



laetus in praesens

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Reimagining Tesla's Creativity through Technomimicry

Psychosocial empowerment by imagining charged conditions otherwise

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Introduction

There is always the possibility that the future will reframe the renowned creative thinking of [Nikola Tesla](#) as "wrong" in a way strange to understanding at the present time. This is a speculative exploration of the possible nature of such a reframing -- one in which Tesla is then understood to have been paradoxically both "wrong" and "right", and necessarily so.

The acknowledged focus of Tesla's work was on electromagnetism -- more specifically on electricity. He was granted some 300 patents as a consequence of his inventions ([List of Nikola Tesla patents](#)). Many inventions were not put into patent protection. His work was central to the emergence of electrical power systems as currently known worldwide, as variously appreciated ([Robert Lomas, *The Man Who Invented the Twentieth Century: Nikola Tesla, forgotten genius of electricity*, 1999](#)).

For the purpose of this exercise, his unusual creativity is understood as being with respect to the handling of positively or negatively charged conditions. These are interpreted generically here rather than solely with respect to electromagnetism. His genius is known to have derived in part from his unusual capacity to imagine models and run them as simulations -- mentally -- without any need to articulate them in conventional design plans and test prototypes.

The possibility to be explored here is whether he was "wrong" in his focus on the material manifestation of his inventions in **patents** -- as exemplifying and justifying his inventiveness. This had as a notable consequence the competitive outcomes with respect to intellectual property which marked his life. Those manifestations can indeed be considered an indicator that he was "right" -- as the operability of his inventions makes evident.

However the question here is whether the future will consider that he was significantly "wrong" in that it was his own imaginative capacity and processes which were indicative of the longer term relevance of a neglected implication of his insight. It was indeed the **patterns** of his thinking that he was able to transform into working physical models. However the physical models were thus indicative of a subtler focus whose wider and more generic implications he effectively neglected -- and which have been neglected in subsequent appreciation of what he exemplified.

The potential of those patterns -- as articulated and tested with respect to patterns in "external" material form -- thus derive from "internal" patterns of thinking. Such a possibility has been extensively argued, from a cognitive psychological perspective with respect to mathematics more generally, by [George Lakoff](#) and [Rafael Nuñez](#) ([Where Mathematics Comes From: how the embodied mind brings mathematics into being](#), 2001).

There is a very extensive literature on Tesla, both of a biographical nature and focused on his inventions. One characteristic of that literature is concern for missing documents, their secretive appropriation by various intelligence services and defence agencies, and the development of his insights for military and related purposes.

However the concern here is not with the many [conspiracy theories](#) with which Tesla's name is associated, notably those relating to the [HAARP](#) facility and to [directed-energy weaponry](#). Rather **the focus is on how Tesla's thinking could prove suggestive of new approaches to individual and collective creativity in a global society** -- now increasingly characterized by evermore shambolic strategic governance. This contrasts with the enthusiasm of some for his focus on unlimited energy. Ironically the military applications do however reflect a very particular insight into globality offering a potentially valuable metaphor for understandings of psychosocial globality.

Fulsome appreciation of the problem-filled life of an eccentric genius

There are a number of biographies whose titles are variously indicative of the appreciation in which he has been held:

- [John J. O'Neill: *Prodigal Genius: the life of Nikola Tesla*](#) (1944, republished in many editions; available online)
- Margaret Cheney: *Tesla: Man Out of Time* (1981)
- Inez Hunt and Wanetta W. Draper: *Lightning in His Hand: the life story of Nikola Tesla* (1964)
- Robert Lomas: *The Man Who Invented the Twentieth Century: Nikola Tesla, forgotten genius of electricity* (1999)
- [Marc J. Seifer: *Wizard: The Life and Times of Nikola Tesla -- biography of a genius*](#) (1996)
- [W. Bernard Carlson: *Tesla: Inventor of the Electrical Age*](#) (2013)

That of John J. O'Neill, science writer of *The New York Herald Tribune*, is perhaps the most inspiring -- written by a person whom Tesla claimed to know him best. As described by O'Neill:

Tesla created the modern era; he was unquestionably one of the world's greatest geniuses, but he leaves no offspring, no legatees of his brilliant mind, who might aid in administering that world; he created fortunes for multitudes of others but himself died penniless, spurning wealth that might be gained from his discoveries. ... His name became synonymous with magic in the intellectual, scientific, engineering and social worlds, and he was recognized as an inventor of unrivaled greatness.... In a single burst of invention he created the world of power today... he gave us our mass-production system... every essential of modern radio; he invented the radar... he gave us high-frequency currents... he gave us remote control by wireless... And these discoveries are merely the inventions made... scores of others remain still unused. (pp. 3-5)

The focus of these accounts is necessarily on the inventions, with other resources (some indicated below) concentrating solely on them, on Tesla's own writings, or on the many patents. In endeavouring to develop a story, the biographical accounts successively offer more detail as more information has become available. The stories, often heroic, incorporate the tragic competition with others, his triumphant successes, his iconic status as a celebrity, his striking eccentricity and unusual beliefs, discovery of lost documents, as well as indications of the manner (worthy of any spy thriller) in which his writings have been seized on his death.

Many other web resources focus on the use to which his insights have supposedly been put for military purposes by both the USA and the former Soviet Union. As described in a section on *The FBI and Tesla (1943-56)* in one of the more comprehensive recent biographies (Seifer, 1996):

After Tesla's death, the FBI, the Office of Alien Property (OAP), and factions of the War Department conspired to impound and protect the Tesla secret-weaponry papers... A half century later, they have yet to release it. (p. 446).

Access to web resources has been further confused (and possibly deliberately so) by recent development and marketing of a [Tesla electric automobile](#) -- inspired by some of Nikola Tesla's work -- but which has engendered other patent controversies.

Successive biographers are necessarily somewhat disparaging of their predecessors. Thus for Margaret Cheney (*Tesla: Man Out of Time*, 2001):

However, from this vantage point of distance in time, O'Neill's biography is now seen to be weak insofar as it analyzed Tesla the man and thin with regard to his interactions with personal associates and friends.... Much information has surfaced since the appearance of O'Neill's biography, adding new dimensions to the extent of knowledge about Tesla. (p. xiv)

A subsequent concern has been expressed by Carlson (2013):

Plenty of biographies glamorize Tesla and his eccentricities, but until now none has carefully examined what, how, and why he invented.

Only mentioned in passing in the biographical accounts is Tesla's unique thinking capacity, now described as [visual thinking](#) or picture thinking, which has come to be particularly associated with the specially gifted (see Linda Kreger Silverman, *Upside-Down Brilliance: the visual-spatial learner*, The Institute for the Study of Advanced Development, 2005). With respect to Tesla, this has been a notable focus of [Felix T. Hong](#) (*Tesla and Creativity: hidden messages from his life*, 2010; *Tesla Composed Like Mozart*, *NIN*, 2006).

It is appropriate to note the focus for interest in Tesla provided by the following:

- [Nikola Tesla Museum](#) (Belgrade)
- [Tesla Memorial Society](#) (Buffalo)
- [International Tesla Society](#) (now defunct)

Creative insight into handling duality

In a very literal sense, Tesla can be understood as having "brought light to the world" -- through creatively relating positive and negative charges. More metaphorically, it could be claimed he enabled bringing the light of knowledge to the world through the development of the internet -- with its particular dependence on the binary system.

As envisaged here, Tesla's work might well be explored more generally as being suggestive of ways of handling essentially intangible dualities -- primarily applied by him to the handling of positive and negative electrical charges. From the perspective of technomimicry, this raises the question of whether the principles, of what he so creatively demonstrated in practice, could as well be applied otherwise in domains in which he exhibited little interest (*Technomimicry as key to a new mode of knowing?* 2014; *Engendering a Psychopter through Biomimicry and Technomimicry: insights from the process of helicopter development*, 2011).

Expressed otherwise, **rather than considering the patterns of his thinking in metaphorical terms, is it fruitful to consider his particular applications as metaphors through which those patterns can be comprehended?**

Materialisation: In this light Tesla merits consideration as having demonstrated remarkable aptitude in transforming a particular understanding of generic principles into material form -- whilst neglecting subtler implications of his own creative processes. He has thus been a key person in engendering "technologies", as now conventionally understood, whilst failing to recognize how such articulation could constitute a form of [misplaced concreteness](#).

This effectively obscures recognition of subtler levels of complexity and abstraction which are vital from other perspectives -- most notably with respect to problematic psychosocial processes. It is noteworthy that few commentators on Tesla's work consider in any detail the manner of his thinking and how his creativity was enabled.

Analogy: Succinctly expressed, **technology can then be understood as "merely" analogy (at least potentially) -- rather than "merely" being a source of analogy (at least potentially)**. Such a perspective calls for interpretation in terms of the extensive arguments of [Douglas Hofstadter](#) and [Emmanuel Sander](#) (*Surfaces and Essences: analogy as the fuel and fire of thinking*, 2013), those of [Robert Romanyshyn](#) (*Technology as Symptom and Dream*, 1989), and those of [Erik Davis](#) (*Techgnosis: myth, magic and mysticism in the age of information*, 1998).

As described by Romanyshyn in an interview:

You are correct in pointing out that a central idea in my work is that the world -- natural, cultural, and historical -- is the landscape of psychological life, and that this idea is a radical challenge to the notion that psychology is about the personal which is private and interior. It is the theme which is explored from various perspectives between my first book, *Psychological Life: From Science to Metaphor* (1982), and my second one, *Technology as Symptom and Dream* (1989), as well as in some two dozen chapters and articles between these two books....

It does not deny the subjective, and there is a sense in which we are private and do have an interior life. Phenomenology only challenges the identification of the subjective with an interior space that is literalized as a real place which is split off from the objective, public space of the material world. In other words, it challenges the Cartesian assumption that we are first thinking beings whose ego-minds have no relation to nature, including the body.

Hofstadter and Sander (2013) are especially valuable in their careful exploration of the role of analogy in the creative process. The controversial study by [Jonah Lehrer](#) (*Imagine: How Creativity Works*, 2012) is noteworthy for its anecdotal approach to recent insights.

Bisociation and blending: Curiously both works avoid mention of that of [Arthur Koestler](#) (*The Act of Creation*, 1964) who engages most specifically with duality through the elaboration of a theory of bisociation. This is understood as the blending of elements drawn from two previously unrelated matrices of thought into a new matrix of meaning by way of a process involving comparison, abstraction and categorisation, analogies and metaphors. Koestler regards many different mental phenomena based on such comparison (analogies, metaphors, parables, allegories, jokes, identification, role-playing, acting, personification, anthropomorphism etc.) as being special cases.

As noted by *Wikipedia*, the concept of bisociation has been adopted, generalised and formalised from a [cognitive linguists](#) perspective by [Gilles Fauconnier](#) and [Mark Turner](#), who developed it into [conceptual blending theory](#) (*The Way We Think: conceptual blending and the mind's hidden complexities*, 2008). This is also termed also called conceptual integration or view application. The blending of diverse scenarios is held to be a subconscious process, which is assumed to be ubiquitous to everyday thought and language.

