



# laetus in praesens

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## Sensing Epiterrestrial Intelligence (SETI) Embedding of "extraterrestrials" in epistemic dynamics?

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## Introduction

Some astronomers continue to express interest in "extraterrestrials" and "life" elsewhere -- and maintaining the [Search for Extraterrestrial Intelligence](#) (SETI). There is disappointment that no traces or signals have been detected after 50 years of searching. Mars exploration has the search for "life" as one preoccupation now. Many people speculate variously on the possibility of such life -- the topic of a recent review by [The Royal Society](#) (*The Detection of Extra-terrestrial Life and the Consequences for Science and Society*, 2011).

Extraterrestrial life remains a major theme of science fiction and related movies. If intelligent, it is potentially a major challenge for religions (*The Peters ETI Religious Crisis Survey*, 2008). The possibility of such "life", and the search for it, is however primarily focused on "where" it might be found, especially now that some 30 [habitable planets](#) have been detected in other solar systems.

**"How" rather than "where"**: The concern here derives from a widely-cited quotation of one science fiction writer, [Ursula Le Guin](#): *There are no right answers to wrong questions*. Assuming that "extraterrestrial life" might be located on such planets may be a consequence of the "wrong question". It may not be a question of "where" such "life" is located but rather of "how" that "life" is expressed. This possibility is consistent with theoretical concerns with [nonlocality](#). As stated by Einstein, [quantum nonlocality](#) refers to the "spooky action at a distance" of [quantum entanglement](#).

The question of "how", rather than "where", frames a concern that there may even be terrestrial forms of "life" which escape the attention of biology -- focused as it is on a particular understanding of its expression through the organization of organic molecules into cellular form. The point could also be made that humans are not especially skilled at communication with nonhuman forms of "life" -- possibly as a consequence of failure to understand the variety of ways through which it may be expressed. That there is evident human insecurity in the desire to demonstrate that humans are the "highest" form of life is also a factor.

**Fruitful communication**: In the light of the dramatic challenge to human communication between those of different religious or philosophical persuasion --- and currently with the Taliban or with alienated youth -- even if "extraterrestrials" (as imagined) were to be detected by the SETI program, it is quite unclear that humans could communicate meaningfully or fruitfully with them. This is the theme of a separate discussion (*Communicating with Aliens: the psychological dimension of dialogue*, 2000).

There the nature of "meaningfully and fruitfully" contrasts significantly with the assumptions typically associated with development of a viable language -- a primary concern of the program for [Communication with Extraterrestrial Intelligence](#) (CETI). The issue with developing a language is well made in the terrestrial setting by the challenge of communicating with "unreasonable" people like the Taliban, alienated youth, and those variously incarcerated (prisons, asylums, hospices, etc). A common "language" is then not the

challenge. A degree of "understanding" may well be evident. The issue is how to render the communication "fruitful". Negotiation and mediation skills have clearly proven to be inadequate. The point is even more strongly made if it is "extraterrestrials" that find humans to be comparable to the Taliban, alienated youth, and those variously incarcerated. They may recognize the need for those with skills equivalent to those portrayed in *The Horse Whisperer* -- with humanity as the "horse".

A concern of the following exploration could be provocatively expressed through recognition that although no "extraterrestrials" have been detected, the dramatic increase in the proportion of terrestrial "extras" has indeed attracted attention. Here "extra" is the variant used to describe a background performer in a film, television show, stage, musical, opera or ballet production -- typically in a nonspeaking, nonsinging or nondancing capacity. The unemployed and alienated could well be understood in that light -- and especially given the challenge of communicating effectively with them. The same might be said of many endangered species -- too readily assumed to be of little significance.

**Relational life:** With respect to "how" intelligent "life" might be otherwise expressed, the concern here is with the possibility that it could be expressed through the dynamics of relationships between what humans isolate conceptually as distinctive entities, variously defined and bounded by categories. The human focus is on the "life" currently associated with a selection of category-defined entities (man, woman, dog, dolphin, etc). The possibility is excluded that the dynamics between such entities may also constitute a vehicle for "life" and intelligent identity. This is partially suggested by *swarm intelligence*, as evident in movement of shoals of fish, or flocks of birds, or human crowds. It is also suggested by recent discussion of *Quantum Aspects of Life* (2008)

The possibility merits attention in suggesting a spectrum of "life" far more extensive than is currently assumed. The "extraterrestrials" for which searches are conducted elsewhere may indeed "exist" on distant planets -- but "elsewhere" on this spectrum than is assumed by the human definition of "life".

**Terrestrial implication:** The focus in what follows is on the possibility that intelligent "life" is also expressed in this way "on Earth" -- to a far greater extent than is conventionally imagined by science, preoccupied as it is with particular categories and modes of detection.

**The challenge to comprehension is clear if the expression of such life is not a matter of "where" but "how" -- and even "when".** If it is through relationships that that intelligent life is distinctively expressed, it is necessarily intangible and primarily implicit -- less "within" than "between". As such it would not lend itself to the conventional focus on the tangible and the explicit -- with which conventional definitions and categories are so readily associated.

**Epiterrestrial:** As a means of clarifying the contrast with the "extraterrestrial" preoccupation, the argument which follows makes use of the uncommon term "epiterrestrial". The prefix "epi" offers one approach to understanding significant differences in the nature of such "relational life" than conventionally associated with use of "extra". Use of "SETI" is a deliberate provocation as a suggested reframing of its conventional use -- as with the replacement of "Search" by "Sensing". This points to the potential of polysensual modalities, as separately argued (*Strategic Challenge of Polysensorial Knowledge: bringing the "elephant" into "focus"*, 2008).

**Strategic possibility:** The exploration may offer insights into the challenges of the Middle East peace process -- now primarily defined in terms of the bounded categories of the land and its ownership -- when a focus on what is "relationally between" might be more fruitful. The discussion of "epiterrestrial" may also help to reframe the current situation of "terrestrial extras".

## Indicative prefixes: contrasting "epi" with "extra"

This exercise follows from several earlier investigations of prefix usage and potential (*Exploration of Prefixes of Global Discourse: implications for sustainable confidality*, 2011; *New Paradigms via a Renewed Set of Prefixes? Dependence of international policy-making on an array of operational terms*, 2003; *Conceptual Gaps and Confused Distinctions: possible ambiguities in the translation of interrelated concepts*. 1974; *Conceptual Distortions from Negative Descriptors: non-governmental vs. anti-governmental*, 1974).

The introduction has focused on the possibility of a fruitful approach to the relation **between** what are distinguished by categories. In practice this is a methodological trap since it is difficult to use language in this way. In "extraterrestrial", use of "extra" implies a relation between "terrestrial" and "non-terrestrial" -- with the focus switched to the "non-terrestrial" and **not** on the relation between the two.

One inspiration for use of "epi" here follows from the problematic outcome of the **Human Genome Project**. This mapping of the human genome was originally promoted widely as providing information capable of explaining all human variability -- as being genetically determined. With the successful completion of the mapping it became apparent that, although valuable, there was also a need to focus on the changes in **gene expression** or **cellular phenotype**, caused by mechanisms **other than changes in the underlying DNA sequence**. This contrasting focus is termed **epigenetics** -- in which the prefix "epi" is indicative of notions such as *over*, *above*, or *outer* (as discussed below). Use of "extra", as with "extragenetic", was considered inappropriate for this purpose.

In the light of this genome mapping example, rather than "extra-terrestrial" (with its strong implication of "non-terrestrial"), **what might "epi-terrestrial" then suggest?** "Extra-terrestrials" may not exist tangibly in the sense that many would wish them to exist -- and this is consistent with the view of those who do not believe they exist. **"Extra-terrestrials" may however exist in other senses -- yet to be understood -- for which the term is less appropriate.**

As with the assumptions originally associated with genome mapping, is much of science effectively focused conceptually on "terrestrial" when further insight might be derived from "epi-terrestrial" -- understood in terms of "changes in expression", whether of "life" or intelligence? If science is primarily focused on the tangible (or measurable), is this to be compared with "terrestrial" (as in the genetics case) -- with the "extra-terrestrial" effectively corresponding to the "extra-tangible", as being especially "terrestrial"? This could be construed in the light of occasional use of "very earthy" as a descriptor, although any implication of being "well grounded" is another matter.

