manner in which it has enhanced the circulation of jokes -- a form typically disseminated with greater rapidity than other content. Humour delightfully embodies an element of surprise, detaching those who appreciate it from their mundane preoccupations -- reframing their situation and conventional mindset from an energizing perspective.

The punch line -- the "point" -- triggers a sense of synergy that may transform and transcend conventional frameworks.

Image circulation: As with jokes, the much-valued circulation of images via the internet has proved to be of striking significance -- irrespective of whether they are upheld or deprecated as "iconic", blasphemous or pornographic. The image offers a widely acknowledged degree of synthesis or focus. It makes "a point" -- "one picture being worth a thousand words".

Poetry, music and song: Sharing some of the qualities of dialogue and the circulation of images, these offer another order of "circulation of the light" and its conscious or unconscious celebration. The circulation offers a means of disseminating values such that they reinforce one another, especially through the recurring dynamics that define their structure. As memetic structures they can carry profound significance which may be collectively shared. The manner in which they encourage individuals to sing or hum refrains is an indication of the circulation process at work -- however unconsciously. Singing **rounds** potentially offers a very direct experience of that process..

Ritual: Many rituals have inherently circular features and may have been consciously or unconsciously engendered of the "circulation of the light". This is most obvious in the use of circlets of beads as a memory aid to "re-member" the significance of a transcendent set of insights as an integrative whole (*Designing Cultural Rosaries and Meaning Malas to Sustain Associations within the Pattern that Connects*, 2000). The process is evident in the circulation of a "pipe of peace" in Native American traditional cultures and their derivatives.

Dance: Possibly combining both music and ritual, dance offers a means of embodying circular movement through a variety of phases and patterns.

Design: More significant than the design and decoration of an object in isolation is its incorporation into the context offered by a set of objects such that together they embody and reflect a larger aesthetic pattern. The eye is drawn from location to location, with each variant offers further insights reinforcing the underlying significance of the overall pattern -- a feature of the **method of loci** in so-called memory theatres. The eyes are "bounced" from one to the other through such aesthetic reflections, a circulation through the pattern constrained by various forms of symmetry, explored as a supportive metaphor for dialogue (*Patterning Archetypal Templates of Emergent Order: implications of diamond faceting for enlightening dialogue*, 2002). This is discussed separately (*Design challenge of imbuing quality and meaning*, 2010) in terms of the insights of Christopher Alexander (*Harmony-Seeking Computations: a science of non-classical dynamics based on the progressive evolution of the larger whole*, *International Journal for Unconventional Computing*, 5, 2009).

Ensuring the complementarity of design factors, elicited through all the senses, were a preoccupation of **Marsilio Ficino** concerned with practical techniques ("natural magic") for ensuring that speculative insights connect with the realities of daily living -- a psychological daily life. a theme of the so-called "natural magic" of the Renaissance period (D. P. Walker, *Spiritual and Demonic Magic: from Ficino to Campanella*, 2000).

Perambulation: The process of ordered physical movement through an architectural complex, possibly constructed to that end (as a perambulatorium), was one promoted by the **peripatetic philosophers** of classical Greece. Many monastic structures have since adopted a style to enable such movement as a catalyst to meditation. The process was explicitly recognized in the mnemotechnical use of **memory palaces and gardens**. Religious and other symbols may be perambulated in occasional ceremonies. The pattern is notably seen in torch relays around the world, as with the **Olympic Flame**. Notably in Italy, the art of taking a walk in the evening, is a social ritual -- *La Passeggiata* -- of "seeing and being seen". Traditional variants exist in other cultures (*El Paseo* in Spain, for example), possibly in the form of a circular drive.

Tours: The pattern of a "tour" exists in a variety of forms. Cultural artefacts may be taken on a tour to enable special events in exhibitions -- before returning to their original location. Indeed exhibition sites may each effectively be at the locus of many such tours over time. People with special skills, such as musicians and singers, may go on tour for similar reasons.

Individuals may go on an educational tour -- following the classical tradition of the **Grand Tour** as a rite of passage for the aristocracy. As an equivalent rite of passage, the *Compagnons du Tour de France* is a French organization of craftsmen and artisans -- dating from the Middle Ages, but still active. On the tour they are employed as an apprentice of a succession of competent masters.

The pattern is also partially reflected in widespread **pilgrimages** and in the rotation of conference venues between the member countries of international organizations. Arguably diluted forms are to be found in tourism itself -- through which recreation is sought.

Games: A degree of circulation may be evident in many games (other than the ball games mentioned above). Examples are to be found in the transfer around a circle of players of a key role (dealer, banker, etc) as well phenomena like bidding cycles (as in card games). Interactive gaming may elicit confidence and its circulation within **online guilds** -- and be much valued for that.

Fairground rides: It is on imaginative **fairground rides** that people, especially children, experience directly the dynamics of circular rather than rectilinear geometry. Typical **thrill rides**, subject to continuing innovation, include: Sizzler Twist, **The Gravitron**, **Booster**, **Freak Out**, Miami and the Top Spinroller coaster. amusement parks may also include **roller coasters**.

Traffic circulation: There is of course widespread experience of traffic and it is readily described as "circulating" due to the nature of the journeys taken. Traffic circulation research includes the creation of a new computerized traffic models that would reasonably simulate current traffic flow patterns and also forecast future travel demands and traffic flow patterns. Traffic circulation maps and plans are produced. Commercial traffic is necessarily associated with regular delivery "rounds".

Gift circulation: In relation to the **gift economy**, especially in its traditional forms in many cultures, attention has focused on the "circulation of the gift" which typically requires more than a gift exchange back-and-forth between two individuals. An information-based society is recognized as partially based on notions of a gift economy, notably through a form of circulation implicit in open source

initiatives.

Crop rotation: The traditional pattern of crop rotation cycles has been considered vital to the sustainability of agriculture. It also offers an admirable metaphor for the sustainability of government through a succession of policies and ruling parties (*An agricultural key from crop rotation -- : Patterns of alternation*: Global Strategies Project, 1995).

Marketing: The viability of certain products may be dependent of their design in terms of an understanding of [product life cycles](#), including designed obsolescence and promotion of anticipation of a new product or upgrade. The viability of such cycles may be recognized within the broader framework of [business cycles](#).

Recycling: As a traditional practice vital to survival, [recycling](#) has been formalized in recent decades as involving processing used, unwanted materials (waste) into new products to prevent waste of potentially useful materials. As a form of "circulation of the light", understanding it calls for appreciation of the intangible value effectively associated with tangible materials. More generally the pattern raises the question of the range of intangibles that can be fruitfully recycled after being (problematically) exploited in some way.

Sexual relations: Considerable consideration has been given over centuries to the sustainability of sexual relationships, taking account of both physical cycles of attraction as well as cycles of affection and disaffection. Traditionally this has been most evident, and considered in the light of its most profound implications, in the Hindu disciplines of [tantra](#).

Cognitive fusion: The circulation of plasma in a toroidal nuclear fusion reactor as a potential source of energy vital to a sustainable future, provides a remarkable metaphor of the possible considerations with respect to the cognitive fusion -- through "circulation of the light" -- that might be required to comprehend and sustain such processes, as explored separately (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006).

Cognitive and strategic implications

Environmental cycles: It is through these "recycling" processes -- especially in the case of air and water systems -- that the planet may be understood as maintaining itself. Individuals and societies necessarily engage with, and are embedded in, such cycles. It is on them that agricultural production is dependent. The cycle of seasons may have considerable psychosocial significance (*Psychology of Sustainability: embodying cyclic environmental processes*, 2002).

