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Encountering Otherness as a Waveform

In the light of a wave theory of being

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Introduction

Human civilization has a serious "otherness problem" -- as indicated by the media on a daily basis. The problem is evident in the relationships between the principles and the adherents of the [Abrahamic religions](#) in particular. It is also evident in the relations between science and alternative perspectives, between one political ideology and another, or between "development" and "environment". The challenge to any worldview now has potentially ever more dangerous implications (*Us and Them: Relating to Challenging Others*, 2009; *Guidelines for Critical Dialogue between Worldviews*, 2006).

The argument for framing experience as a "waveform" is developed separately (*Being a Waveform of Potential as an Experiential Choice: emergent dynamic qualities of identity and integrity*, 2013). This contrasted such an experiential framing with use of conventional categories such as "organization" or "network" -- as articulated by authoritative others by whom identity and existence is effectively defined. In quest of a more radically fundamental approach. The case was made there for drawing on the analogical thinking associated with the remarkable development of wave-related thinking in fundamental physics, as extensively argued by [Douglas Hofstadter](#) and [Emmanuel Sander](#) (*Surfaces and Essences: analogy as the fuel and fire of thinking*, 2013) -- as a further development of Hofstadter's earlier work (*Fluid Concepts and Creative Analogies*, 1995).

The question here is the nature of the encounter with otherness as it might be associated with "being a waveform" -- especially if the other can also be meaningfully "sensed" to be a waveform or is so framed. The argument is developed further in an uncompleted third part (*Clues to Comprehension through Wave Language: evoking *Homo undulans**, 2013).

Engagement with otherness of any form is clearly a fundamental challenge in society -- with its extremes of violence and being in love. Whether understood in the form of dialogue or otherwise, that engagement can be explored metaphorically as "intercourse" ("*Human Intercourse*": "*Intercourse with Nature*" and "*Intercourse with the Other*", 2007). Rather than "images" presented as categories framing and defining the other and determining the relationship, the argument here endeavours to elicit insight into an encounter experienced in "wave language". It is argued here that many frequently experienced encounters may be more fruitfully and appropriately articulated in this way as is evident from metaphors in common use. This applies in particular to the universal focus on "contact" with others as an unrecognized electrical metaphor for **explicit** "networks" of relationships, characterized by **implicit** "waves" of communication within them, and a preoccupation with "switching" from one otherness to another.

The argument concludes by exploring the experience of globality as a form of otherness fruitfully to be understood in terms of "wave language". Engaging with death is considered as an ultimate form of otherness meriting consideration in this light. Provocatively, the framing suggests that it is already possible to detect signs of the emergence of a new human species -- *Homo undulans* -- whose experiential "undulation" is more appropriate to navigation of the waves of change and the adaptive cycle.

Images of the other and the paradoxical mirroring implied

The implication of the "other" has been widely considered. For J. A. Proglor (*The Utility of Islamic Imagery in the West: an American case study*. *Islam101*, 1997):

The 'Other' in Western Colonial Discourse: Images of the Other are prevalent in Western civilization, and have become firmly ensconced in the discourse of colonization and conquest, whoever the victims may be. Some images are rooted in Greek notions of barbarians, others born of the Middle Ages. They have been carried through the Reconquista and Inquisition, picked up during the age of colonial expansion, developed by Orientalists in the 19th and early 20th century, and continue on into the age of mass media and globalized political economy. But images don't exist in a vacuum. They have uses.

For Britha Mikkelsen (*Methods for Development Work and Research: a new guide for practitioners*, 2005), images of "the other" and of "ourselves" are at the root of human behaviour. They may be "toxic" as argued by Jeffrey Stevenson (*Toxic images or imaging the other*, *OpenSecurity: Reconciliation and Conflict*, 22 March 2013). As summarized by Ian Shaw (*Images of 'the Other': exploring the concept in a case study of pharmaceutical advertising*. *Mental Health Review Journal*, 2008):

The "other" is a central concept in much of sociology, psychology and philosophy, and is useful in explaining the social exclusion and stigmatisation of people suffering from mental health problems.

Of special interest is the mirroring of images of the other in conflictual situations (Hercules Millas, *Perceptions of Conflict: Greeks and Turks in each other's mirrors*, 2009). Consideration of mirroring is fundamental to the work of Jacques Lacan (Stijn Vanheule, *Lacan's Construction and Deconstruction of the Double-Mirror Device*, *Frontiers in Psychology*, 2011).

Reference is frequently made to the classic text by Gareth Morgan (*The Images of Organization*, 1986). This distinguishes some 8 contrasting images: machines, organisms, brains, cultures, political systems, psychic prisons, flux and transformation, and instruments of domination.

Some effort has been made to explore contrasting "images of the other". A [Symposium on Globalisation and Images of the Other](#) (Istanbul, 2008) was organized by the Council of Europe (as part of its project with the Research Centre for Islamic History, Art and Culture (IRCICA), and the Organisation of the Islamic Conference. This was in the context of a project on *The Image of the Other in History Teaching*.

Similarly the Center for Russian, East European, and Eurasian Studies organized a [Conference on Images of the Other in Central and Eastern Europe](#) (Warsaw, 2012). King Abdullah Bin Abdulaziz International Centre for Interreligious and Intercultural Dialogue [The Image of the Other: Interreligious and Intercultural Education -- Best Practices in The Europe-Mediterranean region](#) (Vienna, 2013).

Both these initiatives can be seen as related to the [Annual International Conference on "Engaging the Other"](#).

Of further relevance, in the light of the much-favoured optical metaphor, is the question of how "image" is related to "mirror" and "mirroring" -- specifically with regard to otherness. How does otherness serve as a mirror? This has been variously considered separately, whether the other is an individual or a problematic condition (*My Reflecting Mirror World: making my World Summit on Sustainable Development worthwhile*, 2002; *Stepping into, or through, the Mirror: embodying alternative scenario patterns*, 2008; *Snoring of The Other: a politically relevant psycho-spiritual metaphor?* 2006; *Looking in the Mirror -- at Josef Fritzl? Global conditions on reflection*, 2009; *Burkha as Metaphorical Mirror for Imperious Culture?* 2009).

Varieties of encounter susceptible to meaningful framing through wave language

There is a case for exploring how the experience of various "encounters" with otherness's might be better articulated through "wave language" rather than through the conventional categories typically used. There is every reason to consider that such an articulation is best understood as **complementary** (to be valued under certain conditions only) rather than as a preferable **alternative** (upheld as applicable under all circumstances). This ambiguity, or duality, is consistent with arguments developed separately (*Being Neither a-Waving Nor a-Parting: cognitive implications of wave-particle duality in the light of science and spirituality*, 2013). Exemplary "encounters" might then include, as an extension of the indications in the previous paper (*Metaphorical waves with psychosocial implications*, 2013):

Existential encounter / bond: These would include the most readily recognizable experiences sensed to be of another kind or nature -- typically a challenge for adequate explanation in conventional language, understood to be unable to carry the meaning of the experience. Examples, possibly overlapping rather than distinct, are:

- friendship, especially when recognized to be of a deep and lasting kind.
- love, most notably as recognized in the experience of that between the sexes, or within a family
- team mates, especially in sport and the military, where mutual dependence may be deeply tested, possibly in the face of mortal danger
- obligations, possibly lifelong, most notably as framed by the Japanese understanding of *giri*
- muse, embodied inspiration to creativity in literature, science and the arts -- as classically exemplified by the beloved of many painters.
- disadvantage, experienced as a direct challenge to complacency and to existential failure to respond sympathetically -- as exemplified by the encounter with beggars

- suffering, spontaneously evoking sympathy and an unexpected level of compassion -- as exemplified by any encounter with illness, handicap or other forms of distress

Relation to a leader: A potentially subtle relation of follower to a "leader" of some kind may be recognized, as in the following:

- relationship to the leader of an enterprise, especially with a degree of risk and danger
- relationship to a valued facilitator, teacher, mentor, or spiritual guide
- relationship to those figures especially characterized by their charisma, as with some admired celebrities
- relation to spiritual leaders, whether living (as in the case of the Pope) or dead (as with saints). Of particular relevance is the evocation by evangelists of experience possibly leading to conversion -- or to trance in other rituals, such as shamanism.

Appreciation of aesthetic performance: In such cases it is the performance which may be designed to evoke an unconventional bond, as with many concert performers. Of particular interest is the case of flamenco and its subtle transformative goal of *duende* -- involving emotion and authenticity (*Daimon, Djinn, Muse and Duende: variations on a timeless experience*, 2007).

Of related interest are collective performances framed or intended as transformative, possibly for both performers and audience. This is a notable feature of the work of Peter Brook (*The Conference of the Birds*, 1979).

Nature: Encounters with the wild, as variously articulated ("*Human Intercourse*": "*Intercourse with Nature*" and "*Intercourse with the Other*", 2007). More specifically the relationship could be restricted to that with a garden, a tree, or a mountain. Of particular interest is the experience for some of a *sacred place*, whether a *shrine*, a fountain, a *sacred river*, a *sacred rock*, or a *sacred mountain* -- often the focus of *pilgrimage* (possibly for millions).

Special bonds with an animal, whether wild or domesticated (as a pet, or otherwise), also call for consideration. Wave-related interaction with "nature" may also be fundamental to appreciation of certain sports (surfing, paragliding, skiing, skating, roller-blading, etc).

Threat: Experienced as a "global" configuration of circumstances, possibly embodied in another, which elicit a form of focus and augmented vigilance:

- *Potential trickster*: The engagement with a skilled salesperson or a confidence trickster -- presenting a challenge of vigilance where gullibility is encouraged.
- *Potential threats*: The encounter with threatening others as in domestic violence, bullying, urban violence (muggings, etc), blood feuds, terrorism, torturers and executioners
- *Catastrophic events / Crises*: Experienced as disruptive of conventional life -- and typically terrifying

Inspirational challenges: As variously offered and framed as collective enterprises -- "*crusades*" or *jihad* -- notably exemplified by the Christian *Church Militant* and *Al-Qaida*, respectively.

Supernatural entities: As with framings of (envisaged) encounters with:

- *Deity*, or representations thereof, especially as central to the transformative experience of mystics
- *Evil*, especially experienced as the temptation and threat of satanic forces -- notably given contemporary recognition by Barack Obama on the occasion of his acceptance speech for the Nobel Peace Prize and by the current US Secretary of State in relation to the Boston Marathon bombings (*Remarks by the President at the Acceptance of the Nobel Peace Prize*, 10 December 2009; *John Kerry: We've been in direct confrontation with evil*, *BBC News*, 19 April 2013).
- *Messiah / Imam*, consequent on the prophesied arrival of the *Messiah of Christianity*, the *Messiah of Judaism*, or the *Imam of Islam* -- or their analogues in other belief systems
- *Angels*, as variously considered and sought (Gregory Bateson and Mary Catherine Bateson, *Angels Fear: towards an epistemology of the sacred*, 2004; M. D. Faber, *The Psychological Roots of Religious Belief: searching for angels and the parent-god*, 2004; Matthew Fox and Rupert Sheldrake, *The Physics of Angels: exploring the realm where science and spirit meet*, 1996; Alison MacLeod, *The Wave Theory of Angels*, 2005)

Hypothetical "entities": Speculation continues regarding the unconventional nature of the cognitive engagement of humans with the "otherness" of unusual entities such as:

- *Extraterrestrial intelligences*: as previously discussed (*Communicating with Aliens: the psychological dimension of dialogue*, 2000; *Sensing Epiterrestrial Intelligence (SETI): Embedding of "extraterrestrials" in epistemic dynamics?* 2013)
- *Global brain*: as articulated variously (Peter Russell (*The Global Brain: speculations on the evolutionary leap to planetary consciousness*, 1983; Francis Heylighen (*Return to Eden? Promises and Perils on the Road to an Omnipotent Global Intelligence*, 2013; Douglas Heaven, *Not like us: Artificial minds we can't understand*, *New Scientist*, 10 August 2013)
- *Mathematical entities of higher dimensionality*: These are of potential significance in the light of the argument of George Lakoff and Rafael Nuñez (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2001). They might include:
 - *Amplituhedron*: as described by Natalie Wolchover (*A Jewel at the Heart of Quantum Physics*, *Quanta Magazine*, 17 September 2013).
 - *Monster symmetry group*: as separately discussed (*Potential Psychosocial Significance of Monstrous Moonshine: an exceptional form of symmetry as a Rosetta stone for cognitive frameworks*, 2007). So-called exceptionally simple Lie groups, most notably E8, have attracted commentary in this regard
 - *Mandelbrot set*: as separately discussed (*Psycho-social Significance of the Mandelbrot Set: a sustainable boundary between chaos and order*, 2005)
 - *Boltzmann brains*: a hypothesized self-aware entity which arises in the cosmos due to random fluctuations out of a state of chaos.