The genetics example raises the essentially dynamic cognitive possibilities, as yet unexplored, potentially associated with "epi". Framed in

this way, "extra-terrestrial" as currently envisaged might even be understood in terms of questionable projection of "terrestrial" science methodology onto the phenomena to which astronomy is especially attentive -- as another "natural science". Hence the cautionary reference of Ursula Le Guin: *There are no right answers to wrong questions.*

As noted, "epiterrestrial" is an uncommon term primarily associated with botanical descriptions of some orchids -- namely epiphytes growing in trees, rather than rooting into the soil. The term is borrowed here as an indication of modes of life best understood as not being "rooted" within the conventions of "terrestrial thinking". This borrowing is necessarily a literary device, justified only by the inadequacies of language conventionally rooted in the tangible. There is of course a degree of charm to the appropriate association with an exotic flower of striking elegance.

## Searching otherwise for "epiterrestrials"

**Looking otherwise:** Reflection on the possible existence of "epiterrestrial life", and the effort to search for it, merits consideration in the light of the arguments articulated by cognitive scientist [Alexandra Horowitz](#) (*On Looking: eleven walks with expert eyes*, 2013; *Inside of a Dog: what dogs see, smell, and know*, 2010), as remarkably summarized by [Maria Popova](#) (*The Art of Looking: what 11 experts teach us about seeing our familiar city block with new eyes*, *Brain Pickings*, 12 August 2012).

According to Popova, Horowitz begins by pointing our attention to the incompleteness of our experience of what we conveniently call "reality":

Right now, you are missing the vast majority of what is happening around you. You are missing the events unfolding in your body, in the distance, and right in front of you.

By marshaling your attention to these words, helpfully framed in a distinct border of white, you are ignoring an unthinkable large amount of information that continues to bombard all of your senses: the hum of the fluorescent lights, the ambient noise in a large room, the places your chair presses against your legs or back, your tongue touching the roof of your mouth, the tension you are holding in your shoulders or jaw, the map of the cool and warm places on your body, the constant hum of traffic or a distant lawn-mower, the blurred view of your own shoulders and torso in your peripheral vision, a chirp of a bug or whine of a kitchen appliance.

This adaptive ignorance, Horowitz argues, is there for a reason -- celebrated as "concentration" and welcomed as a way of easing our cognitive overload by allowing us to conserve our precious mental resources only for the stimuli of immediate and vital importance, and to dismiss or entirely miss all else. For Horowitz:

Attention is an intentional, unapologetic discriminator. It asks what is relevant right now, and gears us up to notice only that.

In that respect:

A better way of thinking about attention is to consider the problems that evolution might have designed "attention" to solve. The first problem emerges from the nature of the world. The world is wildly distracting. It is full of brightly colored things, large things casting shadows, quickly moving things, approaching things, loud things, irregular things, smelly things.

**Experiential abundance:** Reflecting on this, Popova remarks that infants seem to experience [synaesthesia](#) as a baseline sensory given.... But, eventually, they grow out of this wondrous multidimensional awareness, which William James called "aboriginal sensible muchness," and we, the sensible and selectively attentive adults, emerge. For Horowitz:

Children sense the world at a different granularity, attending to parts of the visual world we gloss over; to sounds we have dismissed as irrelevant. What is indiscernible to us is plain to them.

The possibility has been variously celebrated by such as [David Abram](#) (*The Spell of the Sensuous: perception and language in a more-than-human world*, 1996), [Paul Feyerabend](#) (*Conquest of Abundance: a tale of abstraction versus the richness of being*, 1999) and [Sallie McFague](#) (*Life Abundant: rethinking theology and economy for a planet in peril*, 2000).

The question with respect to sensing the existence of "epiterrestrials" is whether they could exist in some way in modalities to which various modes of "looking" are insensitive. The use of the term "looking" in the more recent work of Horowitz contrasts unfortunately with her highlighting of "smell" in her previous study.

Her point can however be made otherwise through the oft-repeated anecdote about the person searching vainly at night under a lighted street-lamp for a set of keys. When asked by a passer by, why he was searching there, rather than outside the zone that was lit (where the keys were known to have been dropped), he responded: *Because I can see where it is lit.* Has that been the case with respect to the search for extraterrestrial intelligence?

As indicated above in citing Einstein, "searching" may well frame what is sought in terms of "locality" when the modality of "epiterrestrial intelligent life" may call for a panoply of modes of sensing -- perhaps integrated "polysensorially" as implied by synaesthesia. Might a dog have greater capacity to recognize an epiterrestrial -- as in anecdotal tales of the response of domestic animals to environments allegedly "haunted"?

**Combinatory play:** Within the same context, reviewing a work of Einstein (*Ideas and Opinions*), Maria Popova also offers insights relevant to this argument (*How Einstein Thought: fostering combinatorial creativity and unconscious connections*, *Brain Pickings*, 14 August 2012). These anticipate the questions raised in the following sections regarding the conventions of category theory and the relations between categories.

In stressing, in response to a question, that "*Combinatory play seems to be the essential feature in productive thought*", Einstein comments:

(A) The words or the language, as they are written or spoken, do not seem to play any role in my mechanism of thought. The psychological entities which seem to serve as elements in thought are certain signs and more or less clear images which can be "voluntarily" reproduced and combined.

There is, of course, a certain connection between those elements and relevant logical concepts. It is also clear that the desire to arrive finally at logically connected concepts is the emotional basis of this rather vague play with the above-mentioned elements. But taken from a psychological viewpoint, this combinatory play seems to be the essential feature in productive thought -- before there is any connection with logical construction in words or other kinds of signs which can be communicated to others.

(B) The above-mentioned elements are, in my case, of visual and some of muscular type. Conventional words or other signs have to be sought for laboriously only in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will.

(C) According to what has been said, the play with the mentioned elements is aimed to be analogous to certain logical connections one is searching for.

(D) Visual and motor. In a stage when words intervene at all, they are, in my case, purely auditive, but they interfere only in a secondary stage, as already mentioned.

(E) It seems to me that what you call full consciousness is a limit case which can never be fully accomplished. This seems to me connected with the fact called the narrowness of consciousness (*Enge des Bewusstseins*).

This suggests the possibility that any "play" with categories, however they are represented, engenders and sustains a medium within which intelligent epiterrestrial life might be "re-recognized". The fundamental role of play and humour, as potentially relevant to such an argument, is discussed separately (*Humour and Play-Fullness: essential integrative processes in governance, religion and transdisciplinarity*, 2005).

Further to the framing offered by Einstein are the insights to be drawn from "juggling". In this respect it is of interest to note the many references to "conceptual juggling" and "mental juggling" (Jeremy Dean, *The Mental Benefits of "Useless" Skills Like Juggling*, *PsyBlog*, July 2013; American Academy of Neurology, *Neurobics: Mental Juggling*, *Neurology Now*, 7, 2011, pp 11-15). Of particular relevance is the juggling of the conceptual arrays associated with languages (*Juggling Languages Can Build Better Brains*, *Science Daily*, 21 February 2011).

