



# laetus in praesens

Alternative view of segmented documents via Kairos

18 February 2019 | Draft

## Local Reality of Overcrowding -- Global Unreality of Overpopulation

### Comprehensible reframing of engagement with global issues via metaphors of proximity

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## Introduction

A set of seemingly disparate issues are curiously entangled -- whilst variously upheld as of both local and global significance, Most obvious are the attractions of migration for the desperate and the divisive impact on local communities -- possibly framed as invasion or encroachment. Global urgency is claimed as a vital necessity in response to climate change -- notably in the light of particular local disasters. Environmental degradation, pollution and loss of biodiversity are recognized as threats in their own right -- but only by some.

The global economic system is claimed to be vulnerable to imminent failure and otherwise unfit for purpose. Inequality and local economic constraints call into question any preoccupation with issues framed globally -- for those unable to meet their immediate survival needs locally. Access to resources, most obviously water, is becoming an ever more obvious concern -- whether globally or locally. Threats to personal or national security are a major preoccupation -- engendering both mutual suspicion and an accelerated arms race, with the challenge for some of full spectrum dominance.

With collapse variously anticipated, some cultivate alternative possibilities, some pursue business-as-usual, and others indulge in denial. The metaphor of rabbits on a road at night, caught in the headlights of oncoming vehicles, comes readily to mind.

The situation could be explored otherwise in the light of [proxemics](#) -- the human experience of proximity in space -- but extended beyond its immediate personal focus. Proxemics distinguishes degrees of proximity to the person -- how individual humans use the space which immediately surrounds them. If only as a metaphor, the approach can be reframed in terms of degrees of proximity to the local, with any sense of globality then being the most distant extreme.

How "close" are global issues felt to be "in reality" -- global warming, environmental degradation, etc -- especially if they are too readily sensed as distant and "unreal"? Curiously the significance of "global" can be recognized as being as elusive as that claimed with regard to the "local" implications for both deity and consensus, as argued separately (*The Consensus Delusion: mysterious attractor undermining global civilization as currently imagined*, 2011).

Proxemics could then offer clues to ways of articulating the response to threats experienced by communities locally, in contrast to those claimed to be of vital importance to the global community as a whole. Claims with regard to the latter are readily held to be unreal intellectual abstractions -- even surreal -- and therefore easily dismissed as having little experiential meaning.

There is the further possibility of a similar argument with respect to time (Karen Cerulo, *Never Saw It Coming: cultural challenges to envisioning the worst*, 2006). Otherwise explored as **chronemics**, this would distinguish between cognitive engagement with the immediate present moment, the distant past (as with deep time) or the distant future. Such distinctions would include the historical past referenced to a degree in cultural memory, as well as the anticipated future -- whether catastrophic or otherwise. The distinction explored between "overcrowding" and "overpopulation" also lends itself to interpretation in terms of the cognitive implications of information overload, whether for the individual or for civilization as a whole.

Given the lifestyle sacrifices already imposed upon many in France, the challenge could be seen as underlying the uprising there of the **Yellow Vests movement** (*Gilets Jaunes*). This has been a response to the further economic measures planned by its president, Emmanuel Macron, to ensure an "ecological transition" consistent with the **Climate Change Agreement** (*Engaging with Elusive Connectivity and Coherence*, 2018; *Multi-option Technical Facilitation of Public Debate: eliciting consensus nationally and internationally*, 2019).

How should people now be expected to sacrifice themselves for a global cause, as is increasingly promoted as a necessity in response to forthcoming disaster? Is any such expectation a "set up" characteristic of past appeals to the general population -- and despite their disastrous consequences and the evident inability to learn from them?

The argument concludes with reference to variants of a symbol fundamental to widespread understanding of governance -- and the distinction made between global and local. Most evident is that of the **ceremonial mace** central to symbolic processes associated with authority, whether in parliaments, military parades, or religious institutions -- as well as in the associated iconography. A variant is evident in the central role of the **vajra** in Hinduism, Jainism and Buddhism. Others are evident in the **symbolic baton**, staff of office, or royal sceptre. Appropriately such "mace-based governance" is now challenged from the perspective of locally marginalized "indigenous" populations, as remarkably argued by Stacie Swain (*Armed with an Eagle Feather Against the Parliamentary Mace: a discussion of discourse on indigenous sovereignty and spirituality in a settler colonial Canada, 1990-2017*, 2017).

However, rather than any emphasis on the primarily static function of the mace and its placement in such contexts, the argument stresses the dynamic implications symbolized to some degree in its use in "governance" of marching bands by a **drum major** -- celebrated metaphorically in reference to Martin Luther King. The dynamic is emphasized to an even higher degree through the art of **baton twirling**, notably by **drum majorettes**. This complex of symbols is consistent with a separate argument (*Governance as "juggling" -- Juggling as "governance": dynamics of braiding incommensurable insights for sustainable governance*, 2018).

## Urgency: requisite aesthetics for comprehension of new thinking?

The widely reported drama of the popular uprising of the "Yellow Vests" (*Gilets Jaunes*) in France at this time makes it very clear that a **"global"** perspective promoted by its president, Emmanuel Macron, is in many respects **unreal** to the people of France. At the same time, however, this is matched by the **unreality** of the **"local"** perspective as understood by the technocratically sympathetic elites who are primarily supportive of Macron. Equivalent situations are evident in other countries -- and increasingly so, as evidenced by the widespread emergence of populist movements. This can be framed as the urgent crisis of democracy.

The experiential unreality of the local is usefully explored in terms of the sense of "unplace" (John Harris, *Local communities are being silenced: we're in the age of the "Unplace"*, *The Guardian*, 12 March 2019). As indicated below, this strangely echoes the paradoxical understanding of physicists of **quantum nonlocality**, with its potential cognitive implications. The disassociation from the local lends can also be explored -- satirically -- in the light of the many strategic **trial balloons** variously proposed (*Globallooning: strategic inflation of expectations and inconsequential drift*, 2009). Efforts at reconciliation of incommensurability are evident in promotion of **glocalization**, namely the simultaneous occurrence of both universalizing and particularizing tendencies in contemporary social, political, and economic systems. The cognitive preoccupation of billions with "elsewhere" is only too evident from the use of smartphones at every moment of the day.

New approaches merit exploration in a period when it is questionable whether people can effectively engage with potential global crises which can only be presented as abstractions, whether it be climate change, systemic collapse of any kind, or overpopulation. Hence a previous argument with respect to the latter (*Prohibition of Reference to Overpopulation of the Planet*, 2018). However it can also be argued that the pressures on personal space, as locally experienced, are calling increasingly for unforeseen degrees of adaptation. To the extent that these local pressures are inexorable, undermining coping capacity, they too suggest that naming their primary manifest ion could well be usefully avoided, as previously suggested (*Prohibition of Reference to Overcrowding*, 2019).

Paradoxically, are such injunctions appropriate to the cognitive quandary which people now face personally and at the global level, as can be speculatively explored (*Lipoproblems: Developing a Strategy Omitting a Key Problem: the systemic challenge of climate change and resource issues*, 2009)?

Much is made of the "complexity" of the current situation, notably calling upon the **complexity sciences** and the insights they can offer regarding wicked problems (*Embodying Strategic Self-reference in a World Futures Conference: transcending the wicked problem engendered by projecting negativity elsewhere*, 2015). Rather than the intricacy of "complexity", the argument here is focused to a greater degree on the subtlety of the challenge to comprehension, and the degree of incomprehension to which adaptation is required (*Living with Incomprehension and Uncertainty*, 2012).

Rather than endeavouring to "grasp" cognitively the nettle of complexity, this may call for approaches otherwise inspired, notably by aesthetic considerations (*Beyond Harassment of Reality and Grasping Future Possibilities: learnings from sexual harassment as a metaphor*, 1996). The emphasis is therefore on the possibility of a complementary set of metaphors avoiding inappropriately premature closure (*In Quest of Mnemonic Catalysts -- for comprehension of complex psychosocial dynamics*, 2007).

The following argument endeavours to interweave seemingly disparate conventional modes of explanation:

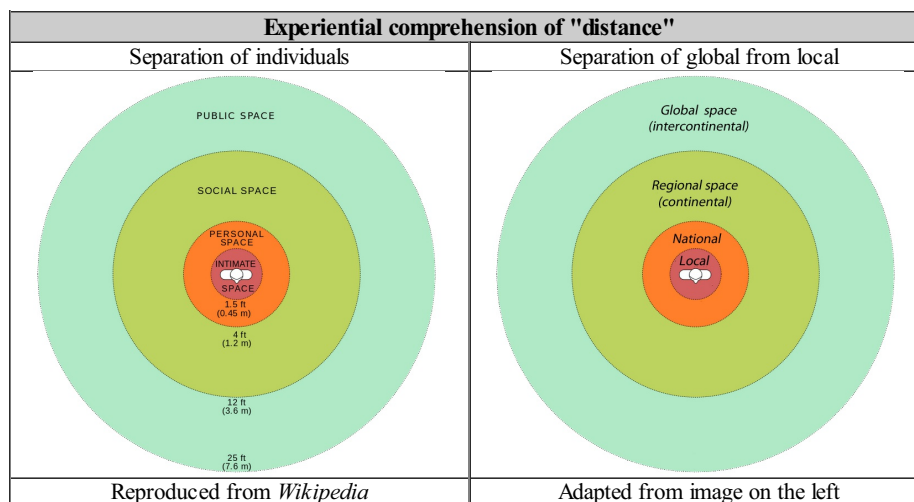
- proxemics
- existential sacrifice
- sensing
- perception and comprehension of incommensurables, exemplified by local vs global
- potentially necessary cognitive paradox
- adaptation and exaptation, in relation to resilience and innovation
- contrasting symbolic framings of governance
- participative redesign of fundamental symbols to facilitate comprehension

In the light of this argument, of particular relevance is then how any such "interweaving" can be comprehended. In concluding, the emphasis in that regard is placed on aesthetic modalities meaningful to the senses rather than on the conventions of intellectual abstraction. Given the track record of "explanation" with regard to global issues, it is appropriate to suspect that there may be poorly recognized constraints on "explanation", and its strategic value, as conventionally understood. The challenge is indeed one of "global sense-making" -- otherwise understood.

## Range: proxemics and dilution of experiential connectivity

**Intensity of connectivity:** As the human experience of degrees of proximity or closeness, an understanding of "proxemics" was first introduced by the anthropologist [Edward T. Hall](#) (*The Hidden Dimension*, 1966) and has engendered an extensive literature regarding [non-verbal engagement](#) between people. The chart on the left below depicts Hall's human interpersonal distances, and the associated spaces so defined (with an indication of radius in feet and meters).

For the purpose of this argument, an analogous chart can be suggested to reflect an understanding of the corresponding dilution of experiential connectivity and engagement -- from "local" experience to the "global" extreme. To be clear, framed in this way, the dimensions on the right are not a preoccupation of proxemics.



"Distances": The 4-fold "horizontal" distances in the image on the left are further articulated by Hall into a pattern of 8, as follows:

- **Intimate distance** for embracing, touching or whispering: close phase (less than 1 to 2 cm); far phase (15 to 46 cm)
- **Personal distance** for interactions among good friends or family: close phase (46 to 76 cm); far phase (76 to 122 cm)
- **Social distance** for interactions among acquaintances: close phase (1.2 to 2.1 m); far phase (2.1 to 3.7 m)
- **Public distance** used for public speaking: close phase (3.7 to 7.6 m); far phase (7.6 m, or more).

A set of "vertical" distances is also recognized -- as in hierarchical social structures -- possibly to be compared with the image on the right.

**Overcrowding?** Proxemics has offered a framework for consideration of forms of [crowding](#) in contrast with those more obviously associated with physical proximity. For Hall:

As more and more is learned about both men and animals, it becomes clear that the skin itself is a very unsatisfactory boundary or measuring point for crowding.

and elsewhere:

When crowding becomes too great after population buildups, interactions intensify, leading to greater and greater stress. As psychological and emotional stress builds up and tempers wear thin, subtle but powerful changes occur in the chemistry of the body. Births drop while deaths progressively increase until as state known as 'population collapse' occurs. Such cycles of build-up and collapse are now generally recognized as normal for the warm-blooded vertebrates and possibly for all life. Contrary to popular belief, the food supply is only indirectly involved in these cycles. (As cited by Dave Pollard, *More Unpalatable Thoughts*)

on *Overpopulation, How to Save the World*, 13 February 2004).

Cross-cultural comparisons have been explored (Agnieszka Sorokowska, et al, *Preferred Interpersonal Distances: a global comparison, Journal of Cross-Cultural Psychology*, 48, 2017, 4; O. Watson, *Proxemic Behavior: a cross-cultural study*, 1970). However Gary W. Evans, et al, argue that:

It is widely believed that cultures vary in their tolerance for crowding. There is, however, little evidence to substantiate this belief, coupled with serious shortcomings in the extant literature. Tolerance for crowding has been confused with cultural differences in personal space preferences along with perceived crowding. (*Cross-Cultural Differences in Tolerance for Crowding: fact or fiction? Journal of Personality and Social Psychology*, 79, 2000, 2, pp. 204-210).

The authors conclude that:

- First, we should be careful not to equate perceived crowding with psychological health impacts of high density living.
- Second, from a policy perspective, it is misguided to presuppose that some cultural groups can better tolerate high-density living space, as advocated by some planners

Crowding, in contrast to "overcrowding" can even be understood as a beneficial intensification of human interaction (Jonathan Freedman, *Crowding and Behavior: the psychology of high-density living*, 1975; Susan Saegert, *Effects of spatial and social density on arousal, mood and social orientation*, University of Michigan, 1974; Wendy Schuman, *Crowding: Is It Always Harmful?; No, New Behavioral Studies Indicate, There Are Times When It May Even Be Good*, *The New York Times*, 30 January 1977).

"Global" engagement? Hall's distinctions offer a means of framing degrees of "closeness" or "intimacy", for which "connectivity" is another experiential descriptor. This can be usefully understood in the light of the argument of Tamara Trowsell, et al (*Recrafting International Relations through Relationality, E-International Relations*, 8 January 2019):

How we relate to others should be a central concern of the field of International Relations. However, independent political communities -- states -- and their interrelations have historically been the focus of the discipline of International Relations (IR), thus limiting the forms of interaction that potentially constitute the field.

The image on the right above then frames the question as to how close is "local" to be experienced in contrast with "global" -- a matter of increasing importance to many in promoting the credibility of local initiatives and the motivation they can engender.

The question is of some relevance to the experience of those promoting global strategies, who may identify themselves as "global citizens", perhaps to be understood in terms of calls for "global citizenship" (Sharon B. Cohen, *Proxemics and Personal Space: Global Citizens What is your Comfort Zone?* 2013).

Any such labelling is of course problematic in the context of this argument in which it is the nature and quality of the engagement experienced which is of relevance -- a consideration to be distinguished from the attribution of labels and definitions. **The quest here is for greater clarity on the nature of local engagement as it may be distinguished from the many urgent appeals for engagement with the problematic conditions of those elsewhere**, or with the global condition as a whole. What does "engagement" mean from that perspective?

As noted by Roland Barthes:

Polemics belong to a typology of subjective spaces in that the subject inhabits them affectively (*How to Live Together: novelistic simulations of some everyday spaces*. Columbia University Press, 2013 p. 111)

The adaptation of proxemics to local-global, suggests a further adaptation -- potentially of wider implication. The distinction specific-general can be explored with respect to knowledge and information. The "reality" of specific information can be readily recognized -- in contrast with the "unreality" of generality. Of greater interest however is the insight offered by the distinctive "distances" of proxemics. Corresponding distances can be recognized with regard to references in an argument, especially those of "global" generality being "a link too far".

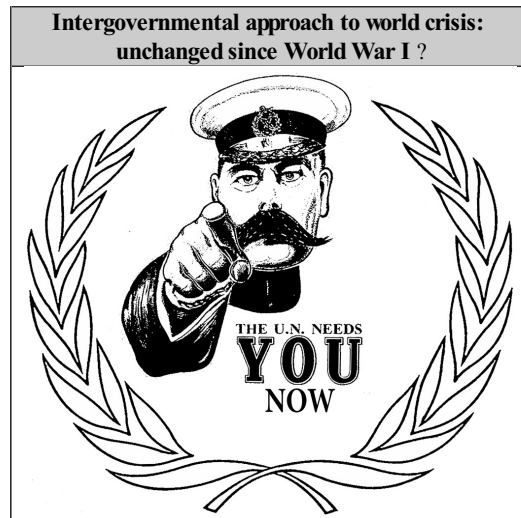
This can be explored in the light of the experiential meaninglessness of the "small world hypothesis" (*Are There Really Six Degrees of Separation Between Everyone?* 28 January 2019). Other "distance constraints" on meaning are evident from Dunbar's number, the Miller number, the Spreadthink number, the Span of control, and the Hayflick limit (*Comprehension of Numbers Challenging Global Civilization*, 2014). The Erdős number, in which mathematicians indulge, offers a related perspective. Others can be speculatively explored (*Zen of Facticity: Bull, Ox or Otherwise? Herding facts and their alternatives in a post-truth-era*, 2017; *Imminent Collective Communication "Info-death"? Collapse of global civilization understood otherwise*, 2018).

## Sacrifice: as organized by "generals"?

**Calls to sacrifice?** Can the question of engagement be provocatively focused through a sense of the willingness for personal "sacrifice" in defence of a local community, in defence of a nation, in defence of a region, or in defence of the globe? Ironically the term engagement is central to the military understanding of the encounter with an enemy -- as governed by "rules of engagement". These define the circumstances, conditions, degree, and manner in which the use of force, or actions which might be construed as

provocative, may be applied.

Eliciting willingness for personal sacrifice has of course been a continuing theme in relation to the defence of the homeland in warfare between nations. The manner in which that willingness has been evoked, most notably with respect to the slaughter of World War I [trench warfare](#), is now seen as manipulative, if necessarily so (*Has history misjudged the generals of World War One?* BBC; *Why were journalists threatened with execution in WWI?* BBC).



Is there current relevance to the tragically perverse combination above of the mobilization icon of World War I with the traditional [laurel wreath](#) favoured by the United Nations and its Agencies (*Game-playing, bull-leaping and laurel wreaths*, 2014)?

**"Generals" of today?** Who are the "generals", endowed with a global strategic perspective, now framing the need for such sacrifice by so many -- a century after World War I? The image above featured in an early commentary on the questionable strategic philosophy of the generals at this time (*Mobilization for Alienation vs. Catalysis for Participation the critical choice for the United Nations system, International Associations*, 25, 1973). Have the generals failed to learn, as separately queried (*Transforming the Unsustainable Cost of General Education: strategic insights from Afghanistan*, 2009).

Given the World War I injunction (as adapted above), there is a perverse historical irony to the more recent appointment of a UN Secretary-General Envoy for Youth, [Ahmad Alhendawi](#), with the announcement: *Young people! the UN needs you now more than ever!* (*UN News*, 29 April 2013).