With respect to Tesla, the concern here is how he creatively responded to the dualities characteristic of electromagnetism, especially the interrelation between positive and negative. However, more generally, of what understanding of duality are these but a particular instance -- as explored separately with respect to some 230 human values polarities (as noted below).

Computer modelling: There is a confluence amongst these threads which is relevant to the argument which follows. A degree of association is recognized between cognitive modelling and the work on conceptual blending by Fauconnier and Turner (2008) and the earlier work of (Jeff Shrager and Langley, *Computational Models of Scientific Discovery and Theory Formation*, 1990). This notably involves the role of analogy ([Dedre Gentner](#), [Keith Holyoak](#), and [Boicho Kokinov](#), *The Analogical Mind: Perspectives from Cognitive*

Science, 2001). Hofstadter has had a specific concern with the computer modelling of conceptual processes and analogy prior to his more recent work on creativity (*Analogy as the Core of Cognition*, 2001; *Fluid Concepts and Creative Analogies: computer models of the fundamental mechanisms of thought*, 1995).

Of further relevance are Hong's arguments with respect to biocomputing and "biology-friendly mathematics" (*Deciphering the Enigma of Human Creativity: can a digital computer think?* *Journal of Computer Science and Systems Biology*, 2013; *The Role of Pattern Recognition in Creative Problem Solving: a case study in search of new mathematics for biology*, *Progress in Biophysics and Molecular Biology*, 2013).

Hypercomputing? The argument can be taken further through current speculation on the possibility of development of a quite different form of computation, as explored separately (*Imagining Order as Hypercomputing: operating an information engine through meta-analogy*, 2014). The latter was introduced by noting:

For 75 years, computers have worked within limits defined by the mathematician [Alan Turing](#) -- although he had also foreseen the possibility of a form of universal computing machine. A recent report draws attention to new investigations into the possibility of such a machine -- one that can solve the unsolvable ([Michael Brooks](#), *Turing's Oracle: the computer that goes beyond logic*, *New Scientist*, 16 July 2014).

As the *New Scientist* editorial notes:

We already have machines that answer our questions in ways we can't fully appreciate: from quantum computers, whose physics remain opaque, to data-crunching black boxes that translate languages and recognise faces despite knowing nothing of grammar or physiology... Turing showed that any computer predicated on human logic alone will struggle with the same questions we do... But **Turing also conceived of an "oracle" that might transcend these limitations...** Conventional computers give us the answers to questions that we can articulate... Turing's oracle could address issues we can't even articulate... *[emphasis added]*

Progressive engagement of the gifted with reality

As argued by Nikola Tesla (*Mankind's Greatest Achievement*):

When a child is born its sense-organs are brought in contact with the outer world. The waves of sound, heat, and light beat upon its feeble body, its sensitive nerve fibers quiver, the muscles contract and relax in obedience: a gasp, a breath, and in this act a marvelous little engine, of inconceivable delicacy and complexity of construction, unlike any on earth, is hitched to the wheel-work of the Universe. The little engine labors and grows, performs more and more involved operations, becomes sensitive to ever subtler influences and now there manifests itself in the fully developed being - Man - a desire mysterious, inscrutable and irresistible: to imitate nature, to create, to work himself the wonders he perceives.

Inspired in this task he searches, discovers and invents, designs and constructs, and enriches with monuments of beauty, grandeur and awe, the star of his birth. He descends into the bowels of the globe to bring forth its hidden treasures and to unlock its immense imprisoned energies for its use.

The above possibility evokes the question of how a [polymath](#), a [philomath](#), or a [genius](#) -- a Tesla, an Einstein, a Ramanujan, a Hawking, an Omar Khayyam, or a Turing -- engages progressively with "reality" through the processes of their cognitive development (see [List of Polymaths](#); list of the 290 *Greatest Minds of All Time*). Of some relevance is any distinction to be usefully made between a genius with particular skills, a polymath with modest skills in a wide range of disciplines, and a so-called [integral thinker](#), potentially to be contrasted with many other integrative approaches ([Integrative Knowledge Project](#); [Jennifer Gidley](#), *The Evolution of Consciousness as a Planetary Imperative: an integration of integral views*, *Integral Review*, 5, 2007).

Considerations with respect to such [intellectual giftedness](#) would be the changing understanding for an individual of:

- the freedom to make assumptions and design choices regarding system boundaries through which otherness is "designed out" (whether as irrelevant non-essentials, challenging, or to be navigated)
- relevant questions and satisfactory answers -- and their implications regarding the nature and identity of the producer and consumer thereof (*Am I Question or Answer?* 2006)
 - what can, or should, be "taken as read" -- unquestioningly
 - what are, to be defined and framed as categories -- and why
- how many are required, namely choices regarding the number of distinctions held to be necessary or appropriate
- the fixity or fluidity of categories, notably in the light of Hofstadter's earlier arguments (*Fluid Concepts and Creative Analogies*, 1995)
- how, when and where is attention to be invested, given the potential constraints of cognitive capacity and information overload, as separately discussed (*Investing Attention Essential to Viable Growth*, 2014), especially with respect to:
 - increasing insight, competence and scope -- creating challenges of successfully communicating subtlety and recognition of any potentially disruptive unknown, as argued by [Nassim Nicholas Taleb](#) (*The Black Swan: the impact of the highly improbable*, 2007; *Antifragile: things that gain from disorder*, 2012).
 - diminishing capacities, as a consequence of aging or otherwise -- engendering a need for some form of reordering ("repacking" or "compression") to mitigate against degradation of identity ([Gilles Fauconnier](#) and [Mark Turner](#),

Compression and Global Insight, Cognitive Linguistics, 2000)

- any sense of integration, whether overarching, underlying or transcendent -- with its self-reflexive implications for understanding of:
 - contextual globality of some kind
 - individual identity

Visual thinking as indicated by Tesla and by consideration thereof

Tesla is widely recognized as having benefitted from unusual thinking skills. The *Wikipedia* summary presents these in relation to eidetic memory as follows:

Tesla related in his autobiography that he experienced detailed moments of inspiration.... He suffered a peculiar affliction in which blinding flashes of light would appear before his eyes, often accompanied by visions. Often, the visions were linked to a word or idea he might have come across; at other times they would provide the solution to a particular problem he had encountered. Just by hearing the name of an item, he would be able to envision it in realistic detail. Tesla would visualize an invention in his mind with extreme precision, including all dimensions, before moving to the construction stage, a technique sometimes known as [picture thinking](#).

Comment by O'Neill: He provided only limited information regarding these thinking processes. As noted by ([John J. O'Neill: *Prodigal Genius: the life of Nikola Tesla*](#)):

Tesla's uncommunicative nature concerning his own intimate experiences has undoubtedly deprived the world of many interesting stories (p. 260)

However O'Neill notes:

If he thought of an object it would appear before him exhibiting the appearance of solidity and massiveness. So greatly did these visions possess the attributes of actual objects that it was usually difficult for him to distinguish between vision and reality.... His strange faculty permitted him to see a visioned blackboard on which the problem was written, and there appeared on this blackboard all of the operations and symbols required in working out the solution. Each step appeared much more rapidly than he could work it out by hand on the actual slate.. As a result, he could give the solution almost as quickly as the whole problem was stated. (p. 23)

Comment by Cheney: As described by Margaret Cheney (*Tesla: Man Out of Time, 2001*):

- Tesla would visualize an invention in his mind with extreme precision, including all dimensions, before moving to the construction stage, a technique sometimes known as [picture thinking](#). He typically did not make drawings by hand but worked from memory. Beginning in his childhood, Tesla had frequent flashbacks to events that had happened previously in his life
- It is a fact that in later life the machines that Tesla built nearly always worked. He might err in his understanding of the scientific principle, or he might even mistake the quantity of materials used in construction, but somehow the machines, as they evolved in his mind and were later translated into metal, usually did just what he intended (p. 14)
- I gained great facility in connecting cause and effect... Soon I became aware, to my surprise, that every thought I conceived was suggested by an external impressions (Nikola Tesla, My Inventions, *Electrical Experimenter*, May-October 1919, p. 14)
- The language of science then being completely inadequate, Tesla described visual effects in the style of a poet in love with the sheer dance of flame and light. Indeed it seemed as if these were as significant to him as tapping the energy within. Yet no scientist could fault him on technical details. (p. 51)
- He spoke of the mysterious fascination of electricity and magnetism, "with their seemingly dual character, unique among the forces of nature, with their phenomena of attractions, repulsions, and rotations, [their] strange manifestations of mysterious agents," that stimulate and excite the mind. (p. 52)

Comment by Hong: Felix Hong (*Tesla and Creativity: Hidden Messages From His Life. 2010; Tesla Composed Like Mozart, 2006*), cites Tesla:

Then I observed to my delight that I could visualize with the greatest facility. I needed no models, drawings or experiments. I could picture them all as real in my mind. Thus I have been led unconsciously to evolve what I consider a new method of materializing inventive concepts and ideas, which is radically opposite to the purely experimental and is in my opinion ever so much more expeditious and efficient.

and then Hong comments:

There is little doubt what Tesla practiced was an extreme form of visual thinking. Few of the rest of us could match him in terms of details, intensity and precision of visual imagery. His method of carrying out an experiment or manipulation mentally not only saved him time and expenses, but also enabled him to capture fleeting ideas, which would have been lost forever otherwise.

Hong continues with a comparison with Mozart and then Gauss:

Let us see whether visual thinking can also be applied to music creativity. In a letter written to an admirer, Baron von P, Mozart claimed to be able to hold an entire music score in his short-term memory so that "[he could] survey it, like a fine picture or a beautiful statue, at a glance". Mozart's picture metaphor implied that what he had practiced was similar to Tesla's visual thinking except what his mind saw (or, rather, hear) is the entire sound pattern instead of an entire diagram of one's invention. What Tesla and Mozart both practiced was known as **parallel processing** in artificial intelligence (AI) jargon. This is evident in the same letter: "Nor do I hear in my imagination the parts successively, but I hear them, as it were, all at once (*gleich alles zusammen*)". Here, Mozart tried to contrast his thinking style to verbal thinkers' style of one word at a time or one sentence at a time, also known as sequential processing in AI jargon....

One of the mysteries of creativity was highlighted by a remark of mathematical genius, Carl Friedrich Gauss. In referring to a long-standing problem, which he had just solved, Gauss said, "The riddle solved itself as lightning strikes, and I myself could not tell or show the connection between what I knew before, what I last used to experiment with, and what produced the final success". Tesla also used the metaphor of lightning to describe his sudden discovery, but he then went on to describe the visual image that he had seen in his "mental operations" (thinking). Piecing all these hints together, there is little doubt that Gauss solved his problem by visual thinking and his inspiration came from part of a picture like a lightning flash.

