



# laetus in praesens

Alternative view of segmented documents via Kairos

27 January 2014 | Draft

## Quantum Wampum Essential to Navigating Ragnarok

### Thrival in crisis through embodying turbulent flow

-- / --

#### Introduction

Collapse of confidence, value, meaning, honour, options and patience

Wampum and its modern variants

Transcending the binary framing of confidence

Implications of quantum framing of reality

Enabling radical reframing of reality by non-physicists

Technomimicry as key to a new mode of knowing?

Cognitive constraints on conventional "life raft" design

Interweaving threads beyond the standard model: "life crafting"?

Distinguishing the elements of "quantum wampum" essential to "life crafting"

Circulation of the light: What flows? What circulates? Cryptocurrency?

References

## Introduction

**Collapse of confidence:** The recent global financial crisis, its current unresolved instabilities, and uncertainty regarding its future stability, all suggest the merit of continuing reflection on alternatives. Alternatives are variously debated, notably with respect to [alternative currencies](#). These range from [local exchange trading systems](#) (LETS) to the recent emergence to prominence of [Bitcoin](#). Despite its inherently intangible nature, the ongoing crisis has however highlighted as a major challenge the erosion of confidence and trust -- and how these are to be (re)built and sustained ([Joseph E. Stiglitz](#), *In No One We Trust*, *The New York Times*, 21 December 2013).

The following speculative argument is inspired by the degree of confidence and interest that has been engendered in Bitcoin following its unforeseen emergence as an online gaming currency -- and the challenges to confidence it necessarily addressed. Curiously its origins are associated with the design of a [peer-to-peer](#) network as "a system for electronic transactions without relying on trust" (Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, 2008).

**Extraordinary possibilities:** Although suggested by Bitcoin, the argument here, as a speculative thought experiment, is of a more radical nature. It explores the nature of confidence through a "system" able to combine both the challenges to conventional thinking offered by [quantum mechanics](#) and the traditional psychosocial role of [wampum](#) for the indigenous peoples of North America -- and elsewhere, by extension.

The approach taken is to weave together contrasting stories variously challenging conventional confidence. These include quantum reality, the early role of wampum, or the gods whose fall is predicted in Ragnarok -- all to be fruitfully understood as strategic fantasies of choice (*Cultivating Global Strategic Fantasies of Choice: learnings from Islamic Al-Qaida and the Republican Tea Party movement*, 2010). Such stories might be understood in terms of the deeper significance of myth ([Karen Armstrong](#), *A Short History of Myth*, 2006).

The framing here makes use of the [Ragnarok](#) of Norse mythology -- now predicted for 22 February 2014 -- as the Twilight of the Gods. This is highlighted in the *Poetic Edda* and as the *Götterdämmerung* in the *Ring Cycle* of operas of [Richard Wagner](#). The argument is that human civilization has been witness to precursors of a significant decline and fall of its gods over past decades. Exploring the "extraordinary" is justified when there is no concrete proof that the "ordinary" has any hope of working (*10 Demands for Concrete Proof by We the Peoples of the World*, 2012). Once again there is a case for "thinking the unthinkable" -- but with even more imagination.

Here the "gods" are understood as the strange attractors which are a focus for the highest value (*Human Values as Strange Attractors*, 1993). It is in these which people have most confidence. Ragnarok is thus the collapse of value -- of that in which it is possible to have confidence -- notably through their embodiment by the highest authorities, as separately noted (*Abuse of Faith in Governance*, 2009). With respect to the "death of gods", it is appropriate to note the much-cited compilation by [H. L. Mencken](#) of the hundreds in which whole populations have believed for extended periods (*Graveyard of Dead Gods* In: *Memorial Service*, 1922).

**Rapid decline:** The progressive decline is especially obvious with respect to the financial system, to the inadequacies of governance, to the honour with which the military was previously associated, to science (subject to market and other pressures and complications), to religion racked by various systemic abuses, to psychology (as complicit in torture), to information (subject to invasive surveillance and marketing abuses), and to sport (whose heroes are subject to doping, corruption and match-fixing scandals). Related use was previously made of [Armageddon](#) (*Spontaneous Initiation of Armageddon: a heartfelt response to systemic negligence*, 2004).

Irrespective of any predicted date, Ragnarok can be considered as already in process, and well advanced, as was argued with respect to the Mayan prophecy with regard to 21 December 2012 (*Imaginative Reconfiguration of a post-Apocalyptic Global Civilization: engaging cognitively with the illusion of the "End of the World"*, 2012). Its manifestation may be appreciated otherwise as the dramatically increasing role of depression, whether economic or psychological -- or more generally as loss of faith in any viable future and in the collective means of engendering it (*Ungovernability of Sustainable Global Democracy?* 2011). Beyond [psychic income](#) (as noted by the *Financial Times Lexicon*), there is a case for recognizing the current challenges to the "psychic economy" of individuals.

**Life rafting:** As implied by the secondary title, the possibility for "thrival" is inspired by the argument of [Thomas Homer-Dixon](#) (*The Upside of Down: catastrophe, creativity, and the renewal of civilization*, 2006). It is by this means that a possibility of eliciting confidence in a healthy global civilization is envisaged.

However, rather than simply eliciting a familiar intangible -- confidence -- the use of "navigating" in the main title suggests that particular skill may need to be cultivated. Ragnarok might then be usefully compared with the extreme conditions of [whitewater](#) rafting -- or the challenges of the [adaptive cycle](#) highlighted by Homer-Dixon, as separately discussed (*Navigating the seasons of the adaptive cycle: natural alchemy?* 2014). The emphasis is on the cognitive implications of acquiring strategic nimbleness. Forms of "life crafting" of higher dimensionality could prove more appropriate.

Reference to "raft" is especially appropriate in this context, given the tendency to cling to the simplest two-dimensional conceptual frameworks in the absence of cognitive vehicles designed for such turbulent conditions. Tabular depictions, such as the [Standard Model](#) of physics, could be understood in this light.

**Enabling flow through metaphor:** As metaphors of collective dying, Armageddon, the Mayan prophecy and Ragnarok are characteristic of an argument developed previously (*Metaphors To Die By: correspondences between a collapsing civilization and a dying person*, 2013). This drew attention to a special sense of "flow" through which such catastrophe might be navigated, raising the question as to the nature of the "flow to be in" through the coming period (*Flowering of Civilization -- Deflowering of Culture: flow as a complex experiential dynamic*, 2014).

The recent study of [Douglas Hofstadter](#) and [Emmanuel Sander](#) (*Surfaces and Essences: analogy as the fuel and fire of thinking*, 2013) is suggestive of possibility.

## Collapse of confidence, value, meaning, honour, options and patience

**Varieties of intangible collapse:** It is curious to note the disarray in recognition of "collapse" with respect to intangibles. This is variously acknowledged and deplored in the case of:

- business confidence
- increasing unbelief and challenges to faith deplored by religions
- democratic deficit deplored by politicians
- erosion of conventional meaning, especially among the young
- reframing of ethics and morality
- limited range of strategic options considered viable
- impatience at the inadequacies of governance and the inability to deliver promised solutions
- confidence in the future, especially in the case of the young
- confidence in the expertise of science
- cultivation of lies, as with respect to money ([Peter Koenig](#), *30 Lies About Money: liberating your life, liberating your money*, 2003)

Figures of authority -- including politicians, financiers, generals, executives, directors, priests, lawyers and scientists -- are increasingly perceived as unbelievable and untrustworthy. They have lost all capacity to prove that they are trustworthy in systemic terms. Election pledges are now typically honoured only in the breach.

These trends can be configured together as explored separately (*Convergence of 30 Disabling Global Trends: mapping the social climate change engendering a perfect storm*, 2012; *Mind Map of Global Civilizational Collapse: why nothing is happening in response to global challenges*, 2011).

Such intangibles, when acknowledged, are typically the focus of ad hoc surveys in support of particular agendas -- and in particular countries or regions. Through ratings, those in power in government may be especially attentive to their "popularity" -- as an indication of confidence. This can be contrasted with the worldwide survey of the (intangible) perceptions of corruption -- itself fundamentally flawed by failure to include the Vatican .

Any such collapse may be reframed by calls to imagine the situation otherwise. In the case of business this may explicitly take the form of overcoming outdated, traditional company values, as articulated by [Tom Peters](#) (*Re-Imagine! Business Excellence in a Disruptive Age*, 2003). In the case of religion, one such call is by [Sallie McFague](#) (*Models of God: theology for an ecological, nuclear age*, 1987)

**Absence of simulation:** It is extraordinary to note the reluctance to simulate either the system in its current dynamically unstable

condition, or in the light of probable outcomes of recommended policy changes, or with respect to possible alternatives -- and the possibility of any transition. To the extent that such simulation is done through a variety of "economic models", their outputs are primarily designed for specialists -- who may themselves be challenged to comprehend them. Policy-makers may well be indifferent to simulations for other reasons (Graham Turner, *A Comparison of the Limits to Growth with Thirty Years of Reality*, 2007).

With respect to intangibles, it could be said that trust is further undermined through systematically avoiding simulation of confidence dynamics in response to proposed initiatives.

There is no sense in which the daily pronouncements of experts and politicians on any matter can be represented in a comprehensible manner, inviting changes in parameters by anyone -- to test understanding of constraints in response to seemingly reasonable suggestions. This might be a form of "crowdtesting" in contrast with "crowdsourcing" -- with the possibility that unexpected discoveries might be submitted for wider appreciation -- as with "crowdsourced testing", [open-source intelligence](#), [open-source software development](#), and [Sodaplay](#). Related arguments can be made with respect to disaster (*Enabling Collective Intelligence in Response to Emergencies*, 2010).

There is no question of designing such simulations for ready comprehension by policy-makers, and presentation through the media, in order to elicit and sustain public confidence. It is assumed that the latter can be achieved by using those in authority to "talk up" new proposals -- even though confidence in such authorities has been totally undermined by their declarations and actions in relation to past events. These points have been the focus of separate discussion (*Uncritical Strategic Dependence on Little-known Metrics: the Gaussian Copula, the Kaya Identity, and what else?* 2009; *Simulation Possibilities for Complementary Currencies*, 2005).

**Time value decay: Ragnarok as expiration date of strategic options for the future?** It is curious to note the importance attached within the financial markets to terms which have similar significance with respect to governance of society. However those trading in these markets are far more assiduous in simulating their implications -- to which they are much more attentive.

Some of the terms common to both domains are as indicated below.

- Those relating to the [financial markets](#) could be enhanced from the *Financial Times Lexicon* and *Investopedia*. The latter was initially a financial dictionary, and is now a resource for investing education, personal finance, market analysis and free trading simulators.
- There does not appear to be any equivalent resource relating to [governance](#) or strategy in general, although resources tend to be available for military, corporate and nonprofit governance -- and more generally for the challenges of "investing" in social change strategies.

| Correspondence of terms ? |   |   |
|---------------------------|---|---|
| Terms                     | Investment in financial markets                 | Investment in strategic governance              |
| Future                    | Futures market                                  | Strategies / plans for the future               |
| Options                   | Trading options                                 | Strategic options and alternatives              |
| Value                     | Monetary value                                  | Embodying psychosocial values                   |
| Timing                    | Relative to option expiration                   | Relative to viable crisis response              |
| Risk                      | Financial risk<br>(and reputation implications) | Strategic risk<br>(and reputation implications) |

As implied above, there is a degree of concern with "outdated" values and their renewal. Questions of interest include:

- What might be learned from the futures market of relevance to governance -- especially in the light of the catastrophe in which both were so recently complicit?
- How is the value of strategic options recognized with respect to crises which demand attention -- and for which delay is readily claimed to be "not an option"?
- To what extent is strategic governance "running out of options"?

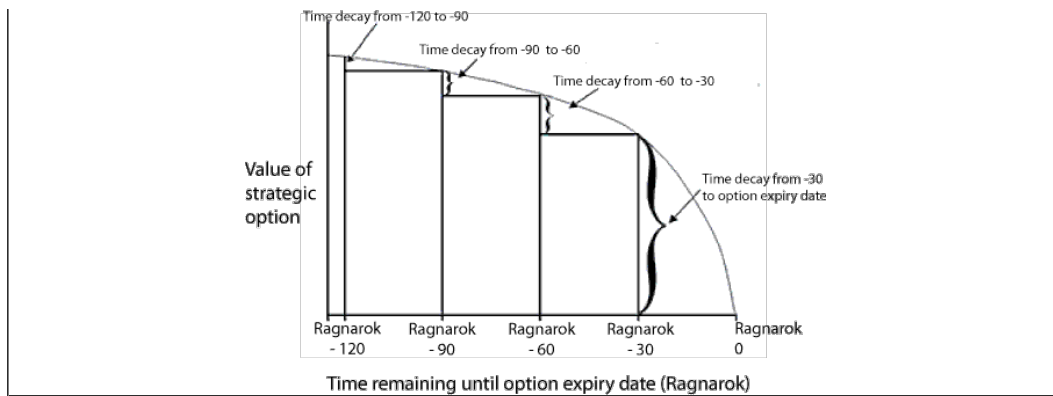
The challenge could be reframed by recognizing the "[planetary boundaries](#)" with which governance is confronted (Johan Rockstrom and Anders Wijkman, *Bankrupting Nature: denying our planetary boundaries*, 2013). Overrunning these boundaries could be usefully compared with the "expiration" of any strategic option.

Basically, an option contract is a bet that a market will move in a certain direction within a certain amount of time. The major feature of options trading on the futures market is that the "[extrinsic value](#)" of the option decays over time. Known as time decay (time-value decay, or theta), this rate of value erosion accelerates as the expiration date approaches.

An option's extrinsic value is therefore recognized as eroding into expiration. Such options are therefore wasting assets. Part of the value of an option is the amount of time left until expiration. As the option gets closer and closer to expiration, the value of the option erodes to "[intrinsic value](#)". This is the value in the money itself. In the case of out of the money options, the value of the option decays to zero at expiration. Options closer to their expiration have less premium and decay at the fastest rate. They will also be the most volatile. Such thinking is of relevance to the value of strategic options in general.

The sensitivity of the value of the derivative to the passage of time -- the time decay -- is measured by theta. The total theta for a portfolio of options can be determined by summing the thetas for each individual position. An equivalent insight is required for the social change strategies of governance.

**Indication of accelerating time decay prior to expiration of any strategic option?**  
(adapted from standard graphs of option time decay in the financial markets)



**Metaphors and myths:** With respect to use of "Ragnarok" in this argument, it is appropriate to note that Stafford (a leading equity options market-maker) launched Ragnarok Systems -- described as a proprietary state-of-the-art trading platform to host cutting edge trading and financial services applications.