Popova notes others who have expressed views that concord with an understanding of combinatory play:

- **Arthur Koestler** through his **theory of "bisociation"**(articulated in *The Act of Creation*, 1964) explained creativity through the combination of elements that don't ordinarily belong together; From describing and comparing many different examples of invention and discovery, Koestler concludes that they all share a common **pattern** which he terms "bisociation" - a 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 **categorization, analogies** and **metaphors**.
- **Paula Scher**: as graphic designer **likens creativity to a slot machine** that aligns the seemingly random jumble of stuff in our heads into a suddenly miraculous combination;
- **T. S. Eliot** who believed that the poet's mind **incubates fragmentary thoughts into beautiful ideas**;
- **Stephen Jay Gould** who maintained that **connecting the seemingly unconnected is the secret of genius**;
- **Johannes Gutenberg's** invention of the printing press **embodied this combinatorial creativity**

Ideally this argument would itself be a polysensual combinatory play. Could "epiterrestrial" be best understood through humour or as a deadly question -- themes fundamental to the appeal of anecdotes by **Douglas Adams** (*The Hitchhiker's Guide to the Galaxy*). What devices enhance the capacity for such playfulness, as suggested by **Rubik's cube** (*Rethinking Rubik's Cube: a mnemonic device for ways of knowing and engagement?* 2009). As with **Sudoku**, it is a quest for "goodness of fit".

## Potential implications of category theory

Use is made of "periconceptual" in relation to concerns preceding or following biological reproduction. Some use is made of "epicategory" and "epiconcept", but primarily in (proprietary) naming of blogs or other initiatives. Of much greater relevance is the conceptualisation associated with what is known as **n-category** theory and **epimorphism**. This provides a formal mathematical reframing of the conventionally simplistic approach to categories and their relationship.

Although highly abstruse, a remarkable effort at clarifying this approach has been made by **Eugenia Cheng** and **Aaron Lauda** (*Higher-Dimensional Categories: an illustrated guide book*, 2004). The issue is whether such an approach could be fruitfully adapted to any understanding of "epiterrestrials" -- especially given the suggestion here that it is with the dynamics of relationship that they might be associated. The question can be usefully asked as to whether conventional simplicity is adequate to the challenges of the times

(*Transcending Simplistic Binary Contractual Relationships: what is hindering their exploration?* 2012).

As is typical of insights of mathematics of great potential significance for psychosocial relations, the "translation" of those insights to enable their wider comprehension is highly problematic -- perhaps appropriately so with respect to "how" epiterrestrials might exist, rather than "where". [*Readers could however choose to skip the following paragraphs and consider possible implications interpreted in terms of social networking -- in the next section*].

Category theory is used to formalize mathematics and its concepts as a collection of *objects* and *arrows* (also called **morphisms**) -- hence the potential relevance to social networking (as it may be mapped) with nodes and links. The theory can be used to formalize concepts of other high-level abstractions (**set theory**, **field theory**, and **group theory**) -- with the implication that higher patterns of order might become evident (or be detectable) in social networking (as noted below).

As noted by *Wikipedia*, in mathematics, *n*-categories are a high-order generalization of the notion of **category** -- to include **higher-dimensional categories** (Tom Leinster, *Higher Operads, Higher Categories*, 2004).

An ordinary category has objects and morphisms. A **2-category** generalizes this by also including 2-morphisms between the 1-morphisms. Continuing this up to *n*-morphisms between (*n*-1)-morphisms gives an *n*-category.

In many fields of mathematics, morphism refers to a *structure-preserving mapping* from one **mathematical structure** to another. The notion of morphism recurs in much of contemporary mathematics. In **set theory**, morphisms are **functions**; in **linear algebra**, **linear transformations**; in **group theory**, **group homomorphisms**; in **topology**, **continuous functions**, and so on.

In **category theory**, *morphism* is a broadly similar idea, but somewhat more abstract: the mathematical objects involved need not be sets, and the relationship between them may be something more general than a map.

The study of morphisms and of the structures (called **objects**) over which they are defined, is central to category theory. Much of the terminology of morphisms, as well as the intuition underlying them, comes from **concrete categories**, where the *objects* are simply *sets with some additional structure*, and *morphisms* are *structure-preserving functions*. In category theory, morphisms are sometimes also called arrows.

In category theory, an **epimorphism** (also called an "epic morphism" or, colloquially, an "epi") is a morphism with particular constraints. Epimorphism has been used as shorthand for a **surjective function** (in contrast to an **injective function**). Strong or regular epimorphisms behave much more closely to surjections than ordinary epimorphisms. As indicated in the *Wikipedia* profile: "They can be very mysterious and have unexpected behaviour".

It remains to be explored whether, understood as "functions", there are morphisms which can be understood as dynamic vehicles for intelligent identity in some way. Might this relate in some unexplored way to the investigations of **René Thom** (*Structural Stability and Morphogenesis*, 1972) and especially its extension into semiotic processes (*Semio Physics: A Sketch*, 1990), as partially described by **David Aubin** (*Forms of Explanations in the Catastrophe Theory of René Thom: Topology, Morphogenesis, and Structuralism*, 2004, pp. 95-130)?

Of related interest is the mathematical work on **q-analysis** of Ron Atkin (*Multidimensional Man; can man live in 3-dimensional space?* 1981) as separately discussed (*Social organization determined by incommunicability of insights*, 1995). This is valuable precisely because it focuses on the challenges to comprehension.

## Implications of category theory for social networking and interrelationships

Any exploration of category theory suggests that it has a remarkable range of implications for reframing problematic interdisciplinary, interfaith, international and intercultural relationships -- together with those characteristic of relations between political ideologies. More remarkable is the lack of exploration of such implications, except possibly in the design of web search engine algorithms -- which few are expected to understand, especially when they are proprietary.

A major constraint is the relative incomprehensibility of the abstractions which might otherwise prove fruitful -- as remarkably clarified by Atkin (1981). This has also proven to be the case with far simpler maps of relationships between nodes in any social network or **concept map** -- or variants (**mind map**, **semantic network**, **sociogram**, **topic map**). This is curious given that these can be readily generated from available data using techniques which have long been basic to **social network analysis** (*Complementary Knowledge Analysis / Mapping Process*, 2006). Very limited use is made of such maps of the social or conceptual complexity within which people are embedded. In contrast to ability with regard to geographical (road) maps, a much higher proportion of the population is effectively "map-averse" or "map dyslexic".

With the explosion of **social networking**, the avoidance of any representational map continues to be evident -- despite the direct experiential sense of being embedded in a dynamic, to whatever degree any pattern is sensed and its pathways travelled. Whilst remarkable, the capacity of category theory to offer a formalization of higher dimensional relationships (which may characterize those relationships) makes an important point through its incomprehensibility in practice.

The practice of social networking, and its popularity, suggests that people are heavily invested in an experiential process -- through what might be understood as "tunnels of connectivity" experienced subjectively. Ironically the objective formalization offered by category theory is "alienating" because it is unable to carry such experience for "social networkers".

It is in this sense that "epiterrestrials" may be effectively invisible and inherently "alien" -- through their ability to dwell within such dynamics as being experientially meaningful vehicles of identity. The formalization capacity of mathematicians can be similarly

understood as being unrelated to the experiential dynamics by which identity might be carried -- especially since subjective "experience" is deprecated as essentially meaningless from that perspective. (*Dynamics of Symmetry Group Theorizing: comprehension of psycho-social implication*, 2008). This is despite a degree of interest in the "experience" of mathematics (Philip J. Davis and Reuben Hersh, *The Mathematical Experience*, 1999)

The argument can be taken further through the potential future implications of Twitter, as discussed separately (*Re-Emergence of the Language of the Birds through Twitter? Harmonising the configuration of pattern-breaking interjections and expletives*, 2010). Of particular significance is the detection of higher order thematic and organizational patterns through category theory, potentially to be offered as additional services to social networking facilities (*Polyhedral Empowerment of Networks through Symmetry: psycho-social implications for organization and global governance*, 2008; *Interweaving Thematic Threads and Learning Pathways: noonautics, magic carpets and wizdomes*, 2010).

## Dynamic insensitivity of the natural sciences

Is it possible that, through the focus on well-bounded categories, that the sciences are relatively insensitive to relational dynamics -- whether between those categories or otherwise?