Comment by Abramovich: Especially insightful as a reflection on Tesla's thinking processes is a little-known document by Velimir Abramovich (*Tesla*, 2007), edited and posted by Sepp Hasslberger (*Tesla's Creative Genius: Intuitive Knowledge predicted Networked Society*. April 2007), and specifically appreciated by some commentators. Abramovich starts by asking:

- How did Tesla make his discoveries?
- What are the main axioms of Tesla's cosmology? How do they follow from his metaphysics? How did he apply them in his physical experiments?
- Why are theorists and empiricists of modern physics of our time so interested in the reconstruction of Tesla's theory of physical reality and his views on electromagnetic phenomena?
- Why didn't Tesla formulate his scientific theory and publish it? Can Tesla's views on the ethical aspect of scientific discoveries help to refine modern natural sciences, especially physics, which is in a crisis of ideas now?
- What can we expect from studying Tesla's concepts in the near future?

For Abramovich:

- Tesla was satisfied to notice that he could clearly visualize his discoveries; **he didn't even need experiments, models and drawings. In this way he developed his own method to give material form to creative ideas.** Tesla sharply distinguished ideas which were coming into his mind as visions, and those which appeared due to analytical mind activity. Tesla explained:

"The moment when somebody designs an imaginary device, there is a problem of putting the raw idea into practice. That's why any discovery made this way has lack of details, and usually it is inferior... My method is a different one."
- Studying the mechanisms of his mental life, Tesla found that visions "from virtual reality" always had certain connection with events of "true reality". He soon was able to find the cause for this. He was glad to understand that every one of his thoughts was a result of influence of external impressions.

Abramovich argues:

- Nikola Tesla used imagination as a psychological precursor for well-ordered disclosure made by mathematical methods. We can say nothing of this kind about his contemporary inventor Thomas Edison, because he had "*weak knowledge in mathematics, and he was mainly guided by long and laborious experiments*". In his records, Tesla often spoke about his predisposition to using mental processes. These processes correspond to the principles Nature uses.
- According to his words, certain conclusions were born in his mind spontaneously, **in the form of geometrical images**. Then followed the understanding of the principle of the discovery and its physical interpretation. Only then mathematical formalization took place, followed by finding materials with the necessary technical properties essential for the continuous operation of a constructed physical model. The work on inventions was for him mainly a struggle for mental clarification, i.e. the elimination of secondary ideas and minute details, which blur the imaging principle and complicate the approach to the real nature of relations between fundamental geometrical elements.
- Tesla also made a hypothesis on the extraordinary effect of external stimulus on human thinking and memory. Referring to Rene Descartes's theory, he concluded that subjective human work and human life as a whole has a feature of automatism, which is stipulated by the cosmos. According to Tesla's evidence, creativity as the appearance of unknown visual ideas can be the consequence of automatic operation of brain, that's why he developed an additional supposition about the reverse effect of brain visual centers on the retina.
- Thus, through human brain processes and information from an external stimulus, the human brain can create new images and relations (associations) between reflected phenomena of the real world and images of the imaginary world.
- And finally, there is Tesla's opinion that thought, memory and motion are feedback processes, that's why we should mention that attempting to understand his inborn gift of invention, he also understood the role of cybernetics as a reflection of cosmic principles of material and informational organization.

With respect to Tesla's construction of his "world order", Abramovich argues that Tesla constructed this from principles of his own

inventions. He lists them as:

- **transformer motors**, i.e. device for creation of electrovibrations with specific properties; a **step-up transformer specially designed to excite the Earth** (this device with its electrical transmission can be seen as analogous to a telescope in astronomy).
- a **wireless system** including a certain number of devices, which is now considered to be an unsurpassed method for the **transmission of electrical current without wires**; a device for individualization of signal, which in comparison with a primitive method to match signal means the same as advanced language in comparison with inarticulate mumbling. Due to this device, it is possible to transmit secret signal both in passive and in active form, because they do not interfere with other transmissions and cannot be jammed by other signals. Any transmission is unique in its rhythm and has individual features; actually, it is an unlimited quantity of stations and instruments, which can act on one or two frequencies and at the same time they would not cause any mutual jamming.
- **wave processes in Earth's ionosphere**; in popular explanation this discovery means that **the field of the Earth reacts to electrical vibrations of given frequency in the same way as a tuning fork resonates with a specific wavelength of sound**. These electrical vibrations can have a strong influence on the field of the Earth. Such resonant effects can be used in different ways - first to change the universal energy system, which is far from being perfect and has not used all its natural possibilities.

Other notable comments:

- Alex Knapp: *Nikola Tesla: Unique Genius Or A Model For Everyone?* (*Forbes*, 28 April 2011)
- *Nikola Tesla's Creative Thinking Secrets* (*CreativeThinkingWith.com*)
- *Nikola Tesla: Humanitarian Genius* (excerpted from *Power and Resonance: Journal of the International Tesla Society*. vol 6, no. 4)
- Thorin Klosowski: *Nikola Tesla's Best Productivity Tricks* (*Lifehacker*)
- Jürg von Ins: *Nikola Tesla (1856-1943): vision, creativity and scientific progress*
- Remez Sasson: *Nikola Tesla: creative thinking and imagination* (*Success Consciousness: mental tools for a great life*)
- William Wyatt: *Nikola Tesla: Life Changing Lessons! Nikola Tesla on Creativity, Entrepreneurship and How To Change The World*. Amazon Digital Services

Psychosocial relevance of Tesla's creative process

How then might the future both appreciate and deprecate the work of Tesla? What will be said of his psychological development, the implications of the competitive social interactions in which he engaged so extensively and disastrously, and the manner in which he sought to mark and protect many of his achievements by patents? What of his predilection for showmanship?

Beyond unfruitful handling of duality: Such questions are pertinent to the failure to derive significance from his work that is of relevance to the more general challenges of handling highly problematic dualities in society -- specifically those framed metaphorically as "positive" in preference to "negative". The use of such terms has notably been the focus of the concern of [Barbara Ehrenreich](#) (*Bright-sided: how the relentless promotion of positive thinking has undermined America*. 2009). The point can be argued more generally, especially from a cybernetic perspective (*Being Positive Avoiding Negativity: management challenge of positive vs negative*, 2005).

Problematic engagement with property: Tesla's focus on intellectual property, consistent with the conventions of his time and the present, also fails to reframe the materialism of that preoccupation -- despite his creativity with respect to the intangibility of electromagnetism. The problematic understanding of property continues to be central to a wide variety of conflicts in society, many of them with the potential to engender disasters of far larger proportions. The Middle East offers a variety of examples at the time of writing. The constraints on the dissemination of knowledge imposed by intellectual property may well endanger lives in unforeseen ways, notably through constraining the widespread creativity now upheld as the key to the survival of a civilization faced with resource challenges ([Thomas Homer-Dixon](#), *The Ingenuity Gap*, 2000).

Is it to be assumed that the future will have the same understanding of property -- and its exclusive possession -- as characterizes the present? Especially suggestive in this respect is the failure to envisage any more complex relationship to property in terms of the dynamics between frames of reference, so creatively explored by Albert Einstein, as argued separately (*Einstein's Implicit Theory of Relativity -- of Cognitive Property? Unexamined influence of patenting procedures*, 2007).

Alternative understandings of property: The contrasting understanding of property in other cultures, and those of the past, also suggests that the future may frame matters otherwise. As indicated by some indigenous knowledge systems, the cognitive engagement with what are now framed conventionally as tangibles may be of a subtler nature ([Darrell Posey](#), *Cultural and spiritual values of biodiversity: a complementary contribution to the Global Biodiversity Assessment*, 1999).

The credibility of some such unexpected forms of understanding is, for example, suggested by the [enactivist arguments](#) of authors such as [Francisco Varela](#) (*Laying Down a Path in Walking: essays on enactive cognition*, 1997). Any such alternatives are perceived to be an unacceptably radical challenge to one another as noted by [Nicholas Rescher](#) (*The Strife of Systems: an essay on the grounds and implications of philosophical diversity*, 1985). It is precisely the uncreativity of such charged conditions which Tesla's insights could contribute to reframing.

Imagining a method for adapting Tesla's insights to a psychosocial context

The speculative assumption made here is that Tesla's inventions -- whether patented or not -- can be understood as "reflections" of imagined patterns (perhaps consistent with considerations of [Platonic ideas](#)). Tesla's patterns were characteristically not static, and might be better understood in terms of [process logic](#). They were processes understood as variously channelled through circuits and field effects as dynamic systems.

Poetic enablement? Tesla was able to articulate patterns in form through material constructs capable of acting as containers and conduits. Whilst this gave rise to strikingly innovative operating models -- whether mental or physical -- this distracted from and obscured any consideration of the patterns themselves. Whilst these might have been represented in some logical or mathematical language of suitable abstraction (as in general systems theory), such was presumably not adequate to the subtlety of the insight. Hence Tesla's notable inspiration from poetry -- consistent with the remark of [Gregory Bateson](#), in explaining why "we are our own metaphor" to a conference on the effects of conscious purpose on human adaptation:

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're 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. (Mary Catherine Bateson, *Our Own Metaphor*, 1972, pp. 288-289)

Bateson is thus pointing to the advantages of poetry in providing access to a level of complexity in people of which they are not normally aware. As discussed separately, this could well be of significance for the governance of social processes characterized by patterns of relationships normally too complex for the mind to grasp (*Innovative Global Management through Metaphor*, 1989). Further to their above-cited concern with conceptual blending, arguments specific to creativity have been developed by Mark B. Turner and Gilles Fauconnier (*A Mechanism of Creativity, Poetics Today*, 1999).

Of special interest in comprehending non-linear cyclic processes in relation to linear thinking, are the potential insights arising from the relation of rhythm to metre in poetry. In this sense the current "spastic" development of society, as a victim of economic cycles, may be seen as resulting from an a-rhythmic approach to governance, as separately argued (*Poetry-making and Policy-making: arranging a marriage between Beauty and the Beast*, 1993; *Strategic Dialogue through Poetic Improvisation: web resources and bibliography*, 2009; *Being a Poem in the Making: engendering a multiverse through musing*, 2012).

Meta-pattern? The assumption here is that in absence of direct access to the cognitive engagement which Tesla had with those patterns -- however conscious that may have been -- it may be possible to "reverse engineer" the inventions (notably via their patent descriptions) in order to obtain a sense of those patterns in any particular case. Given Tesla's capacity for humour, the argument is consistent with the recent approach of Matthew M. Hurley, et al. (*Inside Jokes: using humor to reverse-engineer the mind*, 2013). This might be considered especially appropriate given its concluding chapter on: *Could We Make a Robot with a Sense of Humor?*

More intriguing, however, and with greater potential, is the set of Tesla's inventions as a whole -- as being indicative of some form of generative meta-pattern. Again an insight from Bateson is relevant:

The pattern which connects is a meta-pattern. It is a pattern of patterns. It is that meta-pattern which defines the vast generalization that, indeed, it is patterns which connect. (*Mind and Nature: a necessary unity*, 1979)

And it is from this perspective that Bateson warns: *Break the pattern which connects the items of learning and you necessarily destroy all quality* (1979, pp. 8-11).

The argument is that the remarkable coherence of Tesla's thinking -- assumed to be of a higher order -- and the complementarity of the inventions it engendered, suggests that **such a meta-pattern could then be employed as a template of relevance to eliciting patterns whose form and dynamic would be operable in the less tangible psychosocial realm**. This is consistent with the original inspiration of [general systems theory](#).