With respect to the unconscious implications of Ragnarok, an earlier paper on *Enhancing the Quality of Knowing through Integration of East-West Metaphors* (2000) noted:

The origins of the Finnish success in information technology can be found, according to *Newsweek* (May 1999), in the *Kalevala*, the national epic of Finland. The article focused on Sampo, a virtual machine accumulating wisdom and wealth hundreds of years before Bill Gates. In Jyrki Pöysä's study *Virtual Kalevala - global or national?*, the *Kalevala*, is seen in the context of globalizing information technology. Reinforcing this perception, the Finnish Presidency of the European Commission, was introduced by a speech on the *New Dimensions of Learning in the Information Society* (July 1999) -- referring first to the influential role of the *Kalevala*.

In a similar vein, *Wired* (September 1999) comments on the exceptional anti-authoritarian sentiment, that is the core of Nokia's success, as deriving from Antti Rokka, the hero of Väinö Linna's *The Unknown Soldier*. The hero of the Finnish information society is a person with a marked aversion towards all hierarchies. Asian cultures might do well to explore the significance of their own epics, such as the *Mahabharata*, for knowledge management.

This potential for Asian cultures has been extensively explored by *Susantha Goonatilake* (*Toward a Global Science: mining civilizational knowledge*, 1999)

With respect to the "wampum" thread of this argument, *The Wall Street Journal* notes the existence of a virtual stock exchange game entitled *Wampum* (*Market Watch*, 2013). There is a curious complex of associations between *Native American gaming*, centered on Indian reservations or other tribal land in the USA, and the significance those same tribes traditionally attach to wampum (Barbara Beaucar, *From Furs and Wampum to Slot Machines and Megadollars*, *Social Education*, 67, 2003; Robert Dvorchak, *Without Wampum, Indians Bank on Blackjack: Gambling: Call it the 'Revenge of the Pequots' as tribal coffers are flush with proceeds from the casino*, *Los Angeles Times*, 3 January 1993).

The comparison between options trading and political dynamics can of course be usefully framed by "horse trading" as a descriptor.

**"The Greeks":** As discussed separately (*Gamma as change in the rate of change of value*, 2013), in a period of the severest financial confidence in the country of its origin, the use of the term gamma in mathematical finance derives ironically from "the Greeks". The name is used because the most common of these sensitivities are often denoted by Greek letters. These are the quantities representing the sensitivities of the price of *derivatives* to a change in underlying parameters on which the value of an instrument or portfolio of financial instruments is dependent.

The range, precision and subtlety of such little known measures is extraordinary, by comparison with the fuzzy inadequacies and oversimplifications in the case of debate regarding change in psychosocial systems. *Wikipedia* offers entries on:

#### 1. First-order Greeks

1. **Delta:** measures the rate of change of option value with respect to changes in the underlying asset's price.
2. **Vega:** measures sensitivity to *volatility*. It is the derivative of the option value with respect to the volatility of the underlying asset.
3. **Theta:** measures the sensitivity of the value of the derivative to the passage of time: the "time decay."
4. **Rho:** measures sensitivity to the interest rate: it is the derivative of the option value with respect to the risk free interest rate (for the relevant outstanding term)
5. **Lambda** (Omega): is the percentage change in option value per percentage change in the underlying price, a measure of leverage, sometimes called gearing.

#### 2. Second-order Greeks

1. **Gamma:** measures the rate of change in the delta with respect to changes in the underlying price.
2. **Vanna:** (or DvegaDspot and DdeltaDvol): is a second order derivative of the option value, once to the underlying spot price and once to volatility.
3. **Vomma** (Volga, Vega Convexity, Vega gamma or dTau/dVol) measures second order sensitivity to volatility. It is the second derivative of the option value with respect to the volatility, or, stated another way, vomma measures the rate of

change to vega as volatility changes.

4. **Charm** (or delta decay, or DdeltaDtime): measures the instantaneous rate of change of delta over the passage of time.
5. **DvegaDtime**: measures the rate of change in the vega with respect to the passage of time. It is the second derivative of the value function; once to volatility and once to time.
6. **Vera** (or Rhova): measures the rate of change in rho with respect to volatility. It is the second derivative of the value function; once to volatility and once to interest rate.

### 3. Third-order Greeks

- **Color** (gamma decay or DgammaDtime): measures the rate of change of gamma over the passage of time
- **Speed** (or the gamma of the gamma or DgammaDspot): measures the rate of change in Gamma with respect to changes in the underlying price.
- **Ultima** (or DvommaDvol): measures the sensitivity of the option vomma with respect to change in volatility.
- **Zomma** (or DgammaDvol): measures the rate of change of gamma with respect to changes in volatility.

**Risk and surprise:** Collectively these have also been called the risk sensitivities, risk measures, or hedge parameters. Together "the Greeks" are vital tools in **risk management**. Ironically again, "the Greeks" (including gamma), have been fundamental to the development of the continuing financial crisis -- especially given the manner in which these were based on the dubious packaging and marketing of financial derivatives.

A highly controversial study by a former risk manager, [Nassim Nicholas Taleb](#) (*Antifragile: how to live in a world we don't understand*, 2012), has addressed the conditions which are a source of strategic surprise -- developing an argument made in earlier work (*The Black Swan: the impact of the highly improbable*, 2007). Considerable attention is given to the management of convexity (*Black Swans and Antifragility: a vivid reconceptualization of risk and resilience*, *NPQ: nonprofit quarterly*, 20 March 2013).

Taleb argues for recognition of antifragility, in contrast to fragility, where high-impact events or shocks can be beneficial -- like Ragnarok? He coined the term because he considered that existing words used to describe the opposite of "fragility," such as "robustness," were inaccurate. Antifragility goes beyond robustness; it means that something does not merely withstand a shock but actually improves because of it.

**The recognition of the importance of gamma with respect to one fundamental form of change raises valuable questions as to how it -- together with the other "Greeks" -- could usefully be applied to other forms of change in value, especially those involving a degree of risk.** The criticism of Taleb's thesis -- as one of the few who warned of the financial crisis -- should be compared with the perspective of others who did not, as an indication of that dynamic with respect to more intangible values (Jared Woodard, *Why Taleb is wrong about markets and uncertainty*, *Condor Options*, 26 November 2012).

Whether for the collective or the individual -- is such an approach of relevance to the "psychic economy" noted above? Especially intriguing is the sense in which Ragnarok can be recognized as an ultimate form of moral bankruptcy -- taking into consideration the broader sense of value with which wampum has been held to be associated (*From Quantitative Easing (QE) to Moral Easing (ME): a stimulus package to avert moral bankruptcy?* 2010). Has the focus on the derivatives of finance been a poorly recognized distraction, implicit in other uses of the term, as separately argued (*Vigorous Application of Derivative Thinking to Derivative Problems*, 2013)?

## Wampum and its modern variants

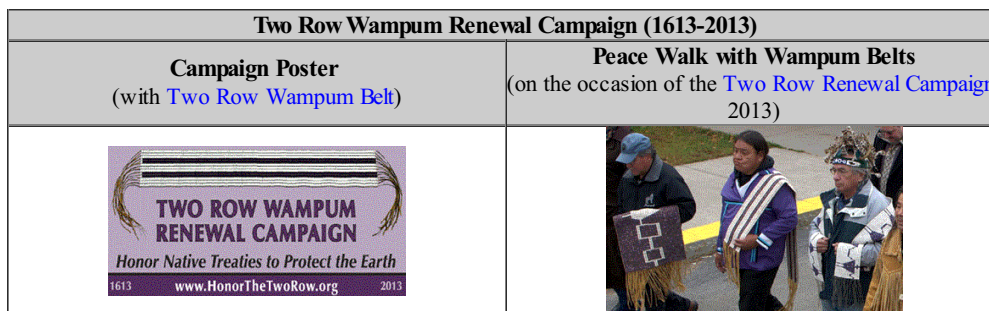
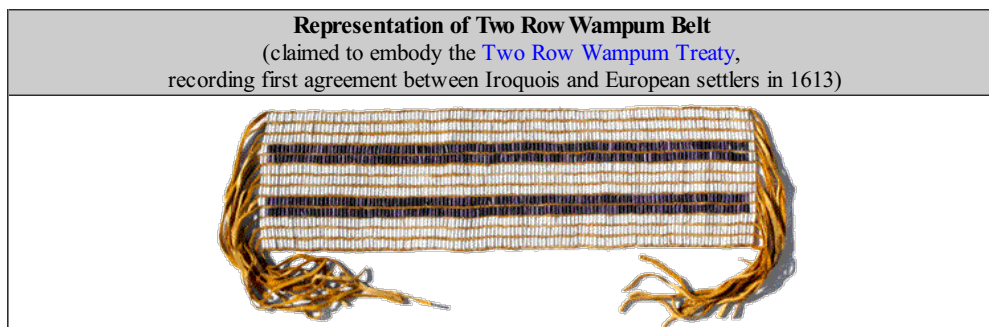
**Wampum** is a term used by the indigenous peoples of North America for traditional shell beads (see [Wampum History and Background](#), NativeTech: Native American Technology and Art). Threaded onto strings, like beads, they were used as money. Such strings of wampum were also used instead of writing, most notably to record historical events and to codify treaties -- such as the [The Hiawatha Belt](#) (*Aionwá:tha* and the [Great Law of Peace](#) (Gayanashagowa) of the [Iroquois](#) (Haudenosaunee) associated with the founding of the Iroquois Confederacy. Wampum had some functions similar to the [Quechua](#) recording devices ([Quipu](#)) of the Andes region -- made of knotting and dyed strings.

Of some relevance is the fact that wampum -- now a general term -- was restricted by the Indians to the white beads (*wompi*, "white"), whereas the dark beads were called *suckáuhock*. According to Ashbel Woodward ([Wampum](#), 1878), it thus appears that the Indians divided their beads into two general classes, the white beads, and the dark beads -- a distinction now lost in more general use of the term..

**Spectrum of values:** Exploring wampum, with its current variants and analogues, highlights the manner in which both it and they can be understood as being a vehicle for a spectrum of values -- of which any use as a monetary substitute implies only one.

The first agreement between the Haudenosaunee (Iroquois) and Europeans on Turtle Island (North America) in 1613 is claimed to have been recorded in the form of the [The Two Row Wampum Belt](#). Although variously disputed, this forms the basis for the covenant chain of all subsequent treaty relationships made by the Haudenosaunee with settler governments on the North American continent (Darren Bonaparte, *The Two Row Wampum Belt: an Akwesasne tradition of the Vessel and Canoe*, *The People's Voice*, 5 August 2005; Darren Bonaparte, *The Disputed Myth, Metaphor and Reality of Two Row Wampum*, *Indian Country*, 9 August 2013; Glenn Coin, *Two Row Wampum agreement is real even though written treaty is fake*, *Journal of Early American History says in special issue*, July 2013). 2013 has been celebrated as the 400th anniversary of that covenant.

The agreement outlines a mutual, three-part commitment to friendship, peace between peoples, and living in parallel forever. According to Haudenosaunee tradition: *As long as the Sun shines upon this Earth, that is how long our [Two Row Wampum] Agreement will stand; Second, as long as the Water still flows; and Third, as long as the Grass Grows Green at a certain time of the year. Now we have Symbolized this Agreement and it shall be binding forever as long as Mother Earth is still in motion.* It provided that the European ship would remain separate from the Native American canoe.

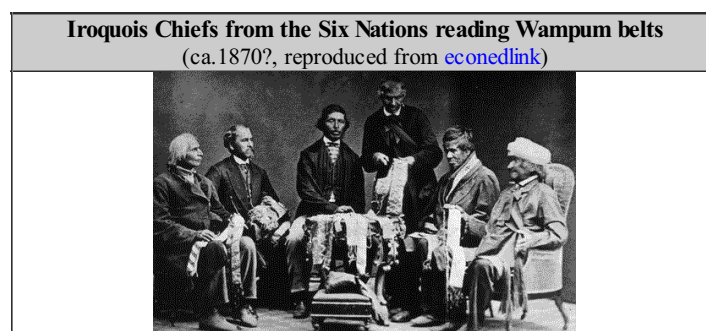


Used as a memory aid, a typically large belt of two metres in length could contain 6000 beads or more and could be held to be very sacred as a container for memories or as an aid to storytelling. Belts could be used as badges of office, as a mark of authority of a speaker, or as ceremonial devices. The various designs of beads denote different ideas according to an accepted system. This has been recently interpreted as hypertext (Angela M. Haas, *Wampum as Hypertext: an American Indian intellectual tradition of multimedia theory and practice*, *Studies in American Indian Literatures*, 2007)

Christopher B. Teuton (*Deep Waters: the textual continuum in American Indian Literature*, 2010) notes that:

Official tribal relations were always guaranteed by the exchange of wampum, whether in strings or belts. When a wampum belt was commissioned by the chiefs, a council speaker "[performed] a speech act which roughly translates as "reading the message into the wampum.... By reading the message into the wampum the words of the chiefs are bound in material form. The messengers who read the wampum "are seen as relatively passive bearers of the wampum, which nevertheless is described as being a 'heavy burden' which they bear on their backs". (p. 49)

The purely mnemonic function is however itself in dispute, as variously discussed (Bruce R. Smith, *The Acoustic World of Early Modern England: attending to the O-Factor*, 1999; F. Ellen Cushman, *Wampum, Sequoyan, and Story: decolonizing the digital archive*, November 2013).



European colonists used wampum for trading with Native Americans, and adopted it as their own currency. However, efficient European production methods -- engendering tens of millions of beads -- caused inflation, and the use of wampum died out. In his [Introduction to Wampum](#), with an extensive discussion of *Money Substitutes in New Netherland and Early New York: Wampum*, Louis Jordan notes that:

Although more convenient than commodity money several problems developed with the use of wampum. As wampum had no intrinsic value, anyone could collect some shells and literally produce their own currency. With no central minting operation the quality of these products was often substandard. Shopkeepers needed to keep a vigilant eye for inferior wampum and legislation was needed so they would not be required to accept poor quality beads. Further, the amount of wampum produced was unregulated, which eventually caused an oversupply. These difficulties were most notable in New York where the use of wampum lasted longer than in other areas, as fewer alternatives were available (*The Coins of Colonial and Early America*, University of Notre Dame, 1997).

**Honourable agreement:** Traditional use of wampum was intimately associated with binding honourable agreement. Hence the continuing concern, noted above, with respect to the original Two Row Wampum Belt agreement between Native Americans and

Europeans in 1613 (*Honour Essential to Psycho-social Integrity*, 2005).