It is appropriate to note how the circular pattern of trade winds across the Atlantic enabled the transportation by sailing ships of 12 to 15 million West Africans to the Americas to work as slaves during the 17th and 18th centuries. The other two stages of the "profitable" three-stage journey involved the carriage of raw cotton from the Americas to England and the transfer of manufactured goods from Europe to Africa.

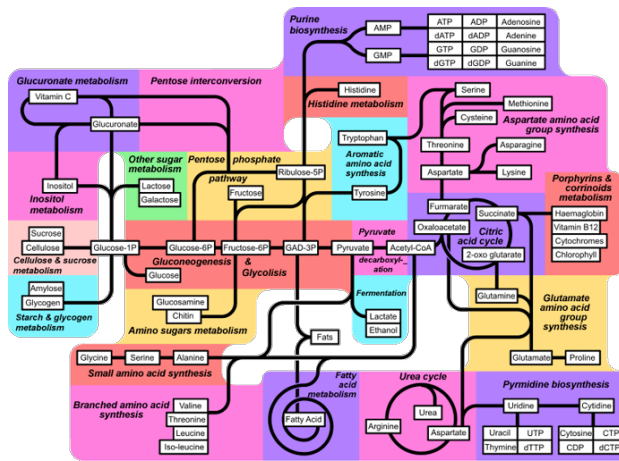
The challenge is that environmental cycles may be less meaningful amongst increasingly urbanized populations. Whereas the cycles have existential significance to rural populations dependent on them for their survival, urban populations are insulated (literally) from their impact. The changing seasons now have little symbolic significance with which people are engaged. The threat of the collapse of cycles, such as that associated with the [Gulf Stream](#), have yet to be widely appreciated.

Physiological cycles: The periodic (cyclic) phenomena in living organisms and their adaptation to solar and lunar related rhythms are the focus of [chronobiology](#). These include the [circadian rhythms](#) in the biochemical, physiological, or behavioural processes essential to living entities (including plants, animals, fungi and cyanobacteria). Given the dependence of these processes on the sun (and the moon), they can indeed be viewed as a form of circulation of the light. This is however more apparent through the implication of light in photosynthesis within metabolic cycles.

In urban environments with an emphasis on 24/7 activity, an objective may well be to minimize any need for dependence on these cycles -- even to ignore them. Any concession to these cycles may be regretted.

Metabolic pathway: The [metabolic pathway](#) is a set of cyclic biochemical cycles at the cellular level, notably in the human body. The reactions are typically catalyzed by enzymes and often require dietary minerals, vitamins, and other cofactors in order to function properly. The interrelationship between the set of distinct cycles and pathways is often presented as a relatively [complex map](#). Since these cycles are so fundamental to the physiology of individual human life -- and are so fully and intimately understood by humans (albeit at an unconscious level) -- there is a case for exploring them as a metaphor for the requisite understanding of psychosocial life (*Alternating between Complementary Conditions -- for sustainable dialogue, vision, conference, policy, network, community and lifestyle*, 1983; *Networking Alternation an alternation network of 384 pathways of organizational transformation*, 1983). On a larger scale they offer a metaphor for reframing the problematic (and serendipitous) cycles within social systems in general, as was the case with the *Encyclopedia of World Problems and Human Potential (Analysis: Vicious cycles and loops*, 1995). In a real sense an individual is governor of those cycles as well as governed by them.

[Metabolic pathway](#) (schematic version from [Wikimedia Commons](#))
(**Disabled:** relabelled with most individual segments hyperlinked to separate explanations in [Wikipedia](#))



It is readily argued that the typical presentation of such sets of cycles on a flat surface is inconsistent with their global coherence -- effectively as the "container" of individual identity. Although the detailed mapping of the cycles on such a surface is a challenge in its own right, there is a case for exploring ways to map them onto the surface of a sphere or a torus as previously argued (*Clarification of a Mathematical Challenge for Systems Science*, 1994). Of particular interest is then the geometric distinction between **great circles** as distinct from **small circles**. All great circles of a given sphere have the same circumference and the same center as the sphere and are the largest circle that can be drawn on such a sphere. Small circles are essential "local" features on a spherical surface. Also of interest is the effort to facilitate comprehension of the various cycles by associating them with songs (Harold Baum, *The Biochemists' Songbook*, 1995 and MP3 files).

Of particular significance are the global forms defined by the intersection of great circles, as separately considered (*Spherical configuration of interlocking roundtables: Internet enhancement of global self-organization through patterns of dialogue*, 1998). Clearly such possibilities are of rapidly emerging interest in relation to the global self-organization of social networking communications and their information highways -- through which there is a particular form of "circulation of the light" (*From Information Highways to Songlines of the Noosphere: Global configuration of hypertext pathways as a prerequisite for meaningful collective transformation*, 1996).

Circulation of information, knowledge and insight: Given common acceptance of the phrase the "circulation of ideas", how exactly is it that ideas "circulate"? (Julie Battilana, et al. *The Circulation of Ideas across Academic Communities*, *Organization Studies*, June 2010; Thomas F. Hellmann, et al., *The Circulation of Ideas: firms versus markets*, Centre for Economic Policy Research, 2006). Current exploration of the topic in terms of "circulation of information" was systematically initiated by **George Zipf** (*Some Determinants of the Circulation of Information*, *American Journal of Psychology*, 1946). The related notion of "circulation of knowledge", presumably fundamental to a knowledge-based society, has also been considered (Atsushi Akera, *The Circulation of Knowledge and Disciplinary Formation: modern computing as an ecology of knowledge*, 2004). Curiously the theme has been disproportionately explored in relation to the emergence of science in past centuries.

Some references are made to "circulation of memes". An organizational strategy for the efficient circulation and refinement of pivotal insights is outlined by Ralph Perrine (*The Random Occurrence of Insights*, 2002), arguing that the most vital survival factor for large distributed organizations is the random occurrence of insights, and how well they are identified and managed. He uses the term 'insights' to refer to all of the following:

- Crystallized perspectives on situations
- Foresight on emerging trends or changes that must be prepared for
- Useful ideas which offer a unique opportunity
- Critical knowledge about tasks which must be done, or
- Memes which if refined and spread would have a desirable effect

Memetic circulatory diseases: A case can be made for attention to the memetic diseases to which a global knowledge-based society is susceptible (*Memetic and Information Diseases in a Knowledge Society: speculations towards the development of cures and preventive measures*, 2008). Such an approach can be extended to the implication for lifestyle diseases (*Cognitive Implications of Lifestyle Diseases of Rich and Poor: transforming personal entanglement with the natural environment*, 2010). In that spirit questions might be asked about "value diseases" -- for a society in which claims are made that values are endangered.

During the recent financial crisis -- a crisis of confidence -- the above-mentioned quote with regard to the circulation of confidence (*the circulation of confidence is better than the circulation of money*) was notably cited by Phyllis Korkki (*When a Nation Suffers From Poor Circulation*, *New York Times*, 1 November 2008). Weaknesses in the circulation of confidence might then merit metaphoric articulation in the light the considerable knowledge of circulatory diseases of the body and their relation to the human **cardiovascular system**. With the addition of the articulation of ideas, such an exploration might be extended to dysfunctions in the circulation of faith, hope and credibility (*Credibility Crunch engendered by Hope-mongering: "Credit crunch" focus as symptom of a dangerous mindset*, 2008).

The question would then be the quality of the insights thereby offered for psychosocial sustainability and the collective engagement with remedial processes like recycling (*Psychology of Sustainability: embodying cyclic environmental processes*, 2002).

Architecture, geometry and clunkiness: History may consider extremely curious the choice of architecture from within which organizations currently design and administer sustainable development strategies for a global society. To the extent that such strategies seek to engage with and govern cycles of various kinds, and may themselves involve budget and reporting cycles, the universal

commitment to rectilinear institutional architecture might be said to reinforce all the patterns which inhibit fruitful engagement with cyclic processes. This mindset is evident in urban grid planning and the architectural portrayals of future cities. Striking examples are provided by the cubic administrative complexes of those of the United Nations or the European Community. If their physical architecture (now and envisaged) is essentially boring, what hope is there for the cognitive architecture which they are expected to house and enable?