- *Large cardinals*: as a property of [transfinite cardinal numbers](#).

Comprehension of wave reality as "experientially otherwise"

There is a very extensive literature on waves and waveforms distinct from that explored here -- irrespective of how it may be mined for fruitful metaphors in the spirit of the argument of [Susantha Goonatilake](#) (*Toward a Global Science: mining civilizational knowledge*, 1999). Reference to such metaphoric potential was made in the preceding paper (*Being a Waveform of Potential as an Experiential Choice: emergent dynamic qualities of identity and integrity*, 2013).

Goonatilake (1999) argues the case for the exploration of metaphor cultivated by "non-western" civilizations, as discussed elsewhere (*Enhancing the Quality of Knowing through Integration of East-West metaphors*, 2000). The argument could be adapted to the exploration of science as a "non-experiential" source of metaphor, especially as suggested with respect to technomimicry (*Technomimicry as Analogous to Biomimicry*, 2011). This is partially justified by the extent to which science is itself inspired by metaphors of common experience, as extensively argued by [Douglas Hofstadter](#) and [Emmanuel Sander](#) (*Surfaces and Essences: analogy as the fuel and fire of thinking*, 2013).

It is however appropriate to indicate (below) **what is not implied** in this argument by the terminology so widely used by science for **objective** purposes. This offers a means of drawing attention to the potential **experiential** significance of the insights to be derived from their metaphoric exploitation (*Knowledge Processes Neglected by Science: insights from the crisis of science and belief*, 2012). It is the experience the scientific language may suggest that is of relevance here, not the manner in which the language is conventionally used.

Sine waves: A valuable introduction to "wave language" is provided by [Nick Herbert](#) (*Quantum Reality: beyond the new physics*, 1985), especially given his own interest as a physicist in its implication for human awareness (*Elemental Mind: human consciousness and the new physics*, 1995). In *Quantum Reality*, he notes:

Lord Kelvin, the dean of English physicists, described *La Théorie analytique de la chaleur*, [Joseph] Fourier's elegant study of the flow of heat, as a "great mathematical poem". Fourier's theorem states that *any wave can be written as a unique sum of sine waves*. The sine wave is a kind of undulatory archetype; its curvy profile is what most people have in mind when they visualize a wave. Vibrating strings and ripples in a pond are shaped each moment like sine waves.... Physicists like these waveforms because when they put a sine wave into any linear system, a similar sine wave always comes out. Linear systems change a sine wave's amplitude and phase but they never change its sinusoidal shape. Mathematicians like sine waves because no matter how many times they differentiate them, the result is always more sine wave....

The question is how such distinctions have meaning in personal experience. Are there implications in the experience of "heated exchanges" between individuals -- and the wave-like form these may be experienced as taking?

Herbert continues:

Imagine a wave w stretched out in space. Wave w is not necessarily oscillatory, it may take any shape whatsoever. Fourier's theorem says that wave w may be written as a sum of sine waves with various spatial frequencies k , amplitudes a , and phases p . Each word in Fourier's sine wave language is a sine wave with a different value for k , a , and p . Translating a wave into its sine wave words is called [Fourier analysis](#).... The particular sine waves which describe wave w are called its Fourier spectrum, or sometimes its vibration recipe. Each vibration recipe is unique: there is only one way to translate a wave into its sine wave language. The gist of Fourier's important discovery is that sine waves form a universal alphabet in terms of which any wave can be written. (pp. 79-80)

Clearly any personal familiarity with waves ensures an intuitive/instinctive take on such analysis.

Herbert uses an upright prism to symbolize wave analysis into any waveform alphabet, distinguishing between a "hard prism" (any kind of machine capable of physical analysis) and a "soft prism" (a computer program performing the analysis). Hard prisms output real waveforms; soft prisms give "vibration recipes". The art of breaking waves apart with soft waveforms is the heart of quantum theory (p. 83). The interval into which the prism splits a wave is the wave's spectral width, or its bandwidth.

The size of this bandwidth bears an inverse relation to how closely wave w "resembles" the prism waveform which is analyzing it. The smaller the bandwidth, the more wave w resembles the prism waveforms; the larger the bandwidth, the less the family resemblance... among all the waveform families of the world, there is one family... whose prism gives the largest possible bandwidth when it's used to analyze wave w . A wave's kin prism is that analysis prism which splits it the least; a wave's conjugate prism is that analysis which splits it the most. A wave belongs to its kin prism's waveform family and resembles least the members of its conjugate family (p. 86)

Wave function: As described by *Wikipedia*, the [Copenhagen Interpretation](#) is one of the earliest and most commonly taught interpretations of quantum mechanics. It holds that quantum mechanics does not yield a description of an objective reality but deals only with probabilities of observing, or measuring, various aspects of energy quanta, entities that fit neither the classical idea of particles nor the classical idea of waves. This clearly raises issues for the "experiencer" (as considered here) in contrast with the "experimenter" (of concern to conventional science). With regard to the [meaning of the wave function](#):

The Copenhagen Interpretation denies that the wave function is anything more than a theoretical concept, or is at least non-committal about its being a discrete entity or a discernible component of some discrete entity.

The **subjective** view, that the wave function is merely a mathematical tool for calculating the probabilities in a specific experiment, has some similarities to the [Ensemble interpretation](#) in that it takes probabilities to be the essence of the quantum state, but unlike the ensemble interpretation, it takes these probabilities to be perfectly applicable to single experimental outcomes, as it interprets them in terms of [subjective probability](#).

Incomprehensibility of quantum mechanics: The issue for the "experiencer" inspired by the potential of quantum mechanics, and the successful experimentation associated with it, is usefully highlighted by Philip Ball (*Will we ever... understand quantum theory?* *BBC Future*, 25 January 2013):

If the baffling behaviour of subatomic particles leaves you scratching your head with confusion, don't worry. Physicists don't really comprehend it either.... Quantum mechanics must be one of the most successful theories in science. Developed at the start of the twentieth century, it has been used to calculate with incredible precision how light and matter behave - how electrical currents pass through silicon transistors in computer circuits, say, or the shapes of molecules and how they absorb light. Much of today's information technology relies on quantum theory, as do some aspects of chemical processing, molecular biology, the discovery of new materials, and much more. Yet the weird thing is that no one actually understands quantum theory. The quote popularly attributed to physicist [Richard Feynman](#) is probably apocryphal, but still true: if you think you understand quantum mechanics, then you don't. That point was proved by [a poll among 33 leading thinkers](#) at a conference in Austria in 2011. This group of physicists, mathematicians and philosophers was given 16 multiple-choice questions about the meaning of the theory, and their answers displayed little consensus.

Potentially relevant to any controversy over engagement with otherness is recognition of the continuing controversy amongst physicists regarding the nature of fundamental physics, as ably documented by [Mara Beller](#) (*Quantum Dialogue: the making of a revolution*, 1999). To what extent is the latter a rich metaphor for understanding the former?

Such unprocessed discord is reminiscent of the deprecated discourse regarding the medieval question: *How many angels can dance on the head of a pin?* -- appropriately evoked by Alison MacLeod (*The Wave Theory of Angels*, 2005).

Beable through theory? Of notable relevance to the argument here is the potentially meaningful expression "beable" -- to the extent that it might have implied the capacity of a theory to be "donned" by an experiencer as a framing "cognitive cloak", namely as a means of being "through the theory", of "being informed" by the theory -- perhaps embodied as a "cognitive exoskeleton". This is not however how it is used by physics ([Adrian Kent](#), *Beable-Guided Quantum Theories: generalising quantum probability law*, 2012; [Guido Bacciagaluppi](#), *Collapse Theories as Beable Theories*, 2010; [S.M. Roy and Virendra Singh](#), *Generalized Beable Quantum Field Theory*, *ScienceDirect*, 1990).

According to discussion in *Wikipedia*, the word "beable" was introduced by the physicist [John Stewart Bell](#) in his article entitled *"The theory of local beables"* (see *Speakable and Unspeakable in Quantum Mechanics*, 1988, pp. 52). A beable of a physical theory is an object that, according to that theory, is supposed to correspond to an element of physical reality. The word "beable" (be-able) contrasts with the word "observable". While the value of an observable can be produced by a complex interaction of a physical system with a given experimental apparatus (and not be associated to any "intrinsic property" of the physical system), a beable exists objectively, independently of observation.

Bell remained interested in objective "observer-free" quantum mechanics. He felt that at the most fundamental level, physical theories ought not to be concerned with observables, but with "be-ables": *The beables of the theory are those elements which might correspond to elements of reality, to things which exist. Their existence does not depend on "observation"*. He remained impressed with Bohm's hidden variables as an example of such a scheme and he attacked the more subjective alternatives such as the [Copenhagen Interpretation](#).

There is indeed a need for "beable theory" through which individuals can engage meaningfully with experiential reality. However this is seemingly not a concern of physicists preoccupied solely with "observables", irrespective of however incomprehensible their explanations may be to those faced with the complex subtleties of their personal experience (*Dynamics of Symmetry Group Theorizing: comprehension of psycho-social implication*, 2008). Relevant to this point is the experiential argument, as a physicist, of [Douglas Hofstadter](#) (*I Am a Strange Loop*, 2007) -- and the collective challenge it implies (*Sustaining a Community of Strange Loops: comprehension and engagement through aesthetic ring transformation*, 2010).

Wave theory of being?

It is curious to note that "theory of being" is employed in the literature of physics -- in conjunction with "wave" -- as a development of the traditional preoccupation of philosophy with a "theory of being" or [ontology](#). It could even be considered an "appropriation" by physics of those more diverse preoccupations. There appears to be no consideration of a "wave theory of being" -- as used in the subtitle above -- although it is implied by the fundamental significance of "waves" for physics, with its implications for all matter, including human beings.

There is of course a controversial relationship between nature as the materialist focus of physics and the nature of consciousness engaging with "nature". This was partially discussed in the preceding paper (*Waves and Consciousness*, 2013), notably with reference to the arguments of [Werner R. Loewenstein](#) regarding *Consciousness and Quantum Information* and *Quantum Information Waves* ([Werner](#)

R. Loewenstein, *Physics in Mind: a quantum view of the brain*, 2013).

As noted there, *Wikipedia* offers entries on:

- The [quantum mind](#) or quantum consciousness hypothesis proposes that classical mechanics cannot explain consciousness, while quantum mechanical phenomena, such as quantum entanglement and superposition, may play an important part in the brain's function, and could form the basis of an explanation of consciousness. It is not one theory, but a collection of distinct ideas...[*of which a number are reviewed*]
- [Quantum cognition](#) is an emerging field which applies the formalism of quantum theory to model cognitive phenomena such as human memory, concepts and conceptual reasoning, human judgment, perception, and decision making. The field clearly distinguishes itself from the quantum mind as it is not reliant on the hypothesis that there is something micro-physical quantum mechanical about the brain.

Impermanence as a fundamental worldview: Given the consonances variously explored between fundamental physics and some insights of Buddhism and Taoism, it is appropriate to note the fundamental importance attributed by Buddhism to [impermanence](#) (*Anicca*):

The aggregates of mind and body, being ever subject to cause and effect... pass through the inconceivably rapid moments of arising, presently existing, and ceasing (*uppaada, .thiti, bha'nga*), just as the unending waves of the sea or as a river in flood sweeps to a climax and subsides. Indeed, human life is compared to a mountain stream that flows and rushes on, changing incessantly (*AN 7.70*) "*nadisoto viya*," like a flowing stream.