As elsewhere with regard to colonial treaties with indigenous tribes, this is currently echoed in the confusion and [historical revisionism](#) regarding that agreement. The confusion is partly exacerbated by the widespread tale regarding the sale of Manhattan to European settlers for what might have been recognized as wampum (*How Trade Beads Bought Manhattan Island - Or Did They?!*, *The Bead Chest*, 20 February 2011; Matt Boniak, *Was Manhattan Really Bought for \$24?* *Mental Floss*, 2 October 2012).

The challenge for the USA is suggested by the slogan of the Renewal Campaign to "Honor Native Treaties to Protect the Earth". Has the USA effectively been built on a pattern of systematic breach of honourable agreement continuing to this day, as explored in a particular case (*Alleged Breach of UN Treaty Obligations by US: press coverage and commentary following WikiLeaks cable dissemination*, 2010)? Rather than *Groundhog Day*, Ragnarok might then be better understood as Chicken Roosting Day (Ward Churchill, *On the Justice of Roosting Chickens: reflections on the consequences of U.S. imperial arrogance and criminality*, 2003; Michael Snyder, *The Last Days Of America? 25 Signs Of Extreme Social Decay*, *The Economic Collapse*, 16 October 2012).

As noted on the website of the *Anishinabek Confederacy to Invoke Our Nationhood*:


When land claims are brought out in Canadian court, they don't pull out the Two Row Wampum, or the 1764 Silver Chain Covenant belt, they produce the *Doctrine of Discovery*... a Papal Bull written by the pope in the 15th century. It divided the New World in segments where the British, French, Portuguese and Spanish were allowed to plunder, rape and extinguish 'pagans' who were not Christian.

In a speculative mode, it might be asked for what wampum -- as uniquely valued by humans -- extraterrestrials might in future purchase human real estate.

**Token of exchange:** Analogous in many respect to wampum beads have been the "bar beads" (popit beads) used worldwide in [Club Med](#) resorts. From 1957 until the early 1990s, patrons used pop beads as currency, notably for premium alcoholic beverages. The beads came in different colors, all carrying the Club Med logo. The different colors represented different currency values -- with the original red, yellow and green beads later became beige, coffee and chocolate brown, the better to complement suntanned skin. Strung together, the beads were worn as necklaces or bracelets.

The beads have been specifically compared to wampum, as noted by Shane Mitchell (*Club Med's New Rx*, *Travel + Leisure*, March 2006):

Back then, both male and female guests made jewelry from this cheap-chic wampum to accessorize their pareos and string bikinis. It was part of the hedonistic fun.

| Wampum beads<br>(reproduced from <i>Wikipedia</i> )                                 | Pop-Arty Beads<br>(as available via <a href="#">Amazon</a> )                        | Pop-it Beads<br>("Bar Beads" as used by Club Med)                                     |
|---|---|---|
|  |  |  |

**Electronic money:** As a developing category with a variety of interpretations, some forms of electronic money have a degree of resemblance to wampum. This is evident in the "electronic purse" function of the [Proton bank card](#) and other [debit cards](#), as implemented in various countries -- and variously rechargeable. The possibility of fund transfers between hand-held devices is also envisaged.

**Portable wealth:** Gold of any form may be sought in wearable form -- neck chains, rings, bracelets or watches -- as an indication of wealth or a form of security. Again, this can be understood as corresponding to some functions of wampum -- wearable wealth. The association to any personal collection of jewelry, as treasure, may well be as to a stash of wampum. Traditional wampum itself might then be understood as reminiscent of a form of "gold standard". However "wealth" needs to be interpreted with greater subtlety, especially in the light of the functions of wampum.

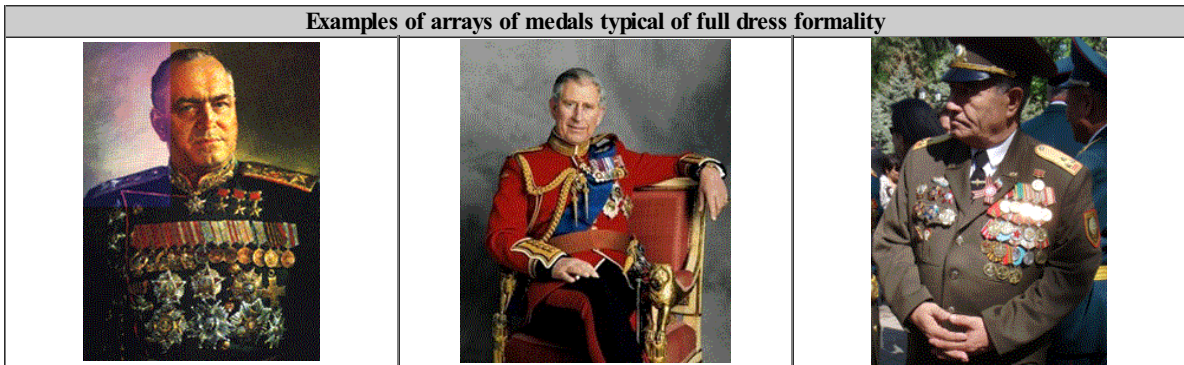
**Mark of honour and distinction:** In addition to the role of livery collars, chains of office, and other marks of identity, the widespread use of medals highlights another function of wampum. These may be awarded to a person or organization as a form of recognition for sporting, scientific, academic, or various other achievements (see *Wikipedia List of famous prizes, medals and awards*) -- but most notably as [military awards and decorations](#), [service ribbons](#), and [campaign medals](#).

| Service Ribbons (reproduced from <i>Wikipedia</i> ) |  |  |
|---|--|--|
| <a href="#">General George S. Patton</a><br>(USA)   | <a href="#">Admiral of the Fleet Louis Mountbatten</a> | Ecuadorian General of the Army<br><a href="#">Paco Moncayo</a> |
|   |  |  |



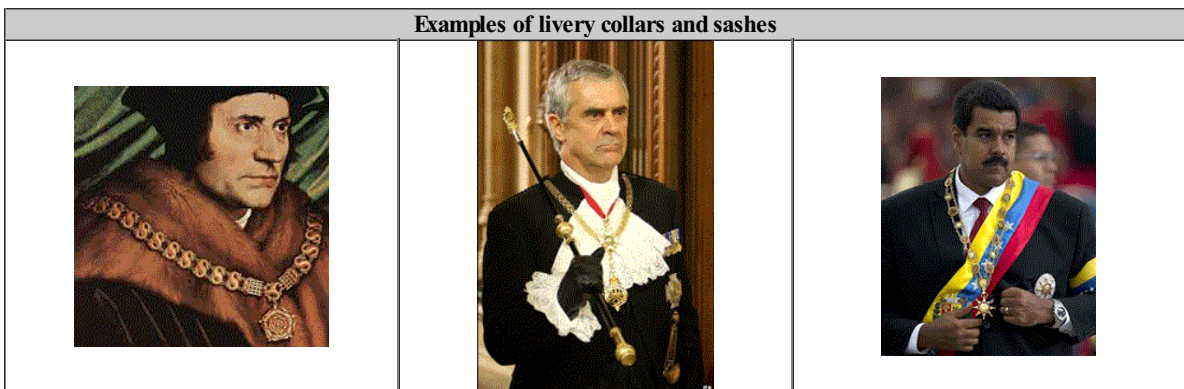
**Badge of office:** In the form of a colourful [sash](#), this has a strong visual resemblance to belts of wampum as worn -- whether draped from shoulder to hip or around the waist. *Wikipedia* usefully distinguishes sashes as follows:

- [Aristocratic and republican use](#)
- [Military use](#)
- [Modern civilian and cultural use](#)
- [Honorific orders](#)
  - [Orders with the sash worn on the left shoulder](#)
  - [Classified examples of current orders' sash](#)



Equivalent to some uses of wampum is the [livery collar](#) or chain of office (usually of gold), worn as an insignia of office (or a mark of fealty or other association). *Wikipedia* distinguishes:

- [Private livery collars](#)
- [Renaissance chains](#)
  - [Mayoral collars](#)
  - [Collars of orders of knighthood](#)
  - [Collars of Freemasonry](#)

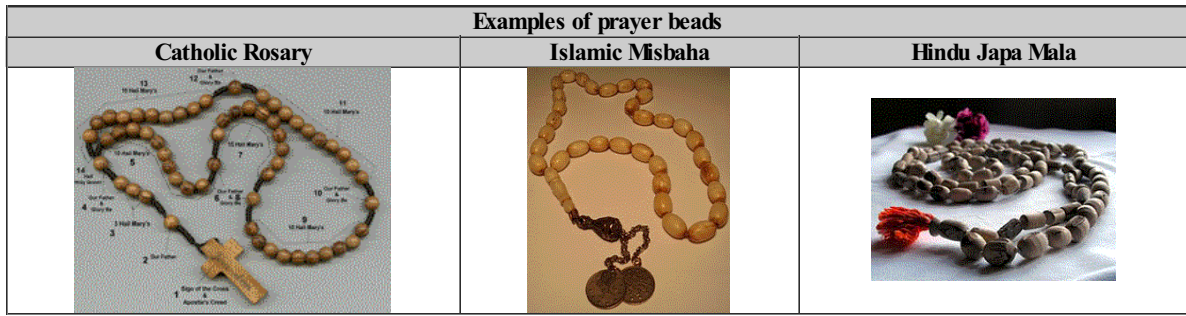


**Mark of identity:** Analogues to wampum can be seen in various other portable devices whereby identity is affirmed. These could be considered as ranging from heraldic devices (as on rings, pendants, or torcs), woven into clothing (as with ties, scarves, tartans), clothing designs (T-shirts, etc), identity badges, logos and trademarks. The most recent development is the use of a Facebook (or similar) page as a presentation of identity via the internet.

**Spiritual, ceremonial and ritual significance:** Analogues to the sacred role of some forms of wampum are to be found in that attributed to certain circlets of beads, most notably [rosaries](#) and their equivalents in other religions, as separately described (*Designing Cultural Rosaries and Meaning Malas to Sustain Associations within the Pattern that Connects*, 2000). Curiously European religious impact on Native Americans resulted in production of a special form of wampum (Marshall Joseph Becker, *The Vatican Wampum Belt: an important American Indian artifact and its cultural origins and meaning within the category of "religious" or "ecclesiastical-convert" belts*, Cape Breton University)

Some cultures may make extensive related use of [garlands of flowers](#). *Wikipedia* distinguishes: [Bead garland](#), [Flower garland](#), [Lei](#), [Pine](#)

garland, **Rope** garland, **Tinsel** garland, **Vine** garland. By contrast, but comparable in form and tactile experience, is the use of worry beads (*komboloi*).



**Protection:** Whatever the form -- necklaces (pendants), bracelets (amulets), and the like -- the device may be held to be offering spiritual (or magical) protection, as associated with some kinds of wampum. *Komboloi* could also be considered as "protection" against worry.

**Memory aid:** As with the memory aid function of wampum for an oral culture, an analogous role is evident in the case of rosaries and other **prayer beads**. With respect to wampum (J. Dyneley Prince, *The Passamaquoddy Wampum Records, Proceedings of the American Philosophical Society*, 36, 1897):

The records they transmitted... were kept in the memory of the historians by means of a mnemonic system of wampum shells arranged on strings in such a manner that certain combinations suggested certain sentences or ideas to the narrator or "reader", who, of course, already knew his record by heart and was merely aided by the association in his mind of the arrangement of the wampum beads with incidents or sentences in the tale, song or ceremony which he was rendering. (p. 480)

The following table endeavours to interrelate the functions identified above.

| Relationship between form and function of wampum and its analogues (tentative) |                               |                 |                     |          |                     |                      |            |                     |
|--|-------------------------------|-----------------|---------------------|----------|---------------------|----------------------|------------|---------------------|
| <i>Forms</i>   | <i>Psychosocial functions</i> |                 |                     |          |                     |                      |            |                     |
|  | exchange value                | honour (status) | meaning (adherence) | elegance | spiritual symbolism | protection (magical) | memory aid | tactile (fingering) |
| wampum (belts)   | *                             | *               | *                   | *        | *                   | ?                    | *          | ?                   |
| medals   |                               | *               | *                   |          |                     |                      | *          |                     |
| ribbons  |                               |                 |                     |          |                     |                      |            |                     |
| necklace/ chain (decorative)   | ?                             | ?               | ?                   | *        | ?                   | ?                    |            |                     |
| sash / chain (of office)   |                               | *               | *                   |          |                     |                      |            |                     |
| prayer beads (rosary, etc)   |                               |                 | *                   |          | *                   | ?                    | *          | *                   |
| komboloi (worry beads)   |                               |                 |                     | ?        |                     |                      | ?          | *                   |
| coin (with hole)   | *                             |                 |                     |          |                     |                      |            | ?                   |
| bar beads (Club Med)   | *                             |                 | ?                   | ?        |                     |                      | ?          | *                   |
| cross, etc (necklace)  |                               |                 | *                   | *        | *                   | *                    | *          |                     |
| garland (flowers, etc)   |                               | *               | *                   | *        | *                   | ?                    |            |                     |
| credit holding device  | *                             |                 |                     |          |                     |                      |            |                     |

**Whompum?** It is curious that "whomp" has come to be understood as a loud, heavy blow, or a process of defeating another (letting them "have it"). Guns may be described as whomping in the distance. It may also be used with respect to making or creating quickly, or rousing -- as in whomping up public approval, or in whomping up a new set of guidelines. The term is indicated as having been first used in the 1920s.

It is tempting to see an as yet unmentioned (or unconscious) relation to "wampum" -- given some of the functions of the latter in asserting power and authority (especially in the culture familiar with both terms, to a degree). Relevant to this argument, *Whomp 'Em*, is the North American version of the Japanese game *Saiyuki World 2: Tenjokai no Majin*, a platform video game released in 1991. The title is recognized as a pun, based on wampum. It is notable for being one of the few video games to feature a Native American as the protagonist.

**Psychosocial functions:** The examples above help to indicate how these functions, embodied in wampum, continue to be cultivated -- but distinctively and through a greater variety of forms. As suggested by whompum, this includes the capacity to have a significant impact on another -- possibly as a virtual blow in the dynamics of interpersonal relations, as in "dressing to kill" in an array of wampum

(decoration, jewellery, etc) as virtual weaponry, or as providing indications of previous successes ("campaign medals").