**Collections:** Concrete illustrations are provided by the manner in which categories are exemplified through the specimens collected and displayed in museums, zoos and botanical gardens:

- insects pinned and labelled in trays of related species (notably butterflies, beetles, etc)
- plant flowers and leaves illustrated or "pressed" in books of related species
- animal species in cages (perhaps arrayed in "houses" with related species) in zoos
- gemstones and other mineral specimens displayed and labelled in trays
- masks, tools and ritual regalia of indigenous tribes arrayed in "rooms"
- displays of animals, "mounted" or otherwise preserved (even including human bones)
- collections of star photographs in star catalogues.

**Missing dynamics:** Such collections may be supplemented by textual descriptions of dynamics. The displays may be augmented by illustrations indicating some relationships. Missing, however, is any focus on the dynamics characteristic of any one species:

- characteristic movements of an individual (gait, etc)
- movement of one individual in relation to another of the same species (courtship rituals, rivalry, etc)
- movement of one species as predator or prey in relation to another
- collective movement of individuals of the same species (bird flocking, fish shoals, mammalian herds, migration, etc)
- characteristic sounds (animal calls, bird song, etc)

There may indeed be video (or audio) displays available with regard to some of these dynamics for some species. Missing however is any preoccupation with the dynamics within which each species is embedded -- perhaps understood as a "dynamicscape" or a [soundscape](#).

**Modelling:** Presumably such movement lends itself to mathematical modelling of some kind -- as is suggested by recent videos simulating the movement of prehistoric animals, or a degree of modelling of [bird flocking](#). There would however seem to be no effort to explore mathematically the complete range of movements -- exemplifying an extensive spectrum of functions. Dynamics are typically inferred, if at all.

The argument can be more provocatively illustrated by the apparent lack of mathematical modelling of human dynamics -- movements of portions of the body -- specifically to elicit insight into those "functions" characteristic of visual attraction, as separately discussed (*Reframing the Dynamics of Engaging with Otherness: triadic correspondences between Topology, Kama Sutra and I Ching*, 2011)

**Ecosystem dynamics:** A form of "conceptual gerrymandering" is further exemplified by the manner in which biology searches for species unknown to science, thereafter named and preserved in isolation from the ecosystemic dynamics within which they were embedded when alive. A similar process is evident in the case of anthropology where artefacts are sought, even if graves held sacred must be robbed. The challenge of recording and engaging with ritual dynamics is evident, however much use is made of appropriate equipment. The meaning held by that ritual for the peoples in question is essentially elusive. This omission contrasts with ambitious efforts to mine social networking data in order to develop global simulations ([FuturICT Living Earth Platform](#); [Synthetic Environment for Analysis and Simulations](#), [Sentient World Simulation](#)).

**Property ownership:** The issue is even more dramatically illustrated by the wide variation in the sense of "territory" and "property", and of how it is believed to be "owned" and "defended" -- "legitimately". Examples include:

- the original "sale" of [Manhattan by American Indians](#) for a collection of trinkets
- the inference that [Aborigines did not "own" land in Australia](#) or consider it their "property" (according to the controversial western legal principle of *terra nullius*)
- the acquisitive preoccupation of museums in building their collections, and the ownership claimed for its constituents (most controversially including bones acquired from graves of indigenous tribes, ritual objects, or artefacts acquired through plunder, like the [Parthenon Marbles](#))
- intense preoccupation with intellectual property by which categories or their descriptions may be defined (*Einstein's Implicit Theory of Relativity - of Cognitive Property? Unexamined influence of patenting procedures*, 2007)
- the challenge to conventional boundaries, as notably enshrined in concrete, is evident in the degree to which they are now covered with [graffiti](#)

Especially interesting is the competitive process of "naming" -- notably with respect to theories, species, stars, or topological features (irrespective of their prior designations in other languages). This recalls the process of psychosocial appropriation of a space at the collective level described by the process of *land nam*, coined by [Ananda Coomaraswamy](#) (*The Rg Veda as Land-Nama Book*, 1935), to refer to the Icelandic tradition of claiming ownership of uninhabited spaces through weaving together a metaphor of geography of place into a unique mythic story. This territorial appropriation process, notably practiced by the Navaho and the Vedic Aryans, was further described by [Joseph Campbell](#) (*The Inner Reaches of Outer Space: metaphor as myth and religion*, 2002), as discussed separately (*Identity, Possessive World-making and their Transformation Dynamics*, 2012)

The "translation" of such processes into rights regarding the property so distinguished severely inhibits consideration of relevant dynamics between what is possessively distinguished in this way -- as is only too evident in the case of emerging conflicts with regard to water rights. The cognitive implications are potentially of greater concern.

There is of course the curious possibility that "epiterrestrials" may have their own understanding of "property" and may indeed frame the whole of Terra through some analogue to *terra nullius* -- with humans perceived as having failed appropriately to register title of "ownership", as was declared to be the case in Australia. Sensitive epiterrestrials may well be guided by human sensitivities in the matter, as speculatively explored (*Writing Guidelines for Future Occupation of Earth by Extraterrestrials: Be done by as you did ?* 2010).

"**Cognitive taxidermy**": Provocatively it might be asked whether the constituents of the body of knowledge, variously assembled, are effectively "mounted" in a manner curiously reminiscent of the mounting of specimens in a museum. "Cognitive taxidermy" implicit in taxonomy? There is little sense of the dynamic relationships between concepts, or interest therein -- thereby underpinning and reinforcing the difficulties of interdisciplinary, international and interfaith relationships.

It is from such a perspective that the claimed willingness of a spectrum of religious adherents to "welcome" extraterrestrials should be considered with the greatest of caution ([Ted Peters](#) and Julie Froehlig, *The Peters ETI Religious Crisis Survey*, 2008; [Jeff Levin](#), *Revisiting the Alexander UFO Religious Crisis Survey (AUFORCS): Is There Really a Crisis? Journal of Scientific Exploration*, 2012). The ongoing bloody strife between religions (Christianity/Islam, Judaism/Islam) and within them (Catholic/Evangelical, Shia/Sunni), and the long-term inability of the Abrahamic religions to address such issues with any efficacy, all suggest that the optimistic survey results hide fundamental dogmatic realities likely to render problematic any relationship with extraterrestrials -- especially if they advocate some other mode of belief, or a divinity named Otherwise.

With respect to engaging with "epiterrestrials". it would seem that neither the sciences nor the religions -- whether separately or in collaboration -- have addressed the issues which fragment their disciplines, as separately argued (*Knowledge Processes Neglected by Science: insights from the crisis of science and belief*, 2012; *Mathematical Theology: Future Science of Confidence in Belief*, 2011).

## Phenomenological implications of "fundierung" for "epi-thinking"

A current collective initiative named [Epi-Thinking](#) ("restoring sagacity to common sense") is clearly a focus for arguments of relevance to that explored here. The organization of the website is indicative of this:

- [The Idea: our way of thinking often does not match our world](#)
- [The Problem: the world is often complex and context dependent](#)
- [Cognitive Phenomenology: the core of Epi-Thinking](#)
- [Science I: a method for the simple and complicated](#)
- [Science II: a method for the complex and context dependent](#)
- [Implications of Epi-Thinking](#)
- [What is Next: applying Epi-Thinking](#)
- [Key Concepts and Vocabulary](#) (notably *Fundierung*)
- [Reference works](#) (Books which influenced Epi-Thinking; Journal Articles and Web Sites which influenced Epi-Thinking)

**Husserl:** With respect to *Fundierung*, as a core concept of "Epi-Thinking", this is usefully introduced there by [Gian-Carlo Rota](#) (*Fundierung as a Logical Concept, The Monist*, 72, 1989):

Husserl's Third *Logical Investigation*, ostensibly dealing with the phenomenology of whole and parts, is actually meant to introduce the notion of *Fundierung*. This term is frequently used in the phenomenological literature, although little has been written about *Fundierung* itself since Husserl introduced it... Our purpose will be to give a phenomenological description of *Fundierung*, which follows Husserl's original intention, but which uses illustrative examples taken from the works of Wittgenstein. Ryle, and Austin, as well as from Husserl...