Heraclitus, that renowned Greek philosopher, was the first Western writer to speak about the fluid nature of things. He taught the [Panta Rhei doctrine](#), the flux theory, at Athens, and one wonders if that teaching was transmitted to him from India.

"There is no static being," says Heraclitus, "no unchanging substratum. Change, movement, is Lord of the Universe. Everything is in a state of becoming, of continual flux (*Panta Rhei*)."

The difficulty at the present time, collectively and for every individual, is that neither the insights of Buddhism, nor of Heraclitus, nor of fundamental physics, would seem to respond to the experiential challenge of living in the changing reality of the moment. Recognition of "change" (climate change, generational change, etc), and recommendations to "be the change", do not enable engagement with the wave-like dynamics of the otherness it constitutes -- however this may imply some form of entrainment or entanglement. For governance through a period of cyclic crises, such arguments do not address the challenge of navigating the [adaptive cycle](#) articulated by the [Resilience Alliance](#), as discussed by [Thomas Homer-Dixon](#) (*The Upside of Down: catastrophe, creativity, and the renewal of civilization*, 2006).

Curiously individuals are offered more powerful "realistic" indications through their own experiential encounters (as noted above) and by more deeply embodied insight into their wave-like dynamic. This argument reframes the case often made for meditative respiration, for example, or attention to heart beat -- or to being "regular" in various ways..

Wave ontology: A useful clarification is offered by [Ian J. Thompson](#) (*Philosophy of Nature and Quantum Reality*, 2010), making the explicit assumption that describing the nature of substances as revealed by quantum physics is not essentially meaningless. He notes the following different ontologies **which it is impossible to distinguish empirically** (*Quantum Ontologies*, 2010):

- [ontology of events](#): the world is not composed of definite material substances, but only "patterns of activity", or "energy in certain forms" (following A. N. Whitehead, or Bertrand Russell)
- [ontology of particles](#): substances are still really Newtonian corpuscles, but that they behave in rather peculiar ways which we just have to accept as 'facts of nature'.
- [ontology of waves](#): substances are really *waves*, albeit rather peculiar waves. Waves are considered the ultimate substance within a "universal field" of which all particles are simply localised concentrations. This followed the articulation of [Schrödinger's wave function](#) -- with his effort to substitute a wave ontology for a particle ontology understood as central to his effort to unify general relativity and quantum mechanics.
- [ontology of wave/particle complementarity](#): according to the Copenhagen Interpretation
- [ontology of propensities](#): potentialities and/or dispositions are built into the very nature of substance itself (by taking some of Aristotle's ideas more seriously)
- quantum theory cannot be applied to *individual* systems at all.

With respect to Schrödinger's wave functions, Thompson offers the reservation:

It is now difficult to interpret the wave functions as real entities in physical space. One modern variant of this "wave ontology" solves the problem of the [reduction of wave packet](#)", by assuming that it never occurs! This is the ["many worlds interpretation"](#) of quantum mechanics... According to this interpretation, the Schrödinger wave function describes everything that there is in the world. If it splits up into two or more alternatives, then the whole universe (or at least some part of it) is duplicated as many times as is necessary. And this happens at every interaction: the theory is generous on universes! ... Even if these difficulties were solved (or ignored), there are still problems in the philosophy of nature, as it is not clear however what exactly is 'waving' when a Schrödinger wave or a field goes by. This is the problem of substance again. It cannot be that a "wave function" makes up the physical world, since a "function" is a mathematical rather than a physical entity.

With respect to both the wave function and wave/particle complementarity, Thompson indicates:

There are troubles with both... approaches, as it turns out nature does not behave as we would expect if it were only particles, or as it would if it were only waves. Niels Bohr therefore proposed his idea of "wave-particle complementarity", which is that nature alternates between being like particles and being like waves, according to what the experimentalist chooses to measure.

Do the distinct interpretations presented by Thompson, and variously favoured by physicists, suggest that the experiential encounter with otherness might lend itself (necessarily?) to a similar range of interpretations? Might this perhaps be according to the predisposition of the experienter, as separately discussed by a number of authors (*Systems of Categories Distinguishing Cultural Biases*, 1993)

Ontology languages: Concern with information theory has resulted in the development of so-called **ontology languages**. An area of artificial intelligence research, **knowledge representation**, is aimed at representing knowledge in symbols to facilitate inferencing from those knowledge elements, creating new elements of knowledge. Most of these are **declarative languages**, and are either **frame languages**, or are based on **first-order logic**. They tend to define only an upper ontology with generic concepts, whereas the domain concepts are not part of the language definition.

Ontology engineering in computer science and information science is a new field, which studies the methods and methodologies for building **ontologies**: formal representations of a set of concepts within a domain and the relationships between those concepts. A large-scale representation of abstract concepts such as actions, time, physical objects and beliefs would be an example of ontological engineering.

Engagement with statistical waves? Deep engagement with "waves" is only too obvious in the manner in which statistical waves are central to the control of complex systems in practice. Frequent media portrayals of financial trading rooms make this apparent. Analogous situations obtain in the case of other control rooms. However it is financial traders who are psychologically most engaged with the representation of rising and falling price on which their personal fortunes depend through judicious risk assessment. They are obliged to "live" the market and have a range of tools to facilitate this. The question relevant to this argument is how this enables their engagement with otherness in other settings -- beyond the focus on risk assessment -- as partially discussed separately (*Psychosocial Implication in Gamma Animation: epimemetics for a Brave New World*, 2013).

Proprietary use of "wave": Use has been made of "wave language" as a special language for processing and supervision of networks. **WAVE** permits the dynamic creation of intelligent, highly parallel and distributed knowledge processing & control structures which may evolve with the systems supervised. It describes any data processing as distributed, parallel and asynchronous navigation of (or movement through) a data network (P. S. Sapaty and P. M. Borst (*An Overview of the WAVE Language and System for Distributed Processing in Open Networks*, 1994):

The WAVE is rather a machine level language oriented on a direct and efficient software or hardware interpretation in distributed environment than the language for a general user. It is based on a quite new type of a universal distributed processing/navigation automaton evolving in an active networked data like a (controlled) virus. This makes the WAVE language implementation possible in any computer network topologies without traditional centralised control, communication, or algorithmic facilities. Different user-friendly higher level programming languages for distributed processing in dynamic systems may be built upon this new type of a machine language.

Another example is provided by the Google Wave bot. This is an automated participant on a wave and is one of two types of Google wave extensions. Such bots interact with a wave. Coincidentally, at the time of writing, the Iranian presentation to the UN General Assembly featured the proposal that it should instigate a **World Against Violence and Extremism** (WAVE).

None of these preoccupations addresses the (subjective) challenge for the individual in experiencing otherness in the world.

Metaphorical articulation of wave-language bonding through science

The experiential examples above help to focus the question of how "wave language" might be more appropriate to the experience of the encounter with otherness and the nature of any associated "bond". The articulations relating to "wave" from physics indicate a higher order of sophistication and subtlety than has seemingly been devoted to understanding any experiential encounter or bond with otherness -- with the exception of articulations in literature and poetry, especially with regard to the subtleties of the romantic bond. One example of the latter is the following verse from a poem (notably given prominence by the movie *Four Weddings and a Funeral*, 1994):

*He was my North, my South, my East and West,
My working week and my Sunday rest,
My noon, my midnight, my talk, my song;
I thought that love would last forever: I was wrong.*
(W. H. Auden, *Funeral Blues*, 1936)

Bonding with the other: Further exploration can also be partially framed by previous arguments (*Marrying an Other whatever the Form: reframing and extending the understanding of marriage*, 2013; *Transcending Simplistic Binary Contractual Relationships: what is hindering their exploration?* 2012).

The term "bond" has been extensively used by science in relation to **molecular bonds in chemistry** and more generally in **materials science**. Although readily represented diagrammatically as networks of linked atoms, such a conveniently simple representation does not

correspond to the reality of the bond in electromagnetic terms. This suggests that an "electromagnetic" metaphor could well be more appropriate to the experience of some psychosocial bonds, if only under certain conditions. Ironically this might well apply to the bonds cultivated between those linked solely by telecommunications, most notably in a social networking context. Any link (or hyperlink) is effectively a carrier for waves of communications -- of quantifiable "frequency" and "amplitude" (if not significance).

This possibility is readily recognized in the common use of certain expressions regarding interpersonal relationships. Examples include:

- feeling positive or negative "vibrations" from the other person
- being "in tune" or "in sync" with the other person, especially in various forms of team work (aerobatics, acrobatics, etc)

The linearity of communication implied by any link or bond is challenged by the argument of Daniel Dervin (*Creativity and Culture: a psychoanalytic study of the creative process in the arts, sciences, and culture*, 1990):

In fact language, with its inherent capacities for tropes, paradoxes, inversions, oxymorons, double entendres, and the turnabouts of puns, has never been a linear system for direct communication of messages between two points; and in some ways these rich resources in language, which everyone draws on, may compensate (or overcompensate) for our sense that direct communication is so often insufficient. Paul Davies's depicting the scientific universe as paradoxical, ambiguous, and surrealistic, evokes Jacques Derrida's deconstructing a literary text. (p. 248).

The "wave-like" nature of the bond is also characteristically experienced in the dynamics of communal singing, dance and sexual intercourse. Some would claim to recognize a waveform in auras.

Molecular chemistry: As noted above, the electromagnetic framing of molecular bonding is very suggestive of new ways of discussing relationships between people, between groups, between concepts, or between other entities. The possibility suggests even further extension to the set of chemical elements and the pattern of recognizable distinctions they suggest (*Tuning a Periodic Table of Religions, Epistemologies and Spirituality -- including the sciences and other belief systems*, 2007; *Possible mapping of periodic correspondences into nested circles*, 2012).

Electrical metaphors (section partially reproduced from *Modulating Cognitive Transformations: electrical metaphors and semiconduction*, 2012): As noted by Marlene Johansson Falck (*Electrifying Performances and Brains that Fuse: metaphor and the cognitive function of electricity*, 2005):

As is evident from my material, which consists of a large number of metaphorical expressions from the OED, CIDE and 20th CW1, there is remarkable consistency among the instances with respect to the kinds of experiences that may be structured by means of our experiences of electricity. Almost all the mappings exemplify the use of electricity to conceptualise people's actions or emotions. (pp. 52-53)

In an extensive review, Dedre Gentner and P. Wolff (*Metaphor and Knowledge Change*, 2000) discuss the subsequent implications of the widely-cited earlier work on comprehension of electricity (D. Gentner and D. R. Gentner, *Flowing Waters or Teeming Crowds: mental models of electricity*, 1983). Much of this literature offers insightful comment on the cognitive implications, notably for learning and comprehension (cf. John M. Carroll and John C. Thomas, *Metaphor and the Cognitive Representation of Computing Systems*, *IEEE Transactions on Systems, Man, and Cybernetics*, 1982, 2; Aristotle Tympas and Dina Dalouka, *Metaphorical Uses of an Electric Power Network*, *metaphorik.de*, 2007, 12)

In the light of Freud's own use of such a metaphor, Don M. Tucker and Phan Luu discuss *An Electrical Metaphor for the Neurophysiological Mechanisms* (In: *Cathexis Revisited: corticolimbic resonance and the adaptive control of memory*, *Annals of New York Academy of Sciences*, 1998). They note:

In drawing from the models of neuronal function of his day, Freud considered their properties as electrical, and theorized about their operations as involving the storage and management of quantity of energy. (p. 137)

In the daily organization of experience, the limbic networks seem to resonate to the motivational (i.e., personal) significance of each event. In doing so, they engage the consolidation of that event in proportion to its significance. Because the adaptive control is integral to the representational process, the phenomenon of "memory" could be redefined as "motive-memory." The significance of each event is integral to the representation itself. In Freud's terms, an event becomes organized in memory to the extent that it is affectively "cathected." (p. 139)

Curiously it would appear that there is surprisingly little effort to explore systematically the correspondences between electrical phenomena and psychosocial phenomena, whether to enable comprehension or as characteristic of cognitive processes and their transformation. As indicated by the reference above to "flowing waters", widespread use is made of the so-called **hydraulic analogy**, treating electrical circuits as water flows:

- **electric potential**, corresponding to **hydraulic head**
- **electric charge**, corresponding to the quantity of water.
- **current**, corresponding to quantity of flowing water over time.
- **voltage**, or potential difference, corresponding to a difference in pressure between two points: the higher the water, the higher the voltage. Negative voltage could then correspond to having water levels lower than some arbitrary zero level.