Developmental pressures? The case could be argued otherwise by assuming that the coherence of Tesla's cognitive development "forced" him to engender his many inventions -- perhaps as vital to maintaining a degree of sanity in the chaotically dynamic reality with which he was confronted. This could be understood as consistent with the title of a work by policy scientist [Geoffrey Vickers](#) (*Freedom in a Rocking Boat: changing values in an unstable society*, 1972).

Such an argument is recognizable with respect to the creative products of many artists -- who experience themselves as effectively "driven" to produce a variety of works to maintain a meaningful engagement with the world -- whether or not this is described in terms of sanity. The process is also recognizable in psychotherapy in the construction of a succession of [mandalas](#) or [yantras](#), for example, possibly inspired by dreams.

In Tesla's case the "mandalas" stabilizing his cognitive condition took the form of operating devices -- although some were of a design reminiscent of complex, multi-level mandalas (to some degree at least). Yantras are especially reminiscent of wiring patterns in Tesla's motors and dynamos (as illustrated in animations below). More generally, tool-making can be fruitfully explored in this light (R. L. Holloway, *Language and tool making are similar cognitive processes, Behavioral Brain Science*, 2012).

Missing rotation or revolution? Missing from many conventional maps of psychosocial configurations and processes is any explicit dynamic -- other than that associated implicitly with the "lines" on such maps, typically presented as networks of conduits, however globally they may be configured.

Framed in this way, one remarkable invention by Tesla related to what might be understood as "map rotation" -- through which alternating currents and motors became feasible. This is discussed more extensively below. This discovery could be considered as a conceptual equivalent to recognition of rotation of the Earth -- in contrast with the prevalent assumption of a geocentric universe, namely one rotating around the Earth. Given the current state of global society, the possibility of some such future cognitive breakthrough merits consideration as a brainstorming exercise.

Such a planetary association can be explored further through Tesla's own demonstration to the [World's Columbian Exposition](#) (1893) of a device he constructed known as the "Egg of Columbus". It was used to demonstrate and explain the principles of the [rotating magnetic field](#) model and the [induction motor](#). It performed the [feat of Columbus](#) with a copper egg in a rotating magnetic field. The egg spins on its major axis, standing on end due to gyroscopic action.

Provocatively, the continuing reversal of perspective -- suggested by rotation of any conceptual map and the process of [enantiodromia](#) -- may ironically call into question presumptuous assumptions of globality, as implied with respect to science by the recent argument of [Marcelo Gleiser](#) (*The Island of Knowledge: the limits of science and the search for meaning*, 2014), or by that of [Thomas L Friedman](#) (*The World Is Flat: a brief history of the Twenty-first Century*, 2005). Such assumptions may be variously challenged (*Knowledge Processes Neglected by Science: insights from the crisis of science and belief*, 2012; *Irresponsible Dependence on a Flat Earth Mentality -- in response to global governance challenges*, 2008).

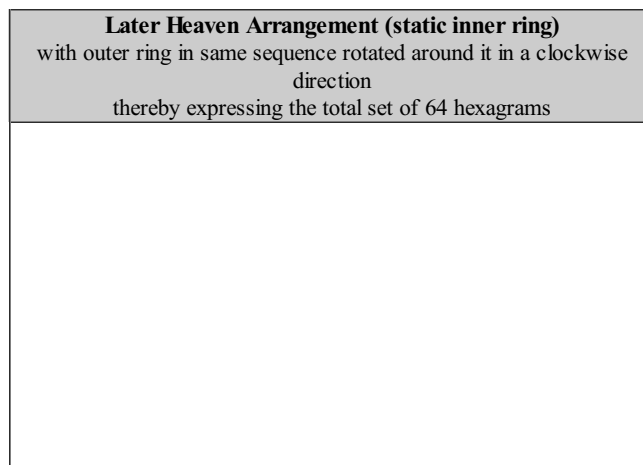
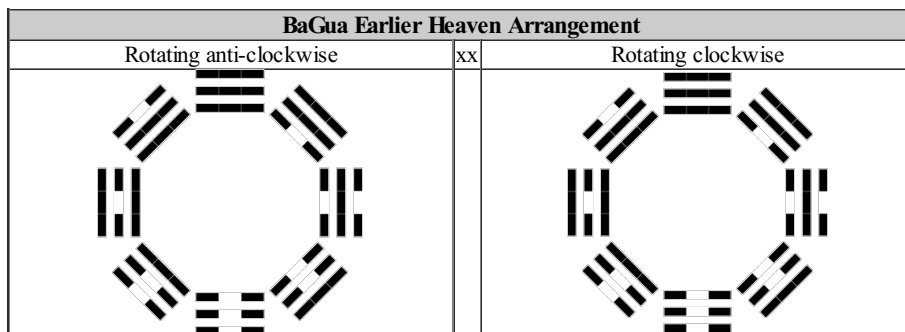
The distinction between a static map and a rotating map can perhaps be usefully suggested by that between arrangement of participants at any round table for purposes of dialogue, and the process of transformative dialogue itself. Place settings do not a dialogue make. Engendering and sustaining dialogue is quite a different matter, as separately discussed (*Implication of the 12 Knights in any Strategic Round Table*, 2014). As explored with respect to Tesla's experiments (below), the issue is how to "turn on" the dialogue and ensure that it runs smoothly -- without "hanging" (as may a parliamentary assembly).

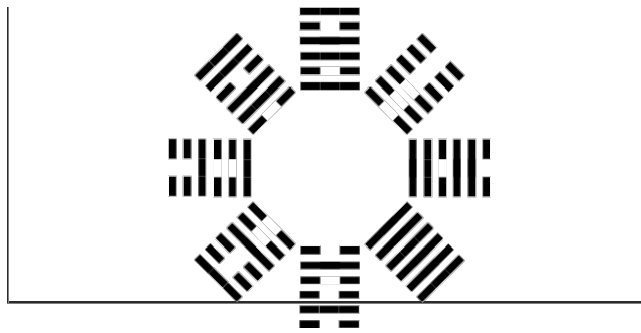
With respect to any map, further insight can be derived from the confusion between "rotation" (notably as used with respect to leadership of any round table or coalition) and "revolution" (as used with respect to disruption of conventional order). Curiously there is a further ambiguous association of relevance in use of "revolving" -- applied from a conventional perspective to either young or old -- as highlighted by a recent play by Devon Williams (*The Old People are Revolting*, 2012).

Engendering psychosocial energy: Given the round table example, the argument can be developed through recognizing contexts in which psychosocial energy is understood (or felt) to be engendered, as discussed separately (*Reframing Sustainable Sources of Energy for the Future: the vital role of psychosocial variants*, 2006; *Massive Elicitation of Psychosocial Energy; requisite technology for collective enlightenment*, 2011). Relatively obvious examples include the appreciation of [circle dancing](#) by communities, the related use by teams (sporting, corporate and military) to psych themselves up through circular warrior-style dances (enhanced by chanting), and multi-part [round singing](#). Of particular relevance is the importance variously associated with use of the term "ceremony", notably in indigenous societies, secret societies, and religions.

Representation of such dynamics through systems of notations could potentially be related to the points to be made below with respect to Tesla's breakthrough. This raises the question as to whether there is a generic pattern as yet to be understood, as separately discussed (*Eliciting a 12-fold Pattern of Generic Operational Insights: recognition of memory constraints on collective strategic comprehension*, 2011). The point can be explored otherwise through recognizing that centro-symmetrical schematics like yantras or mandalas in fact imply a dynamic with which people engage subjectively -- somewhat in contrast to the more obvious externalization in dance.

Example from Chinese culture: One striking example of this is the Chinese *BaGua* schematic, typically displayed in one or more static configurations, each of which explicitly implies a dynamic of transformation. This is suggested by the animations below, reproduced from *Animation of Classical BaGua Arrangements; a dynamic representation of Neti Neti* (2011) where they are discussed with alternative configurations, also discussed otherwise (*Unknown Undoing: challenge of incomprehensibility of systemic neglect*, 2008).





Detecting a meta-pattern of connectivity amongst Tesla's insights

As discussed with respect to the above examples, these are suggestive of the relevance to engagement with issues of: identity, global depression, energy, coherence, attention. In considering correspondences between such schematics and those of Tesla, of particular interest is the role of poles and polarity and the consideration of the mnemonic attributes of the configuration (*Psychosocial Energy from Polarization within a Cyclic Pattern of Enantiodromia*, 2007; *Antagonistic Dualities: Polarization and Paradox*, 1983).

Clustering of insights of Nikola Tesla according to various authors			
<i>My Inventions: the Autobiography of Nikola Tesla</i> The Experimenter (1919)	<i>Prodigal Genius: the life of Nikola Tesla.</i> John J. O'Neill (1968)	Wikipedia entries	<i>10 Inventions of Nikola Tesla that changed the world.</i> Nicholas West Activist Post (2014)
Rotating Magnetic Field Tesla Coil and Transformer Magnifying Transmitter Telautomatics	<i>Direct Current.</i> Motor and generator controls, Arc lights, etc. <i>Polyphase Currents.</i> Electric transmissions of power, Dynamos, Motors, Transformers, Electrical Distribution <i>Currents of High Frequency and High Potential.</i> Apparatus for generating, controls, circuits and systems, insulation, and applications <i>Wireless Systems.</i> Radio telegraphy, Radio mechanics, Methods of tuning and selection, Detectors, etc. <i>Various patents.</i> Steam turbines, Pumps, Speedometers, Airplanes, Mechanical oscillators, Thermo-magnetic motors, etc.	Magnifying transmitter Polyphase system Teleforce Telegeodynamics Terrestrial stationary waves Tesla coil Tesla turbine Tesla's oscillator Three-phase electric power Charged particle beam Directed-energy weapon Rotating magnetic field Wardenclyffe Tower	Alternating Current Light: notably in relation to the Tesla Coil X-rays Radio Remote Control Electric Motor Robotics Laser Wireless Communications Limitless Free Energy

For Velimir Abramovich (*Tesla*, 2007), as edited and posted by Sepp Hasslberger (*Tesla's Creative Genius: Intuitive Knowledge predicted Networked Society*. April 2007), Tesla's most important discoveries are the following:

- *Transmission of energy at any distance*, namely superconductivity of natural environments.
- *"Fireballs"* (synthesis of structural elements of ether and matter), high-frequency resonance oscillator adjusted for waves, which are different from Hertz's waves, waves with the so-called longitudinal modulation. It is a kind of free choice of consciously selecting electromagnetic units, which initially and in an elementary way codify the workings of the electromagnetic field of the human brain, modulate brain oscillations or change their nature. This may lead to various emotions, changes in consciousness, creative impulses, super perception and even to super cognition.
- *Dynamic nature of attraction*, in which every element of the periodic table has its own constant of attraction; in this case Tesla continued the works by Etvash and derived several universal methods.
- *Electromagnetic theory*. This theory was not explained or published. This theory does not use the generally accepted notions, such as "energy", "wavelength", and "frequency". Instead, this theory introduces the notions of "distribution curve", "vibration of spiral systems", "electrical pressure", "proportion of transmission", "ether", "dynamics of electromagnetic fluid", "geometrical abilities of tube" and so on.