Is the framing offered at this time to be understood as comparable to that of the leadership in World War I:

- as by the [Group of 7](#), as previously discussed (*Group of 7 Dwarfs: Future-blind and Warning-deaf -- self-righteous immoral imperative enabling future human sacrifice*, 2018)?
- as by the [Group of 20](#) (*Framing the Global Future by Ignoring Alternatives: unfreezing categories as a vital necessity*, 2009; *Considering All the Strategic Options -- Whilst ignoring alternatives and disclaiming cognitive protectionism*, 2009)?
- as by the [World Economic Forum](#) at the time of writing (Jack Rasmus, *Global Economy on the Brink as Davos Crowd Parties On*, *Global Research*, 23 January 2019).
- as by the world's wealthiest elites (*World's 26 richest people own as much as poorest 50%, says Oxfam*, *The Guardian*, 21 January 2019)?
- as by the [Club of Rome](#) ([Ernst von Weizsaecker](#) and [Anders Wijkman](#), *Come On! Capitalism, Short-termism, Population and the Destruction of the Planet*, 2018), as separately reviewed (*Exhortation to We the Peoples from the Club of Rome*, 2018)?
- as by the [Parliament of the World's Religions](#) as the epitome of interfaith reconciliation between religions engendering conflict world wide -- of significance to be variously understood (Wayne Teasdale and George Cairns, *Community of Religions: voices and images of the Parliament of the World's Religions*, 1996)?
- as by the [International Science Council](#), in creating a "unified, global voice for science", directing "its voice both externally on issues of major public relevance, and internally, on matters that support effective scientific responses, particularly where new knowledge, capacities, resources or ways of working are needed", and in "developing agendas for priority action"?

Given the leadership roles assumed in each case -- faced with the condition of global society, and notably with respect to religion and science -- especially pertinent are the questions avoided by their respective framings (*Metascience Enabling Upgrades to the Scientific Process*, 2014; *Learnings for the Future of Inter-Faith Dialogue*, 1993; *Knowledge Processes Neglected by Science: insights from the crisis of science and belief*, 2012).

The leadership implied in each case could be said to be remarkably lacking in self-reflexive capacity, highlighted in another instance by [James Hillman](#) and [Michael Ventura](#) (*We've Had a Hundred Years of Psychotherapy - And the World's Getting Worse*, 1993). From this perspective, is it probable that leadership might now fail an analogue of the [mirror self-recognition test](#) as implied by the argument of [John Ralston Saul](#) (*The Unconscious Civilization*, 1995)?

How indeed should people be expected to sacrifice themselves for a global cause, as is now promoted as a necessity in response to forthcoming disaster (*We have 12 years to limit climate change catastrophe, warns UN*, *The Guardian*, 8 October 2018; *Habitat loss threatens all our futures, world leaders warned*, *The Guardian*, 17 November 2018)?

Should such a question be explored otherwise?

## Attraction: sensual proximity and evocation of engagement

**Requisite number of senses?** Edward Hall showed a negative correlation between the number of senses involved in the awareness of the other and the proxemic distance between the subjects -- with the more senses involved, the smaller the distance (and vice versa). This might be represented as follows.

	taste	touch	smell	sound	sight
Intimate distance (affective or aggressive situations)	x	x	x	x	x
Personal distance (a degree of mutual trust)		x	x	x	x
Social distance (exchange of information with minimal trust)				x	x
Public distance				x	x

The question is how this might translate from the distance, which is a preoccupation of proxemics, to engagement of greater range along the local-global dimension -- namely the engagement with distant others elsewhere.

Personal-Public	Shortest range		Medium range	Longer range		Local-Global
	taste	touch	odour/smell	hearing/sound	sight	
Intimate distance (affective or aggressive situations)	X	X	X	X	X	Local (compassion?)
Personal distance (a degree of mutual trust)	O	X	X	X	X	National (sympathy?)
Social distance (exchange of information with minimal trust)	O	O	O	X	X	Regional (recognition?)
Public distance	O	O	O	X	X	Global (?)

Of some relevance is the management of news -- traditionally "[column inches](#)" -- in the news media. There is a widely recognized unwritten law regarding the framing of coverage in terms of "proximity". Thus a single death within a country may evoke headlines for days, with many hours of broadcast media, whereas a 100 or a 1000 deaths elsewhere ("around the globe") may be understood to merit little more than a passing comment, if at all (Josh Greenberg and T. Joseph Scanlon, *Old Media, New Media, and the Complex Story of Disasters*, *Natural Hazard Science*, July 2016; *Humanitarian media coverage in the digital age*, *World Disasters Report*, 2005). Especially problematic in this respect is the effort to use individual human tragedy as a means of evoking sympathy when repeated exposure may rapidly engender so-called [psychic numbing](#) (*Starvation Imagery as Humanitarian Trump Card? Counterproductive emotional blackmail engendering worldwide indifference*, 2016; Paul Slovic, *Psychic Numbing and Genocide*, *American Psychological Associations*, November 2007; David Hicks and Andy Bord, *Learning about Global Issues: why most educators only make things worse*, *Environmental Education Research*, 2001).

As presented in the above table, the senses can be understood as each having a distinctive maximum range of sensitivity -- with that of taste being the most localized. Clearly, via the media, that of sight and sound can be extended -- even globally.

**Sense metaphors in policy-making and engagement:** What does it then take to evoke global engagement? How might governance be understood as "coming to its senses" -- **if that does not include the engagement of the other senses associated with shorter ranges?**

One way of exploring this question is through the manner in which each sense is exploited metaphorically in the policy-making process, especially nationally, regionally and globally (*Metaphor and the Language of Futures*, *Futures*, 1992). With respect to "sensing the future", the latter distinguishes between the significance attributed to [foresight](#) and [foretaste](#), relative to that potentially attributed to "forehearing", "foresmell", and "foretouch".

The conventional tendency, **framing policy in terms of vision may well be totally inadequate to global engagement** and any understanding of "mobilization".

With its greater range, far greater use is of course made of the vision metaphor, with the questionable assumption that this evokes the necessary imaginative engagement (*Metaphors of Vision*, *Metaphors in American Politics*, 20 October 2014). By contrast "hearing" -- of lesser range -- is already somewhat problematic, especially when it is argued that it does not necessarily follow from the process of "listening", notably now widely practiced by authorities through surveillance technology -- a point much stressed with respect to the Yellow Vests uprising in France.

**Shock and fear:** It is of course the case that public relations uses metaphors associated with the other senses as a means of evoking disgust and the need for action. Gadhafi was alleged to fart frequently in the presence of visitors (*Muammar Gaddafi Farts During Interview*, *YouTube*, 9 March 2011). Similar characteristics were similarly evoked with respect to Saddam Hussein. Standard pattern? Repugnant, but unconstrained by any sense of fake news?

Another way of exploring this question is through the experiential depth of the sense of shock -- as corresponding (potentially negatively)

to the engagement of existentially intimate experience.

- **Sight:** as of horrific displays of dead bodies, of pictures of the starving, of slum conditions, and general ugliness -- all so readily conveyed by the media from anywhere on the globe. There is of course a considerable degree of insulation from any sense of shock and exposure to the sight of fearful others. It is easy to "switch channels". More problematic is the degree to which violence and torture -- evoking such fear -- are such a regular feature of entertainment, if not vital to attracting an audience. It is readily comprehensible that people become inured to horrific conditions, a condition of [psychic numbing](#) offering protection from the shock of thousands of deaths -- if not millions. Use of such imagery to evoke engagement is therefore of questionable effect, other than to further reinforce such numbing (*Starvation Imagery as Humanitarian Trump Card? Counterproductive emotional blackmail engendering worldwide indifference*, 2016; *Systematic Humanitarian Blackmail via Aquarius? Confronting Europe with a Humanitarian Trojan Horse*, 2018).
- **Sound/Listening/Hearing:** There is of course the process through which people are shocked to hear of conditions elsewhere -- and the process through which authorities listen to complaints regarding those conditions. The volume associated with any such distress conveyed by the media can be readily decreased to the point at which it becomes inaudible. The situation is different when the sound is experienced in the local vicinity -- of violence, fear and torture. A different degree of shock may then be evoked, whether or not it triggers engagement. Whether conveyed from around the world by the media, or not, again there is the degree to which people become inured to sounds which might otherwise be considered repulsive -- as exemplified by painful cries, traffic and factory noise, shrieking neighbours, or noisy companions in shared accommodation.
- **Odour/Smell:** Consistent with the far more limited range of this sense, the media are currently incapable of evoking shock through the experience of odour. This is however obvious in the case of exposure to some forms of pollution, as increasingly experienced in urban environments. It is far more dramatic in its effect through exposure to the stench of slums and refugee camps lacking sanitation. It is only too obvious in the case of exposure to dead bodies, especially those decaying at the roadside for lack of appropriate facilities and resources. The cooking smells of neighbours may be experienced as repugnant, as with body odour. Although significant when used as a metaphor, stench lacks currency, even when associated with that of corruption. However "foetid", this seldom evokes collective shock and engagement -- nor does the "smell of fear". These effects are to be contrasted with the overriding instinctual attraction evoked by [pheromones](#) -- unfortunately also recognized in the attraction evoked by any possibility of exploitation
- **Touch:** Readily understood as of very limited range, touch is most likely to evoke reaction when experienced as "pressure" which may well be "intangible" -- a form of psychic touch. In collective discourse, this necessarily has little weight and does not readily lend itself to description. People and authorities may claim well not to be "touched" by events otherwise held to be shocking. Reaction may however be evoked when sensitive territorial boundaries are "touched", most obviously as with the provocation of some military exercises. Such sensitivity may however be extended to far more subtle boundaries associated with correspondingly subtle territories -- as with those of status, disciplines and religions, whose encroachment may evoke fear. However the sensitivity to touch has acquired far wider significance through issues of sexual harassment -- notably under conditions of overcrowding in public transport ([frotteurs](#), etc). That said, it far from clear how this translates into engagement with the abstractions of global challenges -- by which people cannot obviously be said to be "touched".
- **Taste:** Associated as it is with the most intimate interpersonal relations, the role of taste in a sociopolitical context is curiously constrained by political correctness. The taste of any other group cannot be readily called into question -- even in a local context. This diffidence is notably evident in the arts, despite desperate efforts to distinguish "good taste" from "bad taste". At the same time, however, taste (whatever the preferences) is associated with the highest human values and is held to be fundamental to aspirations to enhanced quality of life -- in contrast to those whose lives are lived with the continuous "taste" of fear. Few would find it in their interest to label the leader of the free world as the epitome of bad taste (Shelley Park, *Trump is Gross: Taking Political Taste (and Distaste) Seriously*, *Kennedy Institute of Ethics Journal*, 2016). As a possible antithesis to "taste" is somewhat extraordinary that "gross" should be central to national economic endeavour (*Evaluating the Grossness of Gross Domestic Product*, 2016).

The examples above highlight problematic experiences offered by the senses. Less evident, given the range of the most personally meaningful, is how these might engender global engagement and mobilization -- despite the shocking nature of their noisome repulsiveness. A contrast could be made between:

- "begging" as a process into which many are increasingly forced, and to which many are increasingly exposed (*Confusion in Exchanging "Something" for "Nothing": cognitive implication in the asymmetrical processes of begging and its surrogates*, 2015). The global need for aid, and the obvious vulnerability of such assistance, merit reflection in this light.
- "overheating" as the primary feature of climate change is curiously relevant as a metaphor for the increasingly "overheated discourse" both globally and locally (*Climate Change as a Metaphor of Social Change: systemic implications of emissions, ozone, sunlight, greenhouse and overheating*, 2008)

**Global attraction:** As implied, the senses also offer attractive possibilities. It is therefore curious to note the extent to which public relations and advertising endeavour to reframe the experiences of the least tangible experiences. This is perhaps most obvious in the case of odour -- when the "stench" of some initiatives is "deodorised" and "perfumed" in metaphorical terms. Efforts are made to ensure that people are "touched" by imagery in order to evoke a desired response to tragedy and opportunity. Initiatives are positioned as the epitome of "taste". It is however unclear, despite promotional packages, how these can attract engagement to global initiatives.

It can be argued that public relations now endeavours to filter reality such as to construct a "filter bubble" precluding any evocation of a strategic response to the complexity of problematic conditions. This can be recognized in the widely cultivated tendency to so-called cocooning, as documented by Faith Popcorn (*The Popcorn Report*, 1992). Curiously this recalls the "bubble" within which the father of Buddha endeavoured to protect his son -- as featured in the classic tale of his upbringing. A modern critique is offered by Barbara Ehrenreich (*Bright-sided: how the relentless promotion of positive thinking has undermined America*, 2009).

Protection from a world "overpopulated" with problems is however matched by the increasing degree of exposure to the reality of "overcrowding" -- whether with respect to accommodation and sleeping arrangements, transportation, entertainment, tourism and experience of the environment.

## Local "force" vs Global "gravity" -- or the reverse?

A curiously favoured metaphor for the planetary challenge is the "gravity" of the global situation, accompanied by increasing recognition of the need to engage the "force" of local community action. The choices may be less than appropriate, or more subtly related, than as most readily understood.

The most recent report on the evolving global crisis by the Institute for Public Policy Research (*This Is a Crisis: facing up to the Age of Environmental Breakdown -- Initial report*, 2019), has been announced by Roger Harrabin with the comment:

Politicians and policymakers have failed to grasp the gravity of the environmental crisis facing the Earth, a report claims. (*Environment in multiple crises - report*. BBC, 12 February 2019)

It should be emphasized that, consistent with the preoccupation of this argument, rather than "explanation" and "definition" alone, the concern here is with how people choose to frame their experience of "local" and "global", most obviously through metaphors which carry a degree of intuitive comprehension of complexity. There is a case for recognizing the contribution of aesthetic insight to the manner in which both local and global are distinguished. This follows from the argument of biologist/anthropologist Gregory Bateson in explaining why "we are our own metaphor", as pointed out to a conference on the effects of conscious purpose on human adaptation that:

One reason why poetry is important for finding out about the world is because in poetry a set of relationships get mapped onto a level of diversity in us that we don't ordinarily have access to. We bring it out in poetry. We can give to each other in poetry the access to a set of relationships in the other person and in the world that we are not usually conscious of in ourselves. So we need poetry as knowledge about the world and about ourselves, because of this mapping from complexity to complexity. (Cited by Mary Catherine Bateson, 1972, pp. 288-9)

**Inverse square law?** In a period in which techno-optimists make much of the future role of robots, artificial intelligence, and even of the global brain, the problematic implications for global civilization are skillfully circumnavigated with some exceptions (John Brockman (Ed.), *Possible Minds: 25 Ways of Looking at AI*, 2019). Ironically it could be argued that the impact of "artificial intelligence" has been to a large extent prefigured by the mindset of bureaucrats and conventional decision-makers operating according to "programs" variously pre-scripted -- with consequences already evident. Using a Turing test, has it already become impossible to distinguish between a robot and a bureaucrat or policy-maker -- in a professional capacity?

However, of curious relevance to the above argument is a degree of recognition of the role of proxemics as it applies to human-robot interaction.

One paper posits that proxemic behaviors can be modeled as a single continuous scaling function which captures the change across three of the proximity zones. This is understood as similar to the inverse-square law from physics, which captures and understanding of gravitational pull (Zachary Henkel, et al, *Evaluation of Proxemic Scaling Functions for Social Robotics*, *IEEE Transactions on Human-Machine Systems* 44, 2014, 3)

Reference to the inverse-square law is indeed a helpful way of generalizing Edward Hall's distinctions of interpersonal distances. It is consistent with recognition of a variety of gravity models by the psychosocial sciences. As used however, such gravity models are applied to what are essentially local conditions -- distance from a supermarket in a consumer catchment area. It is appropriate to ask whether the "consumption" thereby achieved offers (as more generally understood) the required insight for global engagement.

Tentative indication of distinctive forms of (over)consumption		
Sense	Consumption characteristic of a particular sense	Overloading
taste	gustatory pleasures, and metaphors thereof	experienced in terms of surfeit
touch	feeling ("impressions"), and metaphors thereof	experienced in terms of the stress of multiple pressures, arising from the competitive quest for "impact"
smell	odour (perfume), and metaphors thereof	typically framed as "rich", whether appreciatively or not
hearing	sound (music), and metaphors thereof	experienced in terms of excessive volume and possibly cacophony
sight	views (beauty, perspectives). and metaphors thereof	experienced as clutter and confusion (visual crowding), if not as appreciation of variety

Such a gravity model could even be understood as reinforcing a "flat earth" understanding of a global civilization (*Irresponsible Dependence on a Flat Earth Mentality -- in response to global governance challenges*, 2008). The latter constituted a critique of *The World Is Flat* (2005), by Thomas L. Friedman, which was given the first *Financial Times and Goldman Sachs Business Book of the Year Award* in 2005. The award recognizes one business book that provides 'the most compelling and enjoyable insight into modern business issues, including management, finance and economics. Friedman subsequently produced a book whose title is relevant to this argument (*Hot, Flat, and Crowded*, 2008)

Is there an unfortunate use of the "wrong geometry" in addressing the global challenge? The discipline for World War I involved parading on the "square ground". The most distinguished general of that war was Field Marshal Douglas Haig, a Scottish Freemason who would have been profoundly influenced by its framing of "on the square". There is the further suggestion that the geometry of a two-dimensional **surface** is primarily associated with squared parameters, whereas that of the globe (as a sphere) is primarily associated with cubed parameters relevant to its three-dimensional **volume**.

Such a critique can be taken further through the occasional caricature of the vehicle of conventional governance as having "square wheels" (*Reframing the Square Wheels of Global Governance: transcending vain hopes of squaring the circle in global decision-making*, 2017). In these critical times, are the metaphorical implications of strategic "plans" and "planning" themselves inappropriate for the three-dimensionality of the globe, however relevant they may be to two-dimensional surfaces, as can be more speculatively argued (*Adhering to God's Plan in a Global Society: serious problems framed by the Pope from a transfinite perspective*, 2014)?

**Inverse cube law?** It could therefore be asked whether an inverse cube law offers richer insight. Such a law applies to "force" rather than to "gravity", as extensively explained by John Baez (*The Inverse Cube Force Law*, *Azimuth*, 30 August 2015). If the requisite global engagement is better explored in terms of force, then the quest might indeed be for "**Global force -- Local gravity**", the reverse of the subtitle of this section. Gravity may indeed be experienced, but this is arguably inadequate to the challenge.