- **resistance**, corresponding to the degree of constriction in the water conduit
- **inductance**, corresponding to a second loop of water that must be sped up or slowed down by the circuit and that resists the change in current.
- **capacitance**, corresponding to a dam preventing water from crossing and allows a buildup of different water heights on either side.

The argument is also further developed separately (*Use of electrical metaphors for comprehension of transformative cognitive processes*, 2012).

As noted above, one of the terms most basic to transfer of electricity is "contact". It is widely used with respect to contact with others in social relationships -- consistent with the argument of **George Lakoff** and **Mark Johnson** (*Metaphors We Live By*, 1980). It is effectively an unrecognized electrical metaphor for **explicit** "networks" of relationships, characterized by **implicit** "waves" of communication within them, and a preoccupation with "switching" from one otherness to another. This suggests the merit of seeking ways to map such networks into wave-like representations -- perhaps replacing individual linear links by sine curves of a frequency and amplitude indicative commensurate with the communication process along the link (or the use of animated simulations).

It is appropriate to explore whether "wave language" would then offer a richer context within which to transcend the binary limitations of "switching" between one opportunity and another, as separately discussed (*Recontextualizing Social Problems through Metaphor: transcending the 'switch' metaphor*, 1990). This could allow for more conscious attention to the wave-like dynamics which are "hidden" to a degree in patterns of relationships described overly simplistically as "networks". It could help to transcend the constraints of relationships between "contacts" governed by "agreement" versus "disagreement" (*Transcending Simplistic Binary Contractual Relationships: what is hindering their exploration?* 2012).

Matching patterns in relationship communication (section partially reproduced from *Modulating Cognitive Transformations: electrical metaphors and semiconduction*, 2012): Anticipating the argument to follow, it is appropriate to note a degree of recognition from an electrical perspective between switching and the Chinese denotation of *yin-yang* (Ian Wright and Rob Newman, *Electrical or photonic ying and yang of switching*, *Lightwave*, 18, 2001, 6; Ting Cao, Stephen Blackburn, et al. *The Yin and Yang of Power and Performance for Asymmetric Hardware and Managed Software*, National Science Foundation of China, 2012).

This "*yin-yang*" switching perspective is especially striking in relation to the widely used **Smith Chart**, invented by the electrical engineer **Phillip H. Smith** (and independently by Kaneyuki Kurokawa, a Japanese engineer). This is a graphical aid for electrical and electronics engineers specializing in radio frequency engineering to assist in solving problems with transmission lines and matching circuits. A generalized **3D Smith Chart** based on the extended complex plane (**Riemann sphere**) and inversive geometry has recently been proposed (as discussed below). Using the 2D chart, Randy Rhea notes:

Any impedance with a positive real part may be displayed on the standard, unity radius Smith chart. The horizontal line is pure resistance. Circles with a center on this line are constant resistance. Arcs converging at center right are constant reactance. The top half of the chart is inductive and the bottom half is capacitive. (*The Yin-Yang of Matching, High Frequency Electronics, Part 1: Basic Matching Concepts*, March 2006, *Part 2: Practical Matching Techniques*, April 2006):

Rhea explores the matching of both real and complex impedances in networks. Of potential relevance to social networks? At a single frequency, any positive-real complex impedance can be matched to any other positive-real complex impedance using no more than two reactive elements. He presents Smith Chart diagrams of matchable impedance space for 8 types of conditions -- whose resemblance to distinct features of the **Tao symbol** he describes.

Feynman diagrams: The possible relevance of **Feynman diagrams** to an understanding of interpersonal relationship dynamics has been explored separately (*Potential of Feynman Diagrams for Challenging Psychosocial Relationships? Comprehending the neglect of an unexplored possibility*, 2013; *Credibility of Psychosocial Analogues of Feynman Diagrams: cognitive engagement with challenging visualization*, 2013). There the fundamental role played by Feynman diagrams in providing a common language through which the mathematical complexity of fundamental physics can be succinctly implied -- in such a way as to facilitate discourse, whilst avoiding any immediate need for decoding and interpreting the significance of the underlying equations. The diagrams were promoted in their final form by the renowned physicist **Richard Feynman** and have proven to be a remarkable medium of discourse over many decades, as noted by **David Kaiser** (*Drawing Theories Apart: the dispersion of Feynman Diagrams in postwar physics*, 2005).

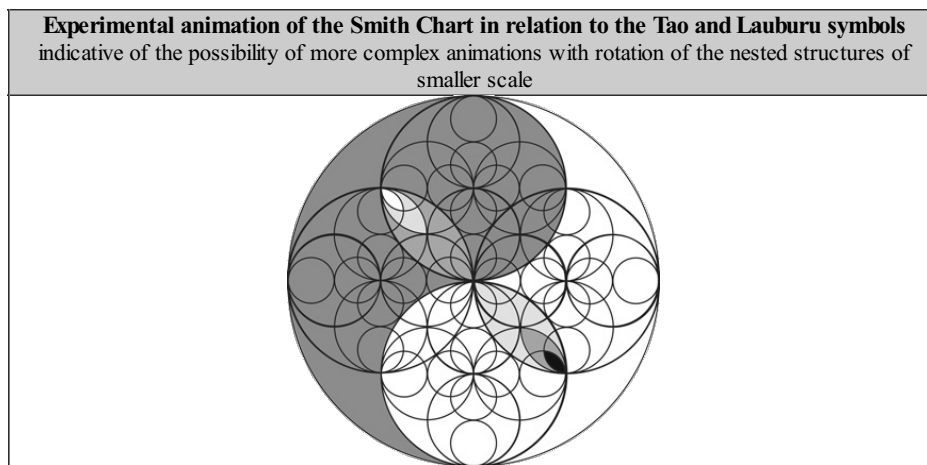
Essentially the diagrams offer a way of engaging with complexity without being rendered impotent by doing so. Given their archetypal simplicity as diagrams, and the fundamental nature of what they are able to "hold", the question to be asked is whether some form of "Feynman diagram" would be of considerable value to discourse regarding challenging psychosocial relationships. More provocatively, the question might be framed as to whether Feynman diagrams could themselves be understood even more generally such as to encompass the cognitive dynamics of psychosocial relationships.

This possibility would be consistent with the cognitive psychology of **George Lakoff** and **Rafael Nuñez** (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2001), as further elaborated by **Chris Fields** (*Metaphorical Motion in Mathematical Reasoning: further evidence for pre-motor implementation of structure mapping in abstract domains, Cognitive Processing*, 2013).

Wave-language potentially implied in encodings elaborated by cultures

The following experimental animation offers an interesting transition between a "scientific" approach to wave language and one implicit in two distinct cultures. The animation is discussed in detail in the document from which it is reproduced (*In Quest of a Dynamic Pattern*

of *Transformations: sensing the strange attractor of an emerging Rosetta Stone*, 2012). The "scientific" dimension derives from an adaptation of the Smith Chart mentioned above. The "cultural" dimension derives from its association with the [symbol of the Tao](#) (as mentioned in relation to that chart) and the Basque [symbol of the Lauburu](#) (known as the Basque cross). The animation successively traces an 8-fold pattern from the Smith Chart, as well as the two symbols -- notably highlighting the "eyes" of the Tao. The pattern of curves is of course suggestive of a "wave language" -- with conventional static representations of both symbols to be fruitfully understood as [standing waves](#).



There is the interesting possibility that "wave language" may be more readily cultivated in some cultures and languages rather than in others. This could well follow from the work on "mindscapes" of [Magoroh Maruyama](#) (*Metaorganization of Information, Cybernetica*, 1965; *Mindscapes and Science Theories, Current Anthropology*, 1980; Poly-ocular Vision, *Indian Journal of Management Technology*, 2008), notably as more recently developed by Maurice Yolles and Gerhard Fink (*An Introduction to Mindset Agency Theory*, 2013). Consideration could be given to cultures with a more dynamic, corporal relation to music.

An example is provided by the seemingly greater uptake of "*réalité ondulatoire*" (in French) -- beyond the boundaries of conventional science as suggested by the following intimation of being a waveform:

La réalité matérielle du monde serait donc une réalité ondulatoire où l'existence de chaque être se définirait par son identité vibratoire, c'est à dire la fréquence à laquelle il vibre. Chaque individualité se présentant comme une vibration de taux vibratoire unique et défini à l'intérieur d'une matrice où coexistent tous les possibles de cette vibration. Toutes ces vibrations interagissent dans un tissu matriciel vibratoire qui forme l'Univers connu, à l'intérieur duquel chaque partie du tout est en interconnexion avec tout le reste selon la loi d'intrication, tout pouvant être dit "en relation avec tout". Or, selon des découvertes récentes, cette réalité vibratoire semble directement influencée par la vision et les pensées de celui qui l'observe, tout en étant soumises aux lois classiques de la physique. Le contenu de notre conscience, lui-même de nature vibratoire, influencerait donc ce champ d'énergie. (Céline Morard, *Qu'est-ce-que le monde quantique ?*)

A number of systemic encodings merit consideration as implying some form of wave-language relevant to interpersonal relationships. These include runes, tarot, etc.

Of particular interest are the classical Chinese binary and ternary coding systems, notably because distinct interpersonal relationships are explicitly associated with the formal encoding through metaphor. These include the:

- ***I Ching*** (or *Yi Jing*), also known as the *Book of Changes*. This identifies 64 patterns (encoded in the form of hexagrams) and the relationships between them (*Diagram of 384 Relationships between I Ching Hexagrams*, 1983). The original commentary makes extensive use of metaphor to facilitate comprehension -- in contrast with conventional systems initiatives. This is a mode which can be adapted to current preoccupations (*Transformation Metaphors -- derived experimentally from the Chinese Book of Changes (I Ching) for sustainable dialogue, vision, conferencing, policy, network, community and lifestyle*, 1997)
- ***Tao Te Ching*** (*9-fold Higher Order Patterning of Tao Te Ching Insights*, 2003; *Commentary on Tao Te Ching Interpretation -- and the possibility of higher order patterning*, 2003). Navigational implications are explored in *Hyperspace Clues to the Psychology of the Pattern that Connects*, 2003).
- ***Taixuanjing*** (or *T'ai Hsüan Ching* or *Canon of Supreme Mystery*). It is also known in the West as *The Alternative I Ching* and *The Elemental Changes*. This identifies 81 situations and the relationships between them.