(for sub-clusters see: Aleksandar S. Marincic, <i>The Nikola Tesla Museum</i>)		
II. Electrical Engineering: heavy current technique	IX. Various materials: characteristics and treatment	XVI. Mechanical oscillators
III. High frequency engineering -- high frequency technique	X. Astronomy	XVII. Mathematics, physics, applied physics and chemistry
IV. Mechanical engineering -- Mechanical techniques in general	XI. Illumination	XVIII. Coils, condensers, etc.
V. Turbo Machines and Thermodynamics	XII. Locomotive headlight	XIX. This number is not used.
VI. Aviation and aircraft or aerial vessels	XIII. Lightning rod	XX. Articles
VII. Telemechanics	XIV. Water fountain	XXI. Varied
VIII. Discharges and oscillators	XV. Applied physics: optics and optical instruments, cinematography	

Patterns of patterns: towards dynamic integrative mapping of inventions

Ordering patents in terms of connectivity: Considerable effort has been devoted to identifying and listing Tesla's inventions, especially to the extent they are reflected in patents -- variously numbered (*Wikipedia List of Nikola Tesla patents*; Twentieth Century Books, *Tesla Patents Worldwide*). It has been claimed that he held 272 patents in 25 countries, with 112 *patents* in the United States alone.

What is most surprising is the seeming lack of effort in presenting the set of inventions in any more significant order -- perhaps a superordinate order honouring the complexity of the content, rather than as a checklist (possibly nested). This is however also true of the ordering of the many branches of mathematics, as discussed separately (*Is the House of Mathematics in Order? Are there vital insights from its design*, 2000; *Missing "map" of mathematics: a self-reflexive "periodic table"?* 2009). Why is that?

Typically the patents are simply listed by number with only the simplest of clustering, if any. Authors have presented the inventions variously, again with only the simplest of clustering (if any). These may well be unrelated to the patents themselves, to the individual inventions, or to the (innovative) principles implied.

The question is **how might the inventions be more fruitfully, categorised, ordered and interrelated** -- in support of the exploration suggested above? What is the nature of their connectivity -- as memetic complexes? Searches using "catalogue" do not clarify the matter. Use of "classification" only highlights the many references regarding the secrecy with which some have been associated.

Patent mapping: Clearly envisaging a fruitful ordering is a project in its own right, probably assisted by the cataloging of materials at the *Tesla Museum*. Typically such cataloging facilitates keyword searching only. Other tools (such as [text mining software](#) and [automatic content extraction](#)) are required to interrelate the variety of topics in order to generate some form of [mind map](#), [concept map](#), or semantic map. This possibility does not appear to have been explored. It could be further enabled by consideration of [patent visualisation](#) and [patent mapping](#) techniques -- indicating potential entailments -- and the [citation analysis](#) typical of academic papers.

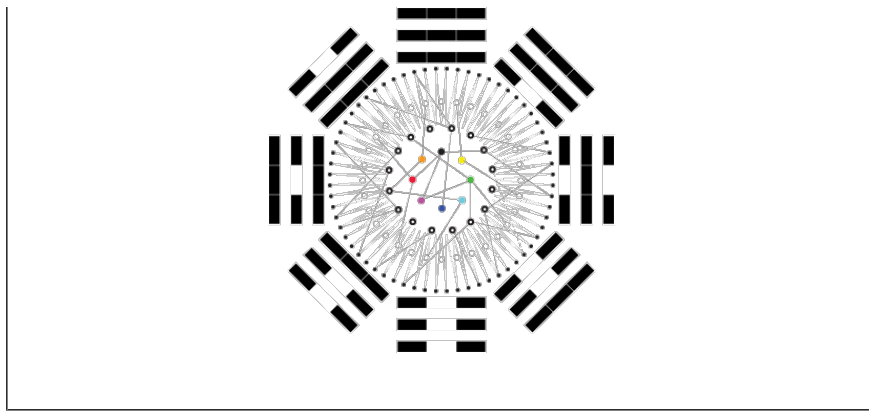
It is however both presumptuous and premature to engage in such an exercise at this stage -- given the expertise required -- if the purpose is to determine the conceptual links between the inventions, notably the innovation pathways (*New Patent Mapping System Helps Find Innovation Pathways*, January 2014). Each invention calls for recognition as a memetic complex in its own right.

Form of a meta-pattern: The approach taken here is limited to considering how some such meta-pattern might emerge and to consider the form it might take. Obvious leads for consideration are the clusters of "key" and "core" inventions, as variously selected and proposed by different authors. Together these could be indicative of the major focal points of any more general network pattern of concepts. Secondary, tertiary, and other points could be linked to them.

The elaboration would preferably be an iterative one, enhanced by various mapping tools and techniques. The resulting map could well have dynamic characteristics in enabling the form as a whole to be variously manipulated, collapsed or expanded by online users. One indicative approach is the striking use of [hyperbolic mapping techniques](#) -- notably through use of hypergraphs in the case of patents (*Invisible link visualization method and system in a hyperbolic space*, 2005; Jonh Lamping and Ramana Rao, *The Hyperbolic Browser: a focus context technique for visualizing large hierarchies*, *Journal of Visual Languages and Computing*, 7, 1996).

Some experiments of relevance are presented separately (*Mapping Songlines of the Noosphere: use of hypergraphs in presentation of the I Ching and the Tao te Ching*, 2006; *Hypergraph Experiment with I Ching Hexagram transformation lines (1-6 + 7-8) applied to transformative conferencing*, 2006)

Exploratory Animation of an Arrangement of Patents/Inventions in the light of the animations above, but with rotation of a cognitive "field" of a hypothetical inner "mapping" of key patents with their derivatives



Many variants of animations like that above could be explored to highlight possible understandings.

Integrative mapping: Achieving the above, however, only distributes the insights in a manner consistent with the opportunities of available techniques. The question is how this facility would then enable the more integrative approaches advocated above. In a sense such a facility offers an insight into the conceptual environment within which Tesla functioned throughout his life. This could perhaps be caricatured as the "monkey bars" of his conceptual "cage" between which he freely and rapidly moved -- and which he variously rearranged.

The argument above is that the inventions emerged from Tesla's efforts to order his experience within that cage as it developed. Each invention might then be compared to the dynamic through which that movement was given a higher degree of order -- as a more systemic meta-pattern.

The question raised above is **whether and how the material form of individual inventions could be recognized by Tesla as mapping the pattern as a whole** -- or some part of it, for a time. To the extent that any invention was a stabilizing concept in Tesla's psychological development, can it be understood as an exercise in self-reflexivity, namely as a mirroring device, or an effort at self-mapping?

Do the inventions potentially constitute valuable mapping surfaces for the projection of insights -- perhaps to be compared to the variously distorted [map projections](#) of the globe and its surfaces ([List of map projections](#))? The importance attached by Tesla to the sphere as a form is relevant to this consideration. Can the inventions be "read" or "re-read" with such understanding ([Principles of Re-reading and Application](#), 2001)?

Potential implications of alternation and rotation in psychosocial fields

Metaphors of alternation: The possibility can be explored through a range of metaphors, as discussed separately ([Metaphors of Alternation: an exploration of their significance for development policy-making](#), 1984). These focus primarily on the **dynamic of alternation**, with the **dynamic of rotation** being typically implicit. A notable exception is crop rotation ([Sustainable Cycles of Policies: crop rotation as a metaphor](#), 1988)

Tesla's insight: The breakthrough in Tesla's thinking with respect to alternation/rotation is eloquently described by John J. O'Neill ([Prodigal Genius: the life of Nikola Tesla](#), 1968):

- The conception of a rotating magnetic field was a majestically beautiful one. It introduced to the scientific world a new principle of sublime grandeur whose simplicity and utility opened a vast new empire of useful applications... Alternating currents motors had heretofore presented what seemed an insoluble problem because the magnetic field produced by alternating currents changed as rapidly as the current. Instead of producing a turning force they churned up useless vibration.

Up to this time everyone who tried to make an alternating current motor used a single circuit, just as was in direct current. As a result the projected motor proved to be like a single cylinder steam engine, stalled at dead center, at the top or bottom of the stroke.

What Tesla did was to use two circuits, each one carrying the same frequency of alternating current, but in which the current waves were out of step with each other. This was equivalent to adding to an engine a second cylinder. The pistons in the two cylinders were connected to the shaft so that their cranks were at an angle to each other which caused them to reach the top or bottom of the stroke at different times. The two could never be on dead center at the same time. If one were on dead center, the other would be off and ready to start the engine turning with a power stroke. (p. 50)

- This analogy oversimplifies the situation, of course, for Tesla's discovery was much more far-reaching and fundamental. What Tesla has discovered was a means of creating a rotating magnetic field, a magnetic whirlwind in space which possessed fantastically new and intriguing properties. It was an utterly new conception. In direct-current motors a fixed magnetic field was tricked by mechanical means into producing rotation in an armature by connecting successively through a commutator each of a series of coils arranged around the circumference of a cylindrical armature. Tesla produced a field of force which rotated in space at high speed and was able to lock tightly into its embrace an armature which required no electrical connections. The rotating field possessed the property of transferring wirelessly through space, by means of its lines of force, energy to the simple closed circuit coils on the isolated armature which enabled it to build up its own magnetic field that locked itself into the rotating

magnetic whirlwind produced by the field coils. The need for a commutator was completely eliminated. (pp. 50-51)

- He worked out the design of dynamos, motors, transformers and all other devices for a complete alternating-current system. He multiplied the effectiveness of the two-phase system by making it operate on three or more alternating currents simultaneously. This was his famous polyphase power system.

The mental constructs were built with meticulous care as concerned size, strength, design and material; and they were tested mentally, he maintained, by having them run for weeks -- after which time he would examine them thoroughly for signs of wear. Here was a most unusual mind being utilized in a most unusual way. If he at any time built a "mental machine", his memory ever afterward retained all the details, even to the finest dimensions. (pp. 51-52)

Force-field analysis in social science: Kurt Lewin has developed an understanding of [force fields](#) in psychosocial systems. It has proven to be a significant contribution to the fields of social science, psychology, social psychology, organizational development, process management, and change management. This has provided a framework for looking at the factors (forces) that influence a situation, originally social situations. It looks at forces that are either driving movement toward a goal (helping forces) or blocking movement toward a goal (hindering forces).

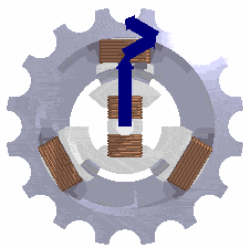
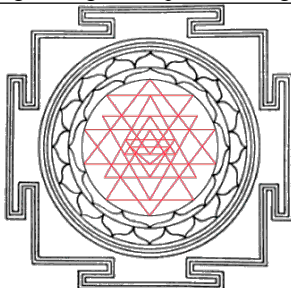
The question raised by Tesla's insight is the manner in which any force field in a psychosocial system could be understood to "rotate" -- however "rotate" might then be fruitfully understood (as suggested by [enantiodromia](#), or the *BaGua* system, for example). Would such an understanding enable what it could be assumed that Lewin's approach has failed to reframe with respect to ongoing conflicts at this time (Kurt Lewin, *Defining the "Field at a Given Time"*, *Psychological Review*. 50, 1943, pp. 292-310; republished in *Resolving Social Conflicts and Field Theory in Social Science*, American Psychological Association, 1997)

Comprehension: There is a fundamental challenge to appreciating Tesla's breakthrough in electromagnetic terms. As is evident from any description, and from the many diagrams illustrating the discovery (available on the web), comprehension is not as simple as might be assumed or desired. This is despite widespread technical familiarity with the operation of devices based on the electrical principles involved, or a degree of correspondence with multi-cylinder combustion engines (see [Hypercomputer operation clarified through metaphors of engine design](#), 2014).