The pattern is however also reflected in preferences for linear text reporting and the use of tabular presentations. Curves and cycles are typically excluded as aids to consideration of the challenge of sustainable development. Whilst these may be present to a degree in systems diagrams, these are typically the focus of experts and are not expected to be comprehensible to policy makers or wider publics. It might be appropriately asserted that institutional thinking at this time is well and truly "in-the-box" with little reinforcement of any tendencies to thinking "out-of-the-box", let alone in cyclic terms (beyond reporting and election cycles). In that sense any "circulation of the light" is heavily inhibited. Global governance is currently effectively exemplified by designed clunkiness.

"Think tank" vs "Think torus"? The architectural pattern of administrative complexes is also typically evident in that of educational complexes, most notably universities. There is little reinforcement of non-linear thinking appropriate to insight into the cyclic processes of sustainable development.

The argument applies specifically to policy research institutes from which guidance on governance of sustainable development is sought. The case is made by the metaphor with which they are most closely associated: think tanks. The question is what dysfunctional thinking that metaphor reinforces, as discussed separately (*Tank-thoughts from Think-tanks: constraining metaphors on developing global governance*, 2003; *Meta-challenges of the Future: for Networking through Think-tanks*, 2005). The issue is even more curious in that "think tanks" are typically upheld as "centres of excellence" within which, and between which, the "circulation of the light" might be expected to occur. Various official initiatives are designed to promote the development of such centres, typically as networks. The "circulation of the light" might be understood as intimately related to the "circulation of excellence" -- the movement of the excellent and the insights between them.

Since it is from such centres that insights appropriate to governance of the future are expected to emerge, the nature of their architecture -- physical or cognitive -- is clearly vital. Some recognition of the need for a "congenial environment" for innovation may indeed influence layout -- but more typically in the case of innovative high-tech business complexes. But a fundamental question might well be whether civilizational collapse is triggered, or rendered probable, when the cognitive geometry (on which a civilization chooses to live) is exhausted -- as an extension of the argument of Jared Diamond (*Collapse: How Societies Choose to Fail or Succeed*, 2005). The point has been argued in a different way by Ron Atkin (*Multidimensional Man: can man live in three dimensional space?* 1981).

There is every reason to argue that it is currently in terms of the geometry of an essentially flat surface that efforts are desperately made to govern a global society. The point is made by the much-extolled report of Thomas L. Friedman (*The World Is Flat*, 2005), as criticized elsewhere (*Irresponsible Dependence on a Flat Earth Mentality -- in response to global governance challenges*, 2008). Given the expected future energy dependence on nuclear fusion in toroidal reactors, rather than a "think tank" there is at least a case for exploring the possibility of a "think torus" (*Comprehension of Requisite Variety for Sustainable Psychosocial Dynamics: transforming a matrix classification onto intertwined tori*, 2006). This is more likely to enable a form of "cognitive fusion" vital to "circulation of the light" (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006).

The need for exploring richer geometries with which to associate a global society is also separately explored (*Metaphorical Geometry in Quest of Globality*, 2009). It is other geometries which might better enable the "circulation of the light" appropriate to collective navigation of the adaptive cycle (*Adaptive Hypercycle of Sustainable Psychosocial Self-organization*, 2010; *System Dynamics, Hypercycles and Psychosocial Self-organization*, 2010).

Cognitive metabolism: The arguments above point to an implicit cognitive or memetic metabolism -- cycles occurring in relation to a systemic analogue to metabolic pathways. The argument can be given greater credibility in terms of recognition by physicists of the intimate relation between energy and information -- necessarily extending to the relation between energy and light (Paul Taylor, *Information and Energy*, 2001). Light indeed provides the energy enabling photosynthesis. Understandings of energy may be extended to psychosocial forms (*Reframing Sustainable Sources of Energy for the Future: the vital role of psychosocial variants*, 2006).

Given the long-standing metaphorical association between the mysteries of light in a physical sense and "light" as an experience of awareness -- possibly heightened awareness -- there is clearly a case for exploring attentively the possibility of an intimate relationship to knowledge, information, energy and motivation. The point was made above that the metabolic cycles within, and by which, individuals live are inappropriately described on flat surfaces. They merit configuration into geometries more consistent with psychoactive engagement with them. The case has been separately made for moving beyond circles to global and more paradoxical forms (*Engaging with Globality: through cognitive lines, circlets, crowns or holes*, 2009).

Hidden dynamics of the "circulation of the light"

Subtlety: The examples of circulation given above highlight the subtlety of any recognition of the "circulation of the light". That which is most to be valued is "hidden" in various ways:

- focus on tokens: as exemplified by monetary tokens which tend to obscure the confidence on which they are supposedly based. Even in non-monetary economies, as with the gift economy, the focus tends to be on the obligations associated with the gift. In both cases, only incidentally is the underlying intangible recognized and valued in its own right. Essentially the circulation is tokenized and routinized -- and thereby deadened in a sense.
- focus on excitement: as exemplified by fairground thrills or, less evidently except for vehicle enthusiasts, by the pleasures of driving and speeding. This focus may also be evident in games (notably ball games), whether as participant or spectator.
- focus on connectivity: as exemplified in stimulating dialogue at its best where, again, what is circulating is very subtle and may be

readily obscured by feel-good factors and a sense of fellow feeling. Even these may be obscured by gamesmanship.

- focus on engagement: as exemplified by intriguing design which can enthrall and enhance experience. Again the manner in which awareness is drawn through the pattern may be readily obscured by intellectualised aesthetic appreciation of the material skills exhibited.
- focus on geometry: as in a number of cases, notably the "circulation of information", where there is in fact little trace or experience of circularity but the readily comprehensible geometry is used as an abstract descriptor obviating the need for further reflection
- focus on gameplaying and gamesmanship

Fundamentally any comprehension of the "circulation of the light" is obscured by materialization of focus on tangibles when the challenge is the engagement with the underlying or implicit intangibles. This "camouflage" of the cognitive nature of the circulation is partially described in terms of [reification](#) and the fallacy of misplaced concreteness.

Conveyor metaphor: The subtle nature and importance of segments of the circulatory path may be more readily comprehensible -- whether the outward bound path or the inward bound path. It is then the circularity as a whole which is not apparent -- and the existence and nature of any essential "missing link". This argument can be fruitfully explored through the (mis)uses of the conveyor metaphor, especially failure to recognize the possibly deeply hidden return pathway essential to its operation (*Potential Misuse of the Conveyor Metaphor: recognition of the circular dynamic essential to its appropriate operation*, 2007). The metaphor suggests some awareness of the dynamic essential to the conveyor.

Tunnel metaphor: Experientially the path may be reduced to experience of a tunnel -- as in the common hope of "reaching the end of the tunnel", encouraged by "seeing the light at the end of the tunnel". This reduces any sense of circulation to a linear experience, culminating in exist from the tunnel. The metaphor emphasizes the constraining nature of the tunnel, as commonly understood, and tends to place all focus on the liberating experience thereafter. This obscures the nature of the light of awareness borne through the tunnel by the process and through which the "tunnel" is engendered.