Given the systemic nature of such coding systems, and the arguments above, there is a case for exploring their relevance to the sense in which the relationship between people is felt to be "electrical" in some way -- and is so described. The question then is whether there are fruitful metaphorical borrowings from articulations of electrical circuits, as partially explored separately (*Use of electrical metaphors for comprehension of transformative cognitive processes*, 2012). There a matrix explored usage (according to search engine results) of the following terms:

- resistance, inductance, impedance, capacitance, charge, current, voltage, potential, conductance, connectivity, circuit, capacity

in conjunction with the following:

- cognitive, psychological, mental, psychosocial, social, meditation

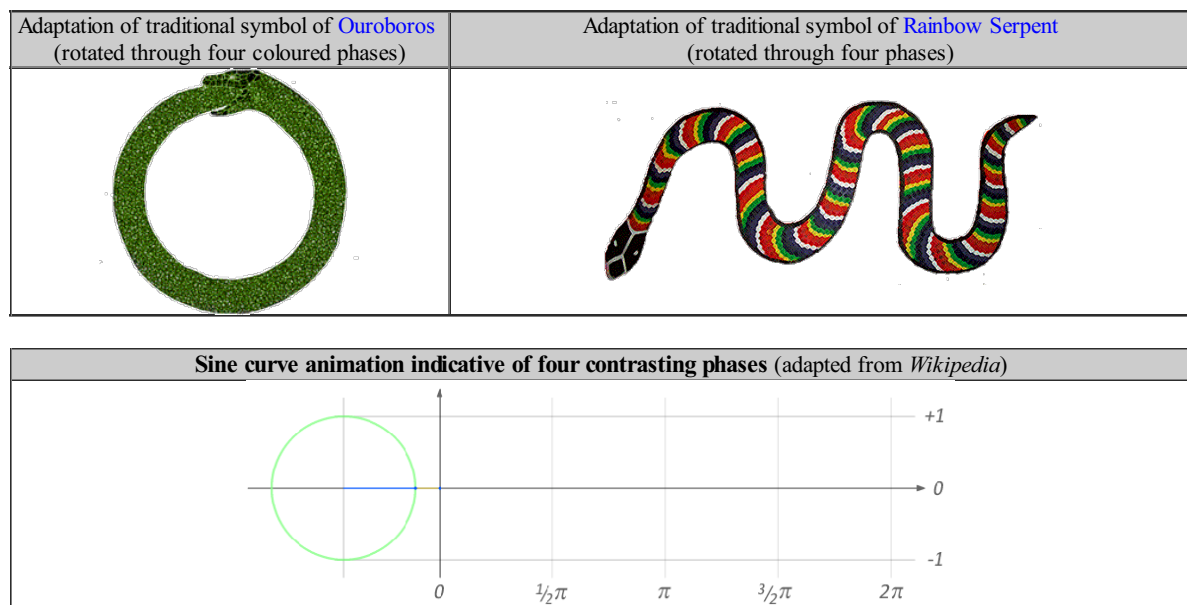
It is appropriate to note how those in the first set are in a number of cases recognizable as used (if only occasionally) in characterizations of interpersonal relationships. These are possibly implicit in any conjunction in usage with some of the second set. It would of course be valuable to elaborate such metaphorical relevance with insights from those having familiarity with electrical systems in describing their own interpersonal relationships, as previously suggested (*Electrical Systems as a Guiding Metaphor for Stages of Group Dialogue*, 2001).

Of further potential relevance is the sense in which the distinct elements of the Chinese coding systems are to be compared with the distinct symbols used to denote elements in electrical systems -- and especially those associated with telecommunications in which wave-language is most probably to be applicable.

From this perspective the "sender" and "receiver" in the dynamic of interpersonal communication could be explored as the contrasting "antenna" configurations appropriate to sending and receiving -- with each configuration being reconfigured (even returned) as required by the process.

Especially interesting to note is the relationship to some patterns of encoding, as in the extremes of "heaven" and "earth" -- in the *I Ching* system. Are these usefully reminiscent of the contrast between "heavenly" (sublime) relationships and "earthy" (well-grounded) relationships? The extensive nature of the articulation of that system suggests an interesting range of other possibilities which merit recognition. There is the further fascinating possibility that elements of the highly innovative electrical thinking of [Nikola Tesla](#) might be interpreted from this metaphorical perspective.

In the quest for fruitful clues for wave insights from different cultures, variants of two traditional symbols are presented below -- juxtaposed with the sine wave animation (from *Wikipedia*) presented in the earlier paper. The traditional symbols have been animated experimentally to suggest a relationship to the sine wave animation. Other aesthetic and animation options (especially better synchronization) could of course be used to heighten the sense of a common wave-related intuition.



In resonance with the above imagery with respect *réalité ondulatoire*, the physicist Roland Tournaire (*Etre et langage*, 2013) indicates:

Comme nous ne pouvons saisir le mouvement que dans l'étendue, nous le mesurons dans le discontinu par le nombre: il est la représentation de ce que Parménide nommait l'inexistant, *to ouk on, to me on*. Mais, s'il est aussi une autre image de la réalité ondulatoire, il est continu, ponctuel, car, de même que l'onde figurée en cercles ou en sphères n'est pas distincte de son centre ponctuel, le mouvement est l'extension dans l'étendu de ce point que les géomètres déplacent pour tracer des lignes (p. 34)

Experiencing otherness as wave-like globality

In its more extreme forms, in the experience of otherness there is a fundamental contrast between that which is associated with a menacing threat and that which is profoundly attractive. Both however have an all-encompassing integrative quality -- readily to be associated with some sense of globality by which the experiential world is redefined in the moment. The experience might well be termed "awesome" in some cases, for example.

In the first case this is recognized in life-threatening insecurity and terror -- as currently evoked by the risk of "terrorism". In the second case this is characteristic of the world-reframing encounter with a profoundly significant other -- perhaps in falling in love, or in encountering a life-changing spiritual mentor.

The attractiveness of the second case of course offers an archetypal echo of the attraction of the ovum for a sperm -- with all that is implied by the encounter of the one with the other. This is suggestive of how any one-pointed attraction to otherness may be

transformed into one with sexual connotations, whether physical or otherwise. The serpent recalls the reference by D. H. Lawrence, as discussed by (Daniel Dervin, *A "Strange Sapience": the creative Imagination of D.H. Lawrence*, 1984) and the argument of Douglas Hofstadter (*I Am a Strange Loop*, 2007). The metaphorical implications can be fruitfully explored with respect to the subsequent process of [invagination](#) -- the infolding of one part of a structure with respect to another (*Engendering Invagination and Gastrulation of Globalization: reconstructive insights from the sciences and the humanities*, 2010). Such a global transformation suggests more paradoxical cognitive variants (*World Introversion through Paracycling: global potential for living sustainably "outside-inside"*, 2013).

Of relevance to the second case, through use of electrical metaphors (as indicated above), is the manner in which the "globality" is echoed in the geometry of the sphere typical of very high voltage electrical discharge experiments. These recall common reference to the unusual experience of a "spark" passing between two people -- transcending conventional recognition. Comparison might even be made with a solar flare and its extension out to a planet in the form of solar wind.

The fundamental nature of solar dynamics in sustaining life suggests their exploration as a cognitive metaphor with a range of psycho-social implications -- in contrast to a widely promoted "flat earth" framing of globalization, as separately discussed (*Irresponsible Dependence on a Flat Earth Mentality -- in response to global governance challenges*, 2008).

The dynamics suggest richer possibilities than those based simply on static structural metaphors of the sphere (*Metaphorical Geometry in Quest of Globality -- in response to global governance challenges*, 2009; *Spherical Representation of Icosidodecahedral Net of Strategies: configuring strategic dilemmas in intersectoral dialogue*, 1995; *Spherical Configuration of Interlocking Roundtables: Internet enhancement of global self-organization through patterns of dialogue*, 1998). Some possibilities of the dynamics of the solar metaphor have been discussed separately (*Embodiment of Identity in Conscious Creativity*, 2011). The cognitive subtlety of cycle "re-cognition" can also be explored, as mentioned above, through "circulation of the light" (*Circulation of the Light: essential metaphor of global sustainability?* 2010).

Insights into the "global" significance of an encounter with another person are available through many individual accounts, perhaps most notably those of [Martin Buber](#) (*I and Thou*, 1937) and [Johann Wolfgang von Goethe](#) (*Elective Affinities*, 1809). Much-valued attempts have been made to elicit insights from dialogues or trialogues between those esteemed for their insight ([David Bohm](#), *Limits of Thought: Discussions with Jiddu Krishnamurti*, 1999; [Sitansu Ray](#), *The Tagore-Einstein Conversations: reality and the human world, causality and chance*, 1995; [Ralph Abraham](#), [Terence McKenna](#) and [Rupert Sheldrake](#), *Triologues at the Edge of the West: chaos, creativity, and the resacralization of the world*, 1992). As a dynamic, dialogue would seem to imply an as yet poorly understood relation to the completion associated with globality (*Sustainable Dialogue as a Necessary Template for Sustainable Global Community*, 1995; *Enabling a 12-fold Pattern of Systemic Dialogue for Governance*, 2011).

Engaging with illness and death as otherness

Wave function collapse: The future may consider it extraordinary that the most extensive references to "death" by physicists, in relation to the wave-related insights of quantum mechanics, concern those of the paradoxical [thought experiment](#) regarding [Schrödinger's cat](#). Curiously quantum physicists do not seem to be able to reconcile their own death with that of the theory most central to their professional concerns. The thought experiment is focused on experimental observation relating to the probability of the death of a cat shut in a box with a radioactive substance that has only a probability of killing it (if the substance decays).

Provocatively it could be argued that fundamental physics does not "do" death -- other than through complicity in its application to ensure the death of others. For physicists, death is a meaningless "nonsense", despite extensive interest in the significance of "nothing" ([Lawrence Krauss](#), *A Universe from Nothing: why there is something rather than nothing*, 2011; [John D. Barrow](#), *The Book of Nothing: vacuums, voids, and the latest ideas about the origins of the universe*, 2002) -- as discussed separately (*Emerging Significance of Nothing*, 2012). Credibility is now given, however, to the manner in which the universe might reconstitute itself after any final cosmic collapse to nothing ***

It could be provocatively argued that the experiment, as a metaphor, offers an extremely valuable insight into the "metaphysical" experience of such physicists -- effectively "locked into" a conceptual framework precluding reference to personal experience (other than "observation"). The experiment can be fruitfully reframed by replacing the cat by a physicist -- "Schrödinger's physicist" (?) -- and eliminating the need for an "external" observer (or considering the cat to be a significant observer). This could be understood as more realistic in that there is a degree of probability to the death of any physicist at any time. The sophistication brought to reflection on this probability by physicists is many orders of magnitude less than that devoted to speculation regarding the cat. The situation is experientially tragic when the death is preceded by progressive mental decay into senility.

In "wave language", death could indeed be readily compared to "wave function collapse" or "reduction of wave packet" -- and presumably this framing figures in private reflections of physicists faced with the certainty of mortality. The phrase can also be usefully applied to reframe other forms of collapse, whether the collapse of an interpersonal relationship, the collapse of civilization, or that of the human species. That of civilizations is evident in the study of macrohistorical cycles ([Johan Galtung](#) and [Sohail Inayatullah](#), *Macrohistory and Macrohistorians: perspectives on individual, social, and civilizational change*, 1997).

Immortality: Despite the attitude of physicists, death is given prominence in popular science periodicals as a major driver of civilization ([Michael Shermer](#), *Climbing Mount Immortality: death, cognition and the making of civilization*, *Scientific American*, 6 April 2012; *Death: a special report on the inevitable*, *New Scientist*, 20 October, 2012). The editorial introducing the latter argues:

So perhaps it is time for humanity to reinvent death, 3 million years or more after our first intimations of it. Indeed, the job is already underway: the proliferation of new types of death - industrial, vehicular and biochemical - has led to correspondingly complex legal codes. And there are those who seek to redefine death still further, by freezing their heads or replicating their

minds outside their bodies - all to reify our long-held notions of passing beyond humanity. Such projects may seem outlandish. But even for sceptics, the idea of greatly deferring or even defying death outright is worth deep and sincere reflection: in thinking about death, we are also thinking about life. (*Memento mori: it's time we reinvented death*)

Whilst death may not be of any theoretical concern to fundamental physicists, irrespective of the more disastrous consequence of their activities, it is curious to note how it becomes a central focus for the extremely wealthy in some way. Iconic examples include the (displaced) preoccupation of [Bill Gates](#) of Microsoft with child mortality, that of [Steve Jobs](#) (of Apple), and that of [Larry Page](#) (of Google). At the time of writing the cover of *Time* magazine (30 September 2013) features the theme *Can Google Solve Death?* -- introducing [Calico](#), a Google-owned initiative to address issues of health and ageing (Harry McCracken and Lev Grossman, *Google vs. Death*, *Time*, 30 September 2013). The new Director of Engineering at Google, [Ray Kurzweil](#), has recently asserted that humans will soon be able to upload their entire minds and become digitally immortal (JohnThomas Didymus, *Google's Ray Kurzweil: 'Mind upload' digital immortality by 2045*, *Digital Journal*, 20 June 2013).