This challenge to comprehension can itself be used as a metaphor of the challenge with respect to any potential application of the insight to psychosocial processes. That it "works" in so many devices is no consolation in endeavouring to render the possibility comprehensible in the psychosocial case. That the original applications have since been further developed in so many ways both increases the challenge and suggests the range of possibilities that might be explored through technomimicry for the psychosocial case.

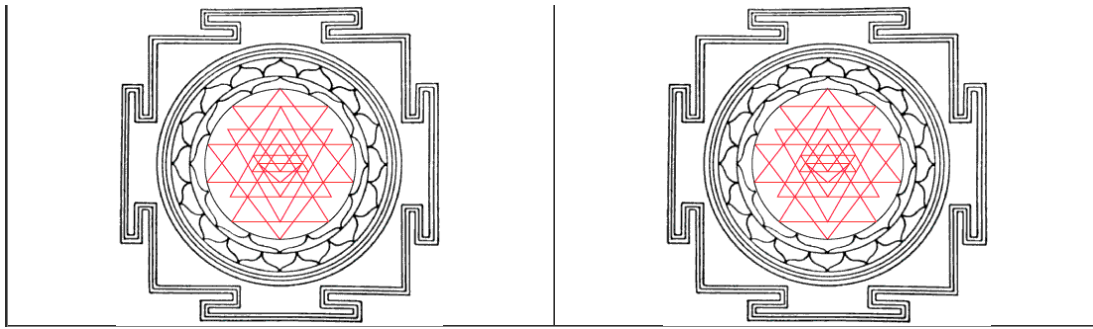
The animation on the left below illustrates the operation of a [polyphase system](#) is a means of [distributing alternating-current electrical power](#). Polyphase systems have three or more energized electrical conductors carrying alternating currents with a definite time offset between the voltage waves in each conductor. Such systems are considered particularly useful for transmitting power to [electric motors](#). [Three-phase electric power](#), as illustrated, is a common method of alternating-current electric power generation, transmission, and distribution.

The animation on the right is an adaptation of the [Sri Yantra](#) of the Shri Vidya school of Hindu tantra. The central part is formed of nine interlocking triangles that surround and radiate out from the central point. As being suggestive of cognitive "wiring", the set of triangles is rotated through three positions at the same rate as that of the animation on the left.

Potential correspondences between electrical and cognitive cycles?	
Magnetic field and vectors from 3-phase coils (animation reproduced from <i>Wikipedia</i>)	Experimental 3-phase animation of classic Sri Yantra (core "wiring" configuration passes through 3 phases)
	

As a further experiment, the set of triangles is rotated at the same rate through 8-phases (image on left below) and 16-phases (image on right). Clearly further experiments of mnemonic significance could be undertaken by rotating different triangles at different rates, possibly differently coloured.

Experimental animations passing through more phases	
Animation through 8 phases	Animation through 16 phases



Implications of rotation suggested by technomimicry: Possibilities are suggested in quite disparate domains, as separately explored:

- *Helicopter development:* The argument for technomimicry was inspired by that of [Arthur M. Young](#), designer of the Bell helicopter, as separately discussed (*Engendering a Psychopter through Biomimicry and Technomimicry: insights from the process of helicopter development*, 2011). Young envisaged the possibilities of applying the principles of helicopter control -- notably involving challenges of rotation -- to the development of a "psychopter" or "winged self" (*Geometry of Meaning*, 1976; *The Bell Notes: A Journey from Physics to Metaphysics*, 1979). Possible understandings are discussed separately (*Characteristics of phases in 12-phase learning-action cycle*, 1998; *Typology of 12 complementary strategies essential to sustainable development*, 1998).
- *Nuclear fusion:* The design principles required to render plasma control feasible in a toroidal reactor (as in the [ITER project](#)) also suggest insights of psychosocial relevance, especially when plasma is understood as the flow of attention (*Enactivating a Cognitive Fusion Reactor: Imaginal Transformation of Energy Resourcing (ITER-8)*, 2006)
- *Fluid flow:* Considerable insight into the functioning of vortices in nature emerged from the work and applications of [Viktor Schauberger](#), as separately discussed (*Enabling Governance through the Dynamics of Nature: exemplified by cognitive implication of vortices and helicoidal flow*, 2010). His principal argument was that humanity could benefit considerably by learning from nature -- specifically the dynamics of water -- rather than trying to correct it (Douglas Hofstadter, *Fluid Concepts and Creative Analogies: computer models of the fundamental mechanisms of thought*, 1995). Schauberger's concern was to liberate people from dependence on inefficient and polluting centralized energy generation. A subsequent development of this turbine is now known as the "[vortex generator](#)" (although many others now exist with that name).
- *Circulation of the light:* This can be considered as a form of "technology" potentially to be related to Tesla's preoccupation with light (*Circulation of the Light: essential metaphor of global sustainability?* 2010). It has been significant in other cultures, notably with respect to the discipline of [Neidan](#). The nature of the metaphorically-enhanced use of word-play in *Neidan* is admirably clarified in essays by Isabelle Robinet (*The World Upside Down: essays on Taoist internal alchemy*, 2011), remarkably translated from the French by Fabrizio Pregadio:

Internal alchemy, or *Neidan*, is a technique of enlightenment whose earliest extant written records date from the eighth century. It appeals both to rationality, which gives order to the world, and to what transcends rationality: the unspeakable, the Totality. Its main tools are the trigrams of the *Yijing* (Book of Changes) and a number of key metaphors, some of which are alchemical in nature, whence the name, "internal alchemy"....

Robinet most notably indicates in one essay (*The Alchemical Language, or the Effort to Say the Contradictory*, 1993):

The principle consists in ordering the world by means of multiple and complex reference points built on the basis of these initial data and of a multi-layered structure. Here lies the rationality of alchemy, in the sense of providing order and intelligibility. However, being a didactic technique oriented toward mysticism, alchemy also involves the denial of its own system. This denial is achieved by several means: the reminder that silence is the foundation of the word; the continuous evocation of Unity, which merges and abolishes all reference points; the adoption of a fundamentally metaphoric language that must be surpassed; the recurrent disruptions in the continuity of discourse; the use of images that play at several levels, operating now in one direction, now in the opposite, levels that are related to one another until being unified; the ellipsis that handles two different entities as equivalent; the reciprocal encasing of all images, so that "the child generates its mother" and the contained is the container; the multiplicity of facets, times, and reference points superimposed above one another, which counteracts the fragmentation wrought by rational analysis.

The alchemists, therefore, use a highly structured language, but transgress it by introducing a negation of their own system, and by expressing, through a system of reciprocal encasing, a duality absorbed into Unity, a rationality traversed by irrationality. The language of alchemy is a language that attempts to say the contradictory.

The relevance of this articulation in relation to phenomenology and topology has been developed by Steven Rosen (*Dreams, Death, Rebirth: a topological odyssey into alchemy's hidden dimensions*, 2014). An argument for contrary expression has been made separately with respect to the [Scientific and Medical Network](#) (*Embodying a Hypercomplex of Unhygienic Nescience: questionable connectivity enabling apprehension of matters otherwise*, 2014)

Insight into global dynamics through Tesla's focus on the sphere

Missing from the discussion above is any mention of Tesla's considerable interest in the sphere -- both in relation to his energy experiments, and to his understanding of the terrestrial globe. There is a case for relating these to the later explorations of [Buckminster Fuller](#) (*Synergetics: explorations in the geometry of thinking*, 1975), as separately discussed (*Geometry of Thinking for Sustainable Global Governance: cognitive implication of synergetics*, 2009).

Arthur Young offers greater insight in terms of distinctive functionality, as variously suggested (*Characteristics of phases in 12-phase learning-action cycle*, 1998; *Typology of 12 complementary strategies essential to sustainable development*, 1998). With respect to Arthur Young's exploration of learning-action cycles in *Geometry of Meaning* (1976), it is appropriate to note his courageous attempt to relate these to the far more widely memorable understanding of zodiacal cycles (*Zodiac: An Analysis of Symbolic Degrees* by Eric Schroeder, 1982). such bridging exercises are rare. Why is that? (*Eliciting a 12-fold Pattern of Generic Operational Insights: Recognition of memory constraints on collective strategic comprehension*, 2011; *Imagining Attractive Global Governance: questioning possibilities and constraints of well-boundedness*, 2013). Relating creativity to widespread understanding of the zodiac is especially valuable as an aid to comprehension and reflection.

From a cybernetic perspective, the work of Fuller and Beer is complemented by the work on syntegrity of [Stafford Beer](#) (*Beyond Dispute: the invention of team syntegrity*, 1994).

These threads are explored through animations presented separately (*Representation of Creative Processes through Dynamics in Three Dimensions: global insight from spherical reframing of mandalas, the zodiac and the enneagram*, 2014) . This is organized in the following sections

- [Global insight implied by circular representation](#)
- [Spherical mapping of conditions traditionally associated with the zodiac](#)
- [Relevance to change, learning and creativity](#)
- [Transcending polar preoccupation](#)
- [Imagining the nature of cognitive "flight" in terms of the enneagram](#)
- [Cognitive navigation?](#)
- [Meaningful cognitive navigation](#)

Psychosocial insights from the electrical War of Currents -- AC versus DC

AC versus DC: The "War of Currents" describes the commercial competition in the late 1880s between the companies of [Thomas Edison](#) and [George Westinghouse](#). The former promoted use of [direct current](#) (DC) for electric power distribution against the latter's promotion of [alternating current](#) (AC) on the basis of many of the patents of Nikola Tesla.

As described by *Wikipedia*:

- the direct-current system (first developed in the USA) generated and distributed electrical power at the same voltage as used by the customer's lamps and motors. This required the use of large, costly, distribution wires and forced generating plants to be near the loads.
- with the development of a practical transformer, using Tesla's polyphase AC induction motor and transformer designs, alternating-current power (developed in some European countries) could be sent long distances over relatively small wires at a convenient high voltage, then reduced in voltage to that used by a customer. Alternating current generating stations could be larger, cheaper to operate, and the distribution wires were relatively less costly.

The lower cost of AC power distribution prevailed, though DC systems persisted in some urban areas throughout the 20th century.