"**Virtual wampum**": Despite its historical origins, use of "wampum" can now be recognized in a cyberspace context:

- Several online facilities offer applications through which virtual wampum can be woven (for example via *Weave A Virtual Wampum Belt*, NativeTech: Native American Technology and Art)
- A virtual stock exchange game has been created with the name *Wampum* (*Market Watch*, 2013), as noted by *The Wall Street Journal*
- Wampum has been reframed in terms of the credit/debit *Wampum card* employed to identify customers at casinos. The Wampum Card also tracks each patron's accumulated premium, bonus, and other "points" in the form of Wampum that can be applied towards purchases throughout the casino complex (Leslie E. Cummings, *Typology of Technology Applications to Expedite Gaming Productivity*, *Gaming Research and Review Journal*, 2012)
- In addition to the boardgame entitled *Wampum*, the term features widely in online gaming. The term wampum is readily understandable amongst online gamers as indicative of the wealth (and associated status) they accumulate in the course of play. It is from this context, with its complex relationship to real-world money used in transactions with the virtual context, that pressures for cryptocurrencies like Bitcoin have emerged:
  - The relation between Bitcoin and wampum has been explicitly recognized:
    - Sam Biddle (*What is Bitcoin?* *Gizmodo*, 19 May 2011): ***If the internet is the Wild West, BitCoin is its wampum.***
    - K. C. Bob (*Bitcoin: Online Wampum*, *Kansas City Bob*, 9 October 2013)
    - *The Bitcoin Bubble*, *The Aporetic* (11 April 2013): Bit?coins are like wampum in many ways-- the supply is limited by "nature," that is, by the terms set by their original programmer... And it's also limited by the fact that the skills required to produce them are in short supply. Partly that's because relatively few people are computer programmers, and because the code to generate them is highly protected by encryption. Like wampum, they were originally imagined as something exchanged in a limited community. But wampum was declared currency by the Puritan government, and its value was set by law. Bitcoins were imagined as an extra-legal form of money, outside of governmental authority.
  - In the UK, an investigation has been launched to find out if iOS games with in-app purchases pressure children into spending their parents' cash for **virtual wampum** (coins, gems, donuts) in order need to progress through a particular game (*UK Office of Fair Trading Investigates Kids' Games with In-app Purchases*, *PadGadget*, 12 April 2013) [*emphasis added*]
  - A *YouTube* video offers guidance in *How To Get FREE Unlimited Wampum in High Noon Game easily*.
  - A Montreal-based tech group (*Aboriginal Territories in Cyberspace*, AbTeC) helps indigenous youth define their own identity through gaming, and most recently through a game entitled *Leni en:te and the Peacemaker's Wampum*. This features a female archeologist, who returns to her home town and relearns her culture in order to save her community from people who are trying to steal the **peacemaker's wampum**, as variously described by Angela Sterritt (*Aboriginal Communities in Cyberspace*, *CBC News*, 4 January 2014; *Bringing Legends to Life with Aboriginal Territories in Cyberspace*, 2013). [*emphasis added*]

The emergence of "virtual wampum" can be usefully considered in relation to the remarkable development of [casino-related gaming in Native American sovereign areas](#) -- presumably extending via the internet to other regions. As noted above, this development curiously interweaves the original sense of wampum with its metaphorical reframing by gamblers. It could be seen as a highly proactive reframing of the failure by government to honour the original wampum-based agreement. More intriguing is the psychic engagement it cultivates in gamblers in managing confidence, expectation, options, and risk with regard to the future -- echoing that of speculators in the futures markets of finance. Given the argument below regarding "quantum reality", a further twist arises from the role of the "quants" in financial speculation in comparison with the controversial role of [card counting](#) in gambling, especially in [advantage play](#).

With respect to the more fundamental implications of wampum, as discussed below, it can be fruitfully considered as a tangible token of intangible honour and respect -- which may appear to take the form of conventional monetary wealth (too readily assumed to engender it). So understood, wampum might be said to be inherently virtual.

Ragnorak is a period in which those who vigorously claim honour and respect -- however much wampum they flout in support of that claim -- are perceived to be no longer worthy of it. Their wampum has been completely devalued, whatever form it takes -- paradoxically mirroring the respect accorded the wampum of the Two Row agreement. This is especially problematic when authority is purportedly legitimated by wampum, trumping any demands for "concrete proof". They can no longer claim deep offence on the basis that their honour has been impugned. Their "word" no longer carries any weight or guarantee.

## Transcending the binary framing of confidence

Through basing itself deliberately on "bits", Bitcoin can be understood as essentially a creature of a binary worldview. It is designed for transactions via the internet -- currently framed in terms of bits -- strings of 0s and 1s. A bit is the basic unit of information in computing and digital communications. Making the assumption that it is not "relying on trust" is to fail to recognize the confidence required for the system to be adopted and used where "communication" is not necessarily digital. How might such confidence be represented?

What role does confidence play in the operation of the internet -- especially following the recent disclosures regarding electronic surveillance, backdoors, and decryption by the NSA and its collaborators? How might this play out with respect to the operation of Bitcoin -- perhaps itself to become a "front-end" for various interests, as with the major search engines?

It is of course the case that science and statistics are both attentive to "degrees of confidence". Reference was notably made to "confidence level" with respect democratic oversight of surveillance systems -- and to their efficacy in detecting threats. However it is

far from being the case that these would be recognized as meeting [Six Sigma](#) standards, as separately argued (*Imaginatively enabling attractive "Six Sigma" global governance*, 2013 ).

This is the case more generally with respect to confidence in any form of authority -- or in the relationship with any "other", as frequently demonstrated in interpersonal relationships. Ironically the heads of security services, following the disclosures, were recognized (as a consequence of their misleading public declarations) to be untrustworthy -- if not completely so.

The issue of moving beyond simplistic approaches to the matter is discussed separately (*Transcending Simplistic Binary Contractual Relationships: what is hindering their exploration?* 2012). This indicates various possibilities under the following headings:

- Enabling a context for creative consideration of possibilities
- Domains of current and potential application of non-binary modalities
- Non-binary approaches in financial ownership
- Potential application of non-binary approaches to governance
- Transcending the challenges of binary interpersonal relationships
- Insights from dialogue, multi-part singing and periodicity
- Enabling a review of the applicability of branches of mathematics
- Simulation of non-binary psychosocial configurations
- Significant applications: anti-social behaviour and inter-faith dialogue .

As discussed separately (*Embodying complexity within a quaternary framework*, 2013), a valuable distinction can be made from an Eastern perspective, noted as a quadrilemma by Kinhide Mushakoji (*Global Issues and Interparadigmatic Dialogue; essays on multipolar politics*, 1988)

- this
- that (namely not this)
- this and that (namely this and not this)
- neither this nor that

The second two are conflated in the cognitive "confusion" of the Middle Way and [liminality](#) (*Living as an Imaginal Bridge between Worlds: global implications of "betwixt and between" and liminality*, 2011). All four can be suggestively interrelated through mapping them onto the [complex plane](#) as framed by the mathematics of [dynamical systems theory](#). They can then be used to hold the distinctions between: problematique, resolutique, imaginatque, and ludique. The first two have been a focus of various presentations by the Club of Rome. "Imaginatique" holds the dynamic of creativity associated with calls for "new thinking" (beyond conventional framings of "problem" and "solution"). The manner in which strategic initiatives are variously enabled, undermined, and disrupted by distractive "game-playing" dynamics, is held by the fourth of the set. This 4-fold pattern is discussed separately (*Imagining the Real Challenge and Realizing the Imaginal Pathway of Sustainable Transformation*, 2007).

This suggests that **a new form of wampum -- the quantum wampum highlighted below -- needs to be characterized by [superposition](#) as recognized in the quantum framing of reality**. This would then suggest a quaternary pattern relating to value (and wealth), by whatever tokens it is recognized:

- having it, as in the conventional quest for wealth
- not having it, as widely considered problematic in relation to the conventional quest for wealth
- both having it and not having it, as recognized:
  - by those who are wealthy who acknowledge that it does not suffice
  - by those who are impoverished who acknowledge other forms of (inner) wealth, as stressed by ([Duane Elgin](#) (*Voluntary Simplicity: toward a way of life that is outwardly simple, inwardly rich*, 2010)
- neither having value/wealth, nor not having it, as in the dynamic which many experience (*Living as an Imaginal Bridge between Worlds: global implications of "betwixt and between" and liminality*, 2011)

## Implications of quantum framing of reality

**Controversial implications:** There has been a degree of enthusiasm for the application to other domains of the implications of the insights developed by physicists regarding quantum mechanics. Examples include [quantum cognition](#), [quantum consciousness](#), [quantum psychology](#), [quantum philosophy](#), quantum medicine, [quantum healing](#), and the like.

Such explorations are typically deplored by the hard sciences. An editor of the *New Scientist* has repeatedly qualified any such use of "quantum" as "fruit looperly" -- when outside the framework defined and authorised by physics (*Feedback: In fruitlooperly's house are many mansions*, *New Scientist*, 19 October 2012; *Towards a universal crackpot standard*, *New Scientist*, 28 April 2010). Such controversy was partially highlighted by the [Sokal Affair](#) and commentary on its aftermath. The "fruit looperly" framing merits consideration in the light of the self-referential argument of physicist [Douglas Hofstadter](#) (*I Am a Strange Loop*, 2007) -- as well as comparison with the notorious advocacy of [book burning](#) by an editor of *Nature*.

**Comprehensibility:** Curiously, given the seemingly abstruse nature of the matter, physicists are reasonably free to speculate with the greatest creativity (and extensive public funding) on more radical understandings of reality and its implications for the origins of the universe. According to the scientific methodology, this process is framed as hypothesis formulation -- thereby according it a degree of legitimacy. Little constraint is imposed on the difficulty of actually comprehending the extremes of its suggested hyperdimensionality -- a matter held to be irrelevant to a credible articulation by the few for the few..

Of particular interest, in relation to quantum mechanics, is a recent survey of physicists regarding their understanding of it. This showed

that they themselves do not share a consensus on the nature of quantum electrodynamics and are perplexed by the meaning framed by the models they variously prefer (Sean Carroll, *The Most Embarrassing Graph in Modern Physics*, 17 January 2013; *Sean Carroll on the embarrassment of quantum mechanics*, 28 February 2013).

**Replicating the challenge for religion:** The difficulty for society faced with such a radical reframing of reality by physicists is that those with the greatest inclination to comprehend it, and the capacity to do so through its special language, progressively reposition themselves as a high priesthood. This replicates the problematic role traditionally sought and defended by those cultivating a theological framing -- including the dissension between them and its potentially bloody consequences. In a knowledge-based society, priding itself on a degree of secularism, physicists and mathematical cosmologists are effectively taking on the role of the theologians of the past. In so doing they trap themselves in the process identified by George Santayana: *Those who cannot remember the past are condemned to repeat it.*

As in that case, those held to be less well-informed are expected to rely on (and have faith in) the framings developed by experts who have devoted years of study to the matter. The difficulty is that the reality so framed is one to which all necessarily have access in some manner -- through being embedded in it (as is the case with the theological framing). How individuals may choose to engage with that reality, and to frame it for themselves, is of little interest to physics -- irrespective of the insights to which that engagement may give rise. Such imaginings -- however they are informed by experience -- can be authoritatively framed as simply erroneous and misinformed.

For theologians, this process resulted in the recognition of heresy -- condemned to various degrees, possibly involving torture (through failure to recant), or to burning at the stake. Theologians have however been especially challenged by charismatic mystics and the threat that their insights constituted for more conventional framings of religion. Scientists cunningly reframe conceptual breakthroughs as insightful revolutions -- when they are eventually accepted.

**Quantum economic implications?** As noted by *Wikipedia*, a **cryptocurrency** is a digital **medium of exchange**. As the first such currency, **Bitcoin** began trading in 2009. Since then, numerous cryptocurrencies have become available. Fundamentally, cryptocurrencies are specifications regarding the use of currency which seek to incorporate principles of cryptography to implement a distributed, decentralized and secure information economy.

Given the emphasis on "bits" in the case of Bitcoin (as mentioned above), it is intriguing to note tentative metaphorical use of "quark" with respect to an innovation in economics. For example, Wayne Barz (*Entrepreneurial Quarks: the elementary particle of the American economy*, *Ben Franklin Technology Partners*, 19 July 2012) argues:

- I believe that the world economy, like the universe, exists because it is composed of increasingly smaller components like national economies and currencies and natural resources.
- The theory of the entrepreneurial quark is something like this: through a desire to improve the condition of their neighbors, and a willingness to pursue their own long-term interests by deferring their short term interests, these entrepreneurial quarks have built quite the universe.

A "quark community" has been established, as one of the first "real grassroots" opportunities for investment in cryptocurrency (*Quark: the elementary currency*, *QuarkCoin*, 5 December 2013). Introduced in the following terms by Bill Still (*Welcome new investors*, 26 November 2013):

- Quark differs from Bitcoin in that it is much more decentralized. It also cannot be mined by huge specialized server farms. It will remain decentralized - forever. That makes it the crypto currency of we, the people.
- If you believe that crypto currency is like the "Internet" - that is, here to stay - jump in with something small -- like \$10 up to \$100.
- Don't bet the farm trying to get rich quick. That won't do anyone any good and will ruin the idea of Quark.
- Beware, watching Quark undulate through the day can become addictive.

According to Still, as Bitcoin runs up over \$800 on the strength of Chinese money, the improved cryptocurrency is starting to function as the little people's investment (*Bill Still Report: Quark vs. Gold, The Financial Armageddon*, #133; *Quarks and China*, #134, 29 November 2013; *Quark vs. Bitcoin*, #132, 25 November 2013). These reports note that the Chinese have dominated the cryptocurrency market in recent months. Despite not being listed on a Chinese exchange, Quarks have appreciated at an unprecedented pace.

**Philosophical implications:** It is appropriate to note in this context the integrative function performed by a new newsletter under the title *3 Quarks Daily*. It frames its function, and the origin of its name, in the following terms:

When Murray Gell-Mann and George Zweig postulated the existence of three new subatomic particles in 1964, Gell-Mann decided to name them "quarks", an unusual word meaning "croak" or "caw" which James Joyce had used in *Finnegans Wake*: "Three quarks for Muster Mark!" In present-day physics, there are more than three quarks, and some are said to have properties named strangeness and charm, which, we think, describe this weblog as well. We have also used the name to symbolize our connections to science, art, and literature; and because we mistakenly thought it short and memorable.