Appropriate to this development of the proxemics argument, in its entry on Edward Hall in the *Hmolpedia* (4, pp. 2174-5), he is cited to the effect that:

Like gravity, the influence of two bodies on each other is inversely proportional not only to the square of the distance **but possibly even the cube of the distance between them**. (1966, p. 129; emphasis added)

The commentary argues further:

In equation form, Hall seems to be giving the following estimate of the measure of the force between humans and animals or what seems to be social gravity: where GS is the social gravity, d is the distance between the two people or animals, and n is a number between 2 and 3.

$$G_S \propto \frac{1}{d^n}$$

Hall explains this logic in terms of his "invisible bubbles" theory and compressed social stress:

If one sees man surrounded by a series of invisible bubbles which have measurable dimensions, architecture can be seen in a new light. It is then possible to conceive that people can be cramped by the spaces in which they have to live and work. They may find themselves forced into behavior, relationships, or emotional outlets that are overly stressful. **When stress increases, sensitivity to crowding rises --- people get more on edge --- so that more and more space is required as less and less is available**. (emphasis added)

The adjacent numbers give some example calculation of what Hall is saying here. In other words, if for example you get in someone's face, at a distance of 0.5 meters, the force may increase at a rate proportional to the inverse cube (8 newtons of force) of the distance rather than the inverse square (4 newtons of force) of the distance, according to Hall's intuitive estimates.

	$G_S \propto \frac{1}{d^2}$ $G_S \propto \frac{1}{d^3}$	
d = 3 m	0.11 N	0.04 N
d = 0.5 m	4 N	8 N

To give a comparative example, magnetic field strength is often described as diminishing inversely proportional to the square of the distance; but one will often hear descriptions that the field strength is inversely proportional to the cube of the distance from the surface of the magnet. It depends on the source of the field and how close you are to it.

It is appropriate to note the extent to which particularly significant interpersonal relations may be described as "magnetic" and related to proximity. This features in a model of the human space within which a person is felt to be centered (Rory John Bufacchi, *Understanding defensive peripersonal space through mathematical modelling*, Thesis, 2018) noting that:

Take as an example the magnetic field strength around a magnet. It falls off as the inverse cube of distance from the magnet. It is because of this large rate of change that when holding a magnetic object and approaching a magnet, we perceive a 'boundary' defining the area where we start feeling the attractive force exerted by the magnet.

## Scale: power laws exemplified by the square-cube law

Although clearly meriting consideration, it is less evident from the literature how the above concerns above are related to the so-called [square-cube law](#). As noted by Pierpaolo Andriani and Bill McKelvey:

Galileo's square-cube law is the oldest recognized cause of scale-free dynamics and power law outcomes. In a study of 46 single-community societies, Carneiro (1987) shows that many villages never exceed a relatively small size because their organizing ability does not keep up with the volume of their population. The square-cube law limits their size unless they develop what he terms structural complexity, which allows their organizing ability (the square) to keep up with population (the cube). As their population grows, villages face a stark choice: split or evolve. By splitting they get their population volume back down into a proper relationship with their organizing ability. By evolving they develop additional complexity traits (Carneiro's term) that give them the organizing capability to cope with larger population. (*Beyond Gaussian Averages: redirecting international business and management research toward extreme events and power laws*, *Journal of International Business Studies*, 38, 2007, pp. 1212-1230)

The authors argue:

Could it be that findings from journal articles legitimated by statistical significance based on Gaussian assumptions and statistics are mistaken, and the derived advice to managers is at odds with reality? We believe the time has come to work toward a different, but equally legitimate, research and teaching approach.... Power law phenomena call for scale-free theories because the same cause and explanation apply to each of the different levels...

To the extent that interdependence applies, researchers ignoring power law effects risk drawing false conclusions in their articles and promulgating inaccurate advice to managers. This because managers increasingly work in surroundings prone to Paretian extremes, not Gaussian averages. Given this, we raise the question: How can we redirect management research toward the study of extremes in ways that still fall within the bounds of an effective science - one that still offers credible bases for asserting truth claims?

Physical, biological, social, organizational, and electronic systems show an impressive variety of power law phenomena (Kaye, 1993). We list 80 kinds of power laws ranging from atoms to galaxies, DNA to species, and networks to wars...

Gaussian and Pareto distributions differ radically. The Gaussian distribution is reliably characterized by its stable mean and finite variance (Greene, 2002). A Pareto distribution doesn't show a well-behaved mean or variance. A power law therefore has no 'average' that can be assumed to represent the typical features of the distribution, and no finite variance upon which to base confidence intervals (Moss, 2002). The dream of social science - of building robust frameworks that allow prediction - is shattered by the absence of statistical regularities in phenomena dominated by persistent interconnectivity.

The practices of (1) searching for the mean so as to conveniently summarize the nature of a phenomenon without attending to the full range of its nature, (2) relying on variance to build confidence intervals and therefore assess the likelihood of single events, and -- even more damaging (3) the habit of excluding outlying events all become misleading or openly wrong in a Paretian world. We need methods and statistics that include extremes rather than assume them away!

The authors apply their insights to organization, most obviously to corporations (*Perspective: From Gaussian to Paretian Thinking: causes and implications of power laws in organizations*, *Organization Science*, 20, 2009, 6; *From Skew Distributions to Power-law Science*, In: Peter Allen (Ed.), *The Sage Handbook of Complexity and Management*, 2011):

- First, the ubiquity of Pareto distributions across all types of distributions within social sciences is striking
- Second, although we claim that in most cases Gaussian statistics represents a reductionist attempt to oversimplify reality and provides only 'an illusion of control' (Makridakis et al., 2009), the alternative we have - Paretian statistics and Paretian analytical tools - is nowhere near the Gaussian option in terms of sophistication and 'user-acceptance'.
- Third, we need to develop rules to understand when a certain social problem is more likely to be approximated via a Gaussian vs. Paretian approach.
- Fourth, a low hanging fruit for PL oriented management researchers is the topic of resilience of organizations
- Fifth, PLs can be used as indicators of self-organizing dynamics. In general, the presumption is that healthy ecosystems are self-organizing and therefore exhibit PL
- Sixth, the occurrence of PLs is explained by SF theories; we have listed a few in Table 15.1 - they come from physics, biology and social science. SF theories offer the promise of explaining extreme outcomes and reducing the fragmenting effect of social science disciplines on organizational research. Discipline-centric researchers may dislike this consequence; discipline-neutral researchers will see research advantages and practitioner relevance.
- Seventh, research on extreme events can profit from PLS. [Scale Free] theories may provide the key to differentiate between scalable and non-scalable TIEs. Andriani and McKelvey (2010) highlight the phrase, 'You can't see what you aren't looking for'. The potential contribution to strategy and entrepreneurship deriving from the identification of butterfly-levers before extreme events occur is significant.

# Human potential: via mysterious coupling of extremes?

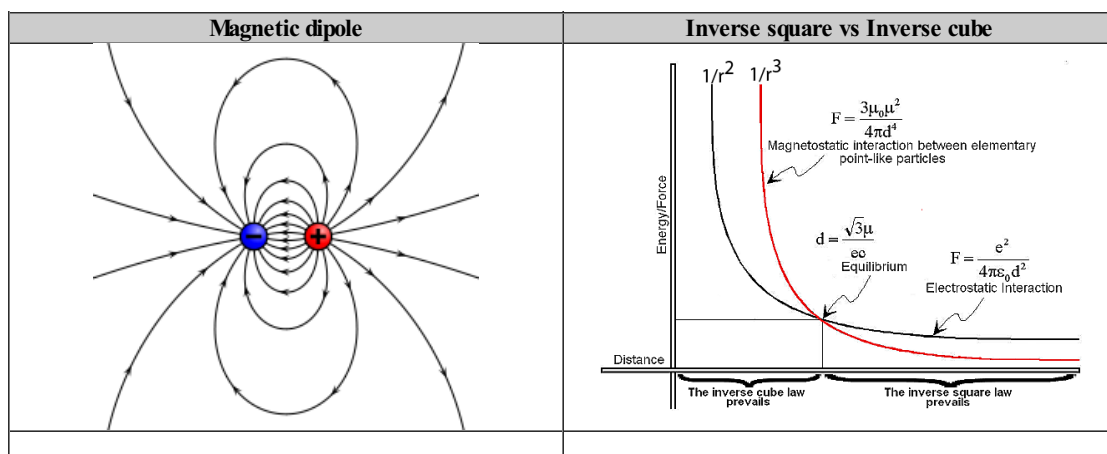
It is useful to consider the possibility that any relation between local and global may indeed be more complex than is readily assumed -- if only, or especially, in cognitive terms. The challenge has been evident in the late acceptance of the Earth as a sphere moving in relation to the Sun. It is even more explicit in the attempts to reconcile the dynamics of local and global sociopolitical preoccupations. How are the many local perspectives to be understood as "moving" in relation to a global frame of reference? The insights offered by the inverse cube law, and its subtleties, help to frame exploration of requisite complexity.

**Light?** A good starting point is in the response to why the inverse square law -- the more obviously comprehensible pattern locally -- is not sufficient in regard to global frameworks. The relevant distinctions can be made with respect to electromagnetism of which light is perhaps the most valuable example -- especially given its metaphorical associations with comprehension.

A light wave composed of both an electric field and a magnetic field. Both are governed by the fact that the magnetic and electric field intensities drops as  $1/r$ , where  $r$  is the distance away from the source. What diminishes as  $1/r^2$  -- according to the inverse square law -- is the power of the light. The power of the light is related to the electric field intensity times the magnetic field intensity. Because both diminish as  $1/r$ , this results in  $(1/r) \times (1/r) = 1/r^2$ .

The cubic behavior of fields depends on the source of the field. A radio wave, just like light, usually gets launched by an antenna. Far away from the antenna the field behaves as expected with the power of the radio wave diminishing as  $1/r^2$  -- termed "far field" behaviour. Near the antenna, the fields behave in a much more complex manner (called the "near field" behavior). Some of the fields will "cling" close to the antenna and not radiate. These are not evident in the far field, and thus it is then reasonable to use the inverse square law. Near the antenna, the field behavior, both electric and magnetic, can have inverse cubic behaviour as  $1/r^3$ .

**Magnetism?** Magnetic structures are different. Unlike positive or negative charged particles, a North pole or South pole does not exist by itself. They must necessarily come in pairs as **magnetic dipoles**, namely two opposite charges of equal magnitude fairly close together. No magnetic monopoles have yet been found. In this case the field drops off rapidly away from the magnet, so that it is the near field conditions which call for particular consideration. The far field conditions can be understood as following the inverse square law ( $1/r^2$ ), whereas the near field conditions are best understood in terms of the inverse cube law ( $1/r^3$ ). The **magnetic dipole moment** of an object is readily defined in terms of the torque that object experiences in a given magnetic field (André Michaud, *On The Magnetostatic Inverse Cube Law and Magnetic Monopoles*, *International Journal of Engineering Research and Development* 7, 2013, 5).

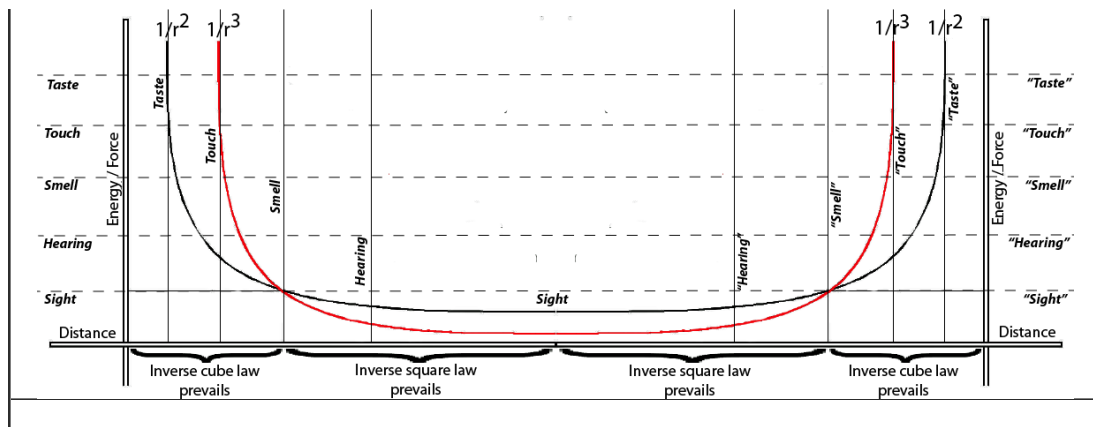


**Interrelating sphere and cube:** The intensity of the Earth's magnetic field follows the inverse square law, but only to a degree. At high altitudes above the poles it is indeed, to a first approximation, an inverse square relationship. However, as a law it only applies to point sources, whereas close to the surface the situation is more complex, varying with latitude and longitude.

Developing the argument above for the contrasting role of the senses in terms of proximity, the relevance of the following depiction might then be explored. This endeavours to show (speculatively) how the senses associated with greatest proximity (taste and touch) are governed by the inverse cube law, in contrast to the senses operating over greater distances (hearing, sight) governed primarily by the inverse square law.

As presented, the depiction is reflected between a "local" condition of greater direct physical familiarity (left-most portion) and a "global" (distant) condition (right-most portion). The prevailing role of the inverse cube law in the later case is usefully exemplified by proximity to a "black hole", whether imagined in astrophysical terms or experienced metaphorically with respect to a financial black hole (with which the former is so often compared). The well-known power of attraction in the physical case is effectively projected (to some degree) onto the remote attractor -- an experience thereby imaginatively reframed.

Interrelating comprehension of "local" and "global" as a cognitive dipole (tentative)		
"local" compactification experienced as globally encompassing	"distance" between local and global in terms of comprehension	"global" compactification described by local metaphors



## Experiential paradoxes of attraction (or repulsion)

**Paradoxical conflation of local-global distinctions:** A diagram of this kind helps to frame the sense in which the local-global relation is usefully explored as a form of dipole -- each extreme being essential to the other. The familiarity of degrees of closeness in relation to taste and touch in local physical terms -- as one pole of potentially overwhelming experience -- is then understood as matched by a degree of all-encompassing comprehension of the closeness associated with a global abstraction.

The senses then frame the experience metaphorically -- as global sense-making. "Global" is then itself experienced three-dimensionally as an all-encompassing form of integration.

The distinction offered by the inverse cube law versus the inverse square law merit careful consideration in terms of how the extremes of local and the extremes of global might be understood (as ruled by the inverse cube law):

- Local: There is clearly a sense in which "local" in its most extreme form offers a sense of "global". Well-documented examples include the meaning which may be attributed to sexual consummation. Use of psychotropic drugs may engender an oceanic experience. Arguably, as conceived, global is then echoed or mirrored in some manner -- whether as an intuition or a mirage. The insight offered may then frame a life-long personal quest. Especially intriguing is the intensity of the drive for that experience, pre-figured by that of "falling in love".
- Global: At the other extreme, the most provocative example is offered by the mysterious nature of the black hole of astrophysics, now borrowed as a metaphor to describe the dynamics of financial disaster and collapse. Curiously, given any case for conflation, the metaphor is also used for the most extreme forms of personal depression -- one in which the "universe" is felt to be collapsing.

There is then a sense in which the inverse square law is indeed descriptive of milder forms of attraction, but far from adequate to any modelling of what is experienced when "falling in love" or by what is imagined to be the experience of "falling into a black hole".

The spermatozoon offers other clues in that it achieves its drive toward the ovum through the spiralling motion of the motilla. At the other extreme, a black hole is understood to be characterized by a spiralling dynamic -- a strange attractor which it is impossible for matter to resist. Spiral models are typically cited with respect to the cycles of depression, if not to the process of falling in love which may brook little resistance. Vagrants may be experienced, or deliberately engendered, with respect to the attraction of a consumer product prior to obsessive spiralling into its acquisition. From the perspective of the spermatozoon these are suggestive processes of comprehension and reframing through which "possession of the universe" is achieved.

Also of some relevance is the manner in which matter is reframed under the extremely intense compressive forces of the black hole of astrophysics. A degree of correspondence, equivalence or complementarity is to be found in the compression of the senses in sexual consummation or psychotropic drug consumption. This can be explored in terms of [synaesthesia](#) (R. E. Cytowic, *Synaesthesia: a union of the senses*, 1989; J. Simner and E. M. Hubbard, *Oxford Handbook of Synaesthesia*, 2013). This is a perceptual phenomenon in which stimulation of one sensory or cognitive pathway leads to automatic, involuntary experiences in a second sensory or cognitive pathway (Janina Nielsen, et al, *Synaesthesia and sexuality: the influence of synaesthetic perceptions on sexual experience*, *Frontiers in Psychology*, 4, 2013).

**Paradoxical complementarity: understanding "global" and "local" generically:** The relationship between unequals is clearly highly challenging if not extremely vexatious, whether between individuals or between nations. Concern with inequality offers a multitude of unresolved dilemmas. It is perhaps not so curious that the small may aspire to become "big", and in the case of nations to "become great" (again). The big may fear collapse, to becoming small, or to fragmenting into the small through schism and secession.

More intriguing with respect to any such dynamic is the sense in which one extreme may be experienced or recognized as transforming into another, as in the paradoxical process of [enantiodromia](#). This raises the question as to whether polarities, most notably "[value polarities](#)", may have such a potentially dynamic relationship (*Value polarities as archetypal bonds*, 2007; *Responding to Conceptual and Value Polarities: learnings from sexuality*, 1998). The transition from childhood to adulthood, and on to a second childhood can be seen and experienced in this light.

Other examples might include:

Contrasting the incommensurable?	
"Small"	"Big"

(aspiring to be big negentropic impulse -- "fulfillment")	(fearing fragmentation/collapse, and entropy -- "emptiness")
nations	powerful nations
small corporations	powerful corporation
teams (sports, etc)	highly ranked teams
individuals (aspiring to importance and recognition)	fearing loss of respect and being forgotten
spermatozoon	ovum

**Local and global in the light of spermatozoon and ovum:** The last example could be considered a significant archetype, provocatively framing the dynamic between the two extremes in some mysterious manner, since it embodies the "cognitive drivers" which play out so uncontrollably in other contexts -- offering a strange form of reconciliation between "small" and "big".

There is a case for using that dynamic as a means of exploring the potentially provocative relation between local and global, both in a planetary sense and with respect to the locus of Earth within the Universe. The latter is evident in aspirations of humanity to "reach the stars" and to "conquer the universe" -- to give meaning to its various efforts to frame universality (*Universal Declaration of Human Rights*). Hypothetical ETs would have every reason to perceive this as extremely presumptuous.

The human egg cell (or ovum, or oocyte) is the largest human cell, measuring 0.15 to 0.2 mm, and therefore just visible to the naked eye. It is almost perfectly round, and therefore has the largest volume in relation to its surface. Given the aspirations it evokes -- notably of "being great again" -- it is appropriately symbolic of "global".

A human sperm cell is some 10,000 times smaller with a tail which flagellates, propelling the sperm cell by whipping in an elliptical cone -- guided by an olfactory mechanism. The sperm cell is also one of the most complex (Ella Davies, *The largest, and smallest, sex cells on the planet Sperm and eggs can be unbelievably tiny, far smaller than those made by people, or they can be unexpectedly enormous* BBC, 20 April 2017). Given the multiplicity of such cells, it is appropriately symbolic of "local".