As described by Nicholas West (*10 Inventions of Nikola Tesla that changed the world*, *Activist Post*, 2014):

The division can be summarized as one of cost and safety: The DC current that Edison (backed by General Electric) had been working on was **costly over long distances, and produced dangerous sparking** from the required converter (called a commutator). Regardless, Edison and his backers utilized the general "dangers" of electric current to instill fear in Tesla's alternative: Alternating Current. [As proof](#), Edison sometimes electrocuted animals at demonstrations. Consequently, Edison gave the world the electric chair, while simultaneously maligning Tesla's attempt to offer safety at a lower cost. Tesla responded by demonstrating that AC was perfectly safe by famously shooting current through his own body to produce light. This Edison-Tesla (GE-Westinghouse) feud in 1893 was the culmination of over a decade of shady business deals, stolen ideas, and patent suppression that Edison and his moneyed interests wielded over Tesla's inventions. Yet, despite it all, it is Tesla's system that provides power generation and distribution to North America in our modern era. [*emphasis added*]

Existence of a psychosocial "war of currents"?: There are curious parallels between the electrical war of currents and the dynamics within the psychosocial realm at the present time -- if only in the manner in which "current of opinion" is understood and used. The implications of these parallels, and the possibility of transcending the associated dualities, are developed in a concluding section below with respect to future possibilities.

The question here is whether the electrical "war" can be used as a metaphor to explore problematic issues of generation and distribution of "energy" in its most general sense. Is it possible that there is a parallel to the principled conflict between Westinghouse and Edison -- or that such conflict derives from a more fundamental pattern which it is difficult to recognize? The pattern of the AC/DC war may help to clarify that dynamic. The historical difficulty in recognizing AC and the manner of its generation gives focus to the point -- further

justified by the relative incomprehension of polyphase systems at the present time..

Provocatively there is a case for exploiting the abbreviations "DC" and "AC" to caricature playfully aspects of the dysfunctional dynamics of the present, as might be suggested by the following table.

Psychosocial "war of the currents"?	
"DC"	"AC"
<i>democratic consensus</i> , as forcefully promoted worldwide	<i>alternating consensus</i> , as variously explored and preferred worldwide
<i>direct(ive) communication</i> , as favoured in many modes of top-down governance	<i>associative communication</i> , as advocated in the light of failures of directive modalities
<i>direct comprehension</i> , widely assumed to follow from simple statements and training programmes	<i>adaptive comprehension</i> , recognized as necessary in complex situations requiring tacit knowledge and experience
<i>democratic certainty</i> , assumed to follow from the democratic process and majority rule	<i>ambiguous conditions</i> characteristic of widespread uncertainty and indeterminacy
<i>"demonic condemnation"</i> , as widely characteristic of negative campaigning and dealing with otherness	<i>"angelic conversion"</i> , as favoured in public relations processes of "evangelisation" and "beatification"

There is a sense in which the "DC" nexus as a cognitive (hyper)complex is directly associated with understandings of the desirability of capitalism and its dynamics, whilst the "AC" nexus is more readily recognized in terms of the dynamics of the "hypercomplex" entangling socialism, communism and communalism -- as variously understood. There is a valuable irony to the fact that the locus of the so-called [Washington Consensus](#) should use "DC" as a state signifier. More provocatively it could be said that the world is faced with a "DC problem" deriving from the mindset unquestioningly deployed globally from that locus.

Is there a case for mapping capitalist democracy, as promoted, onto DC electromagnetic devices -- motors and generators based on DC current -- in order to highlight the constraints played out in the original War of Currents? The dynamic can be framed otherwise in terms of that between the [World Economic Forum](#) and the [World Social Forum](#) (*All Blacks of Davos vs All Greens of Porto Alegre: reframing global strategic discord through polyphony?* 2007). The inadequacies of the corresponding "AC" modality could be highlighted by attempting a mapping onto DC distribution systems, in absence of any appreciation of the polyphase insight underlying the rotating magnetic field -- despite recognition of "multipolar" geopolitics..

The basic point to be made is the spastic, clunky operation of democracy as framed by a "DC" mindset -- in the absence of dynamics associated more effectively with alternation and rotation. It is typified by the acrimonious relationship between "majority" and "opposition" -- between "right" and "left" in parliamentary assemblies. The relationship could be said to have been dramatically illustrated by the movie *Avatar* (2009).

Given the conditions under which DC is favoured over AC for the distribution of power, is it possible that this relationship offers a valuable metaphor through which to explore the problematic distribution of power and resources in society? Rather than seeking the dominance of one or the other, **is there a way in which a metaphor of field rotation could enable unfruitful dialogue to be transcended?** Can the dysfunctional DC/AC psychosocial dynamic be understood otherwise, and transcended?

Tesla as an extraordinarily instructive experimental failure

Commentators variously note how Tesla effectively adopted an experimental attitude to himself and his mode of operation. He can be understood as having consciously designed himself as an experiment.

For John J. O'Neill (*Prodigal Genius: the life of Nikola Tesla*, 1943):

- He stands as a synthetic genius, as self-made superman, the greatest inventor of all times. But when we consider Tesla as a human being, apart from his charming and captivating social manners, it is hard to imagine a worse nightmare than a world inhabited entirely by geniuses....
- The creation of a superman as demonstrated by Tesla was a grand experiment in human evolution, well worthy of the giant intellect that grew out of it, but it did not come up to Nature's standards; and the experiment will have to be made many times more before we learn how to create a super race with the minds of Teslas that can tap the hidden treasury of Nature's store of knowledge, yet endowed too with the vital power of love that will unlock forces more powerful than any which we now glimpse, for advancing the status of the human race (pp. 8-9)

As described by Margaret Cheney (*Tesla: Man Out of Time*, 2001):

From these meditations the young Tesla developed two concepts that -- in rather different ways -- were to be important to him in later life. The first was that human beings could be adequately understood as "meat machines". The second was that machines could, for all practical purposes, be made human. The first idea may have done nothing to improve his sociability, but the second was to lead him deep into the strange world of what he called "teleautomatics" or robotics. (p. 15)

Of particular relevance to this argument was Tesla's materialistic focus. As expressed by O'Neill (1943):

- His materialistic concepts made him intellectually blind to the strange phenomenon by which revelation, or illumination, had come

to him, but made him more keenly appreciative of the value of that which was revealed. It must not be understood that this revelation was a happenstance phenomenon of the moment, for Tesla, endowed by Nature with an intellect capable of vast unfoldment, had exerted almost superhuman efforts to achieve that which was revealed to him, and the effort was not unassociated with the result....

- There was a parallel situation in his philosophy of natural phenomena, in that he suppressed all spiritual aspects of Nature and confined himself to the purely materialistic aspects. (p. 315)

The duality of materialism/spirituality is curiously transcended by the focus, in his terms, on creative invention by which he brought light to his cognitive universe. The opening words of Tesla's autobiography read:

The progressive development of man is vitally dependent on invention. It is the most important product of his creative brain. Its ultimate purpose is the complete mastery of mind over the material world, the harnessing of the forces of nature to human needs.

As suggested in the introduction above, a potentially fruitful question is how **the future might understand Tesla to have been "wrong"**. More provocatively, given use of the phrase in fundamental physics, how could he be considered **"not even wrong"**? More intriguing, given what may be imagined regarding the development of knowledge in the future, **how might Tesla be understood to have been both "right" and "wrong" -- or, better, "neither right nor wrong"?**

This question relates to the possibility of reframing duality in the light of the insights he brought to bear on the matter. As suggested here, **Tesla identified with a cognitive modality which focused on material expression to the exclusion of the subtler expression characteristic of psychosocial systems**. In Bateson's terms, he could be said to have been very much "his own metaphor".

Of particular interest was his seeming inability to integrate into his reflections those factors which are effectively represented, in metaphorical terms, by his criticism of the limitations of direct current modality. With respect to his "world order", these factors could be understood as neglected (or deprecated) "remainders", as separately discussed (*Reintegration of a Remaindered World: cognitive recycling of objects of systemic neglect*, 2011).

Application of his insights regarding duality to the psychosocial realm (as argued above) would seem to call for future integration of factors such as the following:

- *excessive preoccupation with possession/ownership of intellectual property*, usefully extended beyond patents to the wide variety of issues of competition (and claims) for "territory" and "turf" -- in the unquestioned quest for monopoly control
- *excessive preoccupation with precedence*, usefully to be associated with the emphasis in many contexts on being "number one" -- and the related issues of being pre-empted (and gazumped). Tesla enables recognition of the delay in recognition of precedence (with respect to radio), and the manner in which precedence with respect to some insights is variously recognized in terms of "presentation" of an idea, rather than "publishing" it, or successfully "patenting" it, as argued by Seifer (1996). This highlights the manner in which principles may be discovered by other cultures -- of times past or elsewhere -- and the possibility for each to creatively "rediscover the wheel".
- *excessive dependence of innovative development on funding*, usefully recognized in terms of the distortions introduced into the creative process in relating to the constraining expectations of sponsors of research.
- *excessive predilection for elegant showmanship*, usefully recognized as characteristic of the increasingly problematic predominance of marketing spin, exploiting the most attractive design. This is most evident in the questionable degree of investment in the image management of celebrities's and political leadership -- echoed by popular response to fashion, as defined and manipulated by the fashion industry..
- *questionable relation to women*, as noted by his various biographers, suggesting unresolved difficulties in engaging with the fundamentally contrasting values and modalities of femininity -- with all that such contrasts tend to imply more generically
- *problematic disagreements with various parties*, understood more generically -- typically a challenge to any reframing of the ways which might be suggested by Tesla's own insights
- *problematic alternation between wealth and poverty*, otherwise recognized in terms of "boom and bust cycles". Tesla (like Mozart and others) embodied this to a high degree, having experienced periods of wealth, whether financial or otherwise ("**psychic capital**", "**psychic income**", etc). Especially relevant is any reframing of the two conditions in relation to health (*Wholth as Sustaining Dynamic of Health and Wealth: cognitive dynamics sustaining the meta-pattern that connects*, 2013; *Cognitive Implications of Lifestyle Diseases of Rich and Poor: transforming personal entanglement with the natural environment*, 2010). Of particular interest in relation to health is Tesla's work on **diathermy**, namely electrically induced health. Is there a health enhancing psychosocial dynamic yet to be recognized in the alternation between polar perspectives?
- *eliciting the problematic attention of secretive agencies*, without any capacity to anticipate or reframe their engagement for questionable purposes -- or the conspiracy mindsets engendered as a consequence

Together these factors might be considered indicative of the small-mindedness of the 20th century with respect to innovation. Is there a case for understanding such phenomena in "electromagnetic terms" in order to "build these factors back in"? It can be argued, however, that it is with respect to such factors that Tesla could be understood as an extraordinarily instructive "experimental failure".

How might Tesla -- as he might be assumed to have conceived and defined his own identity -- be understood cognitively as some form of "rotating magnetic field"? As with others, were his creative preoccupations those from which he derived most developmental learning? For Tesla, was each device invented as a "solution" to a cognitive "problem" he was experiencing? Was he necessarily the embodiment of his insight, in ways yet to be explored?