Scenarios, narratives and journeys as metaphors: The future is readily framed and viewed through [scenario analysis](#) and [narratives](#), typically presented as alternative "ways" between which a choice may need to be made. As mentioned above, the most recent are the four scenario/narratives presented by Rockefeller Foundation in association with the Global Business Network (*Scenarios for the Future of Technology and International Development*, 2010). The report comments on this methodology to the effect that:

Scenarios are designed to stretch our thinking about both the opportunities and obstacles that the future might hold; they explore, through narrative, events and dynamics that might alter, inhibit, or enhance current trends, often in surprising ways. Together, a set of scenarios captures a range of future possibilities, good and bad, expected and surprising -- but always plausible. Importantly, scenarios are not predictions. Rather, they are thoughtful hypotheses that allow us to imagine, and then to rehearse, different strategies for how to be more prepared for the future -- or more ambitiously, how to help shape better futures ourselves.

The four scenario/narratives identified are:

- Lock step: A world of tighter top-down government control and more authoritarian leadership, with limited innovation and growing citizen pushback
- Clever together: A world in which highly coordinated and successful strategies emerge for addressing both urgent and entrenched worldwide issues
- Hack attack: An economically unstable and shock-prone world in which governments weaken, criminals thrive, and dangerous innovations emerge
- Smart scramble: An economically depressed world in which individuals and communities develop localized, makeshift solutions to a growing set of problems

With respect to the global financial crisis, [Sohail Inayatullah](#) recently presented a set of seven narratives derived by use of [Causal Layered Analysis](#) (*Multiple Narratives of the Futures of the Global Financial Crisis*, *Journal of Futures Studies*, 2010). Like those of the Rockefeller Foundation, each represents a "way" which some constituencies will actively -- even very actively -- seek to follow. To that extent any such sets of scenarios offer but fragmented understanding of a global civilization, possibly exacerbating the possibility of its further fragmentation. There is a case for exploring ways of comprehending the "circulation of the light" which underlies such segmented mindsets as presented separately (*Strategic Embodiment of Time: configuring questions fundamental to change*, 2010). In the latter approach an argument is made for recognizing the necessary interlocking of pathways required by globality, as indicated with reference to "cognitive metabolism" above.

Reflexivity and the mirror metaphor: In his recent reflection on the financial crisis, [George Soros](#) indicates that his original use of the alchemy metaphor was as a means of dealing with "far-from-equilibrium" conditions of the market (*The New Paradigm for Financial Markets: the credit crisis of 2008 and what it means*, 2008). He argues strongly for the [relevance of reflexivity to any understanding of the credit crisis](#), indicating that **the relevance of the theory is not confined to the financial markets alone** but deals with the relationship between thinking and reality, claiming that misconceptions and misinterpretations play a major role in shaping the course of history:

My starting point is that our understanding of the world in which we live is inherently imperfect because we are part of the world we seek to understand... People with imperfect understanding interact with reality in two ways. On the one hand they seek to understand the world in which they live. I call this the cognitive function. On the other, people seek to to make an impact on the

world and change their situation to their advantage. I used to call this the participating function, but for some purposes I now consider it more appropriate to call it the manipulative function.... When both functions are in operation at the same time they may interfere with each other.... In reflexive situations each function deprives the other of the independent variable which it would need to produce determinate results.... Reflexive situations are characterized by a lack of correspondence between the participants' views and the actual state of affairs.... As a result outcomes are liable to diverge from expectations. Economic theory has gone to great lengths to exclude reflexivity from its subject matter (p. 3-5).

In a recent interview, Soros framed these insights succinctly: *Markets don't reflect the facts very well, partly because they create the facts themselves.* Trends in the real world reinforce a bias in market participants' minds, which in turn reinforces those trends in a *double feedback, reflexive connection.* Realities create expectations, but expectations also create realities (Timothy Garton Ash, *Listen to the financial Wizards of Oz and prepare for another disaster*, *The Guardian*, 24 June 2010). This is appropriately to be said of scenarios and narratives.

This reflexivity is usefully captured by the mirror metaphor much appreciated in some schools of philosophy. In response to the unintegrated multiplicity of scenarios, the case, argued separately, is the need cognitively to "step into the mirror" as explored in various myths (*Stepping into, or through, the Mirror: embodying alternative scenario patterns*, 2008). It is this process which is indicative of the subtlety of engaging with the "circulation of the light" -- whether in an alchemical sense or otherwise.

Curiously, but appropriately, the mirror is fundamental to the **mirror test** by which self-awareness is established in animals. Of relevance to the requisite maturity to sustainable global governance, an analogous test may be hypothesized as a measure of human capacity to govern sustainably, as separately argued (*Self-reflective Embodiment of Transdisciplinary Integration (SETI): the universal criteria of species maturity?* 2008). More concretely, the question is whether insights from complexity theory and knowledge cybernetics can be applied to the design of more self-reflexive organizations (*Consciously Self-reflexive Global Initiatives: Renaissance zones, complex adaptive systems, and third order organizations*, 2007).

Circulation of metaphors: Soros (2008) recognizes the power and limitations of metaphor to provide a degree of comprehension of an underlying reality -- logic and mathematics being of "limited use in coping with life" (p. 27). In an early exploration of what is currently a much-debated topic (and the subject of the secretive **ACTA treaty** negotiation), valuable insight into the role of metaphor is provided by David J. Gunkel (*The Rule of Metaphor: prolegomena to any future internet regulation*, *Electronic Journal of Communication*, 1998). He argues that metaphor is not merely a rhetorical ornament in the discourses of media regulation but functions as a conceptual model that legislates and regulates the understanding of technological innovation:

The paper neither argues for the employment of one metaphor over the other, nor does it naively suggest that one proceed in the absence of metaphors. Rather, accepting that metaphorical thinking is to some extent necessary and unavoidable, **it advocates a critical stance with respect to the utilization and circulation of metaphor.** In the end, the paper calls for active participation in the on-going debate concerning Internet regulation through attention to the role and rule of metaphor. Entering the circle of legal metaphor at the correct angle requires, in the first place, that metaphor be taken seriously. Metaphors are always more than mere words.... They are models -- shorthand versions of reality... they are mechanisms of real political hegemony that have the capacity to determine the current and future shape of a technological innovation. Consequently, whoever possesses the authority to develop and disseminate metaphor, has the power to determine the understanding and status of a given technology. [*emphasis added*]

Further to the arguments above regarding the "circulation of ideas", in a section discussing the Circulation of Metaphors, Gemma Corradi Fiumara (*The Metaphoric Process: connections between language and life*, 1995) argues:

There appears to be a vast 'circularity' in the way we generate metaphors. From somatic images we come to produce complex artefacts, all the way to superb combinations of hardware and software. And once the use of these products is thoroughly absorbed by our culture, it becomes 'natural' for us to use it as the basis for generating further metaphoric constructs such as for instance the very popular ones indicating that the mind can be interpreted as a computing device. As is well known, cognitive approaches give an account of the relation of mind and world which may in principle be adequate to describe a variety of human competences. We learn to cope with the world by representing, or misrepresenting it, in terms of mental schemata which are tested and modified by feed-back mechanisms....whether or not it is possible to 'reduce' or 'translate' minds into computers, there is an increasing trend in our culture to metaphorize minds into machines, thus encouraging philosophy to focus on the as yet **neglected background of a pervasive circulation of metaphors.** (pp. 101-102) [*emphasis added*]

There are references in the literature to circulation of metaphors in economics and politics, notably reviewed by Dimitris Akrivoulis (*The 'Quantum Politics' Metaphor in International Relations: towards a hermeneutics of political metaphoricity*, 2007). A commentary on *Governance through enhancing the movement of meaning* of the Metaphor Project of the *Encyclopedia of World Problems and Human Potential*, notes the analysis of "concept life cycles" by Johan Galtung (*Processes in the UN System*, 1980), and concludes that:

Governance is then fundamentally the process of ensuring the emergence and movement of 'guiding' metaphor-models through the information system, as well as their embodiment in organizational form (*Governance through Metaphor*, 1987).