Arguably, to borrow from military strategy, every sperm cell seeks "full spectrum dominance" through uniting with the ovum. It is not difficult to see the formulation of every fundamental insight as similarly striving for "full spectrum dominance" -- whether the insight be that of a religion, of philosophy, of technology (a "killer app"), or of science (notably as a Theory of Everything). Absent from that overriding drive is any sense of a context in which each might expect to have its "full day in the sun". Taking turns is not seemingly well-framed by that dynamic.

For conception one ovum (per menstrual cycle) is required, with some 250 million sperm per ejaculation -- barrenness being indicated by less than 20-40 million sperm since most sperm do not reach the ovum.

With respect to this argument, it is intriguing to note possible symbolism to be recognized in relation to a helical structure of the sperm:

The researchers named the helical structure a "tail axoneme intra-luminal spiral," or TAILS. It's still unclear exactly what TAILS does, what it's made out of and how important it is... We believe that this [spiral may act as a cork](#) inside the microtubules, preventing them from growing and shrinking as they would normally do, and instead allowing the sperm's energy to be fully focused on swimming quickly towards the egg... Just last year, researchers found that human sperm cells get an extra oomph when they swim, largely because of interconnected elastic springs in their tails that communicate with other regions of the tail (*Mysterious Spiral Found in the Tail of Human Sperm*, *LiveScience*, 21 February 2018)

Furthermore researchers have found:

Intriguingly, they saw that [movement beginning near the sperm's head](#) led to an opposite-direction bend at the tip of the tail -- an occurrence known as a counterbend phenomenon. (*The Secret to Sperm's Sexy Swimming*, *LiveScience*, 1 June 2017)

**Higher order derivatives of time:** Given the distinction made with respect to processes governed by the inverse cube versus those governed by the inverse square, a further question might be asked with respect to the role of any higher order derivatives -- less evident and potentially of greater subtlety. These could be associated with radical experience of the extreme present as higher order derivatives of time (*Cognitive Implication of Globality via Temporal Inversion: embodying the future through higher derivatives of time*, 2018; *Waiting as an Experience of Fundamental Significance*, 2018). The former discussed this possibility with respect to:

Illusory projection along the arrow of time?	Psychosocial implication of jerk, jolt, jounce and snap?
Visual indication of the cognitive challenge of a "hole" in time	From sociophysics to learning to jounce?
Paradox of linear versus circular time: strange loops	Varieties of recognition in practice of an elusive missing dimension
Clues to distinguishing "degrees of intensity"	Clues to experience of higher derivatives of time
Temporal inversion and higher derivatives of time	Higher degrees of comprehension and their "compactification"?

**Unity within a quantum framework:** Physics and technology are now challenging conventional binary thinking from a quantum perspective. For physics this is an aspect of the quest for a unified *Theory of Everything* -- "heaven" as it might be comprehended by a physicist. The relevance to governance has been remarkably articulated by an eminent scholar of international relations ([Alexander Wendt](#), *Quantum Mind and Social Science: unifying physical and social ontology*, 2015). As noted separately, Wendt specifically calls into question the very nature of nations states and other global entities. As discussed separately, Wendt provocatively indicates that

people are usefully to be recognized as "walking wave functions" (*On being "walking wave functions" in terms of quantum consciousness?* 2017). Rather than "walking", their recognition in that light might be understood in terms of "standing waves".

The above-mentioned discussion by John Baez (*The Inverse Cube Force Law*, *Azimuth*, 30 August 2015) includes an extensive argument with respect to the relevance of the inverse cube law to insights from quantum mechanics.

## Perspective: thinking globally and acting locally -- from epicycles to hypercycles?

**Adequacy of a global slogan?** The slogan "Think globally, act locally" has long been used to urge people to consider both the health of the entire planet and to take action in their own communities and cities. As noted by *Wikipedia*:

Long before governments began enforcing environmental laws, individuals were coming together to protect habitats and the organisms that live within them. These efforts are referred to as grassroots efforts. They occur on a local level and are primarily run by volunteers and helpers. "Think Globally, Act Locally" originally began at the grassroots level, however, it is now a global concept with high importance. It is not just volunteers who take the environment into consideration. It is corporations, government officials, education system, and local communities....

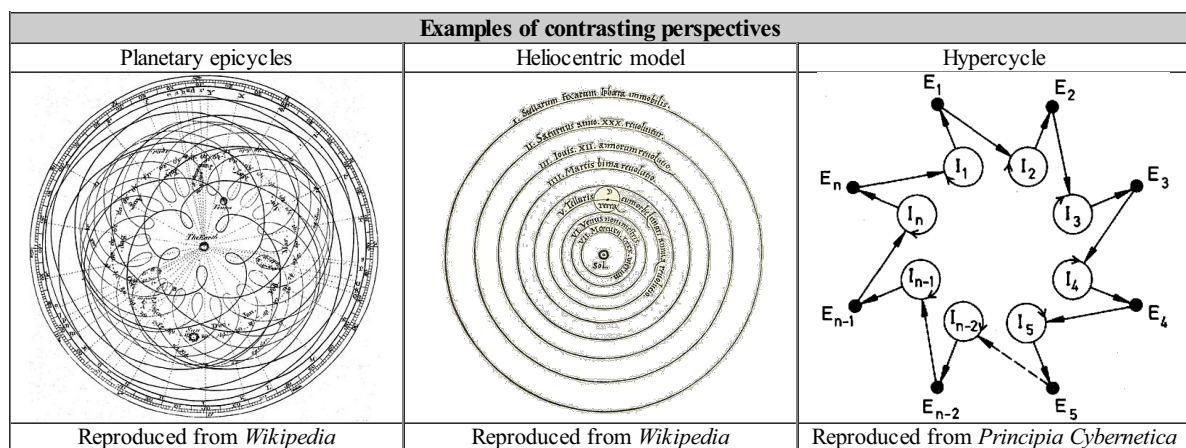
It is not only corporations that are acknowledging the importance of environmental issues, but also the education system. Government officials and school boards across the world are beginning to develop a new way of teaching. Globalization is now thought of as an important concept to understanding the world.... The term is also used in business strategy, where multinational corporations are encouraged to build local roots. This is sometimes expressed by converging the words "global" and "local" into the single word "glocal", a term used by several companies...

The slogan has been a notably feature of initiatives of the United Nations, most notably *Agenda 21*, as formulated at the Earth Summit of 1992. Implementation of the UN's *Sustainable Development Goals* has been described in terms of "Localizing the SDGs" to highlight the role of local institutions and local actors.

Given the questionable achievements to date of initiatives inspired by the slogan, it could now be questioned whether it is oversimplistic -- obscuring dimensions which merit attention in governance more fit for purpose.

**Perceiving locally and comprehending globally?** This argument raises the question: is "global" is an unrealistic abstraction for many, in contrast with the reality of "local"? How then might the dilemmas to which they give rise be more appropriately reconciled?

There is a case for deriving insight from how "global" has been experienced and understood "locally" over millennia -- and how this "mistaken" understanding was rectified through the Copernican revolution. The contrast is usefully illustrated by the depiction of planetary epicycles from a geocentric perspective (below left), as compared with the heliocentric perspective (below centre). The geocentric perspective is necessarily "local" -- within the more "global" framework offered by the heliocentric perspective. Readily forgotten however is that it is the local perspective which is more real in experiential terms to the inhabitants of Earth. The heliocentric perspective is an abstraction -- readily held to be unreal, however greater and more rational is its explanatory power.



**Hypercycles?** The familiar heliocentric model offers the implication that humanity has comprehended adequately the nature of the global system within which the local preoccupations of the planet are embedded. The inadequacy of global governance suggests that further thinking is required to encompass the experiential complexity. Systemic models of many kinds are proposed, ranging from those of astrophysics to those of fundamental physics. Those of the psychosocial sciences and religion also have their appeal, however limited.

In clarifying comprehension of the relation between local and global, the argument here can be developed through reference to the hypercycle. As developed in chemistry, this is an abstract model of organization of self-replicating molecules connected in a cyclic, autocatalytic manner, introduced in 1971 by Manfred Eigen and subsequently further extended in collaboration with Peter Schuster (*The Hypercycle: A Principle of Natural Self-Organization*. 1979):

Topologic methods are used to characterize a particular class of self-replicative reaction networks: the hypercycles. The results show that the properties of hypercycles are sufficient for a stable integration of the information contained in several self-replicative units. Among the catalytic networks studied, hypercyclic organization proves to be a necessary prerequisite for

maintaining the stability of information and for promoting its further evolution.

As illustrated by the diagram (above right) in the entry in *Principia Cybernetica* ([Hypercycles](#)), the commentary includes:

The hypercycle is a self-reproducing macromolecular system, in which RNAs and enzymes cooperate in the following manner...: there are RNA matrices (  $I_i$  );  $i$ -th RNA codes  $i$ -th enzyme  $E_i$  ( $i = 1, 2, \dots, n$ ); the enzymes cyclically increase RNA's replication rates, namely,  $E_1$  increases replication rate of  $I_2$ ,  $E_2$  increases replication rate of  $I_3$ , ...,  $E_n$  increases replication rate of  $I_1$ . In addition, the mentioned macromolecules cooperate to provide primitive translation abilities, so the information, coded in RNA-sequences, is translated into enzymes, analogously to the usual translation processes in biological objects. The cyclic organization of the hypercycle ensures its structure stability. For effective competition, the different hypercycles should be placed in separate compartments.

The insight from chemistry has been variously explored in relation to psychosocial organization (*System Dynamics, Hypercycles and Psychosocial Self-organization: exploration of Chinese correlative understanding*, 2010). The hypercycle proposed by Eigen and Schuster for the emergence of life has been extrapolated to the evolution of language. Indicative references include:

- John Padgett: The Emergence of Simple Ecologies of Skill: a hypercycle approach to economic organization (In: *The Economy as an Evolving Complex System II*, Eds. Arthur, Durlauf, and Lane. SFI Studies in the Sciences of Complexity, Vol. XXVII, Addison-Wesley, 1997, pp. 199-221).
- Wolfgang Wildgen: *Semiotic Hypercycles Driving the Evolution of Language* (*Axiomathes*, 18, 2008, 1, pp. 91-116)
- Tom Froese, Takashi Ikegami and Nathaniel Virgo: The Behavior-Based Hypercycle: from parasitic reaction to symbiotic behavior (*Artificial Life*, 13, 2012, pp. 457-464)

\*\*\* circular economy

The hypercycle approach is potentially significant in relation to the original consideration by [Erich Jantsch](#) of cyclic self-organization of social systems (*The Self-Organizing Universe: scientific and human implications of the emerging paradigm of evolution*, 1980). As discussed in a commentary on [Embracing Difference: system dynamics](#) for the [Global Strategies Project](#) in the above-mentioned *Encyclopedia*, Jantsch draws attention to the work of Manfred Eigen in molecular genetics, namely the question of how new information originates. This is a general problem of evolution, which Jantsch relates to development and to learning.

With respect to the subsequent development of Eigen's thinking, William S. Dockens III notes:

Psychohistory is mental science's approach to evolution. Instead of Darwin's theory, micro geneticists Eigen and Winkler's (1983) *Life/Death Game* is evolution's conceptual framework. All organisms, including *Homo sapiens*, take part in a game that resembles *wei-ch'i* (Japanese *go*). In the *Life/Death Game*, survival is a process rather than a goal, strategies are learned and inherited, both at the same time. Laws of "Chance" and (Necessity) operate simultaneously. The result is an existence that is not strictly determined, but determined more or less. Organisms adapt to the laws of the *Life/Death Game* by means of rules. According to Eigen and Winkler, it is the ability to adapt by means of rules that constitutes "understanding". In fact, only the rules can be understood (*The Asimov Scenario: predicting outcomes of the struggle for cyberspace*, 2000).

In a subsequent study, Dockens argues

Like a powerful, hardly perceptible wall, the psychoanthropological barrier lies between the group formulations that characterize social psychology, sociology, and ethnology and the subjective reasoning that characterize individual modes of thought. More obviously, but equally as formidable, are the epistemological differences separating researchers within each of the scientific disciplines. As a consequence, humanities, behavioral sciences and biological sciences in general, and general systems in particular, lack the connectivity necessary for the broad unified approach that is prerequisite to applying multidisciplinary research to complex social, personal, ethnic, and gender problems. Eigen and Winkler's game theory optimization, together with recent developments in mathematics, microgenetics and ethnology, make it possible to integrate the social physics of Nicolas Rashevsky and the game theory formulations of Anatol Rapoport to produce Synchrony, a unified approach, which though not a seamless web, comes as close to a seamless web as is theoretically possible. But in accepting Synchrony, behavioral scientists must first learn to play *go*, then adopt the concepts of dual cognition, dual time scales, self-reference, chance and necessity. Philosophers and ethnologists must deal with ecological "optimizations" of ethics and cultures. And, finally, as far as groups are concerned, all will have to give up permanent hierarchies, adopt a "feminine" mode of reasoning as optimal, then accept behavioral science's role of "Guardian of Time's Feminine Arrow". (*Time's Feminine Arrow: a behavioral ecological assault on cultural and epistemological barriers*, *Behavioral Science*, 2007)

The question is how the new information emerges to provide the basis for any new patterns of ordering. Any given language, or "answer domain", effectively functions like a self-replicating ecosystem. [Ramon Margalef](#) (*Perspectives in Ecological Theory*, 1968) had described the evolution of such ecosystems as a process of information accumulation. Each such system seeks information from the environment, but only to use it to prevent the assimilation of more new information. Novelty is continuously transformed into confirmation. The question is how any new order can emerge under such circumstances. Hypercycle is used by Eigen to denote any such new order, namely a closed circle of distinct transformatory or catalytic processes in which one or more participants act as autocatalysts.

The above set of images is indicative of the possibility of considering the interrelated set of psychosocial conditions represented by the set of hexagrams as based on what amounts to a hypercycle. As noted in a consideration of fractals by Giuseppe Damiani (*Evolution and Regulation of Metabolic Networks*, in: Gabriele A. Losa, Danilo Merlini, Theo F. Nonnenmacher, Ewald R. Weibel, *Fractals in Biology and Medicine*, 2005):

The concepts of a metabolic hypercycle and of binary processes would greatly facilitate people's intuition about the dynamics of physical and biological systems. A surprising aspect of the proposed model is its similarity with ancient ideas of Hermetic, Hinduist and Taoist philosophers. The main concepts of Taoist medicine are described in detail in the *Nei Ching Su Wen* (The Yellow Emperor's Medicine Classic)... The Taoist concept of health can best be defined as a normal dynamic balance between Yin and Yang... At first the idea of Yin and Yang seems very simplistic; it is not, it describes the basic changing balance of nature: the metabolic hypercycle. (p. 267)

The last remark is developed from a different perspective by A. C. Graham (*Yin-Yang and the Nature of Correlative Thinking*, The Institute of East Asian Philosophies, 1986) and has been related to discussion of the credibility of "correspondences" (*Theories of Correspondences and potential equivalences between them in correlative thinking*, 2007).

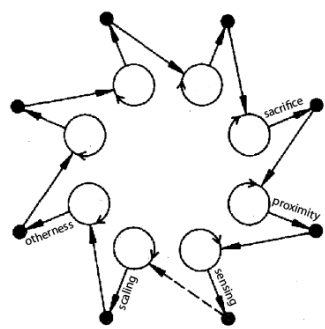
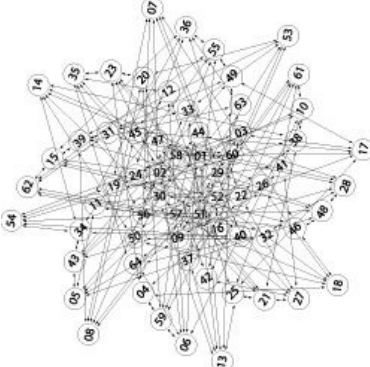
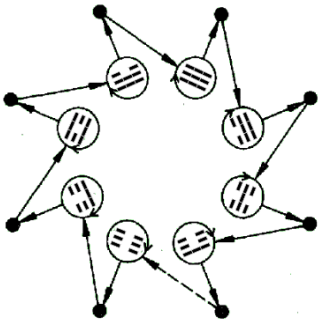
For Jantsch: "Hypercycles...play an important role in many natural phenomena of self-organization, spanning a wide spectrum from chemical and biological evolution to ecological and economic systems and systems of population growth." (1980, p.15). Eigen, in reporting on his detailed analysis with Peter Schuster of the emergence of such new order (1979), states: "The self-replicative components significant for the integration of information reproduce themselves only in a coexistent form when they are connected to one another through cyclic coupling. The mutual stabilization of the components of hypercycles succeeds for more than four partners in the form of nonlinear oscillations..." (p.252).

Such a hypercycle can be seen as a linking process between the participating (sub)systems, themselves cyclically ordered. The formation and maintenance of such a cycle which runs irreversibly in one direction and reconstitutes its participants and thereby itself, is possible only far from equilibrium. Its rhythm is controlled by the cycle of the slowest acting participant, thereby liberating transformative energy steadily rather than explosively (p. 90).

Maximilian Schich *The Hermeneutic Hypercycle*, Edge, 2016):

The "hermeneutic hypercycle" is a term that returned no result in search engines before this contribution went online. A product of horizontal meme-transfer, it combines the hermeneutic circle with the concept of the catalytic hypercycle, as introduced by Eigen and Schuster. Like the carbon-cycle that keeps our sun shining and the citric acid cycle that generates energy in our cells, the hermeneutic circle in data-driven cultural analysis can be understood as a cycle of "reactions", here to nurture our understanding of art and culture.