In its issue on death, the *New Scientist* featured a summary of the work of Stephen Cave (*Immortality: the quest to live forever and how it drives civilization*, 2012). Presented by the *Utne Reader* as "how immortality became a national obsession", [Lewis Lapham](#) (*Memento Mori*, 24 September 2013) argues:

The substituting of the promise of technology for the consolations of philosophy had been foreseen by John Stuart Mill... His premonition is now the just-over-the-horizon prospect of life everlasting bankrolled by [Dmitry Itskov](#), a Russian multimillionaire, vouched for by the Dalai Lama and a synod of Silicon Valley visionaries, among them Hiroshi Ishiguro and Ray Kurzweil. As presented to the [Global Future 2045](#) conference... Itskov's [Avatar Project](#) proposes to reproduce the functions of human life and mind on "nonbiological substrates," do away with the "limited mortal protein-based carrier" and replace it with cybernetic bodies and holograms, a "neohumanity" that will "change the bodily nature of a human being, and make them immortal, free, playful, independent of limitations of space and time." In plain English, lifelike human heads to which digital copies of the contents of a human brain can be downloaded from the cloud.

As "emperors" of cyberspace, their initiatives are reminiscent of the traditional preoccupation of Chinese emperors with ensuring their own [immortality](#). One favoured approach was of course the construction of monuments of appropriately framed significance, as separately discussed (*Enstoning in Memorials and Monuments*, 2012). Of particular interest, and of relevance to this argument, was the exploration by those emperors of the "inner alchemy" of Taoism to that end. This was experientially related to an understanding of the "circulation of light" as essential to sustaining health.

It is therefore somewhat curious that Google should have selected "Calico" as the name for its initiative, given its close association with the [burial shroud](#). The more appropriate traditional name would have been "Elixir" -- unless "shroud" is then to be understood as a "digitally woven" cocoon of relationships of higher dimensionality, as separately discussed (*Interweaving Thematic Threads and Learning Pathways: noonautics, magic carpets and wizdomes*, 2010). Now revealed to be a friendly, global front-end for the US National Security Agency, might Google search facilities enable a transformation of its obsession, as separately discussed (*From ECHELON to NOLEHCE: enabling a strategic conversion to a faith-based global brain*, 2007).

To what extent will some form of "cognitive fusion" be discovered to be vital to the kinds of life prolongation and immortality sought by such initiatives? Is this in effect a significant mirroring at the individual level of the energy sustainability associated with the quest to manage the "power of the sun" through nuclear fusion in the [International Thermonuclear Experiment Project](#) (ITER), as argued separately (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006)? Curiously a fundamental design issue for ITER is management of the snake-like instabilities of the circulating nuclear plasma, again recalling Hofstadter (*I Am a Strange Loop*, 2007).

These associations merit reflection in the light of consideration of the relation between death and alchemy by [Steven M. Rosen](#) (*Dreams, Death, Rebirth: a multimedia topological odyssey into alchemy's hidden dimensions*, 2013), in the light of his earlier work (*Wholeness as the Body of Paradox*, *Journal of Mind and Behavior*, 1997; *The Concept of the Infinite and the Crisis in Modern Physics, Speculations in Science and Technology*, 1983).

Experience of death: Missing from the argument presented in this way is any experiential sense of "approaching" death as the encounter with otherness in its most ultimate form. Some understanding is offered by:

- any sense of "dying a little" every day, especially with advancing age or as a spiritual discipline
- progressive loss of faculties, most notably memory -- possibly experienced as a loss of self or a loss of dignity
- any anticlimax, as a diminishing intensity of experience -- notably as in [post-coital tristesse](#) (also known as *La petite mort*), or perhaps as the manic phase of the bipolar cycle, possibly to be recognized as an experiential "netherworld", as separately discussed (*Designing Global Self-governance for the Future: patterns of dynamic integration of the netherworld*, 2010).
- giving up an aspiration or hope -- notably as with the collapse of an initiative -- and the resulting despair, perhaps exemplified by commentaries such as that of [Arthur Koestler](#) (*Dialogue with Death*, 1942)
- recognition of the need for a so-called [sunset provision](#) -- possibly taking the form of a so-called [living will](#)
- engaging with the death of a significant "other" -- and the extinction of what is experienced as a form of "energy wave" until the other is "no longer there" (Joan Halifax, *Being with Dying: cultivating compassion and fearlessness in the presence of death*, 2009; Judith L. Lief, *Making Friends with Death: a Buddhist guide to encountering mortality*, 2001)
- articulation of the significance in:
 - poetic form, as compiled by [Harold Bloom](#) (*Till I End My Song: a gathering of last poems*, 2010) or by [Yoel Hoffmann](#)

(*Japanese Death Poems: written by Zen monks and haiku poets on the verge of death*, 1998)

- other forms (Sushila Blackman, *Graceful Exits: How Great Beings Die -- death stories of Hindu, Tibetan Buddhist, and Zen masters*, 2005; Martin Crowley, *Dying Words: the last moments of writers and philosophers*, 2000; Simon Critchley, *The Book of Dead Philosophers*, 2009)

There is a certain irony to the manner in which aging is recognized by the progressive development of wrinkles -- effectively waves of shorter period than those which previously sustained a wrinkle-free skin. The ills and pains experienced with advancing age highlight the extent to which the body is itself experienced -- increasingly -- as a form of otherness, even an externality (*Existential Embodiment of Externalities: radical cognitive engagement with environmental categories and disciplines*, 2008). This calls for reflection in terms of the arguments noted above with respect to the embodiment of mind.

If the threat to life through disease and death is intimately related experientially to an encounter with otherness in an ultimate form, then there is a case for engaging in this encounter through the cognitive embodiment of waves in some manner. The threat may well be framed as arising from some form of "dysfunctional" cognitive "entanglement" with otherness as conventionally framed, and as separately argued (*Cognitive Implications of Lifestyle Diseases of Rich and Poor: transforming personal entanglement with the natural environment*, 2010).

Interlocking cognitive cycles essential to health: Curiously the very nature of physical "health" can be considered experientially elusive -- hence the ready engagement in dysfunctional behaviour whereby it is undermined (substance abuse, etc). The nature of psychological or cognitive "health" is even more elusive to those in quest of it. Its integrative nature can be fruitfully explored as "wholth", as separately discussed (*Wholth as Sustaining Dynamic of Health and Wealth: cognitive dynamics sustaining the meta-pattern that connects*, 2013).

Curiously it would appear that the above-named initiatives towards life prolongation and immortality assume that any success will necessarily be a consequence of a focus on physical health. It is therefore especially significant that Google's Calico project may be able to complement this focus with one on eliciting and sustaining the cognitive and experiential cycles which may constitute a form of template for physical health -- *Mens sana in corpore sano*. The argument is reinforced by the prospect of senility and dementia in lives successfully prolonged, if careful attention is not applied to the challenge. Increasing promotion of so-called **brain fitness** and mind training is an indication of a degree of sensitivity to the issue.

Missing is any sense of cycles of complementary styles of knowing and how their phases, as wave functions, may need to interlock in order to sustain health and coherence. A powerfully indicative metaphor is to be found in the **metabolic pathways** vital to physical health -- and the possibility of awareness of cognitive equivalents as discussed separately (*Engaging with Globality through Cognitive Circlets*, 2009). These are perhaps to be inspired by the geometric arguments regarding minimal requirements for system integrity of R. Buckminster Fuller (*Synergetics: Explorations in the Geometry of Thinking*, 1975), as discussed separately, notably in relation to the dynamics of spherically symmetrical tensegrity (*Geometry of Thinking for Sustainable Global Governance: cognitive implication of synergetics*, 2009). What indeed might be the cognitive implications of the *Amplituhedron*, as noted above (Natalie Wolchover, *A Jewel at the Heart of Quantum Physics*, *Quanta Magazine*, 17 September 2013)?

Also missing from the apparent preoccupations of Calico and similar initiatives is how access to the collective wisdom of humanity is to be organized to "inform" sustainable experiential health, namely how search facilities might enable interlocking waves of insight -- perhaps enabling cognitive networking as a complement to social networking. Given the manner in which aphorisms (as traditional vehicles of wisdom) are typically the length of tweets, could Twitter be used to enable the dynamic configuration of sustaining patterns of wisdom -- as separately explored with respect to a **set of Zen koans** (*Configuring a Set of Zen Koan as a Wisdom Container: formatting the Gateless Gate for Twitter*, 2012). The challenge could be framed in terms of the mythical "language of the birds" (*Re-Emergence of the Language of the Birds through Twitter?* 2010).

Given such a framing, it is interesting to note the complementary initiative of the so-called **Quantum University** with its focus on alternative, holistic, natural, and integrative medicine. In the light of the argument above, might experiential health be fruitfully construed as "beable theory"? Given the increasing challenges of comprehension for all, what then of the role of ignorance, as separately explored (*University of Ignorance: engaging with nothing, the unknown, the incomprehensible, and the unsaid*, 2013)?

Given the unprecedented wealth engendered for Bill Gates by the Windows operating system, there is a nice metaphorical contrast between "observation" of the possibility of life prolongation via the search facilities it enables and the absence of "gates" enabling effective embodiment of it in practice. A cognitive variant of the **glass ceiling effect**?

Emergence of Homo undulans -- through a "grokking" dynamic?

The possibility of wave language as being fundamental to a new mode of engaging with otherness, or to any sense of identity, invites the speculation that it might be effectively the basis for a new human "species": *Homo undulans*.

Grokking: The argument for emergence of a new "cognitive species" was previously the focus of an earlier speculative exploration in the light of the science fiction theme of "grok" (*Authentic Grokking: emergence of Homo conjugens*, 2003). As noted there, the term was introduced into science fiction by **Robert Heinlein** (*Stranger in a Strange Land*, 1961) as meaning literally "to drink" and metaphorically "to be one with" -- connoting understanding in a global sense involving intimate and exhaustive knowledge, possibly akin to **synaesthesia**. It is described by Heinlein as:

Grok means to understand so thoroughly that the observer becomes a part of the observed -- to merge, blend, intermarry, lose identity in group experience. It means almost everything that we mean by religion, philosophy, and science -- and it means as little to us (because of our Earthling assumptions) as color means to a blind man.

It has been taken up by cognitive scientists, philosophers and neuro-cosmologists -- as well by practitioners of [zen](#). Its German origin as *verstehen* implies a special form of sympathetic, experiential and intuitive understanding. Milo Clark (*The Art of Grokking*, 2000) summarizes his use of it, in contrast to the unwitting perpetuation of conditioned thought, as:

For my purposes, to grok extends beyond ordinary and even extraordinary levels of comprehension moving far into the vestigial core of being human and possessing, as well as using qualities rarely engaged these days. We may grok more from our reptilian brain segments than from the later evolutionary lobes. As we move beyond transcendent experiencing to genuine transmutations of consciousnesses [plural intended] of being, we move from understanding to grokking -- and then stay there, leaving behind all which is behind without, in any fundamental way, negating the qualities of knowing personally, individually and collectively the histories of humankind on this planet -- now quite lost, barely available through ordinary processes, education, etc. to most. Meditation practices pursued to realization, first levels of samadhi, for example, provide some sensing relevant to and transferable to ordinary, daily life which helps to break, to free from the lulling dualities dominating most.