Accordingly, we avow from the start that we are motivated, as Husserl was, by the hope that the concept of *Fundierung* will one day enrich formal logic, on a par with connectives like implication and negation. That is, in *Fundierung* one finds a necessary connection which can unconditionally serve as a basis for valid inferences and necessary truths. However, we know now, what Husserl was not aware of, that *Fundierung* is not just one more trick to be added to the techniques of mathematical logic. Quite the contrary. It is likely that *Fundierung* may eventually alter the structure of logic more radically than anything Husserl might have envisaged or wished...

Actually, our task is more difficult than that of the logician. We intend to present a philosophical concept that, unlike a mathematical notion, cannot at present be formalized; nor can we hope to give it any kind of definition, since standards of acceptable definition are missing in philosophy. (p. 70)

Another commentary on Husserl's notion is offered by [Fabrice Correia](#) (*Husserl on Foundation, Dialectica*, 2004). For Correia, Husserl draws an important distinction between two kinds of parts: the dependent parts like the redness of a visual datum or the squareness of a given picture, and the independent parts like the head of a horse or a brick in a wall. On his view, the distinction is to be understood in terms of a more fundamental notion, the notion of "foundation" on which his paper focuses, comparing his understanding with that of [Peter Simons](#) (*The Formalization of Husserl's Theory of Wholes and Parts*, 1982) and of K. Fine (*Part-Whole*, 1995).

**Merleau-Ponty:** From a phenomenological perspective, another clarification of *Fundierung* is presented by J. R. Osborn (*Phenomenological Fundierung: Maurice Merleau-Ponty's Phenomenology of Perception and the New Cogito*. ZAZIL 2, 2006, 9):

We move within a world of language and objects, a world to which our experience inevitably belongs. The space of words and the space of things form a seamless fabric in which bodily action, perception, and expression are situated. At one level, this claim appears immediately graspable, almost obvious. How can I experience the world otherwise? At the level of experience, time, space, and language form a common ground through which the body navigates the world. But, if this is so, why is the claim so difficult to understand conceptually?

Merleau-Ponty answers that "*We have become accustomed, through the influence of the Cartesian tradition, to disengage from the object: . . . we have the transparency of an object with no recesses, the transparency of a subject which is nothing but what it thinks it is*" (p. 230). The tradition of separating objects from subjects offers a mode of understanding the world, of classifying the world, of translating the world into a categorical system. But this translation is not how we experience the world. Rather, experience unfolds as an immediate synthesis of perception and expression performed by the body being in-the-world.

**New Cogito:** Osborn's commentary provides a context for citation of Merleau-Ponty's three suggestions for the *New Cogito*:

First suggestion: *It is indeed true, as has been said, that to know is to know that one knows, not because this second order of knowing guarantees knowledge itself but the reverse... that is, there are acts in which I collect myself together in order to surpass myself. The cogito is the recognition of this fundamental fact... it is not the 'I am' which is pre-eminently contained in the 'I think,' not my existence which is brought down to the consciousness which I have of it, but conversely, the 'I think,' which is re-integrated into the transcending process of the "I am," and consciousness into existence.* (p. 446).

Second suggestion: *The relation of reason to fact, or eternity to time, like that of reflection to the unreflective, of thought to language or of thought to perception is this two-way relationship that phenomenology has called Fundierung: the founding term, or originator. . . is primary in the sense that the originated is presented as a determinant or explicit form of the originator, which prevents the latter from reabsorbing the former, and yet the originator is not primary in the empiricist sense and the originated is not simply derived from it, since it is through the originated that the originator is made manifest.* (p. 458).

Third suggestion: *The primary truth is indeed 'I think' but only provided that we understand thereby 'I belong to myself' while belonging to the world.* (p. 474).

**Context dependency:** The "Epi-Thinking" site provides further comment on *Fundierung* (partially replicated and illustrated in its related website for a conference on *Modes of Explanation*, 2013):

*Fundierung* is the ultimate expression of context dependence. As Rota put it:

All whats "are" by the grace of some *Fundierung* relation whose context-dependence cannot be shoved under the rug. Viewing, in manifold modes, is a function; seeing is the facticity that founds viewing... Western philosophy since the Greeks has been haunted by a reductionist anxiety, steadfastly refusing to draw the consequences of taking *Fundierung* seriously. The history of Western philosophy is riddled with attempts, some of them extremely clever, to reduce *Fundierung* relations to "something else" that will satisfy our cravings for certification of existence. We find it inadmissible that "unreal" functions should turn out to matter, rather than "real" objects or neurons in people's brains.

*Fundierung* is the invisibility we afford the pen as the instrument when we are focused on accomplishing the writing. We look past the "foundation" (*fundierung*) which affords the very activity we seek to accomplish. The danger lies in our reaction at those times when we are forced to overcome the *fundierung* relation and look explicitly at the medium of which we are making use (as when the pen runs out of ink)....

Tools are further striking examples of *Fundierung* relations. Pencil, paper, and ink are tools I use in writing. They are normally taken as material objects. But this is a mistake, one of many we are forced to make in our everyday dealings. Pen, paper, and ink are functions in *Fundierung* relations. The pen with which I write I ordinarily take to be a material object. Strictly speaking, the pen is neither material nor object: it is a function that lets me write... (Gian-Carlo Rota: (*Fundierung as a Logical Concept*, *The Monist*, 72, 1989, 1, pp. 70-77)

For our purposes, the *fundierung* relationship which is often denied is that of synecdoche. **If one is making use of label or category, it can be helpful to ask if the fundierung of that relation matters.** Often the mere raising the *fundierung* question is sufficient to shift the focus from the [Science I world of facticities](#) to the [Science II world of functions](#). [*emphasis added*]

**Primary relation:** A valuable clarification of Husserl's understanding of *Fundierung*, as a consequence of Heidegger's criticism, is provided by Sara Heinämaa (*Varieties of Presence: Heidegger and Husserl's accounts of the useful ad the valuable, Parrhesia*, 2011)

The other mistake is to understand Husserl's idea of founding (*fundieren, Fundierung*) on the basis of the model of building or construction. This concept was originally introduced and defined by Husserl in the theory of parts and wholes developed in *Logical Investigations* [1901]. In *Ideas* [1913], Husserl uses the concept of founding to describe the multiple dependency-relations between simpler acts and their components within complex intentional experiences. It is important to be clear about this concept and to keep it separate from the idea of grounding which suggests the false notion of a stable material formation with a spiritual clothing.

Further clarification is offered, in response to criticism of Husserl's approach, by Sonja Rinofner-Kreidl (*Husserl's Fundierungsmodell als Grundfrage einer intentionalen Wertungsanalyse, Metodo: International Studies in Phenomenology and Philosophy*, 2013):

Having reconstructed and specified the difficulties at issue as a referential dilemma (allegedly) inherent in evaluative acts, we then show that this dilemma dissolves if the analysis of these acts adheres to the two-stage constitution of value objects. In this respect, the peculiar presence of values at the primary (non-reflective) level can be characterized as an indirect or adverbial reference to values.

As argued by Rota (1997)

*Fundierung* is a primitive relation, one that can in no way be reduced to simpler (let alone to any "material") relations. It is the primitive logical notion that has to be admitted and understood before any experimental work on perception is undertaken. Confusing function with facticity in a *Fundierung* relation is a case of reduction. Reduction is the most common and devastating error of reasoning in our time (p. 176)

As the most "primitive relation", there is a case for comparing its nature to that of the better known *yin-yang* relation of Chinese culture, usefully clarified by A. C. Graham (*Yin-Yang and the Nature of Correlative Thinking*, 1986). Xavier Sallantin (*L'épistémologie de l'arithmétique*, 1976) offers a related insight in terms of an *a priori* relational prerequisite to establishing agreement (as by a referee tossing a coin for captains before a football match) when, depending on culture, "yes" may be denoted by a "nod" or a "shake" of the head. The ambiguity is also recognized in the distinction between perceiving a glass as being "half-full" rather than "half-empty".