As an indicator of such paradoxical connectivity, in a response to an interview in that newsletter, Mark Blyth (*How the World's Political Economy Works*, *3 Quarks Daily*, 5 September 2013) argues:

Well, it doesn't work according to the textbooks. If you look at economic textbooks, the whole world is meant to work according to the logic of differential calculus; there are these reciprocal relationships - one side goes up and one side goes down. **But deep within it there's a paradox.** On the one side you have Adam Smith, where everyone is pursuing their own self-interest leading to an outcome which is better than any of them could have intended. On the other, you have John Maynard

Keynes. Today Keynes is thought of as someone who just talks about deficit spending and so on, but that's just complete rubbish. Keynes's central message is that individual rational action can be collectively disastrous. So, if you have a series of economic models in a text book where everything balances out, it's much more attuned to the world working the way that Smith would like to tell us. [*emphasis added*]

**Quantum computing:** Despite such controversial interpretations of quantum reality, insights derived from that understanding now inform research on the design of new computer technology and its ever more invasive potential (Steven Rich and Barton Gellman, *NSA seeks to build quantum computer that could crack most types of encryption*, *The Washington Post*, 2 January 2014; Robert McMillan, *The NSA Is Building a Quantum Computer? We Already Knew That*, *Wired*, 3 January 2014):

The basic principle underlying [quantum computing](#) is known as "[quantum superposition](#)", the idea that an object simultaneously exists in all states. A classical computer uses binary bits, which are either zeroes or ones. **A quantum computer uses quantum bits, or qubits, which are simultaneously zero and one.** This seeming impossibility is part of the mystery that lies at the heart of quantum theory, which even theoretical physicists say no one completely understands. [*emphasis added*]

Given the potential relationships between "wampum" and "whompum" noted above, the NSA initiative could be interpreted as a **quantum whomping strategy against global social unrest**. This could be consistent with the strategic mindset exemplified by the earlier US threat of "[Bombing back to the Stone Age](#)" -- if only in terms of communication potential.

## Enabling radical reframing of reality by non-physicists

As argued separately, physicists and mathematicians have demonstrated little competence with respect to the existential challenges faced by individuals (*Mathematical cosmology and death*, 2013). Curiously this is even evident in the tendency to depression and suicide of the creative geniuses of those disciplines. Despite criticism of such inadequacies, "science" strangely frames itself as a comprehensive mode of knowing -- if not the most appropriate mode of knowing (*Knowledge Processes Neglected by Science: insights from the crisis of science and belief*, 2012). Provocatively this might be understood as suggesting the possibility of alternative modes of knowing (*Towards Conscientific Research and Development*, 2002).

With respect to the [Standard Model](#) of particle physics, what might lie "beyond" it? Perhaps of greater relevance to those challenged experientially by the particular language of mathematics regarding the invisible (*Beyond the Standard Model of Universal Awareness: Being Not Even Wrong?* 2010)?

What might be the experiential conceptual analogue to fundamental physics -- one that is inherently widely accessible? It might be argued that this could emerge from a strange marriage between mathematics and theology, especially given the inspiration that each has been to the other in certain instances (*Mathematical Theology: Future Science of Confidence in Belief -- self-reflexive global reframing to enable faith-based governance*, 2011).

**Tabular "boxes":** There are several specific situations in which tables are routinely used as a matter of custom or formal convention through which "[in-the-box](#)" thinking is enabled and reinforced:

- Publishing, as in any [table of contents](#)
- Social ranking may make use of a [table of ranks](#), perhaps in the form of an [order of precedence](#)
- Mathematics, as in the [multiplication table](#) of arithmetic and in [truth table](#) of logic
- Natural sciences, as in the [periodic table](#) of chemistry and in [tide tables](#) of oceanography. A [table of nuclides](#) elaborates on implications of the periodic table.
- Information technology supports the use of tables in software applications and in software development. Modern software applications give users the ability to generate, format, and edit tables and tabular data for a wide variety of uses, most notably in [spreadsheet](#) applications
- Actuarial science and demography make use of a [life table](#) (also called a mortality table or actuarial table) showing, for each age, what the probability is that a person of that age will die before his or her next birthday.

Appropriate to this argument, "tables" have an [historical relation to furniture](#) (as described by *Wikipedia*). The concern here is their appropriateness to the "furniture of the mind" when survival and thrival are a significant concern.

**Engaging imaginatively with confusion and uncertainty:** The tabular articulations above can be understood as having emerged progressively from confusion and tentative exploration of ordering possibilities. In this light, the question here is **how best to recognize future possibilities of emergence -- for a "life craft" rather than a "life raft"** (as discussed below), given the currently evident inadequacies of such tables to human survival and thrival.

The confusing process of emergence can be explored with respect to the historical process of progressive recognition and "forming up" of the:

- Global form of the planet in heliocentric motion, in contrast with the strongest of arguments for a geocentric flat Earth
- Periodic table of chemical elements
- Standard Model of particle physics

In each case it is useful to recognize how the confusion and lack of understanding continues in the minds of many, even in the case of physicists with regard to quantum mechanics (*Irresponsible Dependence on a Flat Earth Mentality -- in response to global governance challenges*, 2008; *Cognitive epicycles -- prefiguring more fundamental insight?* 2013). Part of the issue is communicability (*Living with*

*Incomprehension and Uncertainty: re-cognizing the varieties of non-comprehension and misunderstanding*, 2012). Contestation is a continuing factor.

Living in such a context, how is the next such integrative insight to be recognized -- given [Arthur Clarke's third law](#): *Any sufficiently advanced technology is indistinguishable from magic*? Metaphor is indicative of one possibility -- using as templates patterns of order which have already emerged from such confusion (*Towards the Systematic Reframing of Incomprehension through Metaphor*, 2012). This is reinforced by the arguments of Douglas Hofstadter and Emmanuel Sander (*Surfaces and Essences: analogy as the fuel and fire of thinking*, 2013). these make extensive reference to the creative thinking of Albert Einstein.

**If the understanding lends itself to presentation as a table, then it is necessarily not of requisite complexity** -- as with quantum mechanics or the globe. However such tables may be used suggestively, as explored with respect to the periodic table of chemical elements:

- *Periodic Pattern of Human Life the Periodic Table -- as a metaphor of lifelong learning* (2009)
- *Towards a Periodic Table of Ways of Knowing -- in the light of metaphors of mathematics* (2009)
- *Periodic Pattern of Human Knowing: implication of the Periodic Table as metaphor of elementary order* (2009)

**Requisite craziness:** With respect to innovation in physics, [Freeman Dyson](#) remarked that:

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

Dyson made the remark in commenting on the much-cited response of [Niels Bohr](#) to [Wolfgang Pauli](#):

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

In the context of Ragnarok, individuals and groups must necessarily have recourse to framings of reality which may well appear crazy to others.

## Technomimicry as key to a new mode of knowing?

An argument has been previously made for "technomimicry" -- by analogy to the [biomimicry](#) that has been such an inspiration for the development of some technologies (*Engendering a Psychopter through Biomimicry and Technomimicry: insights from the process of helicopter development*, 2011). The Sokal Affair made mockery of any such endeavour -- but without any ability to offer insights of relevance to the tragedies of individual experience, faced with "nothing", as it now is for so many (\*\*).

Does physics, through the Standard Model and the technologies based upon that framing, suggest a possibility for technomimicry? Expressed more radically, **does any hypothetical product of human creativity invite exploitation as a template in the construction of more radically creative conceptual frameworks?**

The latter question suggests a comparison with the obligation of many to construct their livelihoods, shelters, and modes of transportation, from waste dumps and refuse heaps -- as offering the only resources they can readily access. There is no lack of "conceptual waste". Web search engines might be said to offer ready access to it in the ocean of knowledge -- ignoring the possibility that psychosocial analogues to such waste are generated and accumulated. Web resources might even be understood as accumulating waste -- as in the gyres of the so-called [Pacific Trash Vortex](#), the [Indian Ocean garbage patch](#), or the [North Atlantic garbage patch](#). Many may already be obliged to rely on such resources -- perhaps anticipating the day when humanity as a whole may be obliged to rely on their tangible analogue.

Considerable ingenuity may be exhibited by individuals in exploiting technical waste to construct shelters and the like. Is it appropriate to infer that many may be obliged to dwell in "conceptual slums" using whatever they can derive from conceptual waste dumps?

Although this framing may be considered problematic in the light of the conceptual resources supposedly readily accessible (via the web, etc), the question is with what skill items can be selected and assembled -- in the light of the depreciation and scorn of any with long training in their use (from which they derive personal competitive advantage). In the absence of such training and appropriate resources, as with those depending on waste dumps for their livelihood, there is necessarily a high dependence on personal ingenuity in relation to personal need. As in the construction of shelter in problematic resource situations, any requirement to conform to "building regulations" or to "health and safety regulations" is usefully understood as unrealistic, if not cynically manipulative.

With respect to a collective shelter for humanity, a report entitled *Planetary Boundaries: exploring the safe operating space for humanity* (2009) has been produced a team of 26 scientists, led by [Johan Rockstrom](#) and Will Steffen, and centered on the [Stockholm Resilience Centre](#) and the [Stockholm Environment Institute](#). It is also available under the same title in *Ecology and Society*. This was presented at the Club of Rome General Assembly (Amsterdam, 2009). It has been separately summarized as *The Nine Planetary Boundaries*. These boundaries are necessarily technical environmental constraints and boundary conditions, and the focus was on the degree to which they are already exceeded or in process of being exceeded.

Separately it has been argued that there is a need for *Recognizing the Psychosocial Boundaries of Remedial Action: constraints on ensuring a safe operating space for humanity* (2009). The argument here, in terms of technomimicry, is that the **extensive investment**

in technical insight into the global problematique merits exploitation as a source of insight into the intangible factors essential to engendering a "safe operating space" -- a "life craft" (*Existential Embodiment of Externalities: radical cognitive engagement with environmental categories and disciplines*, 2009).

## Cognitive constraints on conventional "life raft" design

**Limitations of the human mind:** Of great relevance are the constraints of the human mind in framing and interrelating any set of elements thought to be appropriate to "shelter design" (as metaphorically indicated above). Whilst it could be hypothesized that reality can only be explained with the aid of hundreds of factors (parameters or dimensions), curiously the explanations offered -- even by those with the greatest expertise and authority -- rely on a very limited number of factors, however subtle an interpretation they may require. This limitation is strangely consistent with the much-cited psychological text by cognitive scientist [George Miller](#) (*The Magical Number Seven, Plus or Minus Two, Psychological Review*, 1956), as discussed separately (*Representation, Comprehension and Communication of Sets: the role of number*, 1978).

**Requisite variety:** Rather than focus on what may be possible "beyond" the Standard Model, it could therefore be argued that that model can be used as a speculative template suggestive of more generic insight, as separately explored (*Beyond the Standard Model of Universal Awareness: Being Not Even Wrong?* 2010; *Metaphorical Insights from the Patterns of Academic Disciplines: learning from the Standard Model of Physics?* 2012).

Other fundamental frameworks could indeed be used for this purpose (*Patterns of Conceptual Integration*, 1984; *Patterns of N-foldness: Comparison of integrated multi-set concept schemes as forms of presentation*, 1980), However, the current investment in quantum reality suggests that it offers a requisite richness and integrity to merit wider explanation -- if only as a creative provocation, and irrespective of how its self-selected carers may (predictably) deprecate such exploration.

**Comprehensible set of dimensions:** A fruitful attitude in engaging in such innovative development -- as with the construction of any shelter on the basis of the tangible materials to hand -- is to consider how many directions (or dimensions) need to be "usefully" taken into consideration for a "viable" outcome (*Organization and Lifestyle Design: characteristics of a nonverbal structural language*, 1978). Part of the difficulty lies in the subtlety with which directions or dimensions are distinguished and understood as abstractions. In the case of a tangible shelter, these are necessarily obvious and not a focus of controversy.

Essential to this argument is the assumption that human creativity is severely constrained to imagine any explanation or construct which does not derive from a very limited number of "dimensions" or "factors". Any pattern based on larger numbers would simply be condemned as "incredible" and inherently confusing. Strangely the number of [days of the week](#) (6 + 1) offers an excellent example across cultures -- consistent with the constraint identified by George Miller (as noted above). As discussed further below, their naming offers an interesting relation to the challenge of Ragnarok. The unquestioning distinction of this 7-fold pattern across cultures is an astounding indication of a cognitive box within which people find it habitually convenient to order their lives.

**In-the-box thinking:** To illustrate the degree of conceptual entrapment in restrictive frameworks of this kind, consider the following correspondences between the days of the week and the Norse gods or their Roman variants. The question such patterns raise is what capacity of discernment is projected into such frameworks with an implication that it offers comprehensive, coherent and integrative insight. It could be argued more generally that such distinctions are recognized fuzzily (if not with a degree of incoherence), variously aided by intuition, and reinforced by the logic and methodology suggested by the framework -- and its quest for (en)closure. Problematic correspondences may well derive from the limitations of cognitive capacity -- rather than from assertions made through the argumentation of a particular framework.

| Days of the week<br>(employed worldwide) |         |           |           | ^ | Corresponding deities<br>(notably implicated in Ragnarok) |        |        |       |
|--|---------|-----------|-----------|---|---|--------|--------|-------|
| Monday                                   | Tuesday | Wednesday | Sunday-I  | * | Mani  | Tiw    | Wodan  | Sunna |
| Thursday                                 | Friday  | Saturday  | Sunday-II | * | Thor.   | Frige. | Lördag | ?     |

**Patterns of symmetry:** Larger numbers can however be used provided relatively simple patterns of symmetry can be recognized -- although there are interesting constraints to the wider "deployment" of such explanations (*Dynamics of Symmetry Group Theorizing: comprehension of psycho-social implication*, 2008). These are most notable with respect to extreme discoveries of mathematics such as the [Monster Group](#) (*Potential Psychosocial Significance of Monstrous Moonshine: an exceptional form of symmetry as a Rosetta stone for cognitive frameworks*, 2007; *Theories of Correspondences -- and potential equivalences between them in correlative thinking*, 2007). It is appropriate to note that a mathematical "proof" -- confirming the existence of the Monster group -- takes the form of 10,000 pages spread across 500 journals.

## Interweaving threads beyond the standard model: "life crafting"?

As a means of comoensating for the above constraints of relevance -- from the perspective of technomimicry -- is the construction of any [raft](#) in practice, namely the manner in which the logs are cross-layed and bound together. The implications of this approach can be considered with respect to governance and [threaded discussion](#) (*Warp and Weft of Future Governance: ninefold interweaving of incommensurable threads of discourse*, 2010; *Interweaving Thematic Threads and Learning Pathways*, 2010; *Warp and Weft: Governance through Alternation: world governance as a Gandhian challenge for the individual*, 2002).