The question is the relation between "concept life-cycles", "circulation of metaphors" and ensuring their emergence in response to challenges of governance.

Experiential implication in the "circulation of the light"

Subject-Object / Knower-Known distinction: This conventional distinction through which externalities are reified is widely studied (Max Deutscher, *Subjecting and Objecting: an essay in objectivity*, 1983). It is variously called into question by the nature of any participation in a "circulation of the light", especially to the extent that "light" is intimately associated with awareness. Arguments relevant to such cognitive participation have notably been developed by Henry Skolimowski (*The Participatory Mind: a new theory of knowledge and of the universe*, 1995)

Identity: It follows that "circulation of the light" raises the question of "who" or "what" is "circulating". More radically there is the possibility that identity is associated to a greater degree with the dynamic of that circulation rather than with some thing which is circulating. This sense of identity has been explored separately (*Emergence of Cyclical Psycho-social Identity: sustainability as "psychically" defined*, 2007). Also of relevance (as with the Subject/Object distinction) is the extent to which any "externalities" are cognitively embodied -- rather than being effectively "outsourced" through reification (*Existential Embodiment of Externalities*, 2009).

Closure: Understood dynamically, identity raises the epistemological question of how it is bounded and the nature of any invariance over time. These may be speculatively explored (*Am I Question or Answer?*, 2006). This is of relevance in relation to any sense of a bounding "tunnel" by which identity is contained and constrained. How is any such containing boundary challenged and how does this relate to sustainable development -- whether collective or individual? How is dysfunctional, premature closure avoided, as tentatively highlighted separately (*Sustaining the Quest for Sustainable Answers*, 2003)? Currently many countries challenged by articulation of a sustainable development strategy are further challenged by how to define their essential identity -- especially with respect to the implications of immigration. The dynamic between openness and closure has been explored by Orrin E. Klapp (*Opening and Closing: strategies of information adaptation in society*, 1978) and notably first figured in discussion of open source projects (Eric S. Raymond, *The Cathedral and the Bazaar*, 1999). In relation to definition, it is a theme of Hilary Lawson (*Closure: A Story of Everything*, 2001). Perhaps more intriguing is the relation of closure to property, as highlighted by the [enclosure of the commons](#) -- implying that which cannot be closed off in this way is without value. This is relevant to any discussion of around what the "circulation of the light" takes place.

Uncertainty: As most recently emphasized by the above-mentioned Rockefeller study, society is faced with multiple uncertainties -- if only in responding to the scenarios on offer regarding future decades. Individuals too are necessarily faced with such uncertainty. This reinforces the ambiguity associated with any sense of identity and self-worth and how psychosocial entities understand themselves to be bounded and constrained over time -- together with any related sense of extreme existential anxiety. The issue was highlighted by the notorious poem of Donald Rumsfeld in his capacity as US Secretary of Defense, as separately discussed (*Unknown Undoing: challenge of incomprehensibility of systemic neglect*, 2008)

Topology: The above issues constitute a challenge to tendencies to oversimplify the geometry within which "circulation of the light" is understood to occur. Whilst a circle offers a convenient focus, even fairground rides use geometry of greater complexity. Many dances and musical compositions offer richer templates for experience -- intersecting circles, for example. Indeed a circle is perhaps the simplest pattern along which circulation can take place -- within the set of more complex geometric forms. Reference was made above to interlocking circles, fundamental to configuration in three dimensions. Of related relevance is the psychoactive engagement with features of any such topology (*Topology of Valuing: dynamics of collective engagement with polyhedral value configurations*, 2008; *Degrees of Cognitive Engagement with Interrelated Global Categories*, 2009). As raised in the introduction, **does civilizational collapse become probable when the resources of the cognitive geometry on which a civilization chooses to live are exhausted?** What degree of topological complexity is necessary to support the dynamics faced by global governance? What might any such "exhaustion" of cognitive geometry imply for individual mortality -- especially given the obsessive quest for individual mortality in civilizations of the past? The connective role of such geometry is well indicated by Gregory Bateson (*Mind and Nature: a necessary unity*, 1979) in making the point that:

The pattern which connects 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.

And it is from this perspective that he warns in a much-cited phrase: "*Break the pattern which connects the items of learning and you necessarily destroy all quality.*" This might well be described as ensuring mortality.

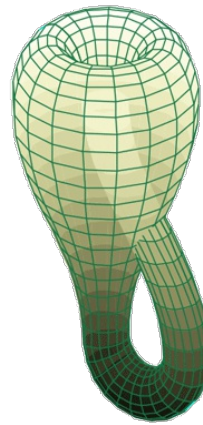
Cognitive twist: The cognitive simplicity of circulation in a circle inhibits recognition of the experiential complexities in the process of that circulation. These are evident in misuse of the conveyor metaphor as mentioned above and separately discussed -- failing to recognize (possibly deprecated) portions of the cycle (*Potential Misuse of the Conveyor Metaphor: recognition of the circular dynamic essential to its appropriate operation*, 2007). Of particular interest are the cognitively paradoxical forms exemplified by the [Möbius strip](#) and the [Klein bottle](#) -- the first being one-sided, despite appearances, and the latter lacking the conventional distinction between inside and outside (*Intercourse with Globality through Enacting a Klein bottle: cognitive implication in a polysensorial "lens"*, 2007). Their psychosocial significance is the subject of a study by Steven M. Rosen (*Science, Paradox, and the Moebius principle: the evolution of a "transcultural" approach to wholeness*, 1994).

Möbius strip

(by David Benbennick from *Wikimedia Commons*)

Klein bottle (4-dimensional)

(from *Wikimedia Commons*)



The Klein bottle is constructed from two Möbius bands (mirror images of each other), connected by an ordinary two-sided band (for visual explanations and animations, see Konrad Polthier, *Imaging Maths: inside the Klein bottle*)

Of further interest is what might be termed a "cognitive twist" in any pattern of circulation through which the assumptions of sidedness (so characteristic of problematic "us and them" distinctions) are called into question in traversing the cycle (*Us and Them: relating to challenging others*, 2009). This twist may be fruitfully explored in relation to the process of [enantiodromia](#) and the [coincidence of opposites](#) -- through which, over time, protagonists take on the previously deprecated characteristics of their polar opposites (*Psychosocial Energy from Polarization: within a cyclic pattern of enantiodromia*, 2007). However, and more challenging, are the implications from various traditions of a necessary "endarkenment" seemingly a prerequisite for "getting through" the twist (*Enlightening Endarkenment: selected web resources on the challenge to comprehension*, 2005).

Dysfunctional cycles: It is clearly appropriate to recognize the highly problematic psychosocial cycles to which viable governance must necessarily respond -- and in which it may be implicated. Most striking, notably in which they are reminiscent of the map above of the global ocean conveyor, are the cyclic patterns associated with the drug trade, the oil trade, and the arms trade -- especially given the degree of implication of Permanent Members of the UN Security Council in the latter. At its simplest these may be recognized as reinforced by [circular arguments](#) which introduce no new insight or change of perspective -- in contrast to the "cognitive twist". Efforts at argument mapping could perhaps be usefully inspired by efforts to map the metabolic pathway.

The more general challenge is evident in the various situations in which the need to "break the cycle" is recognized, most typically of violence (*Web resources on "breaking the cycle"*, 2002). What is intriguing is the manner in which these cycles are sustained by any circulating form of awareness which is resistant to learning. This is in the spirit of the aphorism of [George Santayana](#): *Those who cannot remember the past are condemned to repeat it*. Believers in reincarnation would subscribe to a similar understanding of such cycles.