Also of relevance is a contribution to a *Conference on After Postmodernism* (University of Chicago, 1997) by Steven M. Rosen (*Three specific issues for the conference*, 1997). He notes:

Coming after postmodernism is our conference theme. Granting that *what* we say will focus on this question, does *how we say it*, and how we are with each other when we say it, also have a bearing? Is the way we comport ourselves in the conference relevant to the central issue of the conference? ... In sharing our reflections, would it not help if we could speak to one another from the prereflective body, and listen to each other in the same manner? I must admit that I have never encountered such speaking and listening in any conference I have ever attended. My conference experiences have had a decidedly modernist flavor. People establish their positions and hold to them. People are "pragmatic", primarily concerned with the end-products of their reflections, incognizant of the prereflective process underlying them. People are given to high-flying abstractions about the future and the past, are oblivious to the present situation in which their bodies are grounded.

The fundamental primary relation can also be related to metaphorical references to any form of foundational stone or rock. The use by Atkin (1981) of "holes" or "objects" in social geometry, effectively invisible to the communication flowing around them, could be understood as such (cf. *Social organization determined by incommunicability of insights*). The so-called *Philosopher's Stone* offers another example -- as might references to *St. Peter as the "rock"* on which was built the Christian Church. Other faiths have their own "rocks" (*Enstoning in Memorials and Monuments*, 2012).

Rota's insights are of particular value because of his interest in both mathematics and philosophy and of the challenge they posed to each other, exemplified by two controversial papers (*The Phenomenology of Mathematical Beauty, Synthese*, 1997; *The Pernicious Influence of Mathematics upon Philosophy, Synthese*, 1991). Given the arguments above regarding the relevance of the epimorphisms of category theory, it might be asked what further insights could be drawn from what has been termed *Rota's conjecture*.

## Clues to the nature of "epiterrestrials" from usage of the "epi" prefix?

The prefix **epi-**, or **ep-** (if followed by a vowel, as with **epo**, or the letter "h"), is derived from a Greek preposition meaning: *above, on, over, nearby, upon, outer, besides, in addition to, among, attached to, or toward*. (cf. Sanskrit **api**: *also, besides*; Avestan **aipi**: *also, to, toward*; Armenian **ev**: *also, and*; Latin **ob**: *toward, against, in the way of*). Before unaspirated vowels, reduced to **ep-**; before aspirated vowels, **eph-**. Extensively used in modern scientific compounds (e.g. epicenter).

The website [More Words](#) provides a *List all words starting with epi* -- some 328 (including grammatical and spelling variants). This offers access to a sorted version: *The most frequently occurring words starting with epi* of which some 30 are indicated as occurring more than once per million words of average text. That original list has been reduced to eliminate grammatical variants and clustered as follows. Other words located in web searches have been added. "EPI" is also used as an institutional or methodological acronym (as

noted below), leading to related compound terms (epi+problem). Some may be proprietary (as creatively used by bloggers).

clusters		epi-terms
conceptual (philosophy)	knowledge	<a href="#">epignosis</a> <a href="#">epimathematics</a> <b>epistemology</b> <a href="#">episystem</a> <a href="#">epi-thinking</a> <a href="#">epirelational</a> <a href="#">epimimetics</a> ***
	?	<a href="#">epidimension</a> <a href="#">epi-faith</a> <a href="#">epiknowledge</a> <a href="#">epimemetics</a> <a href="#">epimental</a> <a href="#">epimorphism</a> <a href="#">epiphenomenalism</a> <a href="#">epiphilosophy</a>
	proprietary compounds	<a href="#">epicomplex</a> <a href="#">epiconcept</a> <a href="#">epiconsciousness</a> <a href="#">epilogic</a> <a href="#">epimaths</a> <a href="#">epiproblem</a> <a href="#">epipsychology</a> <a href="#">epireligion</a> <a href="#">episciences</a> <a href="#">epivalue</a> etc etc
social	arts	<a href="#">epicedium</a> <a href="#">epicene</a> <a href="#">epigram</a> <a href="#">epigraph</a> <b>epilogue</b> <a href="#">epiphany</a> <b>epistle</b> <a href="#">epistrophe</a> <b>epitaph</b> <a href="#">epitasis</a> <a href="#">epithesis</a> <b>epithet</b> <b>epitome</b> <a href="#">epiverse</a> <a href="#">epode</a> <a href="#">eponym</a>
	social	<a href="#">epicure</a> <a href="#">epidynamic</a> <a href="#">epigon</a> <b>episcopacy</b>
form	time	<b>epic</b> <a href="#">epiphenomenon</a> <b>episode</b> <a href="#">epoch</a>
	geometry	<a href="#">epicenter</a> <a href="#">epicontinental</a> <b>epicycle</b> <a href="#">epifocal</a>
	material	<a href="#">epidote</a> <b>epigenesis</b> <a href="#">epilimnion</a> <a href="#">epimer</a> <a href="#">epinaoi</a> <a href="#">epipelagic</a> <a href="#">episcope</a> <a href="#">epistyle</a> <a href="#">epitaxy</a>
biology	biology	<b>epigenesis</b> <a href="#">episome</a> <a href="#">epistasis</a> <a href="#">epitope</a>
	botany	<a href="#">epicalyx</a> <a href="#">epicotyl</a> <a href="#">epidendrum</a> <a href="#">epigeous</a> <a href="#">epinasty</a> <a href="#">epiterrestrial</a> <a href="#">epiphyte</a> <a href="#">episcia</a>
	medicine	<b>epidemic</b> <b>epidemiology</b> <a href="#">epidural</a> <a href="#">epilation</a> <b>epilepsy</b> <a href="#">epiotomy</a> <a href="#">epistaxis</a>
	zoology	<a href="#">epiblast</a> <a href="#">epiboly</a> <a href="#">epicardium</a> <a href="#">epicarp</a> <a href="#">epicritic</a> <a href="#">epicuticle</a> <b>epidermis</b> <a href="#">epididymis</a> <a href="#">epifauna</a> <a href="#">epigastric</a> <a href="#">epiglottis</a> <a href="#">epigonatis</a> <a href="#">epigyny</a> <a href="#">epimylis</a> <a href="#">epimysium</a> <a href="#">epinotion</a> <a href="#">epinephrin</a> <a href="#">epineucos</a> <a href="#">epineurium</a> <a href="#">epiphragm</a> <a href="#">epiphysis</a> <a href="#">epiplex</a> <a href="#">epilokele</a> <a href="#">epiplus</a> <a href="#">epistome</a> <b>epithelium</b> <a href="#">epizoon</a>

The question is how "epi" indicates, to whatever degree, another sense or modality of organization which some infer -- to be contrasted with others more commonly used (as discussed below). Of some potential interest is therefore the use of "EPI" to make valued distinctions through proprietary naming (as noted above), as well as its use as the acronym of certain initiatives:

- [Earth Policy Institute \(EPI\)](#)
- [Economic Policy Institute \(EPI\)](#)
- [European Partnership for Independence \(EPI\)](#)
- [Educational Policy Institute \(EPI\)](#)
- [European Pollinator Initiative \(EPI\)](#)
- [EPI Global](#): an organization promoting the practice of inclusive emergency management to the benefit of all people.
- [Episciences-Maths](#): a project hosted by the CCSD (Centre pour la Communication Scientifique Directe), supervised by an "Epicommittee" composed of leading mathematicians, in order to stimulate the constitution of editorial boards willing to create new "epijournals" (technical platform of peer-reviewing) in areas not yet covered. These open access electronic journals will take their contents from preprints deposited in open archives such as arXiv or HAL.