**Operacy:** As with the many tabular representations of relationships between categories, that above relating wampum (and its analogues) to their psychosocial significance is itself an indication of the constraints to the design of more appropriate "cognitive life rafts", as separately argued (*Spreadsheet perspective as the cognitive burka of globalization?* 2010). More radical challenges to comprehension of

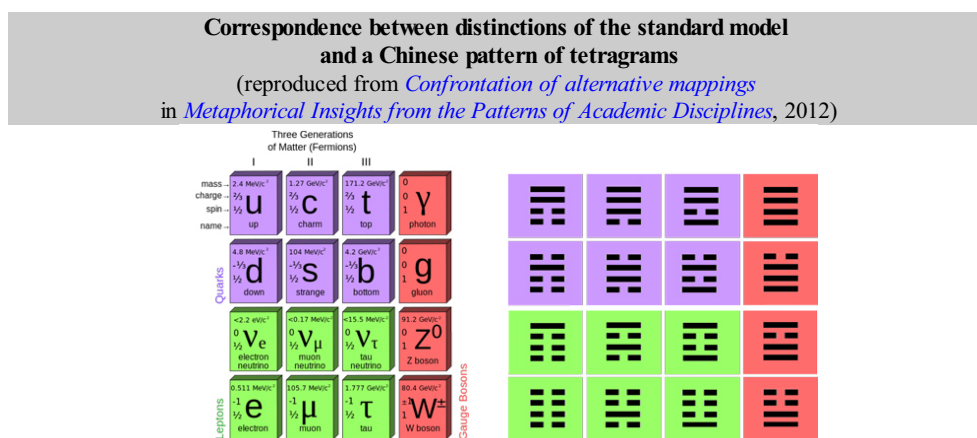
the elements of the table are therefore required -- especially if they are to engender [operacy](#), as highlighted by [Edward de Bono](#) in his focus on "new thinking" (*New Thinking for the New Millennium*, 1999; *Think! Before It's Too Late*, 2009).

More fundamental, as the complete range of functions of wampum indicates, is how "value" in its most profound sense is to be contained by some conscious, dynamic configuration of these functions -- the active comprehension of them.

**Threads and strings:** With respect to this argument, there is a huge irony in the fact that interwoven strings -- on which beads were significantly interrelated in wampum -- should now be the metaphorical basis for the most fundamental thinking on quantum reality. through [string theory](#). Given the narrative function of wampum, it would be a fruitful provocation to determine to what extent the various forms of string theory could be suitably distinguished through wampum designs. As a notational challenge, this could be understood as equivalent to [musical notation](#) or genetic notation.

**Challenging correspondences between boxes:** In the earlier exercise on *Metaphorical Insights from the Patterns of Academic Disciplines* (2012), a direct comparison was made between the Standard Model and the classical Chinese encoding of the 81 tetragrams of the *Tao Te Ching* and of the *T'ai Hsüan Ching* (*T'ai Xuán Jing* or *Canon of Supreme Mystery*).

The following figure positions a complete set of tetragrams such as to correspond to the pattern of the standard model of particle physics -- notably presented as a simple tabular "box". Although the pattern of tetragrams has a degree of internal coherence corresponding to that of the standard model, as a tentative exercise it is merely designed to encourage reflection on any more appropriate ordering. The order of rows and/or columns could be changed -- as was done in a second iteration, when columns 2 and 4 were switched to approximate more closely to the mathematical criterion of a [magic square](#) (*9-fold Magic Square Pattern of Tao Te Ching Insights*, 2006).



There are six types of [quarks](#), known as *flavors*, indicated in the table on the left (up, down, charm, strange, top, bottom), and six [leptons](#) (electron, electron neutrino, muon, muon neutrino, tau, tau neutrino). Pairs from each classification are grouped together to form a [generation](#), with corresponding particles exhibiting similar physical behaviour. The [gauge bosons](#) are defined as [force carriers](#) that mediate the strong, weak, and electromagnetic [fundamental interactions](#). Up and down quarks have the lowest [masses](#) of all quarks. The heavier quarks rapidly change into up and down quarks through a process of [particle decay](#): the transformation from a higher mass state to a lower mass state. Because of this, up and down quarks are generally stable and the most common in the [universe](#), whereas strange, charm, top, and bottom quarks can only be produced in [high energy](#) collisions (such as those involving [cosmic rays](#) and in [particle accelerators](#)).

Quarks have various intrinsic properties, including [electric charge](#), [mass](#), [color charge](#) and [spin](#). Quarks are the only elementary particles in the [Standard Model of particle physics](#) to experience all four [fundamental interactions](#), also known as *fundamental forces* (electromagnetism, gravitation, strong interaction, and weak interaction), as well as the only known particles whose electric charges are not [integer](#) multiples of the [elementary charge](#). For every quark flavor there is a corresponding type of [antiparticle](#), known as an *antiquark*, that differs from the quark only in that some of its properties have [equal magnitude but opposite sign](#).

What might such distinctions, and their powerful integration, then suggest with respect to the configuration of [qualitative](#) psychosocial patterns? The human capacity to distinguish and articulate them in an integrative manner is suggested by consideration of "[qualum psychodynamics](#)" (QPD) as a complement to "[quantum electrodynamics](#)" (QED) in relation to use of [Feynman diagrams](#)? (*Potential of Feynman Diagrams for Challenging Psychosocial Relationships?* 2013). Quantum wampum might then be fruitfully understood as "[qualum wampum](#)". More provocatively, why is notable use made of Greek letters -- as with the quantities representing the sensitivities of the price of [derivatives](#) to a change in underlying parameters on which the financial system is so dependent (as discussed above)

**Metaphorical correspondences:** As is evident from the names attributed to the quarks, extensive use is made of metaphor -- however questionable or deprecated this may be. Similarly, with respect to the Chinese encoding (on the right above), very elaborate use is made of metaphor to associate a comprehensive integrative engagement with features of familiar experience (as specifically noted with respect to the above pattern in the [earlier argument](#)). Of relevance is the degree to which these can be associated with features by which global governance is notably challenged, whether psychosocial relationships, environmental categories ("earth", "air", "fire" and "water"), or especially their interrelationships.

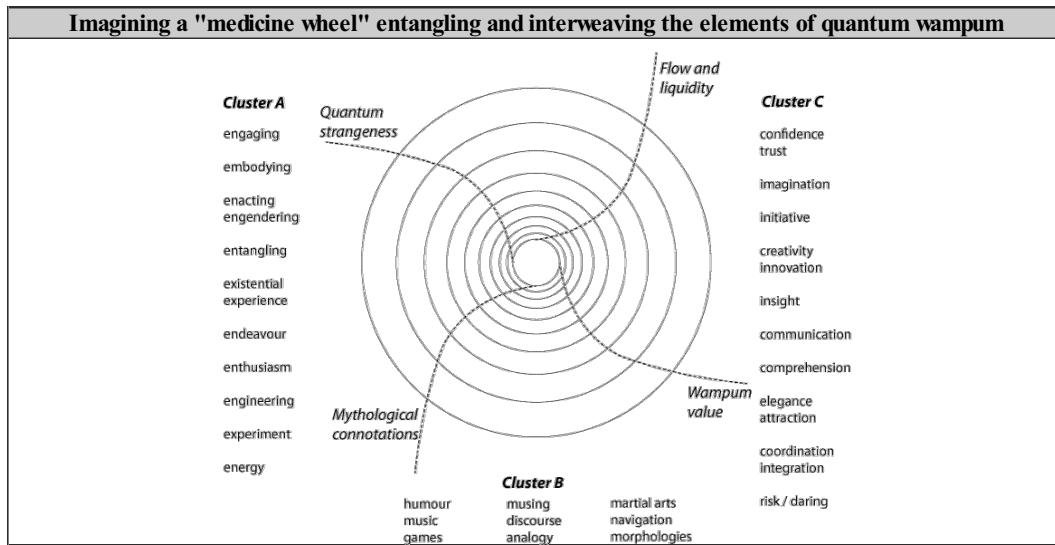
The approach is also of interest with respect to any "fall of the gods" in that traditionally such patterns are associated with clarifying the relationship between "Earth" and "Heaven". Meriting careful attention are the many correspondences explored in the work of [Frank Dodd](#)

## Distinguishing the elements of "quantum wampum" essential to "life crafting"

With respect to the nature of a hypothetical "quantum wampum", the challenge here is at least threefold:

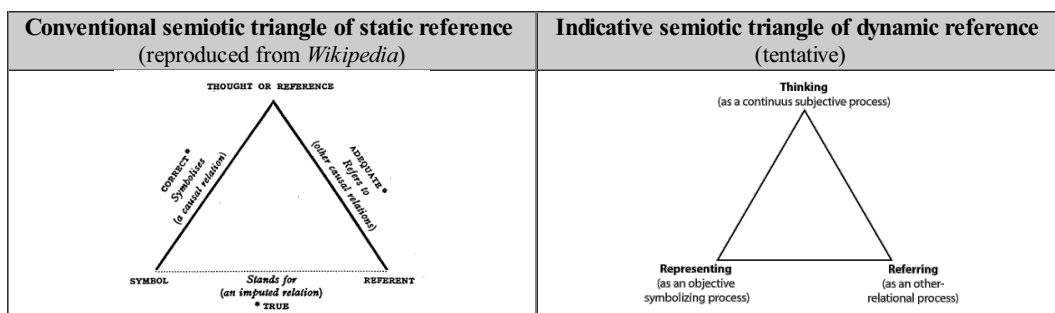
- how might quantum wampum be understood?
- what is to be distinguished by an individual as experientially fundamental -- as a feature of human "quantum reality" understood in human terms?
- how to enable any such distinctions, namely with what methodology or combination of methodologies (if only to be understood metaphorically)?

The following schematic is a preliminary exercise in placing the range of factors on the same table -- with the challenge of how their relationships could best be represented. The argument is that a circular configuration contrasts appropriately with a tabular articulation -- recalling the significance variously associated with a [mandala](#) or a [medicine wheel](#). With respect to imagining a future and more appropriate mode of organization, such a structure might be associated with the form of a [dreamcatcher](#), valued by some North American Indians.



Elements of Cluster A might be associated with one or other of the concentric circles -- reminiscent of the electron shells of the chemical elements. The dotted lines are intended as a reminder of the non-linear nature of the collapse, as highlighted above with respect to time-value decay. The cognitive relationship between the three clusters could be explored in terms of the semiotic triangle, as follows.

**Dynamic implication of the semiotic triangle:** The clusters in the above schematic can be reframed by considering possibilities with regard to a dynamic variant of the so-called [triangle of reference](#) (aka semiotic triangle, triangle of meaning, and semantic triangle). The original triangle focuses on the **static** nodes as indicated in the image on the left -- with any dynamic within them only implied (if at all). A dynamic alternative can be considered, as indicated by the image on the right -- from which static elements might then be variously engendered. The fundamental question is whether "thought" is to be considered an active process, namely a verb rather than a noun.



Curiously -- as a thought product, a symbol and a referent -- the conventional triangle of reference itself calls for review in terms of the processes and paradoxical challenges of self-reference, as variously highlighted (Douglas Hofstadter, *Gödel, Escher, Bach: an Eternal Golden Braid*, 1979; Hilary Lawson, *Reflexivity: the post-modern predicament*, 1985).

Rather than focus prematurely on any questionable closure, is quantum wampum to be considered as fundamental to the following seemingly disparate and mutually incomprehensible "modalities" configured in the triangular representation above ?

**"Thinking"**: The subjective, experiential characteristics of the fundamental "thinking" (cognitive) process implied by the argument for "quantum wampum" might then be suggested by a nexus or complex of interacting processes, perhaps including the dynamics of:

- engaging
- embodying
- entangling
- experiencing (existentially)
- enthusing
- engineering

- enacting / engendering
- endeavouring
- experimenting

Exploiting the mnemonic alliteration, as a dynamically complex economy of the psychic ecosystem, these processes entrain externalities - whilst necessarily eluding exhaustive explanation.

**"Representing"**: In dynamic terms, representing may be understood in terms of a set of seemingly disparate actions through which more fundamental processes are "acted out" in recognizable form. These are listed here in no particular order, to be understood as complementary or overlays -- through which the cognitive fundamentals of quantum wampum are intuited, as "through a glass darkly". The traditional significance associated with the pattern of 9 **Greek and Roman Muses** is of some relevance, as being the personification of engaging in knowledge and the arts, especially literature, dance and music (*Potential alternative applications of the ninefold pattern*, 2010):

- **humour (as joking and its appreciation)**, as variously explored (Matthew M. Hurley, et al., *Inside Jokes: using humor to reverse-engineer the mind*, 2013; John Morreall, *Comic Relief: a comprehensive philosophy of humor*, 2009; Alan Feingold and Ronald Mazzella, *Preliminary Validation of a Multidimensional Model of Wittiness*, *Journal of Personality*, 61, 1993), and separately discussed (*Humour and Play-Fullness: essential integrative processes in governance, religion and transdisciplinarity*, 2005)
- **music (as music-making and its appreciation)**, as variously explored by Ernest G. McClain, *Pythagorean Plato: prelude to the song itself*, 1984; *Myth of Invariance: the origins of the gods, mathematics and music from the Rg Veda to Plato*, 1985) and by Dmitri Tymoczko (*The Geometry of Musical Chords*, *Science* 313, 2006) and separately discussed (*Knowledge Gardening through Music: patterns of coherence for future African management as an alternative to Project Logic*, 2000; *A Singable Earth Charter, EU Constitution or Global Ethic?* 2006)
- **games (as game-playing and its appreciation)**: These associations offer curious echoes to the elaboration of a "game of spheres" by Nicholas de Cusa (*De Ludo Globi*, 1463), written as a contribution to both a literature and a practice of moral game-playing. This formed part of the tradition of the forgotten chess-like game **Rithmomachia** ("The Battle of Numbers" or Rythmomachy), which combined the pleasures of gaming with mathematical study and moral education. Intellectuals of the medieval and Renaissance periods who played this game were not only seeking to master the principles of **Boethian mathematics** but were striving to improve their own understanding of the secrets of the cosmos (Ann E. Moyer, *In The Philosophers' Game*, 2001). This was undoubtedly an inspiration to the magnum opus of Nobel Laureate Hermann Hesse, as noted by Todd R. Harris (*The Interplay of Opposites, the Language of Experience, and the Geometry of Ascent: a comparison of Hermann Hesse's "Das Glasperlenspiel" and Nicholas of Cusa's "De Ludo Globi"*, 2001). James P. Carse. (*Finite and Infinite Games: : a vision of life as play and possibility*, 1986)
- **discourse (as dialoguing and its appreciation)**: as might be distinguished in the modalities of repartee, dialogue, conversation, wrangling, and debate (*Varieties of Dialogue Arenas and Styles*, 1992; *Warp and Weft of Future Governance: ninefold interweaving of incommensurable threads of discourse*, 2010; *Re-Emergence of the Language of the Birds through Twitter?* 2010)
- **analogy (as analogy forming)**, as explored in detail by Douglas Hofstadter and Emmanuel Sander (*Surfaces and Essences: analogy as the fuel and fire of thinking*, 2013)
- **martial arts (as practiced and appreciated)**, as noted in *Clues to Movement and Attitude Control* (2002) as part of a more general discussion (*Navigating Alternative Conceptual Realities: clues to the dynamics of enacting new paradigms through movement*, 2002)
- **navigation (as a process)**, as explored by Arthur M. Young (*Geometry of Meaning*, 1978), as separately adapted (*Typology of 12 complementary dialogue modes essential to sustainable dialogue*, 1998; *Typology of 12 complementary strategies essential to sustainable development*, 1998)
- **transformational morphologies (and their appreciation)**: as articulated by Rene Thom (*Structural Stability and Morphogenesis: an outline of a general theory of models*, 1972) and discussed separately (*Archetypal morphologies*, 2012; see also Wolfgang Wildgen, *Catastrophe Theoretical Semantics: an elaboration and application of Rene Thom's theory*, 1982).
- **dance (as in dancing and its appreciation)**, in terms of arguments variously developed (George Lakoff and Mark Johnson, *Philosophy In The Flesh: the embodied mind and its challenge to Western thought*, 1999; Mark Johnson, *The Meaning of the Body: aesthetics of human understanding*, 2008; Maxine Sheets-Johnstone, *The Primacy of Movement*, 2011)
- **dramatic presentation (and its appreciation)**, as highlighted by the challenges to comprehension and memorability of the pattern of **dramatic plots** -- as with the categorization by Georges Polti of every dramatic situation that might occur in a story or performance (*The Thirty-Six Dramatic Situations*).
- **poetry (as poetry-making and its appreciation)**, as separately argued (*Being a Poem in the Making: engendering a multiverse through musing*, 2012; *Ensuring Strategic Resilience through Haiku Patterns: reframing the scope of the "martial arts" in response to strategic threats*, 2006)

The modalities identified here are suggestive (rather than exclusive), as giving expression to the underlying dynamics of "quantum wampum" -- and/or "qualum wampum", as suggested above. In terms of recognition of these dynamics, they might be combined or distinguished otherwise -- perhaps with reference to the original pattern of Muses (as suggested below). Qualitative use of "appreciation" in each of the above cases merits comparison with its use in reference to quantitative **currency appreciation** (and depreciation).