Sustaining the circulation dynamic

A fundamental question is clearly how the circulation process may be understood as being sustained -- a question notably raised by the credit crisis of 2008-2009. This is a shift in concern beyond the more rhetorical uses of "circulation" which are vague, even trivial, regarding the nature of that dynamic. However, given the subtle nature of the circulation and the challenge it constitutes to comprehension, any understanding of the dynamic can only be suggested through clues as triggers to the imagination (*In Quest of Mnemonic Catalysts -- for comprehension of complex psychosocial dynamics*, 2007). These clues necessarily do not offer closure on a definition, rather the dynamic is then best understood as implied variously by all of them -- and by none of them.

Important to any understanding is a sense of how the dynamic is more than simply the movement of something around a closed circuit -- as with water in a tube or as [depicted in commercially available mouse wheels](#).

The process somehow engenders its own dynamic through transformation through one or more phases. But whilst this may suggest some kind of perpetual motion machine, clearly it is energized in ways that transcend the closure implied by a purely mechanical metaphor. In that sense it is fruitfully understood as "hi-tech" in the most appreciated of senses, recalling one of [Arthur C. Clarke's three laws](#): *Any sufficiently advanced technology is indistinguishable from magic*.

A further consideration is the manner in which understanding the dynamic and what flows is challenged by the paradoxical factors mentioned above. As is best suggested by the nature of plasma in a fusion reactor, identity is as much associated with a part of the circuit as being stretched around the circuit like an electrical current. There is therefore a degree of uncertainty to location in relation to dynamic -- as recognized by a hypothetical analogue of the [Uncertainty Principle](#) (Garrison Sposito, *Does a generalized Heisenberg Principle operate in the social sciences? Inquiry*, 1969).

Another indication is the fundamental requirement in a fusion reactor of ensuring that the contained plasma is not allowed to come in contact with the walls of the toroidal container -- which would otherwise be disastrously damaged. This highlights the challenge of effectively disassociating the material forms through which the "circulation of the light" may be expressed -- such as tokens and surrogates. Again this offers metaphors of potential relevance to the challenge of disassociating circulation of money from circulation of confidence.

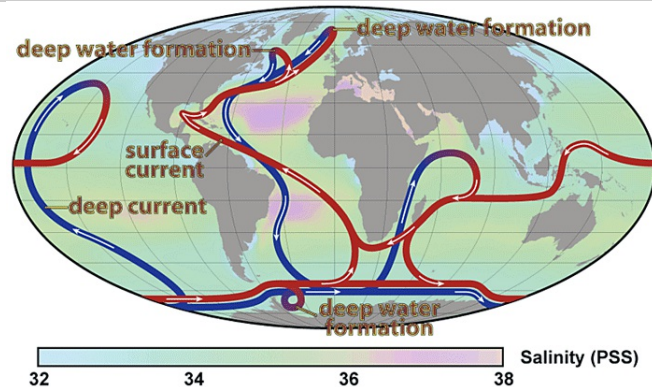
The following pointers therefore say as much about objectifying the circulation dynamic as about human capacity to comprehend that which is inherent in human comprehension -- the challenge of self-reflexivity (George Lakoff and Mark Johnson, *Philosophy in the*

Flesh: the embodied mind and its challenge to Western thought, 1999; Hilary Lawson. *Reflexivity: the post-modern predicament*, 1986).

Global air and water currents: A number of self-sustaining currents are fundamental to the viability of the global environment. In the case of the oceans, their dynamic may be best understood by the [Great Ocean Conveyor](#) (depicted below), of which the potentially endangered Gulf Stream is but a part. The phases in the dynamic are well illustrated by the interplay of heat, salinity and density -- reminiscent of their metaphoric significance in other contexts.

Ocean Circulation and Conveyor Belt: Maps and Explanations (note the problematic correspondence between different schematics)
<ul style="list-style-type: none">• Environmental Literacy Council, <i>The Great Ocean Conveyor Belt</i>, 2007• Stefan Rahmstorf, <i>The Thermohaline Ocean Circulation</i>, 2003• UNEP, <i>Great Ocean Conveyor Belt</i> (schematic)• Detailed world map of <i>Ocean Currents</i> (enlargeable and zoomable)
There are a number of animations of the ocean conveyor but these do only minimal justice to the challenge of comprehending its dynamics.

Thermohaline ocean circulation
(Reproduced from [Wikimedia Commons](#) -- see [description page](#))



Electromagnetic currents: The dynamic is widely understood in the many examples of [electrical generators](#) (or [dynamos](#)), and of [electric motors](#). through which rotation in relation to a magnetic field is converted into electricity, or vice versa. Their construction provides a sense of the configuration required to sustain "circulation of the light", especially given one of the uses of electricity.

Of potentially greater interest are the related toroidal design configurations required to contain [plasma](#) in self-sustaining [nuclear fusion reactors](#). As noted above, this technology offers a powerful metaphor to explore the challenges of cognitive fusion (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006). Of similar interest as a source of insightful metaphor are the circular structure and dynamics associated with the [Large Hadron Collider](#). In both cases electromagnets along the length of the toroidal form are dynamically adjusted to ensure the stability of the contents and the associated movement by which the process is sustained.

Thermodynamic work cycle: Another source of metaphor is that offered by the [thermodynamic work cycle](#). The nature of the "circulation of the light" can then be explored as a form of [heat engine](#) -- a physical or theoretical device that converts thermal energy to mechanical output. The question explored separately is whether such a device offers insights regarding a psychosocial work cycle (*Psychosocial Work Cycle: Beyond the plane of Mobius*, 2007). For example a [Carnot heat engine](#) is a hypothetical engine (a thermodynamic cycle) that operates on the reversible [Carnot cycle](#).

Peristalsis: As the radially symmetrical contraction of annular muscles, [peristalsis](#) propagates in a wave down a muscular tube, most notably the digestive tract -- from the oesophagus through the colon to the anus. The pattern in humans is notably shared with earthworms. Whilst the annular contraction may be understood as corresponding to the adjustment achieved by the electromagnets in the previous case, of special interest is the apparent non-circularity of the arrangement. Ironically, however, for that "internal" physiological system to be sustained, "external" processes must occur -- namely some form of production (enabling consumption) through one end of the tube, where the production may be dependent on appropriate recycling of the waste products excreted at the other end. This points to the inappropriateness of defining a system in terms of a limited understanding of its boundaries.

More intriguing, from a cognitive perspective, is to understand the "inner" system as continuous with what is "outside" -- perhaps in the form of a 4-dimensional Klein bottle in which a form of peristalsis operates to ensure "circulation of the light" in the sense of the nourishment sustaining the system. This then offers an illustration of the cognitive challenge of embodying externalities as mentioned above -- of cognitively transforming "outside" into "inside" and "inside" into "outside" (*Existential Embodiment of Externalities*, 2009).

Breathing: A related metaphor is offered by the process of respiration -- inspiration and expiration. This metaphor, and the associated practices, are fundamental to many disciplines of meditation, variously associated with notions of the "circulation of the light". In the case of Taoist yoga, as previously mentioned, the inner *chi kung (qi gong)* or *chi* energy cultivation technique involves deep breathing exercises, in conjunction with meditation and concentration techniques. These develop the flow of *chi* along certain pathways of energy in the human body. The associated "circulation of light" is known as the [Microcosmic Orbit](#) or "Self Winding Wheel of the Law" and is widely referenced in relation to healing. In that respect, for example, Gordon Davidson (*The Science of Circulatory Health: a key to the new civilization*, 2009) comments on spiritual circulation, mental circulation, emotional circulation, and physical/etheric circulation. Given the competitive claims made by various schools of meditation, these may be seen as fruitfully indicative of the attachment to form which

containment of plasma endeavours so skillfully to avoid in fusion reactors, as previously discussed (*Aesthetic Challenge of Interfaith Dialogue as Exemplified by Meditation*, 1997).