The cycle of reactions is a catalytic hypercycle, as data collection, quantification, interpretation, and data modeling all feed back to catalyze themselves. Their cyclical connection provides a mutual corrective of bias (avoiding an error catastrophe) and leads to a vigorous growth of the field (as we learn what to learn next). In simple words, data collection leads to more data collection, quantification leads to more quantification, interpretation leads to more interpretation, and modeling leads to more modeling. Altogether, data collection nurtures quantification and interpretation, which in turn nurtures modeling, which again nurtures data collection, etc

<b>Preliminary indication of potential relevance of a hypercycle perspective</b> (adapted from <i>Principia Cybernetica</i> entry) as implied by the changes encoded by the set of 64 hexagrams representing conditions of change (from the so-called <i>Book of Changes</i> )		
Hexagram organization of 8 "houses" of <i>I Ching</i> as a hypercycle (reduced version of image above)	Configuration of 64 conditions implied by "houses" on left (rings rotated to simplify graphics)	Hypercycle adaptation indicative of transformation pathways between conditions in images on left (animation)
		

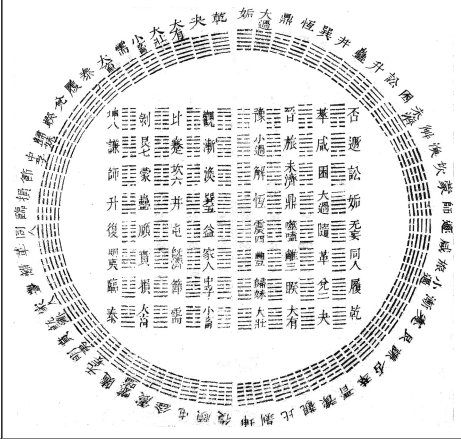
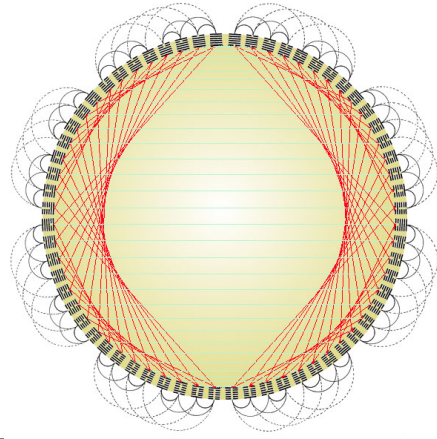
Arguments relating to the spiral representation above are developed further in detail in *Adaptive Hypercycle of Sustainable Psychosocial Self-organization: designing a mapping of a Chinese metaphorical pattern language* (2010) which notably includes the following sections:

Comprehending the psychosocial hypercycle through an interplay of metaphors  
 Global governance communication  
 Towards an appropriate architecture of global conference communication  
 Cyclic adaptive resilience  
 Hypercyclic stability?

The argument is further developed with respect to the possible *Five-fold cognitive dynamics of relevance to governance?* (2015). This pattern is curiously consistent with the classic Chinese 5-fold *Wu Xing* pattern, as discussed separately (*Memorable dynamics of living and dying: Hygeia and Wu Xing*, 2014; *Cycles of enstoring forming mnemonic pentagrams: Hygeia and Wu Xing*, 2012). Ironically however, comprehension of those dynamics may be most readily enabled through dance patterns.

As noted by *Wikipedia*, it was subsequently indicated that in reality, a hypercycle can maintain only fewer than five members (Josef Hofbauer and Karl Sigmund, *The Theory of Evolution and Dynamical Systems: mathematical aspects of selection*, 1992).. In agreement with Eigen and Schuster's principal analysis, the latter argues that systems with five or more species exhibit limited and unstable cyclic behaviour, because some species can die out due to **stochastic events** and break the positive feedback loop that sustains the hypercycle. The extinction of the hypercycle then follows. It was also emphasized that a hypercycle size of up to four is too small to maintain the amount of information sufficient to cross the information threshold.

As presented on the right, particular transformations between conditions of change, as denoted by the hexagrams, are indicated according to that coding system. Interpretative descriptions of each are provided separately (as **noted above**). As a pattern indicative of a dynamic understanding of unity, it lends itself to experimental animations, as described separately (*Dynamic Exploration of Value Configurations: interrelating traditional cultural symbols through animation*, 2008). One variant is accessible in video format (*Relating cultural symbols using dynamic I Ching configuration*, YouTube).

Examples of circular configurations of I Ching hexagrams	
As communicated to Leibniz (1703)	Indicating transformations between conditions
	
<p>By Unknown - Perkins, Franklin. <i>Leibniz and China: a commerce of light</i>. Cambridge UP, 2004. 117., Public Domain, <a href="#">Link</a></p>	<p>As used on this website, for which it was elaborated; further details of the configuration are provided <a href="#">separately</a></p>

## Exaptation: embodying innovation into the "adaptive cycle"

**Exaptation in biological evolution:** This argument can be further developed in the light of insights into **exaptation**, as introduced by Stephen Jay Gould and Elisabeth S. Vrba (*Exaptation: a missing term in the science of form*. *Paleobiology*, 8, 1982, 1). This was proposed as a replacement for what was considered the teleologically-loaded term "pre-adaptation".

Exaptation was understood as a characteristic currently subject to selection, whose origin could be ascribed to processes other than selection or to selection for a different function. Adaptations and exaptations are included in the set of "aptations": all characters currently subject to selection.

**Exaptation of exaptation:** The concept has been controversial since it first arose, largely because it has been so difficult to distinguish between the forces of exaptation and adaptation in the historical context of evolution. The mixed reception is usefully summarized by Greger Larson, et al. (*Exapting exaptation*, *Trends in Ecology and Evolution*, 28, 2013, 9):

The term exaptation was introduced to encourage biologists to consider alternatives to adaptation to explain the origins of traits. Here, we discuss why exaptation has proved more successful in technological than biological contexts, and propose a revised definition of exaptation applicable to both genetic and cultural evolution...Despite failing to catch on in evolutionary biology, exaptation has been adopted with considerable success in studies of the history of technology [5]. Technological innovations frequently involve the use of a process or artefact in a new context...

The ironies of this narrative are manifold. The co-option of the term by those outside of biological evolution epitomises the very process that exaptation was coined to describe. Furthermore, Gould and Vrba invented the term to replace pre-adaptation in evolutionary narratives and the teleological inference inherent in that term. Yet, as we have argued here, it is impossible to

differentiate exaptation from adaptation unless we interpret the term teleologically. For this reason, most evolutionary biologists have abandoned exaptation. However, there are domains of both cultural and genetic evolution where processes of variation and selection are not blind, but directed by a degree of foresight, such as artificial selection and technological innovation. We contend that in these areas, teleological explanations are not only legitimate but necessary, and provide a wide remit for a renewed exaptationist program.

As argued by Pierpaolo Andriani Jack Cohen:

Biological adaptation assumes the evolution of structures toward better functions. Yet, the roots of adaptive trajectories usually entail subverted -- perverted-structures, derived from a different function: what Gould and Vrba called "**exaptation**". Generally, this derivation is regarded as contingent or serendipitous, but it also may have regularities, if not rules, in both biological evolution and technological innovation. On the basis of biological examples and examples from the history of technology, the authors demonstrate the centrality of exaptation for a modern understanding of niche, selection, and environment. In some cases, biological understanding illuminates technical exaptation. Thus, the driver of exaptation is not simply chance matching of function and form; it depends on particular, permissive contexts. (*From exaptation to radical niche construction in biological and technological complex systems*. *Complexity*, 18, 2013, 5, pp. 7-14)

**Innovation and cognitive exaptation:** As the emergence of latent functionality in existing artifacts, exaptation is an underexplored mechanism of novelty generation in innovation. With respect to technological innovation and sociocultural change, Exaptation produces a feature that performs a function that was not produced by natural selection for its current use (Clive Higgins, *The True Meaning of Catalyst, Crescendo, and Adaptation*, *Exaptive*, 23 October 2017). Cognitive exaptation can then be understood as the application of an idea in a different context than the one in which it originally emerged (Alicia Knoedler, *Sparking Ideas for Visualizing Innovative Research Teams*, *Exaptive*, 10 January 2019).

With respect to logical and cognitive exaptation, as noted by Alberto Gualandi.

Gould has opened the way for all a series of cognitive and neurobiological consequences, psychological and linguistic, anthropological and philosophical of which we have not yet taken full measure (*Stephen J. Gould: Between Humanism and Anti-humanism: neoteny, exaptation and human sciences*)

Indicative references include:

- Wynne Parry: *Exaptation: How Evolution Uses What's Available* (*LiveScience*, 16 September 2013); *Evolution Is an Opportunist* (*Quanta Magazine*, 5 September 2013)
- Roger Lass: *How to do things with junk: exaptation in language evolution* (*Journal of Linguistics*, 26, 1990, 79-102)
- Pierpaolo Andriani and Giuseppe Carignani: *Modular Exaptation: a missing link in the synthesis of artificial form* (*Research Policy*, 43, 2014, 9)
- Gino Cattani and Pierpaolo Andriani: *Exaptation as source of creativity, innovation, and diversity* (*Research Gate*, December 2015)
- Andrea Ganzaroli and Luciano Pilotti: *Exaptation as source of creativity and innovation* (*Research Gate*, January 2011)
- Pierpaolo Andriani, Ayfer Ali and Mariano Mastrogiorgio: *Measuring Exaptation and Its Impact on Innovation, Search, and Problem Solving* (*Organization Science*, 28, 2017, 2)

The term was highlighted in an annual Edge question with respect to the scientific term or concept that ought to be more widely known (W. Tecumseh Fitch, *Exaptation*, *Edge*, 2017)

We can thus envision an exaptive cycle as being at the heart of many novel evolutionary traits: first adaptation for some function, then exaptation for a new function, and finally further adaptive tuning to this new function. A trait's tenure as an exaptation should thus typically be brief in evolutionary terms: a few thousand generations should suffice for new mutations to appear and shape it to its new function.

For Raghu Garud, Joel Gehman and Antonio Paco Giuliani:

Extant literature draws attention to the importance of science-push, demand-pull, and institutional-steering as mechanisms driving science-based innovations. We contribute to this literature by highlighting exaptation, which refers to the cooptation of existing traits for new functions. When applied to science-based innovations, exaptation refers to the emergence of functionalities for scientific discoveries that were unanticipated ex ante. We explore how exaptation can be induced through narrative properties (relationality, temporality, and performativity), and how serendipity arrangements such as exaptive pools, exaptive events, and exaptive forums can be structured to maintain, activate and contextualize scientific discoveries. (*Serendipity Arrangements for Exapting Science-Based Innovations* *Academy of Management Perspectives*, 32, 2018, 1)

The relevance of exaptation can be seen in terms of patterns as a language, as variously emphasized (Christopher Alexander, *A Pattern Language*, 1977; Jeremy Lent, *The Patterning Instinct: a cultural history of humanity's search for meaning*, 2017). Deriving insight from patterns is evident in the current interest in biomimicry as a clue to technical innovation and the dynamics of collective intelligence. With

respect to collective governance the process can be extended further in terms of the patterns embodied in technology, as argued separately (*Engendering a Psychopter through Biomimicry and Technomimicry: insights from the process of helicopter development*, 2011).

Of relevance to the development of this argument is the sense in which configurations of higher dimensionality can be derived from lower dimensionality through [projective geometry](#) and [geometric transformation](#): points imply lines, lines, imply planes and the like. A pattern in two dimensions can then be said to anticipate or imply one in 3D, suggesting the relevance to cognitive development of any understanding of exaptation.

If the immediate challenge of governance is a question of navigating the [adaptive cycle](#), of concern is how an exaptive cycle of innovation is then related to it (Brian D. Fath, et al., *Navigating the adaptive cycle: an approach to managing the resilience of social systems*, *Ecology and Society*, 20, 2015, 2); Daniel Christian Wahl, *The adaptive cycle as a dynamic map for resilience thinking*, *Hackermoon*, 15 April 2017).

## Embodying the essence of governance in ritual dynamics with mace, sceptre, fasces or vajra?

**Mace and baton:** In a society characterized by multiple unreconciled divisions, it is more than extraordinary to note the extent to which partisan divisions are transcended to a degree by the symbolism associated with the [ceremonial mace](#) (or analogues) in a variety of forms -- with associated protocols and rituals. These are related to the standard borne by a [standard-bearer](#) as a formal, visual symbol of a state, prince, military unit, etc.

The range of institutions in which using a mace-like form is itself surprising, given its apparent dissociation from the challenges of governance -- and the unquestioned implications in a complex society of any "standard" borne in that context. The institutions may include:

- **Parliaments**, most notably: [Australia](#), [Bahamas](#), [Canada](#), [Guyana](#), [Ireland](#), [Kenya](#), New Zealand, Nigeria, [Philippines](#), [Sri Lanka](#), [United Kingdom](#), [United States](#). Prior to its restoration, it is recorded that in 1653, Oliver Cromwell derided the mace as a "fools' bauble" and ordered his troops to take it away. Modern parliaments, by contrast, have responded vigorously to disrespect for their mace (*UK Parliament erupts after lawmaker grabs mace in Brexit protest*, *CNN*, 11 December 2018; *Chaos in Nigerian Senate as 'hoodlums' steal mace in packed chamber*, *Euronews*, 19 April 2018),
- **Educational institutions**, particularly [universities](#), where ceremonial maces are used as symbols of the internal authority over members and the independence from external authority. In 1663, Charles II presented a silver-gilt mace to the [Royal Society](#).
- **Religious institutions**: maces or staves continue to be carried before ecclesiastical dignitaries and clergy in some contexts, as was the practice with popes and cardinals of the Catholic Church
- **City mayors** may have a mace as a symbol of their authority. Most [livery companies](#) have their own mace, as do [county councils](#) throughout England.
- **Military institutions**, exemplified by their use in directing [military bands](#) and [marching bands](#) leading parades (as noted below).
- **Sporting events**, exemplified by the associated role of dancing groups led by drum majorettes (as noted below)
- **Music direction**, as with the [conductor's baton](#), used primarily to enlarge and enhance the manual and bodily movements associated with directing an ensemble of musicians.

As noted by Sean Kelsey, the civic mace has a long tradition as a symbol of authority in England:

For a long time it was not so much a symbol as the implement for enforcing authority, the weapon wielded by sergeants of the military orders of the Holy Land, by Richard I's sergeants-at-arms, by Edward I's domestic bodyguards, then by medieval town constables, bailiffs or sergeants as the indispensable tool of their police duties and penal jurisdiction. They gradually attained a more ceremonial quality as the emblem of the Crown serjeanty's administrative powers (*Inventing a Republic: The Political Culture of the English Commonwealth, 1649-1653*, Manchester University Press, 1997 pp 89-91)

Given the considerable importance attached to current usage of mace in many such "local" contexts, **the fundamental contrast with the apparent lack of relevance to the challenges of "global" governance could be considered remarkable** -- if only because the matter is unquestionable. Why indeed is the symbol taken so seriously in a period in which the processes of governance and law-and-order are widely called into question?

Whatever that significance for governance, the fact that no ceremonial mace is associated with intergovernmental institutions could even be considered indicative of their incapacity to transcend the partisan dynamics typical of their discourse. One questionable exception to this argument includes the presentation of a [Commonwealth Mace](#) to the Queen in 1992 (*Golden mace "a symbol of The Queen's legacy"*, says *Secretary-General*, *The Commonwealth*, 29 May 2018). It is noteworthy that the [John Smith Memorial Mace](#) is the oldest debating competition in the world. It is contested by universities in England, Ireland, Scotland and Wales in emulation of the practices of the British Parliament.

In the case of the United Nations, it could be argued that a form of mace is subtly implied by elements of the [UN emblem](#): a map of the world representing an azimuthal equidistant projection centred on the North Pole. Alternatively, such a mace might be recognized as implied by the [flagpole](#) from which the UN flag is flown. In a hypersensitive global context, a projection "centred on the North Pole" alone could of course be considered emblematic of a questionably limited understanding of global approaches to governance. An obvious remedy is to render dynamic the UN logo -- with an alternation between the polar variants.

European institutions appear to accord significance to a mace solely through acronyms, possibly indicative of residual recognition of its symbolic import:

- [Metadata for Architectural Contents in Europe](#)
- [Modern Agriculture in Central and Eastern Europe.](#)

Somewhat ironically, "MACE" is variously used as an acronym for model building (e.g. [Models And Counter-Examples](#), [MACE Model United Nations](#)). The *Military Activities and Cyber Effects (MACE)* taxonomy was originally developed to provide the foundation for the modeling, simulation and experimentation of cyber effects and threats in a military setting. As a means preferred by governments for preserving law and order, [chemical mace](#) is a tear gas used by security forces. This is also ironical in that the mace has strong early associations with a weapon. As with the appropriation of Greek and Roman deities in naming weaponry, mace is used as the acronym for regular NATO air defence exercises (MACE 2014, etc).

**Sceptre and baton:** A [symbolic baton](#), continues to be highly valued in some contexts, as a [staff of office](#) -- although the use of "swagger sticks" (notably in the military and police forces), has fallen out of favour, except as occasionally adopted by presidents. The baton is reminiscent of the royal [sceptre](#) or [wand of office](#), held in the hand by a ruling [monarch](#) as an item of [royal or imperial insignia](#) (and iconography), whose symbolism in relation to governance has long been a focus of reflection:

- Victoria Howard: *Symbols of Monarchy: the orb and the sceptre* (*The Crown Chronicles*, 20 August 2016)
- E. Douglas Van Buren: *The Sceptre, its origin and significance* (*Revue d'Assyriologie et d'archÉologie orientale*, 50, 1956, 2)
- Marjorie Bowen: *Crowns and Sceptres* (1936)

The symbolism notably has had religious connotations over millennia (and across cultures) through the manner in which rulership has some form of divine mandate, however that is understood:

- [What is the scepter of God? \(Got Questions?\)](#)
- [Sceptre \(Bible Hub\)](#)
- [Scepters and Staffs \(Ancient Egypt Online\)](#)
- [Sceptre \(International Standard Bible Encyclopedia\)](#)
- [The Symbolism of the Sacred Thunderbolt or Diamond Sceptre of the Lamas](#)

**"Rod" and "Staff":** Far greater reference is made to "rod" and "staff" as biblical metaphors, deriving from *Thy rod and thy staff, they comfort me (Psalm 23)* understood with respect to the shepherd's care for a flock of sheep, on which there is very extensive commentary -- implicitly with respect to global governance, as framed by Christians and Jews. For example:

- The staff the shepherd uses... is to assist the sheep along their perilous journeys, and the rod to protect them in case of attack. The rod and the staff are necessary for the welfare of the flock, necessary to guide and shield them in their wanderings, and to bring them safely home. So too, it is with us, the children of God. To be properly protected and guided to our happy end we have need of the rod of affliction and adversity, and likewise of the staff of mercy. (Charles J. Callan, *The Shepherd of My Soul*, [BibleHub](#))
- The *shebat* (rod) has the meaning of a 'tribe' or a 'sceptre'. The primary role of the king was to protect his people. The rod is symbolic of the power of God in discipline for his own and judgement for others. It is a protection from danger from within and without. A closely related word '*shabbath*' means 'rest', which is possible under the competent protection of the shepherd. The *mishenah* or staff has the meaning of support... David knew well the meaning and the use of the rod and the staff, and he did not use the terms redundantly. Unfortunately, many translations mix them up calling a staff a rod and a rod a staff. Addressing the idea that they are one tool, this is unlikely. An animal associates discomfort and pleasure with the object that causes it. If you use a rod to discipline an animal, it will shy from it, making the tool useless for comforting it. It is important that the two tools are visibly different. It is more likely that modern shepherds who use only a single tool are often hirelings, and do not build individual trust with the sheep. So they care only for utility, (lengthening the arm) rather than the trust with the animal. ([What is the meaning of "rod and staff" \(Psalm 23\)? Biblical Hermeneutics](#))

Further insights are offered by the current importance associated with the extraordinarily named role of [Black Rod](#) in some parliaments -- with responsibility for ensuring their security (*Office of the Black Rod: Parliament of South Australia*). This offers relatively obvious associations to the symbolic function of rods in Freemasonry (C. Richard Walk, *The Masonic Rods and Staffs*, [Masonic World](#)).