**"Referring"**: Perhaps to be usefully understood as the process of relating and sustaining an objective pattern of connectivity in the light of the above processes, this might include:

- |                        |                         |                              |
|------------------------|-------------------------|------------------------------|
| • confidence / trust   | • communication         | • coordination / integration |
| • initiative           | • comprehension         | • risk / daring              |
| • creativity / insight | • elegance / attraction | • imagination                |

**Subtle body dynamically understood:** The reference above to "life craft" may be fruitfully considered as the subjective cognitive dynamic engendering the clusters of processes of "representing" and "referring". As such, "life crafting" is the more appropriate term. In this sense it may be seen in terms of what is widely described as the "subtle body". There is an extensive literature on the subtle body from a wide variety of perspectives, variously confusing (Geoffrey Samuel and Jay Johnston, *Religion and the Subtle Body in Asia and the West: between mind and body*, 2013; Mark Stavish, *The Body of Light in the Western Esoteric Tradition*, 1997). According to *Wikipedia*, it can be described as:

A subtle body is one of a series of psycho-spiritual constituents of living beings, according to various esoteric, occult, and mystical teachings. Each subtle body corresponds to a subtle plane of existence, in a hierarchy or great chain of being that culminates in the physical form.

An extensive commentary has been made in terms of the paradoxical form of the **Klein bottle** by Steven M. Rosen (*Dreams, Death, Rebirth: a multimedia topological odyssey into alchemy's hidden dimensions*, 2013). It may be explored as existential wholth, as separately discussed (*Wholth as Sustaining Dynamic of Health and Wealth: cognitive dynamics sustaining the meta-pattern that connects*, 2013)

- Varieties of integrative thinking
- Elusive nature of the pattern that connects
- Experiential implications of wholth
- Wholth: Theology vs. Mathematics?
- Wholth through mathematical echoes of religious preoccupations
- Wholth through religious echoes of mathematical preoccupations
- Eliciting wholth through associating mathematics and theology
- Engaging with mathaphors, isophors, analogies and correspondences
- Wholth as essential to health
- Contextualizing wealth as engendered by wholth
- Whole and hole in the light of the stealth of wholth

As that title indicates this again stresses the value of a dynamic -- rather than static -- understanding of "body", as might be required for engagement with the "medicine wheel", "dreamcatcher" or "mandala" metaphor. In this sense the Klein-bottle framing of Rosen could beneficially be understood as a Klein dynamic, of which any seemingly static "bottle" might be understood as a form of **standing wave**. This is consistent with arguments for a dynamic sense of identity (*Encountering Otherness as a Waveform: in the light of a wave theory of being*, 2013; *Being a Waveform of Potential as an Experiential Choice: emergent dynamic qualities of identity and integrity*, 2013).

That exploration included discussion of the emergence of *Homo undulans* and *Homo conjugens* (*Emergence of Homo undulans -- through a "grokking" dynamic?* 2013; *Authentic Grokking: emergence of Homo conjugens*, 2003). Appropriate to this argument, according to *Wikipedia*, the Old Norse word "ragnarok" is a compound of two words. *Ragna* means "conjure" and is used metonymically to refer to beings, most notably creator-gods, who possess the power of conjuring as an attribute. The second word, *rök*, has several meanings, such as "development, origin, cause, relation, fate".

The metaphorical use of "body" by alchemy is intriguingly associated to its use of the "vessel" within which experimental processes are undertaken. As noted by Adam McLean:

There are many different forms of vessel described and depicted in the alchemical literature and emblematic engravings. There are a seeming multiplicity of forms of retort, pelicans, water baths, alembics, cucurbites, stills, etc. However, in the interior work we will find that all these different outer manifestations of the apparatus reduce to three archetypal forms -- which we can call the crucible [or *athanor*], the retort and the still (*The Alchemical Vessel as Symbol of the Soul, The Alchemy Website*)

Given the context, it is somewhat extraordinary that "vessel" is also the common descriptor of a floating container -- a ship or boat -- whereby transportation is achieved over water or through space(time). Given the symbolic preoccupations of alchemy, what might be understood as being transported? Given the "wake" engendered by such vessels (and its various connotations), more provocative is the suggestive wordplay: Is one a vessel and/or a wake? Wake also happens to be a nickname for the novel by James Joyce *Finnegans Wake* (1939) from which the term "quark" was derived by physicists (as noted above).

As an organizing template (and the best and most convenient conceptual "box"), might the significance of the above processes then be tentatively configured, using the Standard Model (or the proposed Chinese correspondence) to give:

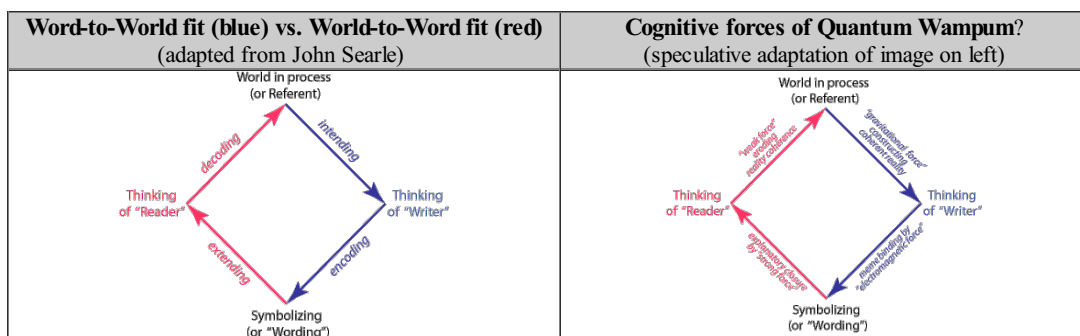
| Association of names and commentary with the pattern of tetragrams above  |   |   |  |   |  |   |   |    |
|---|---|---|--|---|--|---|---|----|
| Names of the numbered tetragrams in the sequence of the <i>T'ai Hsüan Ching</i> are given with a line of commentary, as separately discussed ( <i>9-fold Magic Square Pattern of Tao Te Ching Insights</i> , 2006). |   |   |  |   |  |   |   |    |
| 84  | <b>Differences</b> between the numbers in the neighbouring coloured cells in the table are given in the intervening rows and columns.<br><b>Totals</b> of the numbers in the coloured cells are given on the right and below. The totals for the coloured cells on the <b>diagonal</b> are given in the top right and left hand corners of the table. |   |  |   | 84   |   |   |    |
|   | <i>Lessening:</i><br>Engendering through complementarity ( <b>keeping small</b> )<br>(5)  | 3 | <i>Surrounding:</i><br>Engaging without engaging ( <b>full circle</b> )<br>(2) | 2 | <i>Obstructing:</i><br>Having been there; having done that ( <b>barrier</b> )<br>(4) | 3 | <i>Centering:</i><br>Journeying through unnamng the myriad patterns of the past ( <b>center</b> ) | 12 |

|   |    |   |   |   |     |  |     |
|---|----|---|---|---|-----|--|-----|
|   |    |   |   |   | (1) |  |     |
| 27  |    | 27  |   | 27  |     | 108  |     |
| <i>Multiplying:</i><br>Knowing when to cease making essential distinctions<br><b>(legion)</b><br>(32) | 3  | <i>Severing:</i><br>Doing "nothing" to the world<br><b>(decisiveness)</b><br>(29)         | 2 | <i>Pretending:</i><br>Using weapons, when there is no choice, with a calm, still mind<br><b>(packing)</b><br>(31) | 3   | <i>Changing:</i><br>Knowing the other, and retaining one's identity and quality<br><b>(change)</b><br>(28) | 120 |
| 18  |    | 18  |   | 18  |     | 72   |     |
| <i>Focusing:</i><br>Living the present<br><b>(penetration)</b><br>(14)                                | 3  | <i>Mistaking:</i><br>Benefiting from what is not<br><b>(divergence)</b><br>(11)           | 2 | <i>Increasing:</i><br>Governing others appropriately<br><b>(increase)</b><br>(13)                                 | 3   | <i>Praising:</i><br>Centering through learning<br><b>(defectiveness / distortion)</b><br>(10)              | 48  |
| 27  |    | 27  |   | 27  |     | 108  |     |
| <i>Befitting:</i><br>Understanding appropriateness<br><b>(response)</b><br>(41)                       | 3  | <i>Abounding:</i><br>Abiding in letting go and doing nothing<br><b>(fullness)</b><br>(38) | 2 | <i>Regulating:</i><br>Returning from weakness<br><b>(law / model)</b><br>(40)                                     | 3   | <i>Encycling:</i><br>Self-organizing of myriad things<br><b>(purity)</b><br>(37)                           | 156 |
| 92  | 12 | 80  | 8 | 88  | 12  | 336  |     |

The attribution here is necessarily tentative and for purposes of illustration -- and even possibly simply a matter of personal preferences and creativity. *Whatever Works* (2009) -- as portrayed by **Woody Allen**? Just as physics has focussed on the essentials embodied in the Standard Model, the question for the individual is what "quarks" to recognize as comprehensible within some such configuration. The question of whether a tabular configurations is appropriate to comprehension and credibility is addressed separately (*Metaphorical Geometry in Quest of Globality -- in response to global governance challenges*, 2009).

If only for the individual, the essential challenge is one of configuring, both comprehensibly and comprehensively, the quantum wampum processes -- potentially inspired by the creativity so evident in explorations by physics of the paradoxical subtleties of the Standard Model. Such explorations have implications for the collective, as discussed with respect to the work of **R. Buckminster Fuller** on *synergetics* (*Geometry of Thinking for Sustainable Global Governance: cognitive implication of synergetics*, 2009). Of particular interest in relation to the semiotic triangle above is his extensive development of the fundamental significance of triangulation -- yet to be adapted to cognitive processes (*Triangulation of Incommensurable Concepts for Global Configuration*, 2011).

In this respect, of interest is a complementary "quaternary" elaboration of the focus of the semiotic triangle by **John Searle** in terms of "direction of fit" to create a taxonomy of **illocutionary acts** (A Classification of Illocutionary Acts, *Language in Society*, 1976). The image on the left below is a rotation of the variant presented in the *Wikipedia* profile (with commentary), but with a dynamic rendering of the nodes (eg "Thought" to "Thinking"). With respect to quantum wampum, the arrows in the image on the left can be tentatively relabelled as cognitive "forces", analogous to the **four fundamental forces** or interactions that are conventionally recognized: gravitational, electromagnetic, strong nuclear, and weak nuclear.



The speculative image on the right suggests a tentative correspondence:

| Systemic correspondences between physics and "metaphysics" (tentative) |  |
|--|--|
| Physics  | "Metaphysics"  |
| Gravitational force<br>(as in the binding of the solar system)         | Cognitive force constructing coherent reality<br>(as in <b>social constructionism</b> ; <b>personal construct theory</b> ) |
| Electromagnetic force<br>(as in the binding of atoms)                  | Cognitive force binding memes<br>(as in robust <b>meme complexes</b> )   |
| Weak nuclear force<br>(as in radioactive decay)                        | Erosion of perceived coherence and meaning<br>(as in forgetting, misunderstanding, deprecation and dementia)               |
| Strong nuclear force<br>binding the nucleus of the atom                | Strong force of explanatory closure<br>(as in conceptual "lock-in", and "in-the-box" thinking )                            |

## Circulation of the light: What flows? What circulates? Cryptocurrency?

The subtle body (discussed above) could be understood more conventionally as a bounded container, whatever the number of its dimensions. As noted there, it could also be understood dynamically in terms of a standing wave. It more probably exemplifies the quadrilemma in being a case of "both and" and "neither nor" as speculatively explored (*Being Neither a-Waving Nor a-Parting: cognitive implications of wave-particle duality in the light of science and spirituality*, 2013). In whichever case, the question is what circulates "within" the subtle body -- whether or not it is that circulation which constitutes the standing wave.

**Circulation:** There is an extensive literature on the "circulation of the light", as discussed separately (*Circulation of the Light: essential metaphor of global sustainability?* 2010). This has notably been highlighted by **Carl Jung** and **Richard Wilhelm** with respect to a Chinese classic, *The Secret of the Golden Flower* (*Tai Yi Jin Hua Zong Zhi*). The Wilhelm translation is accompanied by a translation of another classic, the *Book of Consciousness and Life* (*Hui Ming Ching*) containing images indicative of the toroidal channel within which the "circulation of the light" takes place in that process. This could be considered fruitful reinforcement of the argument for a dynamic variant of the Klein bottle as indicative of the form of a subtle body.