Encycling positive and negative for future sustainability

Problematic charged polarities: As implied above, the discovery by Tesla of the potential of a rotating magnetic field suggests that the focus on positive and negative in electromagnetic terms could be extended as a [generative metaphor](#) to reframe the relationship between other dualities and polarities that now prove so unfruitfully divisive in global society (Frank J. Barrett and David L. Cooperrider, *Generative Metaphor Intervention: a new approach for working with systems divided by conflict and caught in defensive perception*, *Journal of Applied Behavioral Science*, 1990). Examples might include:

- *positive / negative*, as widely used to distinguish what is desirable from what is undesirable, and variously extended into *good / bad*. As noted above, the matter has been specifically addressed by [Barbara Ehrenreich](#) (*Bright-sided: How the Relentless Promotion of Positive Thinking Has Undermined America*, 2010; *Smile Or Die: How Positive Thinking Fooled America and the World*, 2010).
- *right / wrong*: typically characterized by constituencies that perceive themselves to be unquestionably right in contrast with others understood to be unquestionably wrong -- with many dramas indicative of a reversal of such perspective, notably through "under the table" processes reflecting "shades of grey". The dilemma was specifically addressed by [Edward de Bono](#) (*I am Right You are Wrong: From This to the New Renaissance: From Rock Logic to Water Logic*, 1991; *Practical Thinking: 4 Ways to be Right; 5 Ways to be Wrong; 5 Ways to Understand*, 1992). The associated strategic dilemmas can be usefully explored in terms of so-called "wicked problems", and the challenge of "encycling" them (*Encycling Problematic Wickedness for Potential Humanity*, 2014).
- *right / left*, as used to frame radically opposed political ideologies and strategies, notably extended into *conservative / progressive* -- typically with no fruitful process to reconcile them, and especially in the light of the track record of democracy (*Ungovernability of Sustainable Global Democracy?* 2011). This dynamic might be recognized as a primitive response to a failure of discernment of intermediary phases
- *truth / falsehood*, as widely evident in advocacy of every kind (whether scientific, religious, political, or product marketing) -- with each claiming "truth" and condemning the other for "falsehood" of some kind. This is most notably evident with respect to media bias (*Vital Collective Learning from Biased Media Coverage: acquiring vigilance to deceptive strategies used in mugging the world*, 2014)
- *knowledge / ignorance*, as widely used as a basis for assumptions justifying discrimination and in order to frame a direction of progress -- despite a degree of recognition of the limits of one and the merits of the other, as separately argued (*University of Ignorance: engaging with nothing, the unknown, the incomprehensible, and the unsaid*, 2013). The point can be extended to include *sense / nonsense*, given their role in learning and those facing constraints in that regard. Especially relevant is the amount of "sense" that can be held to be "nonsense" by some, and vice versa (*10 Shocking Facts About Society That We Absurdly Accept As Normal, Collective Evolution*, 25 August 2014). The sense of the present could be understood to be the nonsense of the future -- if any significant advancement of knowledge is to be assumed. The point is made otherwise by [Hannah Arendt](#) (*The Life of the Mind*, 1978) as remarkably reviewed by [Maria Popova](#) (*Hannah Arendt on Thinking vs. Knowing and the Crucial Difference Between Truth and Meaning, Brain Pickings*, 14 September 2014)
- *answer / question*, as fundamental to imposition of the answers and explanations of particular worldviews -- potentially to be considered premature by the future -- thereby framing the questions considered appropriate and avoiding others as unacceptable, as may be variously explored (*Question Avoidance, Evasion, Aversion and Phobia: why we are unable to escape from traps*, 2006; *Strategic Implications of 12 Unasked Questions in Response to Disaster*, 2013)
- *public / private*, as fundamental to notions of possession of property, whether tangible or intangible. How are subtler combinations to be recognized -- as notably explored in the challenge of access to intellectual property associated with academic research funded by taxpayers, and the debate regarding open access and *Science 2.0?* (*Metascience Enabling Upgrades to the Scientific Process: beyond Science 2.0 in the light of polyhedral metaphors?* 2014; John Abraham, *Deciding who should pay to publish peer-reviewed scientific research, The Guardian*, 18 September 2014)

The problem of handling such dualities is remarkably illustrated in a most evident manner by the challenges of [intersexuality](#) as they are now increasingly recognized. These have been recently dramatised in public debate through the cases of the athlete [Caster Semenya](#), of [Conchita Wurst](#) (winner of the 2014 Eurovision Song Contest), and of [Chelsea Manning](#) (*Chelsea Manning sues US military over denial of gender dysphoria treatment, The Guardian*, 23 September 2014). Nearly 16 intermediate conditions between "male" and "female" (defined genetically) are as yet poorly recognized, as separately tabulated (*Radical Disagreement Reframed Metaphorically through Intersexuality*, 2009). They are indicative of the relevance of such distinctions with respect to the "grey areas" between other polar extremes -- as with that between North and South on any compass. Mememtic analogues are to be expected.

The fundamental point to be made is that it is only through an alternation of perspective through intermediary phases that it can be appreciated that those upholding one view may be obliged to discover the merits of an alternative view initially rejected. This "polar shift" is remarkably illustrated by the extent to which western democracies have been obliged to find merit in the invasive surveillance

previously deplored as characteristic of the undemocratic communist bloc, as well as by the recent proactive response to market capitalism by China (after having long rejected it).

A comprehensive set of 230 such dualities has been identified as [value polarities](#) through the [Human Values Project](#). This subsequently explored ways of configuring them as strategic dilemmas (*Configuring Globally and Contending Locally: shaping the global network of local bargains by decoding and mapping Earth Summit inter-sectoral issues*, 1992). These approaches do not however take account of the possibility of insights associated with Tesla's rotation of a magnetic field. This can be understood as recognizing a cyclic process involving many "phases" -- through which a higher order of "light" is engendered (*Circulation of the Light: essential metaphor of global sustainability?* 2010).

If *knowledge/ignorance* is to be compared to *positive/negative* in an electromagnetic sense, how many phases may it be useful to distinguish in a sustainable system? The 64 conditions of the Chinese *Book of Changes* merit reflection in this light (*Transformation Metaphors derived experimentally from the Chinese Book of Changes (I Ching) -- for sustainable dialogue, vision, conferencing, policy, network, community and lifestyle*, 1997).

Challenge of comprehension: The wisdom associated with appreciation of the ambiguity of contrasting (even incommensurable) insights is partially indicated by *Contradictory Quotes (Brainy Quotes)*. Such quotes are themselves necessarily controversial. It would seem that the set of dualities calls for a more fundamental insight into its operation -- to which "rotation of a magnetic field" is a useful pointer. As a metaphor this is consistent with the Taoist insight of [Chuang-Tzu](#):

<i>The Pivot</i> by Chuang-Tzu
Tao is obscured when men understand only one of a pair of opposites, or concentrate only on a partial aspect of being. Then clear expression also becomes muddled by mere wordplay, affirming this one aspect and denying the rest. Hence the wrangling... each denies what the other affirms, and affirms what the other denies. What use is this struggle to set up "No" against "Yes," and "Yes" against "No"?...
When the wise man grasps this pivot, he is in the center of the circle, and there he stands while "Yes" and "No" pursue each other around the circumference.

Part of the difficulty in comprehension would seem to lie in the dog-like focus on the pointing finger, rather than "re-cognition" of the direction to which it points. Ironically interpretation of the complex mathematical forms associated with [crop circles](#) could be interpreted in this light (Benjamin Radford, *Beautiful Math Equation Found in Crop Circle*, *LiveScience*, 8 June 2010; Marc West, *Pi appears in crop circle*, *plus.maths.org*, 8 June 2010). The most concrete evidence for "extraterrestrial life" might then be the failure to detect meaning in the variety of forms it most probably takes (*Sensing Epiterrestrial Intelligence (SETI): embedding of "extraterrestrials" in episystemic dynamics?* 2013).

The arguments of Arthur Young (mentioned above) are very suggestive of a new approach through his focus on learning-action cycles. Understandings of [enantiadromia](#) are also valuable in this respect. As discussed elsewhere (*Toward an Enantiomorphic Policy*), the cultural historian [William Irwin Thompson](#) (*From Nation to Emanation; planetary culture and world governance*, 1982) has sharpened considerably the ecology-sensitive intuition concerning the psycho-social lessons to be learned from cooperation between co-evolving systems.

The challenge for the future would therefore seem to lie in the challenge of comprehension -- in a context in which *comprehension/incomprehension* is potentially a reality for all (*Living with Incomprehension and Uncertainty: re-cognizing the varieties of non-comprehension and misunderstanding*, 2012; *Living as an Imaginal Bridge between Worlds: global implications of "betwixt and between" and liminality*, 2011). Whilst it may be asked whether Tesla himself had any implicit sense of himself in terms of a "rotating magnetic field", will some such recognition be open to individuals and collectivities in the future -- to whatever degree?

Engaging otherwise: Tesla's breakthrough with respect to comprehension of a rotating magnetic field suggests that many will be able to reframe their engagement with reality through related insights. Instances of corresponding psychosocial insight were cited above (notably the *BaGua* dynamic of Chinese culture). Framed through other disciplines, some may indeed be deprecated as of lower precision (dance, etc). In the case of music as a psychosocial ordering pattern, [Jacques Attali](#) argues that the currently dominant pattern of social order is reinforced by classical music -- with psychosocial ordering only now in process of adapting to the order inherent in emergent preferences for music (*Noise: the political economy of music*, 1985). **Can Tesla's technology breakthrough be understood as anticipating -- or prefiguring -- a corresponding cognitive breakthrough in cognitive dynamics?**

The probability is that it is individuals who may benefit most readily from the framing offered by Tesla -- adapting to a polyphase cyclic identity, as previously intimated (*Emergence of Cyclical Psycho-social Identity: sustainability as "psychically" defined*, 2007; *Being Neither a-Waving Nor a-Parting: cognitive implications of wave-particle duality in the light of science and spirituality*, 2013; *Liberation of Integration, Universality and Concord -- through pattern, oscillation, harmony and embodiment*, 1980).

Are the centuries-old problematic dynamics between the three Abrahamic religions to be considered as a 3-phase system inappropriately understood -- to be caricatured in terms of a "DC mindset"-- as may be separately explored (*Systemic Reliance of World Religions on Human Sacrifice*, 2014) ? A polyphase system could be understood as enabling the emergence of a new cognitive modality -- perhaps even *Homo conjugens* or *Homo undulans*, as previously explored (*Authentic Grokking: emergence of Homo conjugens*, 2003; *Encountering Otherness as a Waveform: in the light of a wave theory of being*, 2013).

What could then be imagined with respect to embodiment of cognitive processes, as may be variously understood (*ζ Embodying a Way Round Pointlessness ?* 2012; *Psychology of Sustainability: embodying cyclic environmental processes*, 2002; *Embodying the Sphere of Change: reframing metaphors of the I Ching as a codification of the patterns of change*, 2001).

The emergent modality may be operable collectively in ways to be explored -- as an inspiration for global civilization operating on impoverished metaphors (*Imagining Attractive Global Governance*, 2013). There is considerable irony to the fact that the secretive use of HAARP technology for military purposes may be suggestive of cognitive modalities through which global and local may be related through unforeseen implications of wave mechanics. More provocative is the possibility that this may be associated in some way with an hypothesised [cataclysmic pole shift](#) -- a [geomagnetic reversal](#). Is a shift in "cognitive poles" to be anticipated? Should this be integrated into a rotational dynamic of some kind?

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