Also spelt as "groking", Bill Hayashi has explained it as "moving from a merely conceptual, mental understanding to a personally felt and experiential knowing" (*Groking: Transformational Knowing*, 1997). For Obafemi Adewumi:

Groking occurs naturally when we practice whole body listening. To grok something is to grasp it: to get the marrow, the inner meaning, the crux, or the gist of it. It is to get the essence of a communication or sharing such that we are able to recreate it in our own language. By practising groking, we can all become contributors to the planetary evolution. Groking enables us to learn quickly and to share what we have learned with others. [[more](#)]

Homo conjugens: The earlier argument suggested that beyond *Homo sapiens* lies a species, *Homo conjugens*, that is fecund in ways that *Homo sapiens* could only project into biological reproduction. The emergence of *Homo conjugens* would then signal a new way of engaging and joining with the world. The characteristics of that species were described there under the following headings:

- [Paradox and ambiguity](#) | [Dualism and polarity](#) | [Intercourse](#) | [Consummation](#) | [Enactivism](#)
- [Reflection-within](#) | [Reflection-without](#) | [Environment](#) | [Instrumentalism](#) | [Possession](#)
- [Inter-personal relationships](#) | [Group activity](#) | [Commitment](#) | [Paradigm shift](#)
- [Time-binding](#) | [Language](#) | [Self-constraint](#) | [Dynamic](#) | [Playfulness](#) | [Humour](#)

Homo undulans: The argument above with respect to "wave language", and cognitive identification with a wave modality, provoked a search for a more appropriate species qualifier -- beyond "*conjugens*". "Undulans" (deriving etymologically from "wave") is currently used in the distinction of a range of species, for example: *Marginella undulans* (a species of sea snail), *Heteropsis undulans* (a species of butterfly), *Blepharisma undulans* (a species of heterotrich ciliate), and *Gyrodinium undulans* (a species of algae).

Of far greater relevance to the above argument is the description of *Homo undulans* as the theme of a penultimate chapter of the very detailed study by Daniel Dervin (*Creativity and Culture: a psychoanalytic study of the creative process in the arts, sciences, and culture*, 1990). Appropriately he relates this to a "third birth" of "self-creation", discussed at length in his final chapter. For Dervin, with respect to *Homo undulans*:

On his most rudimentary level, Einstein has taught us that, even more than vacuums, nature abhors straight lines. At least Relativity abhors them... So a straight line put under pressure, as it were, of scientific observation is recreated as a curve. Does the awareness of curvature also mark the beginning of creativity? One can be grateful, in any case, to Einstein for locating in the bending of light and the curving of space some faint correspondence to that "vain, diverse, and undulating object" that [Michel de] Montaigne described as man, adding "tis hard to find any constant and uniform judgment on him" (p. 244)

Dervin relates this to a view of [John Ruskin](#) (*The Nature of the Gothic*, 1853):

John Ruskin had maintained that the best in us "cannot manifest itself but in company of much error." To err means to go astray, to divagate, to wander; but an errant knight is on a quest; and an errand bespeaks a message to deliver... Freedom -- what Ruskin is talking about -- is a deviation, and he finds it supremely manifested in the Gothic " " examine once more those ugly goblins, and formless monsters... but do not mock them, for they are signs of the life and liberty of every workman who struck the stone"... In any case, it is not so bad to find the universe just a trifle more gothic than the uniformity of Newton's machinery would have it be. Curves, bends, warps, whirlpools, and spirals endow it with a sort of independent creative life apart from our own straight-mindedness, which now looks more deviant than normative...

A psychoanalyst, having referred to the concept of working through as linear, expressed his discomfort with it... Rather the analyst suggested the metaphor of the double helix, and the term working-over, a repeated upward/downward spiraling -- closer to Montaigne's undulating humanity. (pp. 244-245)

Dervin then continues:

... in the psychological sphere, the abnormal (trauma) -- like the bend of light particles, the swerve of evolution into neoteny, the narcissistic blow in the artist's early years, the gaps and uncertainties of natural creativity... can all be entertained as indigenous to the normal curves of our human nature -- or so I think, not wanting to exempt myself from the wavering principle of uncertainty. (p. 249)

Through the appropriate emphasis on "undulating" (as a characteristic of "wave language"), and through a sense of **embodied cognition**, this usefully suggests cognitive implication in the body in movement -- most obviously dance, as noted above. This is consistent with the arguments of **Mark Johnson** (*The Meaning of the Body: aesthetics of human understanding*, 2007; *The Body in the Mind: the bodily basis of meaning, imagination, and reason*, 1987), and with **George Lakoff** (*Philosophy in the Flesh: the embodied mind and its challenge to western thought*, 1999). **Undulatory locomotion** is the type of motion characterized by wave-like movement patterns that act to propel an animal forward and is the most primitive of vertebrate locomotor patterns.

"*The Law of Undulation*" is the title of a chapter in a work of **C. S. Lewis** (*The Screwtape Letters*, 1942, chapter 8) with respect to the Christian experience of life. It has been creatively visualized by Dani Herman (*Law of Undulation*, Prezi, 20 November 2012). It is a theme for numerous Christian commentaries (R. Penman Smith, *The Law of Undulation, Morning by Morning*, 21 March 2013; *Deeper Waters*, *The Law of Undulation*, *ubfriends.org*, 4 July 2010; William Femi Awodele, *The Law of Undulation*, 2011). The chapter notes:

Humans are amphibians -- half spirit and half animal... As spirits they belong to the eternal world, but as animals they inhabit time. This means that while their spirit can be directed to an eternal object, their bodies, passions, and imaginations are in continual change, for to be in time means to change. Their nearest approach to constancy, therefore, is undulation -- the repeated return to a level from which they repeatedly fall back, a series of troughs and peaks.

The "law" also features as central to the work of Japanese architect Ikuro Adachi at the Institute of Form-Undulatory Energy (*The Law of Undulation: contemporary Earth culture and its future*, 2007). "Undulation" is an explicit feature of a wide variety of fitness exercises.

As a principle "undulation" had been promoted earlier by the transcendentalist **Ralph Waldo Emerson** (*The American Scholar*, 1837):

That great Principle of Undulation in nature, that shows itself in the inspiring and expiring of the breath; in desire and satiety; in the ebb and flow of the sea; in day and night; in heat and cold; and as yet more deeply ingrained in every atom and every fluid, is known to us under the name of Polarity -- these "fits of easy transmission and reflection," as Newton called them, are the law of Nature because they are the law of spirit.

For Emerson, the ideal life has "undulation" -- a rhythm that balances, or alternates, thought and action, labor and contemplation (Lewis Leary, *The Maneuverings of a Transcendental Mind: Emerson's Essays of 1841*, *Prospects*, 3, 1978). As noted in this regard by Barry Albert Wood (*Emerson as a Process Philosopher*, University of Toronto, 1963):

Emerson's "all-dissolving unity", then, was the Soul, or as he called it in one essay, "that Over-soul, within which every man's particular being is contained and made one with all other"... Words cannot describe the unity because words depend upon variety, upon classifications, divisions, and contrasts. To descend to creedal statements about the central identity of all things is to substitute "tropes" for "principles"; it is to limit the vision to the clutter of immediate things and fail to expand the mind to the infinite circle of the All. It is to create a static world of distinct things arranged in a pattern rather than to see the eternal undulation that dissolves the pattern in process. (p. 59)

In an interview with **Vlady Stevanovitch** (*Les Arts Martiaux et le Tai Chi de la Voie Interieure*, 1987), he was questioned on his use of the term *Homo Fluidus Ondulans*, to which he responded:

C'est une plaisanterie. J'aime bien me moquer de toutes les sciences. De la chinoise aussi. Il y a, cependant, une réalité faite d'énergie, d'ondes, de forces qui s'attirent et se repoussent. L'homme aussi a sa place dans cette réalité. Il est lui-même une source d'énergie et il subit et utilise l'énergie de l'espace environnant. J'évite de parler de cosmos. Gardons les pieds sur terre. En définitive, toute notre recherche consiste à libérer notre propre source d'énergie et à nous mettre à l'unisson avec les forces de la Nature. Dans la pratique du Tai ji quan, chaque mouvement que nous faisons est guidé par cette recherche-là.

Alternation: *Homo undulans* is also appropriately consistent with earlier arguments for recognition of the neglected role of "alternation" in sustainable development of any kind. These were presented in a collection of papers (*Policy Alternation for Development*, 1984). That on *Metaphors of Alternation* (1984) effectively offers further examples of "wave language" for which a case had been previously made (*Liberation of Integration, Universality and Concord -- through pattern, oscillation, harmony and embodiment*, 1980). It is also consistent with a more speculative development of the argument (*Sensing Epiterrestrial Intelligence (SETI): embedding of "extraterrestrials" in epistemic dynamics?* 2013). Of interest is the reconciliation in French of "otherness" with "alternation" through "alterité" and *alternance* -- the latter being upheld as basic to the democratic process.

Given the importance variously accorded by physics and mathematics to complementarity and correspondences, the question is what greater cognitive role might these modalities play in the encounter with otherness of a necessarily elusive nature (*Theories of Correspondences -- and potential equivalences between them in correlative thinking*, 2007; *Functional Complementarity of Higher Order Questions: psycho-social sustainability modelled by coordinated movement*, 2004) ?

One pointer is offered by the manner in which the insight articulated in one proverb can be found denied in the articulation of another -- suggesting that a more fundamental insight of another nature is to be found in the alternation between those perspectives (Michael Rogers, *Contradictory Quotations*, 1983; *Contradictories: Webster's Quotations, Facts and Phrases*, 2010; Max Cryer, *Preposterous Proverbs*, 2011; James Barnett, *15 Pairs of Contradictory Proverbs, The People's Almanac*; Nigel Barber, *Proverbs That Contradict Each Other: why folk wisdom contradicts itself*, *Psychology Today*, 2012). This pattern was explored systematically in the [Human Values Project](#), structured in terms of the "value polarities" between which human behaviour oscillates. It is this alternation which suggests that the wisdom implied by proverbs, and associated with "*Homo sapiens*", will come to be embodied more consciously by "*Homo undulans*" -- perhaps following the capacity of a "*Homo conjugens*" to "conjugate" contradictions.

Missing from any such alternation (as implied by the form of the sine wave) is the manner in which the most elusive wisdom emerges through constraining such variation within a "higher" form of order. This can be suggested by constraining the "linear" (sine) wave into the "circular" form implied by the Ouroboros -- with its implication of an elusive centre (as in animations below). The paradoxically transcendent nature of such a "centre of gravity" can be variously discussed (*Paradoxes of Engaging with the Ultimate in any Guise: living life penultimately*, 2012; *Implication of Indwelling Intelligence in Global Confidence-building: sustaining the construction and dynamic of psychosocial reality through questioning*, 2012).

A sense of the value attached to such an implicit centre of gravity is evident at the most embodied level, namely in the appreciation of the gravitational pull associated with [centripetal force](#) felt by a person in the process of circular motion (on roller-coasters, etc) -- and in contrast to that of [centrifugal force](#). Far less evident is the manner in which this is experienced in "psychosocial orbiting", as discussed separately (*Orbiting Round Nothingness across Communication Space*, 2012).

Dancing with the reality of otherness

Homo undulans suggests the emergence of a human species that may effectively "dance with reality" in cognitive terms, in contrast with what would be perceived by that species as the current "harassment of reality", as previously argued (*Beyond Harassment of Reality and Grasping Future Possibilities: learnings from sexual harassment as a metaphor*, 1996). The metaphor has been explored by Gary Zukav (*The Dancing Wu Li Masters: an overview of the new physics*, 1979).

There is the delightful irony that a very particular precursor of *Homo undulans* is only too evident through recognition of forms of individual human behaviour in society typically framed through metaphor as "worm-like" or "snake-like". This is particularly notable in the case of the many currently proclaiming vigorously their innocence with respect to complicity in enabling the ongoing global financial crisis -- from which they benefitted so significantly.

The dynamic is intuitively "grokked" as an insidious form of "wriggling", ensuring "wriggle room" through so-called [plausible deniability](#). It is a somewhat splendid irony that it could be said that the "masters of wave language" are in fact politicians -- both in their relationship with mass audiences and in their skills at "wavering" on any fundamental policy issue. Might any acclaimed "Supreme Leader" now be fruitfully recognized as a "Supreme Undulator" -- as currently exemplified by [Silvio Berlusconi](#)? In deserving such leadership in a democracy, could it be said that this "wavering" is consistent with the engagement of *Homo undulans* with the "threat" of consensus on any issue (*The Consensus Delusion: mysterious attractor undermining global civilization as currently imagined*, 2011; *Ungovernability of Sustainable Global Democracy? Towards engaging appropriately with time*, 2011)?