Creativity / Discovery / Innovation: The experience of the creative process and the excitement of discovery offer extremely valuable insights into the "circulation of the light". For many the challenge is indeed how to sustain creativity. This is a vital concern in business environments dependent on innovation for their survival. Much is made of "human ingenuity" as the means by which humanity will survive the challenges to come -- despite expressed concerns (Thomas Homer-Dixon, *The Ingenuity Gap*, 2000).

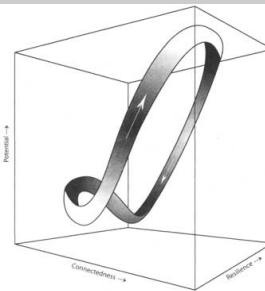
The process sustaining the "circulation of the light" may then be understood as being as "mysterious" as the process eliciting and sustaining curiosity and creativity. It may be "driven" by questions -- notably the classical WH-questions (where, when, what, which, how, who, why), although separately it is argued that these may themselves be derivative (*WH-Questions as derivative psychosocial constructs*, 2010). Any associated motivation may be expressed in terms of sustaining interest and/or avoidance of boredom (*Eliciting and deriving interest: financial and otherwise*, 2010). More intriguing is the degree to which the eternal renewal of interest and creativity may be compared in some way to the classic image of a donkey moving forward attracted by the carrot attached to its head and dangling just out of reach in front of its mouth.

Human values can be considered as **strange attractors** (*Human Values as Strange Attractors*, 1993; *Cardioid Attractor Fundamental to Sustainability*, 2005). If that is the case, is the "circulation of the light" to be compared in some way to a strange attractor (as in the left-hand image below)?

Visual representation of a strange attractor
(by Nicolas Desprez from *Wikimedia Commons*)



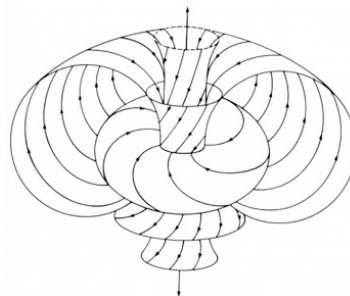
Adaptive cycle in complex systems
(reproduced from Thomas Homer-Dixon, 2006)



Adaptive cycle: As noted above, the future challenge of governance for sustainable development and the survival of human civilization can be framed in terms of navigating the **adaptive cycle**. The question was raised as to whether this would be impossible if the cognitive implications of the "circulation of the light" were not internalised into individual and collective memory. This followed from earlier explorations (*Adaptive Hypercycle of Sustainable Psychosocial Self-organization*, 2010). The challenge for governance has been strongly articulated by Thomas Homer-Dixon (*The Upside of Down: catastrophe, creativity, and the renewal of civilization*, 2006). The right-hand image above might then suggest some of the challenge of understanding the "circulation of the light" and the dimensions within which it is operative (a focus of the **Resilience Alliance**).

Twistor: As discussed in the preceding paper (*Strategic Embodiment of Time*, 2010), physicists are now challenging previously accepted notions of spacetime and gravity in their ongoing quest for a theory of everything. As noted by George Musser ("*Twistor*" *Theory Reignites the Latest Superstring Revolution*, *Scientific American*, June 2010), the **theory of twistors** and **string theory** have now been fruitfully associated in **twistor-string theory**, through the initiative of Edward Witten (*Perturbative gauge theory as a string theory in twistor space*, 2004). With respect to the "circulation of the light", of special interest is the early attempt by Roger Penrose to depict a twistor -- effectively a twisted torus -- as recently republished in enhanced form by *Scientific American*.

Depiction of a twistor
Roger Penrose (*On the Origins of Twistor Theory*, 1987)



Of further potential interest in relation to the "circulation of the light" are the continuing explorations of Roger Penrose in association with Stuart Hameroff regarding **physics and consciousness** -- namely the nature of consciousness in terms compatible with fundamental physics.

Circulation around what?

Whether the circulation is associated with one or more interlocking circles, or with one or more interlocking tori, the configuration begs the question around what the circulation is taking place -- if significance can be attributed to that. Several possibilities are worth

considering.

Simplicial complexes: The above-mentioned mathematical approach of Ron Atkin (*Multidimensional Man: can man live in three dimensional space?* 1981) is helpful in providing a formal articulation of one understanding. A review of it clarifies the nature of the central "hole" in relation to which comprehension and communication may "flow" through the (circular) geometry (*Social organization determined by incommunicability of insights*, 1995).

Unsaid: Far less formal, but somewhat consistent with Atkin's approach, are understandings of the "circulation of the light" as communication circling around "the unsaid", namely that which is avoided in formal, and possibly even informal, interaction (*Global Strategic Implications of the Unsaid: from myth-making towards a wisdom society*, 2003). The unsaid is then effectively an implicit focus of communication geometry.

Lipoproblems and Lipostrategies: Rather than being considered "unsaid" (as discussed above), global governance manifests a remarkable tendency to undertake its business by ignoring central issues. As with climate change, such issues have been named as the "elephant in the living room". The capacity to design certain issues out of public discourse is such that this may be compared to an eccentric art form practiced by certain mathematicians and writers of the **Oulipo** group (*Ouvroir de littérature potentielle*). From such a perspective reference may be made to such deliberately excised central issues as "lipoproblems" and the art of governance in circling around them might be termed a "lipostrategy" (*Lipoproblems: developing a strategy omitting a key problem*, 2009). The strategic response to overpopulation provides an admirable example.

Unuttered thoughts: Gemma Corradi Fiumara (1995) cites H. A. Wolfson (*Philosophical Foundations of Religious Philosophy in Judaism, Christianity and Islam*, 1947) to the effect that:

The purpose of... philosophy, therefore is to uncover these unuttered thoughts, to reconstruct the latent processes that always lie behind uttered words.

About which Fiumara states:

To pursue this philosophical project of revealing unuttered thoughts, we should confront the issue of being able to gain a measure of intellectual mobility, such as freedom to make reversals of background and figure: on nearly every approach metaphor is appraised within a framework that takes literalness for granted; and yet even this frame owe its existence to the hisotrical sedimentations of our metaphoric potential. There is a latent epistemic constraint whereby we must adhere to the stipulation of what is to be regarded as standard background and what we may appreciate as metaphoric figure; this is the sort of intellectual immobility from which there is little to gain. (pp. 100-101)

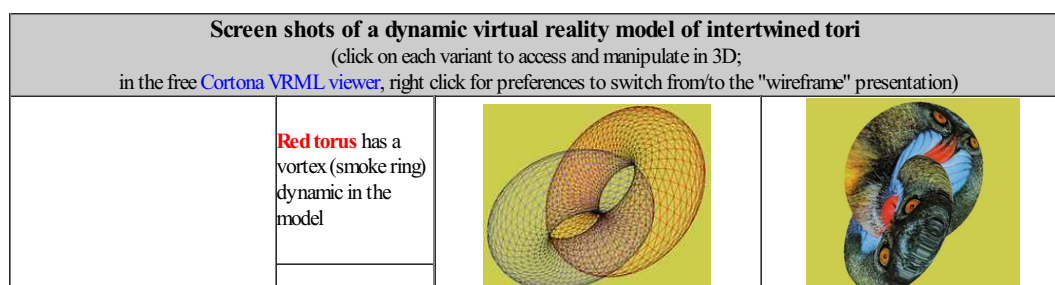
Unsayable: Of traditional interest in theological discourse is the process of **apophasis**, namely mentioning without mentioning -- or even use of negative statements and "unsaying" (Michael A. Sells, *Mystical Languages of Unsaying*, 1994; Jonah Winters, *Saying Nothing about No-Thing: apophatic theology in the classical world*, 1994). This is most evident with respect to recognition of the inappropriateness or inadequacy of definitive statements about extreme subtleties such as deity. Such considerations are of relevance to personal identity and any constraining overdefinition (*Being What You Want: problematic kataphatic identity vs. potential of apophatic identity?* 2008).