**Mystification:** Of concern in this argument is the tendency to mystification with regard to the "light" in question, since light is so readily used as an indication of every level of subtlety. This argument can be made with respect to *ch'i* (*qi*) and its circulation, despite the appreciation in which this is held (**Ralph G. H. Siu**, *Ch'i: a neo-taoist approach to life*, Massachusetts Institute of Technology, 1974; Bing YeYoung, *The Conceptual Scheme of Chinese Philosophical Thinking: Qi*). It also applies with respect to the variants in other cultures and traditions (**Henry Corbin**, *The Man of Light in Iranian Sufism*, 1994). This mystification can of course be considered comparable to that relating to quantum reality and string theory -- meaningful as it is only the very few who argue that others can only acquire such insight through many years of effort. More provocatively however, some thought can be given to the attractiveness of "mist" and the play of light therein.

**Accessibility:** The framing offered by the argument above suggests that, rather than focus on a singular "mystical" light, there is a case for recognizing the manner in which any circulation is some kind of complex configuration of the following -- with which people naturally have a degree of meaningful, conscious relationship through the activities to which they are attracted and in which they engage:

- engaging
- embodying
- enacting / engendering
- entangling
- experiencing (existentially)
- endeavouring
- enthusing
- engineering
- experimenting

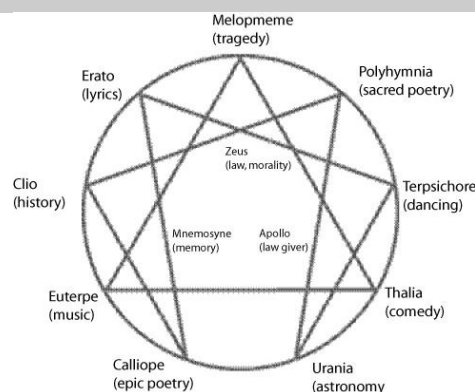
As argued, these entrain, engender or sustain even more commonly acknowledged factors such as:

- confidence / trust
- initiative
- creativity / insight
- communication
- comprehension
- elegance / attraction
- coordination / integration
- risk / daring
- imagination

**Implied subtlety:** The subtlest circulation is then effectively **implied** by those more readily recognized -- effectively qualities of *ch'i* or the like, conflated therein. Given the enthusiasm for 10 or more dimensions in string theory, arguments as to how they are "packed" and "curled up" could be applied to the elements distinguished here -- especially as dynamic processes (Rob Bryanton, *Imagining the Tenth Dimension: a new way of thinking about time and space*, Trafford Publishing, 2007). The circulation could also be compared to insight developed with respect to that of plasma in a toroidal nuclear fusion reactor, as discussed separately (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006). Potentially this can also be compared to that of the flow of concentrated attention.

**Pathways of transformational flow:** Other metaphors merit exploration with respect to what flows and where within the subtle body. This pattern of flows is extensively explored in the traditional literature on **internal alchemy** (*Neidan*) with many elusive pointers. There is a strong case for adapting the framework of **metabolic pathways** and their **mapping** -- especially given the suggestive role of "photosynthesis". Also of interest is the **enneagram pattern**, extensively discussed by **A. G. E. Blake** (*The Intelligent Enneagram*, 1996), and associated elsewhere with the set of Muses as reproduced below.

**Association of the 9 Muses to the Enneagram pattern** (tentative)  
(reproduced from *A Singable Earth Charter, EU Constitution or Global Ethic?* 2006)



**Paradox and its cognitive challenge:** Whilst arguing for a degree of accessibility through understanding of processes such as those

distinguished above, of particular importance is recognition of the paradoxical nature of their interweaving and mutual entanglement, as suggested by reference to the Klein bottle. This may well be suggested by the surprising "twists", much valued in humour, music, games, drama, dialogue, analogies, and the like (*Twistedness in Psycho-social Systems: challenge to logic, morality, leadership and personal development*, 2004; *Engaging with Questions of Higher Order: cognitive vigilance required for higher degrees of twistedness*, 2004).

The point is well made in a work by Douglas Hofstadter (*I Am a Strange Loop*, 2007). On what does such a strange loop achieve traction, and what are its collective implications as separately discussed (*Sustaining a Community of Strange Loops: comprehension and engagement through aesthetic ring transformation*, 2010)? How radical may be the cognitive challenge is also discussed separately (*World Introversion through Paracycling: global potential for living sustainably "outside-inside"*, 2013; *Implication of Indwelling Intelligence in Global Confidence-building Sustaining the construction and dynamic of psychosocial reality through questioning*, 2012).

**Humour as an indicator process:** As noted above, humour plays a vital role in psychosocial integrity through its communicability. This is especially the case where the "twist" to the humour is essentially self-referential, calling into question its very source -- as exemplified by the Middle Eastern fables of **Nasreddin** and their equivalents, of which *Wikipedia* cites as an example appropriate to this theme: *Whom do you trust?*. In a period of collapsing confidence and eroding value, an appropriate slogan might be: *Trust the twinkle in the eyes of the other -- beware the glare of arrogant authority.*

**Cryptocurrency?** With respect to the introductory concern regarding collapse of confidence, and its implications for liquidity (more generally understood as flow). The question of what circulates can also be considered more provocatively (*Primary Global Reserve Currency: the Con? Cognitive implications of a prefix for sustainable confidality*, 2011). The various references to emerging cryptocurrencies also offer the delightful suggestion that what may flow, whether for individuals or larger collectivities, may well be implied by more general understanding of the "crypto" prefix -- being an essentially secret or encoded mode of communication, already only too evident in the case of disciplines like physics or mathematics.

It is however the manner in which the cognitive processes interweave and experientially that is necessarily the secret of flow, eluding explanation -- the secret of quantum wampum.

**Deadly question:** Ragnarok effectively poses a deadly question for conventional civilization (*World Futures Conference as Catastrophic Question: from performance to morphogenesis and transformation*, 2013). It is a question which the paradoxical light of quantum wampum implies should be answered unconventionally -- otherwise. The self-referential form of a Klein bottle is suggestive of the nature of a self-answering question and of a self-questioning answer.

---

## References

Raymond Abellio. *La Structure Absolue*. Editions Gallimard, 1965.

Sandy Antal. *Wampum Denied: Procter's War of 1812*. McGill-Queen's Press, 1997

Karen Armstrong. *A Short History of Myth*. Canongate, 2006

Barbara Beaucar. From Furs and Wampum to Slot Machines and Megadollars. *Social Education*, 67, 2003, 5 [[text](#)]

A. G. E. Blake. *The Intelligent Enneagram*. Shambhala, 1996

Cyrus Townsend Brady. *The Master of Repartee*. Bibliolife, 2009.

Rob Bryanton. *Imagining the Tenth Dimension: a new way of thinking about time and space*. Trafford Publishing, 2007

A. S. Byatt. *The Myth of Ragnarok*. Knopf Canada, 2011

James P. Carse. *Finite and Infinite Games: a vision of life as play and possibility*. Free Press, 1986 [[summary](#)]

Ward Churchill. *On the Justice of Roosting Chickens: reflections on the consequences of U.S. imperial arrogance and criminality*. AK Press, 2003 [[summary](#)]

Henry Corbin. *The Man of Light in Iranian Sufism*. Omega Publications, 1994

Edward de Bono:

- *New Thinking for the New Millennium*. Penguin, 2000
- *Think! Before It's Too Late*. Random House, 2010

Heinz Duthel. *The Trilateral Commission and the New World Order "Thinking the Unthinkable"*. lulu.com, 2011

Duane Elgin. *Voluntary Simplicity: toward a way of life that is outwardly simple, inwardly rich*. Harper, 2010

Alan Feingold and Ronald Mazzella. Preliminary Validation of a Multidimensional Model of Wittiness. *Journal of Personality*, 61, 1993, 3, pp. 439-456 [[abstract](#)]

Jack Goodman and Albert Rice. *I wish I'd said that!: Being a discussion of the art of repartee by two good listeners*. Simon and Schuster, 1935.

Susantha Goonatilake. *Toward a Global Science: mining civilizational knowledge*. Indiana University Press, 1999

Angela M. Haas. Wampum as Hypertext: an American Indian intellectual tradition of multimedia theory and practice. *Studies in American Indian Literatures*, 19, 2007, 4, pp. 77-100 [[text](#)]

Douglas Hofstadter:

- I Am a Strange Loop. Basic Books, 2007
- Fluid Concepts and Creative Analogies: computer models of the fundamental mechanisms of thought. Harvester Wheatsheaf, 1995 [summary]
- Analogy as the Core of Cognition. In: Dedre Gentner, Keith Holyoak, and Boicho Kokinov (Eds.), The Analogical Mind: perspectives from cognitive science, MIT Press, 2001, pp.499-538. [text]
- Gödel, Escher, Bach: an Eternal Golden Braid. Basic Books, 1979 [summary]

Douglas Hofstadter and Emmanuel Sander. Surfaces and Essences: analogy as the fuel and fire of thinking. Basic Books, 2013

Thomas Homer-Dixon. The Upside of Down: catastrophe, creativity, and the renewal of civilization. Knopf, 2006

Matthew M. Hurley, Daniel C. Dennett and Reginald B. Adams Jr. Inside Jokes: using humor to reverse-engineer the mind. MIT Press, 2013

Mark Johnson:

- The Body in the Mind: the bodily basis of meaning, imagination, and reason. University of Chicago Press, 1987
- The Meaning of the Body: aesthetics of human understanding. University of Chicago Press, 2008

Herman Kahn. Thinking About the Unthinkable in the 1980s. Simon and Schuster, 1984

Peter Koenig. 30 Lies About Money: liberating your life, liberating your money. iUniverse, 2003.

George Lakoff and Mark Johnson. Philosophy In The Flesh: the embodied mind and its challenge to Western thought. Basic Books, 1999

Hilary Lawson. Reflexivity: the post-modern predicament. HarperCollins, 1985

John Stanley Martin. Ragnarok: an investigation into Old Norse concepts of the fate of the gods. Van Gorcum, 1972

Ernest G. McClain:

- Pythagorean Plato: prelude to the song itself. Nicolas-Hays, 1984;
- Myth of Invariance: the origins of the gods, mathematics and music from the Rg Veda to Plato. Red Wheel Weiser, 1985;
- Meditations Through the Quran: tonal images in an oral culture Red Wheel Weiser, 1981

Sallie McFague. Models of God: theology for an ecological, nuclear age. Fortress Press, 1987

John Morreall (Ed.). The Philosophy of Laughter and Humor. State University of New York Press, 1986

John Morreall. Comic Relief: a comprehensive philosophy of humor. Wiley-Blackwell, 2009

Ann E. Moyer. The Philosophers' Game: Rithmomachia in Medieval and Renaissance Europe. University of Michigan Press, 2001 [summary]

Kinhide Mushakoji. Global Issues and Interparadigmatic Dialogue; essays on multipolar politics. Albert Meynier, 1988

Roland Omnes. Quantum Philosophy: understanding and interpreting contemporary science. Princeton University Press, 1999 [summary]

Tom Peters. Re-Imagine! Business Excellence in a Disruptive Age. DK Publishing, 2003

J. Dyneley Prince. The Passamaquoddy Wampum Records. *Proceedings of the American Philosophical Society*, 36, 156, 1897, pp. 479-495 [text]

Johan Rockstrom and Anders Wijkman. Bankrupting Nature: denying our planetary boundaries. Routledge, 2013

Steven M. Rosen:

- Dreams, Death, Rebirth: a multimedia topological odyssey into alchemy's hidden dimensions. 2013 [text]
- Topologies of the Flesh: a multidimensional exploration of the lifeworld. Ohio University Press, 2006 [text]
- Dimensions of Apeiron: a topological phenomenology of space, time, and individuation. Editions Rodopi, 2004 [text]

Brian Rotman. Xenomoney. In: Signifying Nothing: the semiotics of zero. Macmillan, 1987 [text]

Geoffrey Samuel and Jay Johnston (Eds.). Religion and the Subtle Body in Asia and the West: between mind and body. Routledge, 2013

John Searle:

- A Taxonomy of Illocutionary Acts. In: K. Gunderson (Ed.), *Language, Mind, and Knowledge*, University of Minnesota Press, 1975, pp. 344-369.
- A Classification of Illocutionary Acts. *Language in Society*, 5, 1976, pp. 1-24.

Elizabeth Shapiro Peña. Wampum Production in New Netherland and New York: the historical and archeological context. Boston University, 1990

Maxine Sheets-Johnstone. The Primacy of Movement. John Benjamins, 2011

Marc Shell. Wampum and the Origins of American Money. University of Illinois. 2013 [review].

R G H Siu. Ch'i: a neo-taoist approach to life. Massachusetts Institute of Technology, 1974

Bruce R. Smith. *The Acoustic World of Early Modern England: attending to the O-Factor*. University of Chicago Press, 1999

Mark Stavish. *The Body of Light in the Western Esoteric Tradition*, 1997 [[text](#)]

Nassim Nicholas Taleb:

- *Antifragile: how to live in a world we don't understand*. Allen Lane, 2012 [[summary](#)]
- *The Black Swan: the impact of the highly improbable*. Allen Lane, 2007) [[summary](#)]

Tehanetorens. *Wampum Belts of the Iroquois*. Book Publishing, 1999

Christopher B. Teuton. *Deep Waters: the textual continuum in American Indian Literature*. University of Nebraska Press, 2010

Rene Thom:

- *Structural Stability and Morphogenesis: an outline of a general theory of models*. Benjamin, 1972
- *Morphogenèse et imaginaire. Méthodologie de l'imaginaire*, 8-9, 1978
- *Paraboles et catastrophes*. Flammarion, 1983
- *Esquisse d'une Sémiophysique: physique aristotélicienne et théorie des catastrophes*. Interéditions, 1989

Ann C. Tweedy. *From Beads to Bounty: how wampum became America's first currency -- and lost its power*. *Indian Country*, 14 January 2013 [[text](#)]

F. R. Twycross. *Approaching Ragnarok: use of Norse mythology in late Twentieth Century Scandinavian literature*. University of Edinburgh, 1998

Wolfgang Wildgen. *Catastrophe Theoretic Semantics: an elaboration and application of René Thom's theory*. John Benjamins, 1982 [[abstract](#)]

Wolfgang Wildgen and Per Aage Brandt (Eds.):

- *Semiosis and Catastrophes: René Thom's Semiotic Heritage*. Peter Lang International Academic Publishers, 2010
- *Metarepresentation, Self-Organization and Art*. Peter Lang, 2009

Robert A. Williams, Jr. *Linking Arms Together: American Indian Treaty Visions of Law and Peace, 1600-1800*. Routledge, 1997

Robert Anton Wilson. *Quantum Psychology: how brain software programs you and your world*. New Falcon Publications. 1990 [[summary](#)]

Ashbel Woodward. *Wampum: a paper presented to The Numismatic and Antiquarian Society of Philadelphia*. J. Munsell, 1878 [[text](#)]

Slavoj Žižek. *Living the End Times*. Verso, 2010



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](#).

For further updates on this site, [subscribe here](#)