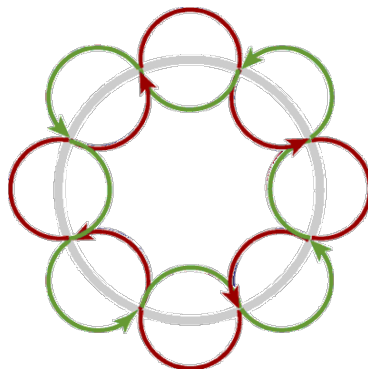
Such dynamics are increasingly recognized as calling for a higher form of vigilance -- presumably instinctive to *Homo undulans* (*Engaging with Questions of Higher Order: cognitive vigilance required for higher degrees of twistedness*, 2004; *Twistedness in Psycho-social Systems: challenge to logic, morality, leadership and personal development*, 2004). Is a weaving metaphor a key to the future coherence of governance, as separately explored (*Warp and Weft -- Governance through Alternation: world governance as a Gandhian challenge for the individual*, 2002)?

Exploiting modern myth-making and its appeal to the imagination, how might the "dark riders" of the waves of change be distinguished and constrained (*The "Dark Riders" of Social Change: a challenge for any Fellowship of the Ring*, 2002)? How can popular fantasies regarding dragon riding (as in the movie *Avatar*, 2009) be translated into the experiential riding of "waves of change"?

In this light, could some of the experiential limitations of quantum physics be seen as deriving from the same delusion as with regard to the management of risk on the financial markets ([Pablo Triana](#) and [Nassim Taleb](#), *Lecturing Birds on Flying: can mathematical theories destroy the financial markets?* 2009). Does promotion of quantum reality miss the extent to which there is a fundamental experiential understanding of reality -- an understanding which is at risk of "destruction" by incomprehensible mathematics? As being most readily recognizable, is this evident in the manner in which members of football team members weaving between each other to maintain control of the ball?

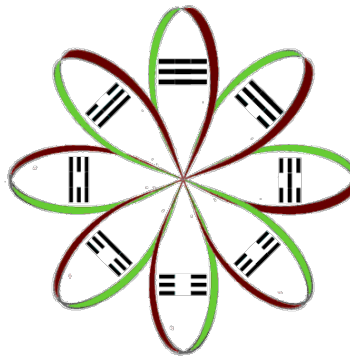
This risk might be considered as partially indicated by the sense of loss of dignity addressed by the injunction in French of [Stéphane Hessel](#) (*Indignez-vous!* 2010) -- translated into English as *Time for Outrage!* (2011). It is recognized as having triggered the worldwide wave of protest of the [Occupy Movement](#) ([Noam Chomsky](#), *Occupy*, 2012).

Experimental animation framing the "Ouroboros" by contrary "Serpentine" movements
(tentatively "combining" the dynamics of the animations above)



A further challenge is to build into such an animation a suggestion of the cognitive paradox associated with use of wave language in this way, as suggested by the following and discussed separately (*World Introversion through Paracycling: global potential for living sustainably "outside-inside"*, 2013).

Experimental animation using 8-fold pattern of Möbius strips
(adapted from *Paracycling: towards a terminological and visual clarification*, 2013)



Exploratory use of an 8-fold pattern	Exploratory superposition of 3 paracycles

In the present period, the all-seeing electronic surveillance of the US National Security Agency could be provocatively (but appropriately) compared in modern myth-making with the capacities of the Dark Lord *Sauron* of *The Lord of the Rings* -- duly aided by "*Dark Riders*" as mentioned above. Curiously it was C. S. Lewis, fellow-member of the *Inklings* with the author of the latter, who offered "inklings" of the operation of N.I.C.E. -- a front for sinister forces (*That Hideous Strength: a modern fairy-tale for grown-ups*. 1945).

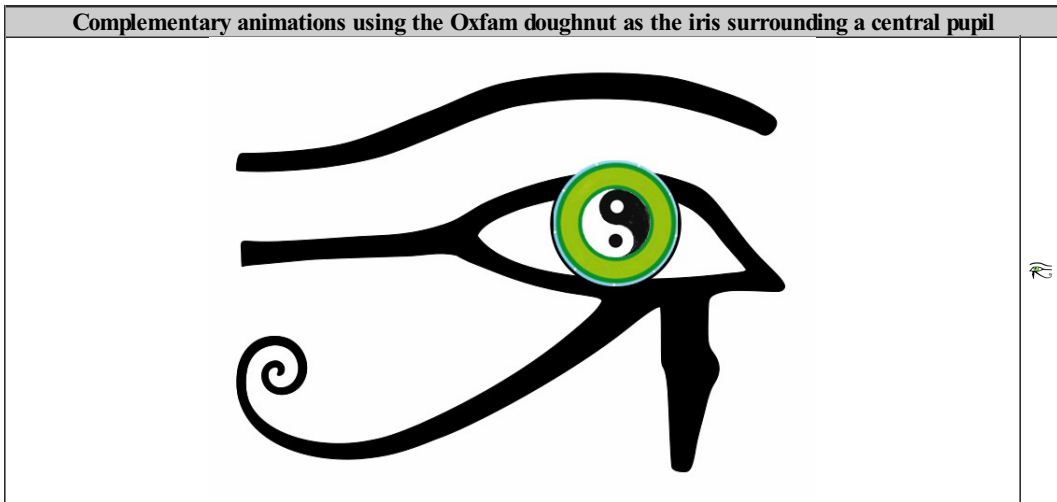
Ironically, NICE is now the acronym of an initiative within the complex of intelligence agencies responsible for global surveillance programmes, namely the National Initiative for Cybersecurity Education. Strangely it would seem that the NSA *PRISM* surveillance program has effectively painted itself into a corner of the collective imagination curiously consistent with the image of one portion of the *Great Seal of the United States* on the *US dollar bill* (as below).

Depictions of the current global knowledge society, and its dependence on electromagnetic waves, could then be imaginatively associated with the "all-seeing eye" (or *Eye of Providence*) -- functionally framed by wave-language images such as those above. Consistent with that argument, the image was incorporated into the logo of the US *Information Awareness Office* established in 2002 to achieve *Total Information Awareness*. In so doing that initiative has effectively framed itself as the ultimate form of "otherness" -- a challenging waveform to be encountered in new ways as a waveform, in the light of the above argument.

Image on US dollar bill (adapted from <i>Wikipedia</i>)	Logo of Information Awareness Office (reproduced from <i>Wikipedia</i>)

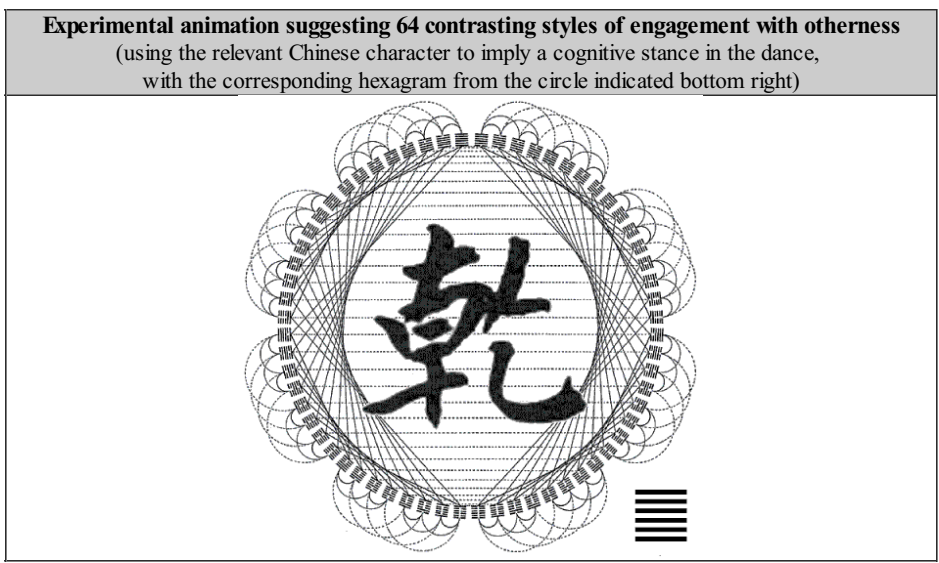


This functionality is reminiscent of that attributed to the [Eye of Horus](#) of classical Egyptian myth. Such a singular "cyclopean" eye contrasts with understandings that truth deriving from depth perception requires the [stereoscopic vision](#) of at least two eyes (*Cyclopean Vision vs Poly-sensual Engagement*, 2006). The above images are also reminiscent of the [Oxfam Doughnut's](#) framing of [planetary boundaries](#), as separately discussed and represented in the following animations (*Exploring the Hidden Mysteries of Oxfam's Doughnut: recognizing the systemic negligence of an Earth Summit*, 2012).



Another suggestive approach is to imagine a "wave-language alphabet" whose "letters" could be understood as "standing waves" embodied in movement -- as variously envisaged by dance notation systems, notably the [Labanotation of Laban Movement Analysis](#). The Chinese (and related) scripts offer examples of [logograms](#), whether [pictograms](#), [ideographs](#) (or compounds thereof) or [phono-semantic](#) compounds. As an experimental animation, the set of logograms traditionally associated with the different conditions of change identified in the Chinese classic *Yi Jing* (*The Book of Changes*) could be understood as "standing waves" in a "cognitive dance" -- the possible steps in the encounter with otherness.

The 64 distinct "moments in the dance" can then be presented successively on a "dance arena" as follows, with the arena defined by a circular array of all 64 [hexagrams](#) by which these distinctions are otherwise encoded. The formal transformations between the hexagram conditions are also used in the articulation of the arena -- being indicative of the possible transitions from one condition to another (*Diagram of 384 Relationships between I Ching Hexagrams*, 1983).



As "snapshots" of moments in a dance, the animation can be considered as a complex process through which the "dancer on the floor" engages with the otherness of the "next dancer". This involves attraction, partnering, and entrainment -- effectively eliciting the

embodiment of the other as the "next dancer". Its associated paradoxes could be explored in terms of:

- **movement and its control**, notably as exemplified by the **katas** of the martial arts (*Navigating Alternative Conceptual Realities: clues to the dynamics of enacting new paradigms through movement*, 2002). In the relation to otherness, this could include the insights suggested by **shadow dancing**
- **morphogenesis**, as articulated by **René Thom** (*Structural Stability and Morphogenesis*, 1972) and especially its extension into semiotic processes (*Semio Physics: A Sketch*, 1990), as partially described by **David Aubin** (*Forms of Explanations in the Catastrophe Theory of René Thom: Topology, Morphogenesis, and Structuralism*, 2004, pp. 95-130)
- **mirroring**, namely a recognition of self in the other (*Mirroring of Self and Other: enjoyment "through" the world*, 2011)
- **shapeshifting**, namely in response to the other (*En-minding the Extended Body: enactive engagement in conceptual shapeshifting and deep ecology*, 2003)
- **enantiodromia**, namely a degree of transformation into the other (*Psychosocial Energy from Polarization within a Cyclic Pattern of Enantiodromia*, 2007)
- **invagination** of the experiential globality of the other (*Engendering Invagination and Gastrulation of Globalization*, 2010)
- **introversion**, in response to the other (*World Introversion through Paracycling: global potential for living sustainably "outside-inside"*, 2013)
- **questioning**, through the manner in which each "dancer" poses a catastrophic question to which the other becomes an answer, as separately explored (*World Futures Conference as Catastrophic Question: from performance to morphogenesis and transformation*, 2013)

Potentially of significance to a wave-language, interpretations of the cognitive implications of the array are separately discussed (*Transformation Metaphors derived experimentally from the Chinese Book of Changes (I Ching) for sustainable dialogue, vision, conferencing, policy, network, community and lifestyle*, 1997). Documents concerning related explorations are listed separately (*Patterns of I Ching / Tao te Ching*). The animation could of course be improved in a variety of ways, notably by morphing techniques and offering readers the possibility of interacting with it (experimenting with changes of rate, use of sound files, etc). A more complex animation based on the same array is explored separately (*Dynamic Exploration of Value Configurations: interrelating traditional cultural symbols through animation*, 2008).

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