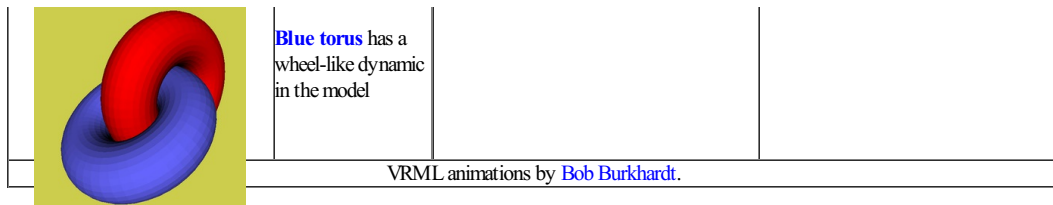
Emptiness and nothingness: As noted above, the circulation may be understood as taking place around a central emptiness -- much celebrated in Zen and other spiritual disciplines, as succinctly expressed by **Chuang-tzu** (*The Pivot*). Given current speculative arguments of fundamental physics regarding the derivative nature of time and gravity, the nature of the nothingness from which such concepts arise remains an open question (*Import of Nothingness and Emptiness through Happening and Mattering*, 2008).

Circulation engendering circulation?

Understood in electromagnetic terms, circulation necessarily engenders effects. This is the basis of the electric motor and the dynamo. It is also intimately related to the **magnetohydrodynamics** governing the movement and containment of plasma. A distinction is to be made between circulation **around** the circuit and circulation at any point in the circuit (at right angles to the former). Together these are represented on a single torus. In electromagnetic terms, the motion around the circuit engenders a third motion through the centre of the torus. The "circulation of the light" **around** the torus may then be understood as engendering this other motion **through** its centre -- or being engendered by it.

These dynamics may be represented on interlinked tori as shown below -- assuming that the third motion itself forms a torus, with its own fourth motion at any point.





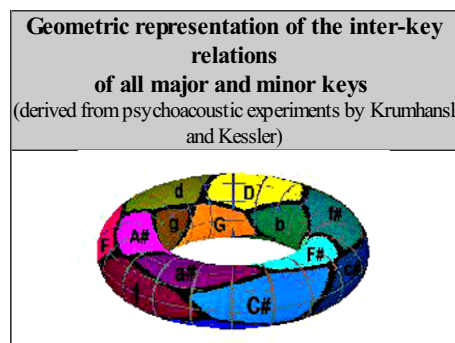
This representation forms part of a separate discussion (*Comprehension of Requisite Variety for Sustainable Psychosocial Dynamics: transforming a matrix classification onto intertwined tori*, 2006), notably with respect to following:

- Distribution of significance "within" a torus: using a third dimension for "Engagement with reality"
- Contiguity of paired circular cross-sections
- "Empty" centres and four-dimensionality
- Psychosocial relevance of torus-related dynamics
- Coherence, instability and failure of psychosocial systems
- Resonant associations and comprehension of feedback vital to sustainability
- Beyond the plane: form and medium in terms of the calculus of indications
- Resonant association of psychosocial identity with intertwined tori
- Memorability: musical clues to psychosocial system sustainability
- Possible immediate applications of relevance to sustainability
- Choosing the dimensionality of living
- Potentially problematic consequences

The framework suggests ways of distinguishing between any sense of sustainable "progress" in the shorter or longer term -- in the light of one torus. But it also offers the possibility of distinguishing those from emergent insight and learning in the shorter or longer term -- in the light of the other torus. The framework also suggests powerful ways of exploring the problematic, "contrary" understandings of any "other". Of particular interest are the relative motions of each torus and how these may engage with the other under various conditions.

Symbolic indications

Harmony: As noted above, music has always been associated with tantalizing insights into the "circulation of the light". It is therefore of considerable interest to note the results of psychoacoustic experiments by C L Krumhansl and E J Kessler (*Tracing the dynamic changes in perceived tonal organization in a spatial representation of musical keys*, Psychological Review, 1982) of the inter-key relations of all major and minor keys can be represented geometrically on a torus -- as shown by Benjamin Blankertz, Hendrik Purwins and Klaus Obermayer (*Constant Q Profiles and Toroidal Models of Inter-Key Relations -- ToMIR*, 1999) in the following image.



It is tempting to consider that such representations might be a key to exploring the kinds of "harmony" so desperately sought with respect to global governance, as separately argued (*A Singable Earth Charter, EU Constitution or Global Ethic?* 2006). Is such a representation an indication of a key to the "circulation of the light" essential to sustainable global governance? A particular value of this representation is the suggestion that through music a sense of that circulation is powerfully internalized through a toroidal form or an orbifold -- a more complex form uniquely explained by the work of Dmitri Tymoczko (*The Geometry of Musical Chords, Science*, 2006).

"Enlightenment": Associated with any understanding of "circulation of the light" is some sense of "knowing thyself" as famously recommended by the oracle at Delphi. The "revelation" associated with this cycle of learning might be succinctly expressed by the much-quoted verse of T. S. Eliot (*Little Gidding*):

We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know it for the first time.

Ouroboros: As a widely recognized symbol of "circulation of the light", the circular **Ouroboros** and its variants highlight the challenge of returning to a point of origin. Ironically this is reflected to the current challenges of sustainable governance, namely "making ends meet", especially in terms of finances and other resources. It is the challenge for the impoverished.

Infinity symbol: Reflecting more closely the cognitive twist and the counter-intuitive nature of the Mobius strip, the infinity symbol is

also fundamental to more complex forms of mathematics as well as figuring prominently on representations of the [magician](#) in the tarot pack.

Halo: In a world in which faith-based governance plays a considerable (if not determining) role, it is useful to note the widespread use of the [halo](#) in depictions of the enlightened. The future may find it curious that the associated values are disassociated from typically secular integrative preoccupations with "holism" -- especially as these relate to wholistic strategies deemed appropriate to sustainable governance.

Rings and torcs : Considerable significance is associated with circlets of various kinds as separately discussed (*Cognitive torque and fruitful associations*, 2009). Beyond its symbolic representation, they may be recognized as an embodiment of the "circulation of the light". In the modern myth-making of the epic tale of *Lord of the Rings*, the question is the nature of the greater ring that "binds" the lesser rings -- a matter not without relevance to global governance (*Relevance of Mythopoeic Insights to Global Challenges: cognitive integration implied by the Lord of the Rings*, 2009). With respect to governance, symbolic rings are of course traditionally associated with sovereigns, heads of religious orders, and heads of secret societies.

Completing the circuit

Whilst the various arguments above point to forms through which the "circulation of the light" becomes evident to a degree, it is vital to highlight how comprehensible it may be experientially. As in the following, such experience seems to be variously associated with:

- a sense of appropriate completion of an initiative, even understood as the fulfillment of a life
- the satisfaction of "making ends meet", most notably in relation to sustainable use of resources
- a sense of rhyming, whether in song or poetry, and the manner in which this is a guarantee of meaning
- a sense of resonance and correspondence between the seemingly disparate, namely a deep connection
- a reconnection with origins and roots

The sense is succinctly expressed in the poem of T. S. Eliot, cited above. As the sense of [eternal return](#) and a traditional cyclic sense of time -- so central to many cultures -- it was a focus of the research of [Mircea Eliade](#) (*The Myth of the Eternal Return: cosmos and history*, 1971). The challenge for sustainable global governance is to enhance the psychological credibility of such cycles, whether in the shorter term or the longer term (*Engaging Macrohistory through the Present Moment*, 2004; *Psychology of Sustainability: embodying cyclic environmental processes*, 2002).

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