The term "rod" suggests further associations, although no Freudian exploration of "black rod" seems to have been made, despite criticism of sexual innuendo in relation to that function. The formal title of "Gentleman Usher of the Black Rod" features in questions regarding [gender neutrality of official titles](#). In the absence of any mace in the symbolism of international institutions, it is curious to note the extreme dependence on the "staff" in each case -- and the importance which may be attached to a "[chief of staff](#)", as in the governance of nations.

**Fasces:** Whether accompanying the sceptre or instead of it, the symbol of the [fasces](#) is of considerable continuing significance. This is a bound bundle of wooden rods, sometimes including an axe with its blade emerging. It had its origin in the Etruscan civilization and was passed on to ancient Rome, where it symbolized a magistrate's power and jurisdiction. The symbol has survived in the modern world as a representation of magisterial or collective power, law and governance. Despite its recent associations with [fascism](#), it has remained in use in many societies, most notably in France and the United States ([federal fasces iconography](#)). It is a feature of heraldry, appearing on [flags of some countries](#).

**Vajra / Dorje:** A variant of the mace is evident in the central role of the [vajra](#) in Hinduism, Jainism and Buddhism. As symbolic weapons, curiously it would seem that relatively little attention has been to comparison of the mace as characteristic of primarily Western traditions with that of *vajra* (Rita Louise, *The Vajra: an ancient weapon of the gods*, *Soulhealer*, 19 May 2015; *Mace vs Vajra: What's*

*the difference? WikiDiff*). An obvious difference is the symmetry of the *vajra* compared to the asymmetry of the mace or sceptre -- especially indicative of distinctively unreconciled understandings, potentially most notable in that between a "global" perspective and a "local" one.

The *vajra* is held to be symbolic of the nature of reality and its endless creativity. The significance of the symmetry of the symbol is as an indication of the unification of relative and absolute truth. As a prefix, "*vajra*" adds a transcendental connotation to names of deities and more subtle words. As a symbol, *vajra* may have nine, five or three spokes. In the four-pronged case, these curve around the central fifth to form a lotus-bud shape. A nine-pronged *vajra* is less commonly used.

The spokes of a "peaceful" *vajra* meet at the tip whereas those of a "wrathful" *vajra* are slightly splayed at the end. The closing of the prongs at the end of the symbol represent closing the wheels of Samsara, or the realization of Enlightenment. In the case of a five-spoked *vajra*, the five lower spokes symbolize the five mothers, whereas the upper set of spokes then symbolize the five wisdoms:

- mirror like wisdom - that which reflects all sense perceptions is purified when one attains enlightenment and becomes the mirror like wisdom.
- wisdom of equality - arises after all the feelings of pleasantness, unpleasantness and indifference have been purified.
- wisdom of individual analysis - arises when the factor of discrimination, which distinguishes one object from another is purified.
- wisdom of accomplishing activity - arises when the basic ability to perform acts according to particular circumstances is purified.
- wisdom of the sphere of reality - arises when consciousness is purified and becomes the mind that is the seed of the wisdom truth body of a Buddha.

**Magic wand:** The "supernatural" connotations of the mace and sceptre are especially cultivated in ceremonial use of **magic wands**, whether as continues to be highlighted in popular fiction or as may be practiced in **ceremonial magic**. The fascination is obvious in the worldwide interest of the younger generation in the dramatic function of **lightsabers** in the *Star Wars* universe.

**"Baton twirling":** However, rather than any emphasis on the primarily **static function** of the mace for governance, as framed by the contexts above, of particular interest are clues to the **dynamic functions** of governance offered by its use in "governing" military bands and marching bands, variously held to be of considerable symbolic significance, most especially in formal national parades and the fascination they evoke (Elisabeth Brawl, *Military bands trumpet the might and status of their nation*, *Financial Times*, 4 January 2018; Luke Ryan, *A look at military bands around the world*, *NewsRep*, 6 April 2018, [International Military Music Society](#)). The **Annual NATO Music Festival**, featuring such bands, has been held for 45 years.

The governance function is exemplified by the role of the **drum major**:

- Halei Jo R. Fuller: *The Drum Major's Drill: a comprehensive guide and workbook for the successful competitive drum major* (CreateSpace, 2012)
- George N. Parks:
  - *The Dynamic Drum Major: a complete training manual for drum major and directors* (Barnhouse, 1984)
  - *The Dynamic Drum Major: a complete training manual for drum major and directors* (Drum Major Academy, 2011)
- Bob and Charles Scott Roberts: *The Art of Drum Majoring: a complete manual for the drum major and drum majorette* (Belwin Mills, 1958)
- U. S. Army:
  - *The U.S. Army Drum Major: majoring and baton techniques* (U.S. Army, 2013)
  - *Training Circular TC 1-19.50: The Army Drum Major* (U.S. Army, 2017)
- Edgar T Macintyre: *On Parade: A Manual for Drum Majors: modified British style for Highland Scottish Pipe Bands and Other Marchin* (Vantage Press, 1994)
- Gary E. Smith: *The System: marching band methods* (GIA Publications, 2016)
- George Malstrom: *The Drum Major's Manual* (Ludwig, 1932)

That role has been celebrated metaphorically in reference to Martin Luther King and others ( Justin Rose: *The Drum Major Instinct: Martin Luther King Jr.'s Theory of Political Service*, University of Georgia Press, 2019; *Drum Major for a Dream: poetic tributes to Martin Luther King, Jr.*, 2002; Khalid el-Hakim, *Drum Majors for Justice: 101 Quotes by African American Politicians*, CreateSpace, 2016). The metaphor has been applied to deity (Larry W. McCormick, *God Is My Drum Major*, Sharper, 2011).

The dynamic is emphasized to an even higher degree -- most notably by **drum majorettes** -- through the art of **baton twirling** with three global governing bodies (the **World Baton Twirling Federation (WBTF)**, the **World Twirling Association (WTA)**, and the **Global Alliance of National Baton Twirling and Majorette Associations (NBTA)**). Their role may be variously associated with **marching bands**, for which there is a **World Association of Marching Show Bands** (most notably associated with universities in the USA).

This complex of symbols is consistent with a separate argument (*Governance as "juggling" -- Juggling as "governance": dynamics of braiding incommensurable insights for sustainable governance*, 2018).

**Drum vs Bell vs Orb?** As is evident from the role of the drum in parades "governed" by indicative use of a baton, whether recognizable as mace or sceptre, this tends to be complemented symbolically by a second symbol. Clearly this can take the form of a drum. In the case of the *vajra*, its ceremonial use is accompanied by the sounding of a bell (*ghanta*). Governing deities may be depicted holding *vajra* and *ghanta* in each hand.

In the center of the ornamental *vajra*, there is a sphere which represents sunyata (the emptiness of true reality). As noted above, a royal sceptre may be matched by an orb -- with typical depictions of royalty holding each in a hand. To what extent the spherical form may be said to correspond to that of the *vajra* is unclear. Possible equivalences may be found in the blessing *Urbi et Orbi* given to the city of Rome and to the entire world by the **Roman pontiff** on certain solemn occasions. Can "*urbi*" be usefully recognized as "local", with "*orbi*"

as "global"? Far more reflection of potential relevance to governance would seem to have been evoked by the *vajra-ghanta* pair than by the sceptre-orb pair.

Depictions of the *ghanta* can be readily seen as modifications to one end of a *vajra* as emblematic of *yin-yang* polarity. This has the obvious implication that these constitute archetypal emblems of female and male genitalia and the instinctual quest for the ovum by the sperm to engender a new form.

## Global-Local dynamic: mace-based governance challenged by a feather?

The current period is clearly witness to a challenge to the globalization imperative by populist movements in a range of countries. These are variously preoccupied with local priorities and perspectives. This is curiously paralleled by challenges to the traditions of male dominance and patriarchy, exemplified by feminism and the tragedy of sexual abuse by the clergy. However it is also accompanied by desperate efforts "to be great again", whether focused through competitive business, sport, or the construction of ever taller skyscrapers, or ever more impressive vehicles. The reactivation of the arms race, and the quest for full spectrum dominance, are part of the "mace-based" pattern which is increasingly called into question. The process is especially evident in the desperate attempts to ensure exclusive possession of resources on the Moon or Mars -- despite obvious inadequacies in governance of the resources of the Earth.

It is in this sense that comprehensible connectivity between global and local merits attention. Especially striking is the articulation of the challenge in terms of the unreconciled issues of indigenous peoples historically dominated by a "mace-based" pattern. These have been creatively framed in the study by [Stacie A. Swain](#) (*Armed with an Eagle Feather Against the Parliamentary Mace: a discussion of discourse on indigenous sovereignty and spirituality in a settler colonial Canada, 1990-2017*, University of Ottawa, 2017).

The parliamentary mace and the eagle feather are conceptualized as emblematic and condensed metaphors, or metonyms, that assert and represent Canadian and Indigenous sovereignties. As a settler colonial sovereignty, established and naturalized partially through discourses on religion, Canadian sovereignty requires the displacement of Indigenous sovereignty. In events from 1990 to 2017, Indigenous people wielding eagle feathers disrupt Canadian governance and challenge the legitimacy of Canadian sovereignty (p. iv)

I examine two objects, the Canadian parliamentary mace and the eagle feather, within a set of narrative connections to discuss the contexts, histories, and social relations that have led to [Canada 150](#). More specifically, I cite the parliamentary mace and the eagle feather and discourse upon these items to discuss competing sovereignties, and the relations between the collectivities that claim and assert those sovereignties. (pp 1-2)

After discussing discourses on the eagle feather in relation to authority, sovereignty, and jurisdiction, I suggest that the eagle feather be theorized as more than either a "religious" or a "political" item. (p. 6) ,, I propose that the eagle feather signifies an assertion of Indigenous nations' displaced sovereignty. The eagle feather is thus understood as a threat to Canadian authority and sovereignty. (p. 7)

Focusing upon the mace enables me to examine the normalization of Canadian settler colonialism, sovereignty, and governance -- the terms through which life is constrained. Focusing upon the eagle feather in challenges to the norm open up different modes of living. Contemporary discourses on Indigenous sovereignty and spirituality reveal acts of refusal and redeployments of categories, the processes and terms through which these different modes of living -- and new understandings of Indigeneity, Canada, and sovereignty -- may come about. (p. 8)

Swain only mentions in passing the original [Iroquois Confederacy](#) of five Indigenous nations, and the role of the feather symbol in celebrating its legacy (p. 59). The question could be speculatively explored as to whether its dynamics could be understood as a psychosocial hypercycle.

## Imagining local-global connectivity through innovative mace and vajra design

As traditional symbols valued in the comprehension of governance, there is clearly a case for asking whether any such symbols are currently "fit for purpose". Whilst there are complex ceremonial rituals and protocol in relation to them, typically they are held to be static -- even if they are carried from place to place and variously manipulated. The symbols themselves are not dynamic in any sense, whatever the dynamics they may be said to imply in relation to governance. In the case of the *vajra*, reference is made to its association with a thunderbolt. As noted above, both mace and *vajra* are held to be potential weapons and derive their power from that traditional association.

It is however most curious that any comprehensible dynamic is currently most obvious in baton-twirling, readily deprecated as trivial in relation to governance, despite the extremely serious consideration given to its role in formal parades. Clearly use of a "lightsaber" is far more evocative for many. Is it time for a "lightmace" or a "lightsceptre" -- especially given the traditional "thunderbolt" associations of the *vajra* symbol? Given the 5-sense argument developed above (and below), use of such a weapon in a martial art offers associations to both the classic strategic manual (*The Book of Five Rings*, 1645) and to the use of sword-surrogates as in [stick-fighting](#), [quarterstaff](#) and [kendo](#).

It is in this sense that there is a case for exploring how a mace-vajra might now be designed in relation to an orb-ghanta given the issues raised above regarding comprehensibility of paradoxical connectivity and issues relating to the unreality of any "other" -- even to its illusory nature, emphasized in the contrasting experience between "local" and "global".

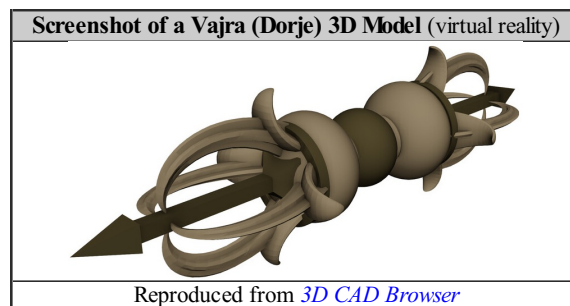
Aspects of the challenge have been delightfully suggested by the mace-feather incommensurability discussed above in a sensitive

Canadian context. It is indeed in that context that a current mace design has been called into question with respect to a university mace (Lindsay Dowling, *A Symbol of Significance: Dal seeks ideas for new ceremonial object to replace university mace*, *Dal News*, 7 March 2017; Jacob Boon, *Dalhousie takes another swing at replacing ceremonial mace*, *The Coast*, 7 June 2017). The controversy has been extended to include that of the Canadian parliament (Pat Steenberg, *Redesign the mace to include Indigenous contributions*, *The Star*, 3 July 2017; Todd Lamirande, *Redesign Parliament mace to include Indigenous contributions*, *National News*, 14 September 2017). In South Australia, such a redesign has been framed as a regular student project (*Parliamentary Mace*, *Makers Empire*, 2017).

**Design principles?** Notably in highlighting the complex subtleties of the "global"--"local" relationship, these might include:

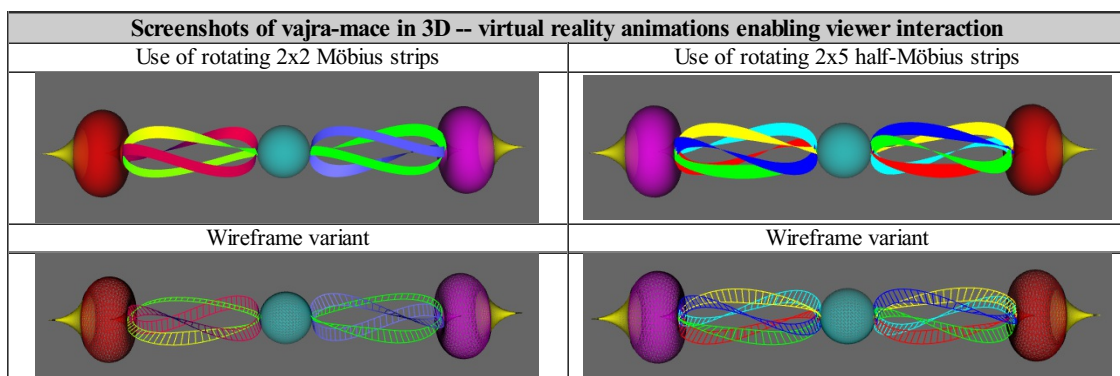
- indication of potential, whether:
  - higher order of connectivity
  - vulnerability degrees of pathological dysfunction and disconnectivity -- especially as a consequence of cognitive reductionism
- ability to carry:
  - complexity, notably reframed in terms of aesthetic subtlety inviting multiple interpretations
  - a diversity of alternative perceptions, readily framed as incommensurable (as with the mace-feather argument above)
  - contrasting perspectives rendering one end only partially visible from the other, if at all (indicative of the challenge of recognizing a local perspective on one side of a globe from one on the other other)
- embody cognitive paradox of transition in comprehension between incommensurables:
  - from local to global
  - from marginalized extremes to global norms (as indicated by the mace-feather distinction in Canadian discourse)
- take advantage of emerging information technology in its enhancement of the scope of creative imagination:
  - 3D facilities, including virtual reality
  - interaction with the design, possibly allowing for modification of parameters
  - emphasis on animation rather than stasis
  - morphing possibilities, namely transformation between distinctive forms rather than locking into a singular unchanging form
- retain a degree of relationship to traditional designs, and the principles on which they have been based (possibly to the point of embodying legendary symbolic attributes and iconography)

In considering possibilities, note the extensive array of *Sceptre 3D Models*, as well as those of the mace (*Free 3D Mace Models*; *Mace 3D models*, *CGTrader*) -- referring primarily to traditional forms of mace as a weapon. Interactive variants exist of the original symbol (*3D Vajra*, *Sketchfab*; *Vajra 3D models*, *STLFinder*), as with the *ghanta*. Some are designed for **3D printing**. A virtual reality variant, depicted below, is also accessible (*Vajra (Dorje) 3D Model*).



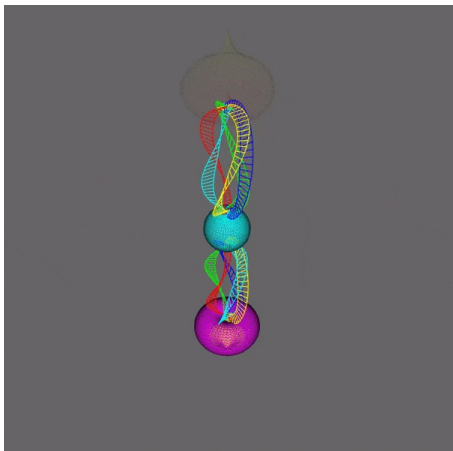
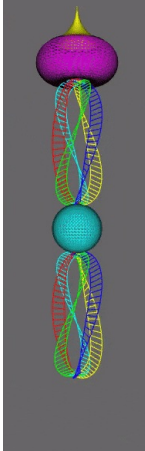
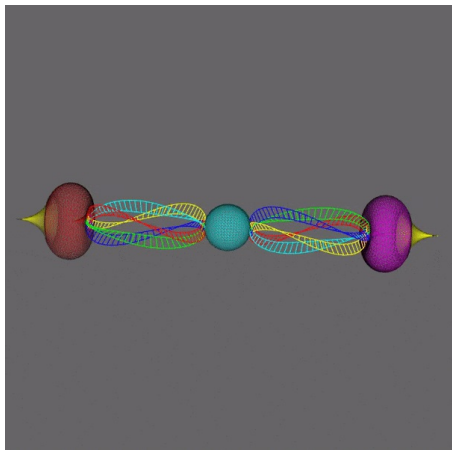
It is appropriate to note that many of the accessible "*Vajra 3D Models*" are primarily those of the *Vajra jet fighter* of India. This recalls appropriation of the *Merkabah*, a fundamental symbol of Jewish mysticism, in naming the primary Israeli battle tank (the *Merkava*), as indicated separately with respect to analogous design considerations (*Framing Global Transformation through the Polyhedral Merkabah: neglected implicit cognitive cycles in viable complex systems*, 2017).