Of similar potential interest is the use made of "epi" in certain indicators and measures:

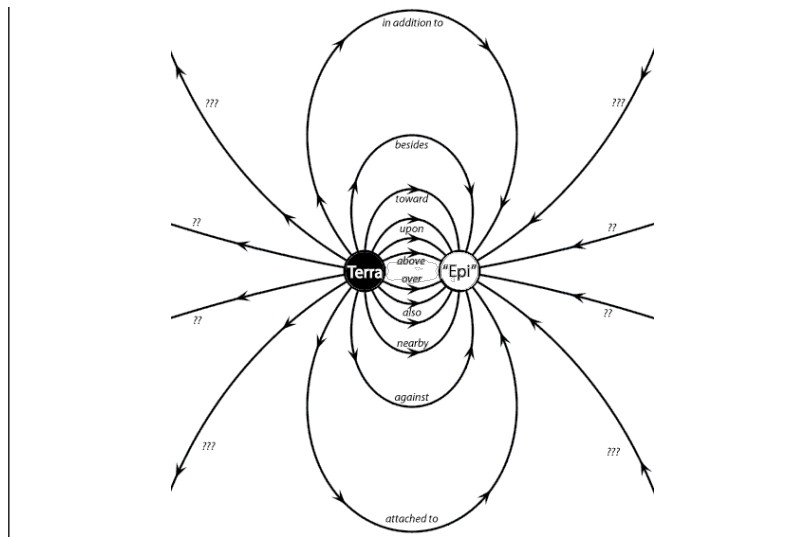
- [Entropy Power Inequality \(EPI\)](#)
- [Ethical Positioning Index \(EPI\)](#)
- [European Participation Index \(EPI\)?](#)
- [Environmental Performance Index \(EPI\)](#)

Of particular relevance to this argument is [Extreme Physical Information \(EPI\)](#), a concept in a theory of physics based on information. It is a principle that states that the precipitation of scientific laws can be derived through [Fisher information](#), taking the form of [differential equations](#) and [probability distribution functions](#). EPI can then be seen as an extension of [information theory](#) that encompasses much theoretical physics and chemistry (eg, [Schrödinger wave equation](#), [Maxwell-Boltzmann distribution law](#)). It can be used to derive a number of fundamental laws of physics, biology, chemistry and economics. EPI has also be seen as a game against nature. It is consistent with the recognition by physicist [John Archibald Wheeler](#) that:

All things physical are information-theoretic in origin and this is a participatory universe...  
Observer participancy gives rise to information; and information gives rise to physics.

\*\*\*

Suggestive indication of connotations between a "terrestrial" and an "epi" focus



## Comparison of "epi" with other potentially indicative prefixes

This approach was originally framed by the review of the distinctions between inter-, cross-, multi-, pluri-, and meta- with respect to disciplinarity in terms of the organization and relationship of fields of knowledge by [Erich Jantsch](#) (*Towards Interdisciplinarity and Transdisciplinarity*, 1972). To the extent that the set reflects degrees of sensitivity to patterns of organization, this was discussed separately with respect to the constraints on the preservation of such distinctions in the process of translation into different languages (*Conceptual Gaps And Confused Distinctions: possible ambiguities in the translation of interrelated concepts between sectors, jargons or languages*, 1974).

Before exploring other relevant indications suggested by use of "epi", the following table offers some other pointers (more or less fruitful) to the nature of possible "epiterrestrial" life, identity and intelligence -- in the light of other prefixes.

Prefixes	Selected themes (parenthesis indicate proprietary or unfruitful use)				
	terrestrial	dimension(al)	thesis	disciplinary	memetic
<b>extra-</b>	extraterrestrial	extradimensional	(extrathesis)	extradisciplinary	extramemetic
<b>epi-</b>	epiterrestrial	epidimensional	epithesis	(epidisciplinary)	epimemetic
<b>hyper-</b>	(hyperterrestrial)	<a href="#">hyperdimensional</a>	(epidimensional)	(hyperdisciplinary)	(hypermemetic)
<b>hypo-</b>	hypoterrestrial	(hypodimensional)	hypothesis	(hypodisciplinary)	(hypomemetic)
<b>trans-</b>	(transterrestrial)	<a href="#">transdimensional</a>	(transthesis)	<a href="#">transdisciplinary</a>	transmemetic
<b>super-</b>	superterrestrial	(superdimensional)	(superthesis)	superdisciplinary	<a href="#">supermemetic</a>
<b>meta-</b>	(metaterrestrial)	metadimensional	<a href="#">metathesis</a>	metaconcept	metamemetic

Those which would seem to be of potentially greater relevance are:

- **epi-thinking**: as discussed above
- **episystemic**: as discussed below
- **transmemetic**: Edward W. Piotrowski and Jan Sladkowski (*Quantum Transmemetic Intelligence*, 2008), as discussed further below
- **epignosis** is extensively used in Bible studies as an indication of intimate, personal, experiential knowledge. For comparison of various understandings, see *Epignosis* (Wenstrom Bible Societies), *Knowledge, Gnosis and Epignosis. Philippians 4:9* (Robert R. McLaughlin Bible Ministries), Robert E. Picirelli (*The Meaning of "Epignosis"*, *The Evangelical Quarterly*, 1975), *The Work of Mastering Paul's Gospel: the role of epignosis* (Trinity Grace Fellowship, 1997). Many comparisons are made between gnosis and epignosis:
  - use of epi must be regarded as an intensive use of a preposition that gives the compound word a greater strength than the simple word alone possesses
  - epignosis is the complete comprehension after the first knowledge (gnosin) of a matter... a more exact viewing of an object
  - there is a tremendous difference between having gnosis (knowledge) and epignosis (wisdom): epignosis, metabolized doctrine, is absolutely essential to spiritual life and relationship with God.
- **epirelational** is introduced by Ferdinand D. Rivera (*Toward a Visually-Oriented School Mathematics Curriculum*, 2011, pp. 80-81, 84-85, 106):

Epirelational objects pertain to objects that are known through special relationships that are inferred among their parts. For example pi is an epirelational object whose approximate value could be visualized by physically measuring and calculating the ratio of the circumference and diameter of a circle

What does it mean to have a visual representation of a mathematical object, concept, or process? What visualization strategies support growth in mathematical thinking, reasoning, generalization, and knowledge? Is mathematical seeing culture-free? How can information drawn from studies in blind subjects help us understand the significance of a multimodal approach to learning mathematics? ... it draws on findings within and outside of mathematics education that

help practitioners and scholars gain a better understanding of what it means to pleasurablely experience the symmetric visual/symbolic reversal phenomenon that is, seeing the visual in the symbolic and the symbolic in the visual.'

- **hyperrelation**: notable with respect to "hyperconnectivity", as separately discussed (*Hyperaction through Hypercomprehension and Hyperdrive*, 2006); significant in the relation between a set of multiple hypotheses in artificial intelligence. A hypothesis space is then one in which a hypothesis is a hyperrelation, in effect a disjunction of conjunctions of disjunctions of attribute-value pairs (Hui Wanga, et al., *Hyperrelations in version space*, *International Journal of Approximate Reasoning*, 2004; Yuancheng Tu, *Hyper and Equal Relations*, 2003).
- **epimemetic**: following from the argument for a meme as the conceptual analogue to a gene, hence memetics, a case can be made for avoiding the trap of the genome mapping assumptions by exploring the possibility of epimemetics, as discussed separately (*Epimemetics, biomimetics, epimimetics and biomemetics*, 2010)
- **epimimetics** (a proposed neologism, discussed separately), understood as a form of mirroring (*Stepping into, or through, the Mirror: embodying alternative scenario patterns*, 2008). It is characteristic of the art of memory (mnemotechnics) and its supportive contexts (memory palaces and theatres) as documented by Frances A. Yates (*The Art of Memory*, 1966).
- **hyperdimensional**: as following from the arguments of fundamental physics, showing the necessity of from 10 to 26 dimensions. Science has occasionally speculated on a hyperdimensional perspective -- followed by authors of science fiction with respect to "extraterrestrials". There are many speculative texts with regard to the possibility that "extraterrestrials" are "hyperdimensional entities" or "epi-dimensional" (Andrea Hairston, *Mindscape: a novel*, 2006). Beyond such suppositions, there is (necessarily) little clarification of the nature of that existence.
- **metaterrestrial**: there are various published speculations regarding the possibility that "extraterrestrials" might be considered "metaterrestrial entities". As with "hyperdimensional", there is (necessarily) little clarification of the nature of that existence.
- **hypoterrestrial**: might be considered as indicative of a perspective "underlying" or "beneath" a conventional "terrestrial" worldview -- perhaps somewhat consistent with reference to the foundational implications of *Fundierung*.
- **transdisciplinary**: separately discussed (*Transdisciplinarity-3 as the Emergence of Patterned Experience*, 1993)

What insights and forms of intelligence might be associated with such indications? **Do they enable or engender modalities with which unconventional forms of identity can be associated?** Might an epimemetic perspective sustain forms of process philosophy and identity? Would some with unusual mathematical skills be able to "dwell" within hyperdimensional frameworks? How might this relate to what has been variously explored as "mathematical experience" (as noted above)?