**Examples of exploration of particular design options:**

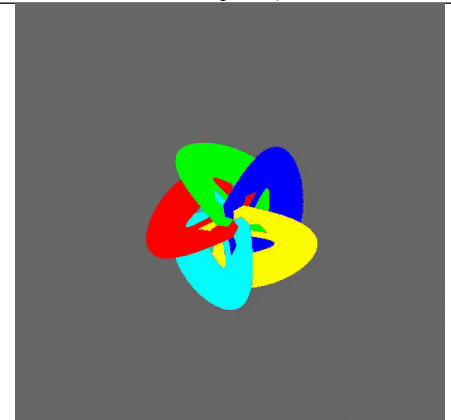
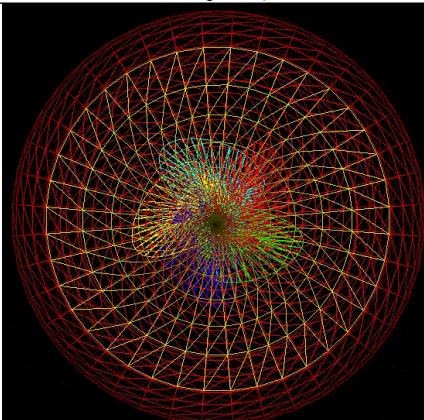


As an illustration of some of the options indicated below, the following animations show how the ends of the mace-vajra (and any central

sphere) might be variously rendered visible or invisible. The rotations are also indicative of routines in baton twirling. Modifying the transparency of the ends is especially helpful in suggesting how incommensurables -- such as "local" or "global" -- might be held to be nonexistent or meaningless in symbolic terms. Modifying the transparency of the central sphere is also suggestive of conditions under which there is a disconnectivity and a failure of integration.

Indicative experimental animations of wireframe versions of a mace-vajra		
Rotation out of the plane of the screen	"Sceptre-mode"	Rotation in the plane of the screen
		
Virtual reality interactive 3D variants: <a href="#">x3d</a> , <a href="#">wrl</a> . Video variants (mp4): <a href="#">rotation-out-of-plane</a> ; <a href="#">rotation-in-plane</a> ; <a href="#">rotation-vertical</a>		

In the light of the manner in which the major end of a sceptre may be heavily decorated with jewels of symbolic significance, there is a case for viewing one end of the above model along its polar axis, as shown below.

Polar view of one end of mace-vajra showing rotation of 5 half-Möbius strips	
Solid rendering (end structure periodically transparent)	Wireframe rendering (end structure periodically transparent)
	

**Options for separation between polar extremities, variously suggestive of cognitive complexity:** The requisite subtlety is most readily indicated by use of the Möbius strip, as indicated above, following the argument of [Steven Rosen](#) (*Science, Paradox, and the Moebius Principle: the evolution of a "transcultural" approach to wholeness*, SUNY, 1994):

- 2: single Möbius strip (employed twice, or alone if the central sphere is omitted)
- 3: half-Möbius strip x 3 (employed twice, or alone if the central sphere is omitted)
- 4: Möbius strip x 2 (employed twice, or alone if the central sphere is omitted)
- 5: half-Möbius strip x 5 (employed twice, or alone if the central sphere is omitted)
- 9: Möbius strip x 3 (employed twice, or alone if the central sphere is omitted)

Any such distinctions are somewhat consistent with current interest in the [Triple Helix model of innovation](#) (inspired by the functional role of the [double helix](#) and [triple helix](#) of biochemistry), in contrast with its proposed extension to a Quadruple Helix model, or a Quintuple Helix model. These are variously discussed separately (*Contrasting the implications of "triple helix" -- cognitive and otherwise*, 2017; *Systemic closure: fourth helix -- and beyond?* 2017; *Suggestive representation of dynamics of a "cognitive wormhole" associated with a quintuple helix*, 2017; *Climbing Elven Stairways: DNA as a macroscopic metaphor of polarized psychodynamics*, 2007). Given the challenge of the symbolic feather to the mace of Canada by the Indigenous nations (as noted above), there is some irony to the resemblance between the fine structure of a feather and the wireframe rendering of 5 half-Möbius strips in virtual reality -- recalling the 5 nations of the Iroquois Confederacy.

**Options for polar extremes:** Clearly a basic design choice is between asymmetric ends (typical of mace and sceptre design) and a symmetric form (typical of the *vajra*), unless animation is used to alternate periodically between choices. The choice arguably has implications for comprehension of governance and the nature of the cognitive relationship reinforced between "local" and "global".

Possibilities include:

- some form of crown, as is characteristic of sceptre design (although then primarily for one end). Some cognitive implications are discussed separately (*Engaging with Globality through Cognitive Crowns*, 2009).
- some form of **lotus pattern** (as recognized in relation to the *vajra*), notably if its opening and closing was a feature of a dynamic design. This recalls the arguments made by **Orrin Klapp** (*Opening and Closing: strategies of information adaptation in society*, 1978). These could be extended to the challenging relationship between objectivity and subjectivity (Max Deutscher, *Subjecting and Objecting: an essay in objectivity*, University of Queensland, 1983)
- heart-pattern, notably as explored separately with respect to a variant in 3D (*Symbolizing Collective Remembering Otherwise: encompassing the "headless hearts" and heartless heads" through their dynamic entanglement*, 2018), especially a *Heart symbol as a standing wave pattern of feedback loops* (2018). To the extent that each end is then formed by the juxtaposition of two tori (as depicted above), of potential interest are the related dynamics of one or more **Lissajous curves**, as shown separately (*Cognitive heart dynamics framed by two tori in 3D*, 2016; *Implications of a 3D heart symbol*, 2018). [Thanks are due to Sergey Bederov of **Cortona3D** for earlier development of that structure, as used here].
- symmetric form of Platonic and Archimedean solids, especially given the jewel bedecked features of some sceptres and the significance attributed to them, as discussed separately (*Patterning Archetypal Templates of Emergent Order: implications of diamond faceting for enlightening dialogue*, 2002). The *vajra* symbol is also known as the **Diamond Sceptre**. Additional possibilities include:
  - nesting polyhedral forms, possibly with animations indicative of cycles of emergence, as illustrated separately (*Psychosocial Implication in Polyhedral Animations in 3D: patterns of change suggested by nesting, packing, and transforming symmetrical polyhedra*, 2015). Such a dynamic might be especially associated with any central sphere between the extremities.
  - positioning a succession of polyhedra along the length of the separation between the extremes, possibly in conformity with the above-mentioned square-cube law. Such a presentation might be considered reminiscent of the spinal sequence of **chakras** and any association of **kundalini** with the "thunderbolt" symbolism of the *vajra*. These associations are also suggestive of the extent to which any mace-sphere could be considered a form of external projection of the "spine" of the nation or other collective -- as much as the nature of individual identity within it. Similar bodily projections are evident in the case of "heart" (of a community), **headquarters**, if not of hindquarters (despite the necessary distinction from **arsenal** for security purposes). From such a symbolic perspective, are global organizations to be considered as characteristically "spineless", given the notable lack of any mace? Alternatively, is the configuration of flagpoles in front of their headquarters to be considered as an approximation to the fasces symbol?
- spherical pentagram, namely the 2D form projected onto a spherical end (as is typical of any symbolic orb). This is potentially especially interesting in the light of the seminal role played by the **Pentagramma Mirificum** in the mathematics of navigation around the globe, as discussed separately (*Global Psychosocial Implication in the Pentagramma Mirificum: clues from spherical geometry to "getting around" and circumnavigating imaginatively*, 2015). The images presented there also indicate how one such spherical pentagram is matched by a second (inverted) version on the other side of the sphere. This is suggestive of how each could be associated with a sphere at each end of the mace-vajra (with the implication that it is in their projection into any central sphere that the two patterns would be linked by great circles).

## Imagining a mnemonic device of requisite higher dimensionality

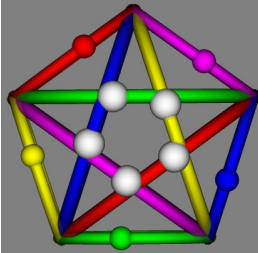
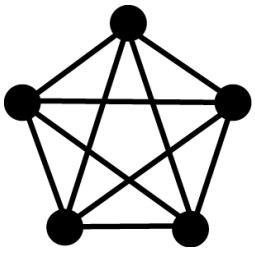
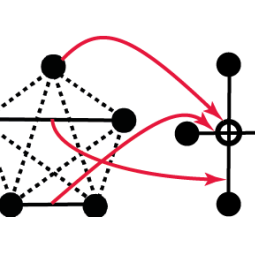
**5-fold systemic clues:** The spherical pentagram presentation also draws attention to the similarity with the the classic Chinese 5-fold *Wu Xing* pattern (mentioned above) -- a reminder that the systemic links in that pattern (as presented in 2D, below left) are spherical -- not planar. A polar extreme of any mace-vajra could also be designed as a toroidal complex derived by adapting the 2D features of the *Wu Xing* into a 3D configuration of tori (as shown below). Such links are oversimplistically understood as straight lines; they are curves or arcs around a sphere -- potentially even of a hypersphere.

<b>Chinese 5-phase <i>Wu Xing</i> cycle experimentally depicted as a configuration of tori in 3D</b> (Animations of spheres moving through tori as systemic links; models rotated on x-axis. Correspondence to 2D image evident during the rotation)		
Classic 2D representation	Wireframe rendering (spheres moving within tori)	Solid rendering (spheres moving over tori)

<p>Adapted from <b>Wu Xing</b> entry in <i>Wikipedia</i>  <b>Interaction arrows:</b>  <b>black=generating; white=overcoming</b></p>	<p>Virtual reality variants: <b>x3d</b>, <b>wrl</b>. Video variants: <b>mp4</b> (left), <b>mp4</b> (right)  Other design parameters could be used for diameter/colour/speed of spheres, and direction/speed of rotation  Transparency could be changed. Spheres could be replaced by distinctive Platonic polyhedra</p>
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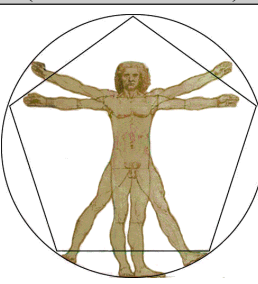
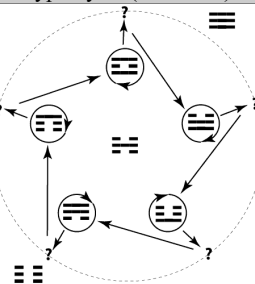
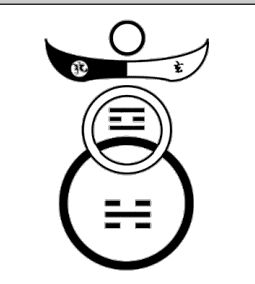
As a mnemonic device, one of the merits of the configuration is the extent to which different features of its geometry can be imagined as axes of rotation and manipulation. As with the animations above, these could be understood as implied by those demonstrated in baton twirling, quarterstaff, or kendo -- and even rope spinning (*Rope Spinning: Flat Loop Tricks*, YouTube, 2018; *Short clips from Ropers Get-To-Gather 2014*, YouTube). One possibility, for example, is to consider that pairs of spheres of the 3D *Wu Xing* could be understood as **dumbbells**, whose ("twirling") movement is constrained by the particular torus in terms of which they can be rotated.

For mnemonic purposes, the elements of the structure can be considered as visible or invisible (as suggested by the animation below centre). In terms of alternative perspectives, the 3D structure can then be considered as offering views from different angles, depending on the relative rotation of the dumbbells (as suggested below right). A related mnemonic argument has been developed separately with respect to use of Rubik's Cube (*Interplay of Sustainable Development Goals through Rubik Cube Variations: engaging otherwise with what people find meaningful*, 2017).

Toroidal <i>Wu Xing</i> in 3D (screen shot)	Variations in pentagram visibility (animation)	3D Pentagram in perspective (example)
		

As argued above, the *Wu Xing* pattern might be usefully be understood as a form of 5-fold hypercycle. This lends itself to the configuration presented as an animation (below centre). Speculatively, the primary complementarity is indicated outside that framework (as a diagonal), consistent with the role of the dipole (as mentioned above). 5 other elements of the *BaGua* pattern (incorporated together in a possible 8-fold hypercycle above) are indicated as part of the 5-fold hypercycle pattern, with a sixth placed at the centre.

This mnemonic approach has the advantage of drawing attention to the perspective of the observer in "grasping" cognitively the hypercycle -- an extra-systemic sixth position -- as with any "grasp" of a mace-vajra or a baton-twirler. This recalls the argument of Terrence Deacon (*What's Missing from Theories of Information?* 2010). Together these elements emphasize through their animation that **the elusive requisite comprehension of challenging systems is dynamic rather than the dangerously simplistic conventional implication that it is static**, as emphasized separately (*Engaging with Elusive Connectivity and Coherence: global comprehension as a mistaken quest for closure*, 2018).

Vitruvian man/woman (animation) (multi-coloured variant)	Indicative mapping of BaGua elements onto 5-fold hypercycle (animation)	Alchemical representation of the mysterious (plasma) fluid moving within the toroidal vessel above
		

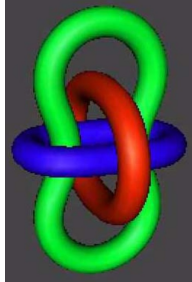
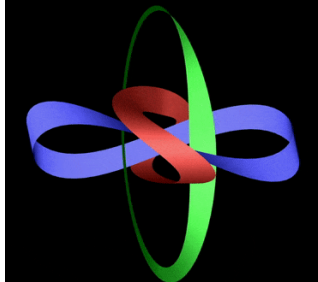
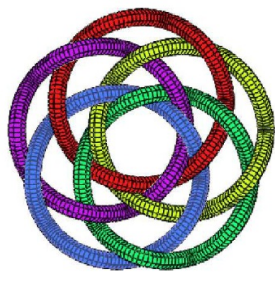
As indicated in the animation (above left), the cognitive appeal can be further understood in the light of the aesthetic proportions of an animated form of the classic *Vitruvian Man* of Leonardo da Vinci (C. Lance Harding, *Mysteries of the Vitruvian Man*, Academy of Sacred Geometry, 2014). As variously illustrated in the latter, this is in itself suggestive of an imaginatively sophisticated mace-vajra design.

The focus of this argument has been on the complementarity between local and global, each effectively "mysterious" from the perspective of the other. This is usefully emphasized by the strangeness of the Taoist alchemical symbol (*xuanpin*) for the so-called **valley spirit**, or mysterious feminine, as widely discussed (*Embodying topological succinctness beyond questions*, 2014; Shuren Wang, *Returning to Primordially Creative Thinking: Chinese wisdom on the horizon of "Xiang thinking"*, 2018; Evgueni A. Tortchinov, *The Doctrine of the "Mysterious Female" in Taoism*, 1997; Ellen M. Chen, *In Praise of Nothing: an exploration of Daoist fundamental ontology*, 2010).

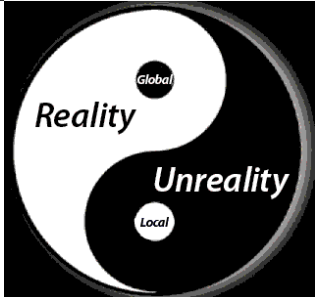

This "spirit" may be fruitfully considered as corresponding to the plasma (an unusual state of matter) -- a mysterious "feminine" fluid -- circulating in the "valley" formed by the ITER nuclear fusion reactor. It could however be considered as a form of systems diagram of the cognitive processes of ITER-8 and the challenge of cognitive fusion and its comprehension (*Enactivating a Cognitive Fusion*

Reactor: Imaginal Transformation of Energy Resourcing (ITER-8), 2006).

It is intriguing to note a degree of relation between the three rings in the Taoist symbol above and how Dante Alighieri describes the three rings (*tre giri*) of the Holy Trinity in *Paradiso 33* of the *Divine Comedy* (Arielle Saiber and Aba Mbirika, *The Three Giri of Paradiso XXXIII*, *Dante Studies*, 131, 2013, pp. 237-272). The rings are discussed separately in terms of interlocking Borromean rings from which the images below are reproduced (*Borromean challenge to comprehension of any trinity?*, 2018; *Comprehension of Unity as a Paradoxical Dynamic: metaphors reframing problematic engagement with otherness*, 2019). The perception of local from global, and vice versa, can indeed be seen as one of problematic engagement with "otherness".

Representations of Borromean rings		
Toroidal version	3 Möbius strips (animation)	5-fold Borromean rings
		
Reproduced from Kauffman (2006)	Video (mp4); Virtual reality (x3d; wrl)	Reproduced from Chamberland and Herma (2013)

Could the *Wu Xing* dynamic be considered in terms of the pattern of 5-fold Borromean rings discussed separately (Marc Chamberland and Eugene A Herma, *Rock-Paper-Scissors meets Borromean Rings*, Grinnell College, 2014)? Such questions are relevant to the current pattern of global (or local) strategic dilemmas implied by the elements of the *Wu Xing* pattern.

Use of the Tao symbol as a mnemonic device		
	"Valley spirit" ?	
Images adapted from <i>Snoring of The Other: a politically relevant psycho-spiritual metaphor?</i> (2006)		

The animations above follow from related experiments in visualization which suggest other possibilities (*Framing Global Transformation through the Polyhedral Merkabah: neglected implicit cognitive cycles in viable complex systems*, 2017; *Circular configuration of cognitive phases framing toroidal experience?* 2017; *Psychosocial Learnings from the Spiral Form of Hurricanes*, 2017; *Concordian Mandala as a Symbolic Nexus: insights from dynamics of a pentagonal configuration of nonagons in 3D*, 2016). Possibilities with regard to use of the Möbius strip can be related to the *Ouroboros*, given the above use of a torus (*Complementary visual patterns: Ouroboros, Möbius strip, Klein bottle*, 2017; *Experimental animations in 3D of the ouroboros pattern*, 2017).

**Relative movement of elements, with cognitive implication suggested by optical effects:** As currently designed, no relative movement between the elements of mace or sceptre is incorporated. Again this reinforces the sense of stasis associated with mace-based governance -- a characteristic of global reporting, as discussed separately (*Dynamic Transformation of Static Reporting of Global Processes: suggestions for process-oriented titles of global issue reports*, 2013). Possibilities might include:

- translation (of Möbius complexes) along polar axis
  - to encompass central sphere
  - to penetrate and fill 3D end structures (whether crown, heart-pattern, polyhedra, or otherwise)
- rotation
  - of Möbius strand complexes (as shown above), whether in same direction or in a counter direction
  - of any 3D end structures
- speed
  - slower, with more meditative connotations
  - faster, such as to suggest a sinusoidal effect

**Relative dimensions of elements:** Of potential significance is the relative size of the mace-sceptre of Western inspiration (possibly requiring two hands) in comparison with that of a *vajra* of Eastern inspiration (potentially enfolded within a hand in *mudra* rituals). With respect to the elements of such symbols, possibilities include:

- strand complexes:
  - thicker / thinner

- shorter / longer
- more / less transparent
- as wireframe variant
- central sphere:
  - larger / smaller
  - more / less transparent, notably in the light of any dynamics through which it is understood as emergent, namely as a cognitive lens enabling insight through optical metaphors (potentially inverting the image of global from local, and vice versa)

**Rotation of mace-vajra as a whole:** Arguably a mace is most typically raised or lowered vertically with respect to its polar axis, prior to being placed horizontally on a stand. It is unclear that such movement is held to be of any significance for governance (with the potential exception of rituals associated with Black Rod in parliamentary assemblies). Other possibilities include:

- rotation in horizontal plane, typical of animated depictions of a [centrifugal governor](#) by which the speed of an engine is controlled
- rotation in vertical plane, as is most characteristic of baton twirling by a drum major(ette)

**Transformations:** Information technology now offers new kinds of support for imaginative exploration of the role of a mace-vajra symbol through morphing transformations:

- **Complementary forms:**
  - **Vajra-Bell:** Of particular significance, the *ghanta* can be recognized as having one end of a *vajra* expanded into bell-shape, whilst the other retains the form of the other *vajra* extremity. Various approaches can then be envisaged to morphing a *vajra* end into a bell-shape.
  - **Sceptre-Orb:** A mace of simpler form may well have one end in the form of a sphere. Clearly the expansion of an end into that form can be readily envisaged, as with the "absorption" of the complete length of the mace into that orb (and the possibility of reversing that process).
- **Mace to Fasces:** Of potential interest, especially given the highly controversial symbolic implications, the single "rod" of a mace can be readily multiplied to constitute the set of rods characteristic of the form of the fasces symbol. The central axe of the latter is of course reminiscent of the function of the mace as a weapon through which law and order is enforced.
- **Möbius strip to Klein bottle:** In the effort to emphasize a seemingly essential "cognitive twist" between incommensurables (such as local-global, or ny relation to otherness), the example above makes use of the Möbius strip. Of further potential interest is the manner in which the more challenging form of a Klein bottle is made by stitching together two Möbius strips of opposite chirality (*How is a Klein bottle made of two Möbius strips?* *Quora*, 2016; Konrad Polthier, *Imaging Maths: inside the Klein bottle, Plus*, 1 September 2003). This possibility raises the question as to how the local-global polarity might be understood as "separated" or distinguished by the strange form of a Klein bottle, if paired Möbius strips in the example above were represented by such a form. Conversely, what is then lost if the Klein bottle is reduced to Möbius strips -- and further, to the simply rod-like form of a mace-sceptre?
- **Wu-Xing to Torus:** Given the 5-fold distinction of the senses by which the proxemic dimension of this argument was introduced, there is a case for relating this tentatively to the classic Chinese 5-phase articulation known as *Wu Xing*. This conceptual scheme is used in many traditional fields to explain a wide array of phenomena, including the succession of political regimes -- or the of planets of significant gravity (*Cycles of enstony forming mnemonic pentagrams: Hygiea and Wu Xing*, 2012; *Memorable dynamics of living and dying: Hygiea and Wu Xing*, 2014). As typically presented in 2D this could be explored as a cross-section of the 5-fold array of elements by which the polar shaft of the mace can be depicted (in one of the examples above). There is the further possibility of presenting it in 3D with the links between the 5 elements taking toroidal form (as shown above) -- then to be understood as a transformation into a configuration at each end of the mace.

**Higher dimensionality?** Is it too readily assumed that an adequate symbol for global governance can be appropriately designed in 3D? The introduction of animation above already suggests that the subtlety may need to make use of 4D. The mace-vajra of the future may require a higher order of connectivity to reinforce comprehension appropriate to the challenge, as discussed separately (*Envisaging NATO Otherwise -- in 3D and 4D? Potentially hidden faces of global strategy highlighted through polyhedra*, 2017; *Beyond dispute in 5-dimensional space: Pentagramma Mirificum?*, 2015).

The manner in which twirling of a baton-mace is so intimately related to the direction of music also suggests that wider comprehension of higher dimensionality may depend on the memorable connectivity offered by recognizable patterns in music, as separately argued (*A Singable Earth Charter, EU Constitution or Global Ethic?* 2006). As a much-valued symbol, the role of the anthem bears consideration in this respect -- as with the provocative case for its reversal, given the current crisis of governance (*Reversing the Anthem of Europe to Signal Distress: transcending crises of governance via reverse music and reverse speech?* 2016). The subtle insights of Omar Khayyam, as a famed poet of a tent-making family, suggest that the comprehension and design of a "big tent", seen as necessary for effective interfaith discourse, needs to be understood otherwise (*Global Brane Comprehension Enabling a Higher Dimensional Big Tent? Strategic implication in encompassing nothing and coming to naught*, 2011; Philip Clayton, *Seeking Common Ground in 'Big Tent' Christianity*, *The Huffington Post*, 9 January 2010).

As implied by the case for a Quintuple Helix model of innovative governance (mentioned above), and reference to "MACE" as a European meta-data project, any requisite mace-vajra may well need to be a symbol of higher dimensionality. Clues in that respect are to be found in the 4D analogues of polyhedra, known in 4D as [polychora](#) (with variants of yet higher order), as discussed in more detail:

Visual representations of globality of requisite variety for global governance  
Four-dimensional requisite for a time-bound global civilization?

Five-fold cognitive dynamics of relevance to governance?  
Decision-making capacity versus Distinction-making capacity  
From space-ship design to time-ship embodiment as a requisite



A valuable context for consideration of the 5-fold *Wu Xing* framework is offered by Xiaoying Qi (*Paradoxical Integration: globalised knowledge flows and Chinese concepts in social theory*, University of Western Sydney, 2011). If higher dimensional subtlety is indeed required, then paradox is more than likely to be a feature of it, as argued separately (*Comprehension of Unity as a Paradoxical Dynamic: metaphors reframing problematic engagement with otherness*, 2019). However Qi makes no explicit mention of that framework, despite extensive discussion of the concepts of *wu* and *wuwei*. Instead Qi indicates that knowledge flows can thus be part of what has been characterized by global cultural flows, analyzed by Arjun Appadurai in terms of "five dimensions": (a) ethnoscapas; (b) mediascapas; (c) technoscapas; (d) finanscapas; and (e) ideoscapas (*Grassroots Globalisation and the Research Imagination*, 2001).

The relation to otherness, exemplified here by that between local and global, would seem to require forms of governance with a higher dimensional perspective -- given the highly problematic dynamics to which that relationship gives rise. There is a case for comparing the challenge to comprehension with that of the **Principle of Complementarity** regarding the relation between wave and particle in quantum mechanics. This would suggest that it is impossible to give due consideration of global and local perspectives at the same time. The need for a reframing of social and international relations with such an understanding has been articulated by Alexander Wendt (*Quantum Mind and Social Science: unifying physical and social ontology*, 2015). As mentioned above, does understanding of the paradox of "glocalization" require insights from understandings of nonlocality as framed by fundamental physics?

Physics is accustomed to the articulation of reality in 10 dimensions (Matt Williams, *A universe of 10 dimensions*, *Phys.org*, 11 December 2014). The latter notes the striking videos enabling visualization of 10-dimensionality (*Thinking visually about higher dimensions*, *YouTube*, 11 August 2017). Arguably the animation above of the 10-torus configuration in 3D of the *Wu Xing* offers another example.

There is some irony to the possibility that other modes of articulating psychosocial organization may be appropriate. One example might be that of **wampum belts** of the Iroquois Confederacy, given their equivalent in the symbolic **sashes** currently used as an indication of authority (*Quantum Wampum Essential to Navigating Ragnarok: thrival in crisis through embodying turbulent flow*, 2014; Penelope Myrtle Kelsey, *Reading the Wampum: essays on Hodinöhsö:ni' visual code and epistemological recovery*, 2014). The role of the as yet undecoded **quipu** in ensuring the integrity of the Andean civilization over an extensive period could be considered another example.

Is global governance currently exhibiting a high order of what might be termed "imaginative failure" -- as with the assessment of the **ijntelligence failure** in anticipation of 9/11. However speculative, given the transcendental, if not religious, significance accorded to symbols in the process of governance, there is clearly a case for exploring subtler modes of understanding the relation with any "other". The wave-particle complementarity would appear to offer valuable clues in that respect, as argued separately (*Being Neither a-Waving Nor a-Parting: cognitive implications of wave-particle duality in the light of science and spirituality*, 2013; *Encountering Otherness as a Waveform -- in the light of a wave theory of being*, 2013). Global and local perspectives may be appropriately understood as equally illusory -- each to the other.

Local Reality of Overcrowding?	
Climbers queuing on Mount Everest (May 2019)	Crowd of refugees arriving in Malmo (Sweden)
	
Image which went viral, taken on 23 May by the climber Nimal Pujra (AFP Photo; Project Possible) (Peter Beaumont, <i>Why I won't be joining the queue at the top of Everest</i> , <i>The Guardian</i> , 26 May 2019; Helier Cheung, <i>Mount Everest: Why the summit can get so crowded</i> , <i>BBC News</i> , 24 May 2019)	Copyright by Reuters / TT News Agency; reproduced from <i>Civil war or bright future? Sweden beckons more migrants with 'land of benefits' website as ex-Scania CEO predicts grave conflict</i> (RT, 29 Oct, 2019) following account by Paulina Neuding ( <i>Bomb attacks are now a normal part of Swedish life</i> , <i>The Spectator</i> , October 2019)

Imposition of Tourism Quotas -- Local Overcrowding?
<p><i>15 Beloved Places Struggling With Overtourism</i> (Canada <i>Nast Traveler</i>, 15 October 2018): Mallorca, Bali, Ecuador (Galapagos), Amsterdam, Boracay, Angkor Wat, Peru (Machu Picchu), Iceland, Bali, Dubrovnik, Santorini, Barcelona, Thai Islands, Mount Everest, Venice</p> <p><i>8 Destinations Putting a Cap on Tourist Numbers</i> (EscapeHere): Bhutan, Beijing (The Forbidden City), Australia (Lord Howe Island), Antarctica, Seychelles</p> <p><i>Tourism pressures: Five places tackling too many visitors</i> (BBC News, 16 April 2018): Thailand (Maya Bay), Italy (Cinque Terre), South Korea (Jeju Island), Colombia (Caño Cristales)</p> <p><i>17 Places That Have Been Ruined by Tourism</i> (Reader's Digest)</p> <p><i>Europe Made Billions from Tourists. Now It's Turning Them Away</i> (Time, 26 July 2018)</p> <p><i>Coping with Success: Managing overcrowding in tourism destinations</i> (World</p>

Travel and Tourism Council / McKinsey, 2017): Heatmap of 68 cities in initial diagnostic  
*The tourist attractions on top of your bucket list might not actually want you there* (Quartz, 13 December 2017)  
*Some European Cities May Begin Limiting Tourism After Angry Backlash* (The Huffington Post, 7 August 2017)

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## References

Christopher Alexander. *A Pattern Language*. Oxford University Press, 1977

Irwin Altman. *The Environment and Social Behavior: privacy, personal space, territory, crowding*. Brooks/Cole, 1975

Pierpaolo Andriani. On the Relevance of Extremes vs. Means in Organization Science: some theory, research, statistics, and power law implications. European Conference on Complex Systems, Dresden, 2007 [[video](#)]

Pierpaolo Andriani and Bill McKelvey:

- Beyond Gaussian averages: redirecting international business and management research toward extreme events and power laws. *Journal of International Business Studies*, 38, 2007, pp. 1212-1230 [[text](#)]
- Perspective: From Gaussian to Paretian Thinking: Causes and Implications of Power Laws in Organizations. *Organization Science*, 20, 2009, 6, pp. 1053-1071 [[text](#)]
- From skew distributions to power-law science. In: Peter Allen (Ed.), *The sage handbook of complexity and management*, 2011

Arjun Appadurai:

- *Grassroots Globalisation and the Research Imagination*. Duke University Press, 2001
- *Modernity at Large: cultural dimensions of globalization*. University of Minnesota Press, 2001

Mary Catherine Bateson and Gregory Bateson:

- *Our Own Metaphor: A Personal Account of a Conference on the Effects of Conscious Purpose on Human Adaptation*. Hampton Press, 1972
- *Angels Fear: Towards an Epistemology of the Sacred*. Macmillan, 1987

J. A. P. J. Breukers and R. J. Hoekstra. Epistemology and ontology in core ontologies: FOLaw and LRICore, two core ontologies for law. CEUR Workshop Proceedings. General, 2004

John Brockman (Ed.). *Possible Minds: 25 Ways of Looking at AI*. Penguin, 2019 [[contents](#)]

R. L. Carneiro. The evolution of complexity in human societies and its mathematical expression. *International Journal of Comparative Sociology*, 28, 1987, 2-3, pp. 111-128.

Karen A. Cerulo:

- *Never Saw It Coming: cultural challenges to envisioning the worst*. University of Chicago Press, 2006
- *Deciphering Violence: the cognitive structure of right and wrong*. Routledge, 1998

R. E. Cytowic. *Synesthesia: a union of the senses*. Springer, 1989

Terrence W. Deacon:

- *Incomplete Nature: how mind emerged from matter*. W. W. Norton, 2011
- What's Missing from Theories of Information? In: Paul Davies and Niels Henrik Gregersen (Eds.), *Information and the Nature of Reality: From Physics to Metaphysics*. Cambridge University Press, 2010, pp. 146-169 [[text](#)]

Nicholas Dew and Saras D. Sarasvathy. Exaptation and niche construction: behavioral insights for an evolutionary theory. *Industrial and Corporate Change*, 25, 2016, 1

Barbara Ehrenreich:

- *Bright-sided: how the relentless promotion of positive thinking has undermined America*. Metropolitan Books, 2009
- *Smile Or Die: how positive thinking fooled America and the world*. Granta Books, 2010 [[summary](#)]

Manfred Eigen and Peter Schuster. *The Hypercycle: A Principle of Natural Self-Organization*. Springer, 2012

Gary W. Evans, Stephen J. Lepore and Karen Mata Allen. Cross-Cultural Differences in Tolerance for Crowding: fact or fiction? *Journal of Personality and Social Psychology*, 79, 2000, 2, pp. 204-210

Jonathan Freedman. *Crowding and Behavior: the psychology of high-density living*. Viking Adult, 1975

Thomas L. Friedman:

- *The World Is Flat: a brief history of the twenty-first century*. Farrar, Straus and Giroux, 2005 [[review](#)] [[review](#)]
- *The World Is Flat: the globalized world in the twenty-first century*. Penguin, 2006
- *Hot, Flat, and Crowded*. Farrar, Straus and Giroux, 2008 [[contents](#)]

Tom Froese, Takashi Ikegami and Nathaniel Virgo. *The Behavior-Based Hypercycle: from parasitic reaction to symbiotic behavior*.

*Artificial Life*, 13, 2012, pp. 457-464

Stephen Jay Gould and Elisabeth S. Vrba. Exaptation: a missing term in the science of form. *Paleobiology*, 8, 1982, 1, pp. 4-15

Edward T. Hall:

- The Hidden Dimension: an anthropologist examines man's use of space in public in private. Anchor Books, 1966.
- Beyond Culture. Anchor Books, 1976
- The Dance of Life: The Other Dimension of Time. Anchor Books, 1983

James Hillman with Michael Ventura. We've Had a Hundred Years of Psychotherapy -- And the World's Getting Worse. HarperCollins, 1993

Josef Hofbauer and Karl Sigmund. The Theory of Evolution and Dynamical Systems: mathematical aspects of selection. Cambridge University Press, 1992

U. Jain. The Psychological Consequences of Crowding. Sage, 1987

Jeremy Lent. The Patterning Instinct: a cultural history of humanity's search for meaning. Prometheus Books, 2017

Mariano Mastrogiorgio and Victor Gilsing. Innovation through exaptation and its determinants: the role of technological complexity, analogy making and patent scope. *Research Policy*, 45, 2016, 7

Gareth Morgan:

- Images of Organization. Sage, 1986
- Imaginization: New Mindsets for Seeing, Organizing and Managing. Sage, 1993

Xiaoying Qi:

- Paradoxical Integration: globalised knowledge flows and Chinese concepts in social theory. University of Western Sydney, 2011 [[text](#)]
- Globalized Knowledge Flows and Chinese Social Theory. Routledge, 2014 [[contents](#)]

Steven M. Rosen:

- Science, Paradox, and the Moebius Principle: the evolution of a "transcultural" approach to wholeness. SUNY, 1994 [[summary](#)]
- Topologies of the Flesh: a multidimensional exploration of the lifeworld. Ohio University Press, 2006 [[summary](#)]

Susan Saegert. Effects of spatial and social density on arousal, mood and social orientation. University of Michigan, 1974 [[text](#)]

J. Simner and E. M. Hubbard (Eds.). Oxford Handbook of Synesthesia. Oxford University Press, 2013

Stacie A. Swain. Armed with an Eagle Feather Against the Parliamentary Mace: a discussion of discourse on indigenous sovereignty and spirituality in a settler colonial Canada, 1990-2017. University of Ottawa, 2017 [[text](#)]

Wayne Teasdale and George Cairns (Eds.). Community of Religions: voices and images of the Parliament of the World's Religions. Continuum, 1996

Ernst von Weizsaecker with Anders Wijkman. Come On! Capitalism, Short-termism, Population and the Destruction of the Planet. Springer, 2018

Elisabeth S. Vrba. Macroevolutionary trends: new perspectives on the roles of adaptation and incidental effect. *Science*, 221, 1983, 3 [[text](#)]

Shuren Wang:

- Returning to Primordially Creative Thinking: Chinese wisdom on the horizon of "Xiang thinking". Springer, 2018
- The roots of chinese philosophy and culture: an introduction to "Xiang" and "Xiang thinking". *Frontiers of Philosophy in China*, 4, 2009, 1, pp.1-12 [[abstract](#)]

Alexander Wendt:

- Quantum Mind and Social Science: unifying physical and social ontology. Cambridge University Press, 2015
- Flatland: Quantum Mind and the International Hologram. In: Mathias Albert, et al. (Eds), New Systems Theories of World Politics, Palgrave Macmillan, 2010
- Social Theory of International Politics. Cambridge University Press, 1999

David Whitney and Dennis M. Levi. Visual Crowding: a fundamental limit on conscious perception and object recognition. *Trends in Cognitive Science*, 15, 2011, 4, pp. 160-168. [[text](#)]

Wolfgang Wildgen:

- Semiotic Hypercycles Driving the Evolution of Language. *Axiomathes*, 18, 2008, 1, pp. :91-116 [[abstract](#)]
- The Semiotic Hypercycle and the Run-Away Process of Linguistic (Symbolic) Evolution. Cradle of Language Conference, Stellenbosch, 2006 [[ppt](#)]

Frances Yates. The Art of Memory. University of Chicago Press, 1966.

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