## Potential insights from an "episystemic" perspective

Use of "episystem" would seem to have been variously explored in ways potentially relevant to this argument. The purpose in citing such usage below is to give a sense of the "flavour" of thinking projected into use of the term.

In viewing attention as the fundamental basis for culture, Maurice Merleau-Ponty is recognized as having noted an "epi-systemic shift" that privileges the activity of the knower who is "given more constitutive roles" (John C. O'Neal, *Changing Minds: the shifting perception of culture in eighteenth-century France*, 2002, p. 20).

**Development**: Use of "episystemic", as being relevant to development, has been noted by Elisabeth Molteberg and Cassandra Bergström (*Our Common Discourse: Diversity and Paradigms in Development Studies*, NORAGRIC Working paper, September 2000). Specifically they indicate the distinction made by R. Bawden (*Systems Thinking and Practice in Agriculture*, *Journal of Dairy Science*, 1991) between "ontosystemic" and "episystemic":

With the former term, Bawden refers to what he states is the most common approach to systems work. In this case, he says, ...analysis usually proceeds from the two questions. Which system is being investigated, e.g., what is the ecology of a particular dairy farm? What constitutes an improvement to its performance?

Here, it is the question that is being asked, the way the problem itself is central. It is perfectly possible within Bawden's ontosystemic approach to recognize that a problem needs to be addressed by a number of different disciplines, and then to separate the individual parts among a team along traditional disciplinary lines. This is an additive approach. Each individual works in parallel and is expected to contribute their distinct part. A joint conclusion may or may not be made. Bawden differentiates this from an episystemic approach where, he says,

'... the leading questions follow a different logic: in this messy and complex situation, which is somehow or another associated with dairying, what seem to be the issues that people perceive as problematic? How can systems of inquiry (systemic thinking and practices) be used to explore and eventually improve them?' ( p. 2367)

The emphasis has changed here from the system itself, to the way in which we go about understanding the system. The same can be said about integrative inter-disciplinarity. In our understanding of it, focus is altered away from the way we define the problem, towards the way we go about gaining an understanding of it -- towards the process of understanding. Checkland [1981] clarifies this distinction in differentiating between hard and soft systems.

The real distinction lies in the attribution of systemicity (having the property of system-like characteristics). Hard systems thinking assumes that the world is a set of systems (i.e. is systemic ) and that these can be systematically engineered to achieve objectives. In the soft tradition, the world is assumed to be problematic, but it is also assumed that

the process of inquiry into the problematic situations that make up the world can be organized as a system. In other words, assumed systemicity is shifted from taking the world to be systemic to taking the process of inquiry to be systemic.

Of relevance to this argument, Bawden (1991) introduces his discussion of the distinction he makes between "ontosystemic" and "epistemologic" as follows:

Reductionist science with its positivistic philosophical roots and experimental research practices has generally served agriculture well for around 150 yr. Technological innovations based on the propositions generated through this paradigm have played a profound role in the extraordinary productivity growth that has occurred in agriculture across the globe.

Yet with recognition of its success in this context is the realization of its inadequacies from broader perspectives. There is an increasing sense of unease about degradation of biophysical environments, distortions of socioeconomic environments, and dislocations of cultural environments too often associated with agricultural practices. There are calls for a new science and praxis of complexity to deal with these problematic relationships between agriculture and the environments in which it is conducted.

A study by [Christine D. Egger](#) (*Wholeness, Understanding, and Development: an epistemologic inquiry*, 2005) explores certain theoretical proposals of [David Bohm](#) and [F. David Peat](#), and searches for their reflection in international development theory and practice. As summarized:

Bohm proposes an undivided wholeness that underlies all apparently separate phenomena and from which reality, knowledge, and process are abstractions. Qualitative and epistemologic in design, data are gathered from multiple sources: participation in a week-long course given by Peat; Bohm's and Peat's writings on quantum theory, chaos theory, and philosophy; and literature in philosophy, anthropology, and economics. Similarities between Bohm's and Peat's proposals are found in Hans-Georg Gadamer's description of philosophical hermeneutics and in Amartya Sen's [1999] description of process as an indication of relevance. Findings will be of value to those interested in exploring an ethics of development that emphasizes a relationship between an underlying wholeness and the apparently separate phenomena with which developmentalists are involved.

Egger notes that Bawden draws from Peter Checkland (*Systems Thinking, Systems Practice*, 1981) in defining epistemologic inquiry as that which is concerned "not with an external reality but on people's perceptions of reality, on their mental processes rather than on the objects of those processes" (Checkland in Bawden, 1991, p. 2368). As Egger notes, this then frames the epistemologic nature of the exploration:

This epistemologic stance and its impact on Bohm and Peat's work, as well as on my own thinking, became key factors in this research project. Both scientists write that theories are "primarily a form of insight, i.e. a way of looking at the world, and not a form of knowledge of how the world is" (Bohm, 1980: 4). While Bohm and Peat do often present their ideas as "facts," they regularly make explicit mention of the metaphorical nature of their theories and proposals. Over time, I came to consider the real value of Bohm and Peat's work as indicators of a way of thinking, and I became less concerned with the occasional "dogmatic" style of their delivery.

**World views:** A relationship between epistemologies and world views is explored by [Max Urchs](#) (*Events of Epistemologies*, 2000, pp. 229-240):

Let us begin with the concept of an epistemology... The notion of epistemology is related to the idea of cognitive system. The most characteristic feature of epistemologies is that they "gain information" about the world. Every epistemology receives and memorizes information and draws inferences from information in its knowledge system by rules of an implemented logical system. The system obtains information from (the axioms of) its calculus and by denotation postulates (each of these sets may be empty). Furthermore, it (possibly) receives further information from the surrounding world...

Let us suppose that each epistemology possesses exactly one world-view... a person qua being a human individual does not constitute an epistemology, but qua being a scientist it still may be one. In general, human beings constitute a more or less harmonized conglomerate of several epistemologies... The assumption of a unique world-view enables us to identify epistemologies with their world-views.

A further simplifying assumption concerns the language of the system. The epistemology uses a language to draw inferences from data of its implemented knowledge basis and from the denotation postulates... Whatever appears in the world-view of an epistemology is per se true for that system, in other words: the empirical false does not exist. From the internal perspective of a single epistemology there can't be any difference between an object out there in the world and percept of it produced by the system.... The world of an epistemology is precisely what it perceives

**Deconstructive literary criticism:** In the light of the 1781 [massacre of captive Africans on the slave ship Zong](#), its implications are explored by [Ian Baucom](#) (*Specters of the Atlantic: finance capital, slavery, and the philosophy of history*, 2005) in terms of the perspective of [Gayatri Spivak](#) (*A Critique of Postcolonial Reason: towards a history of the vanishing present*, 1999). For Baucom:

Above all, for my concerns here, the *Zong* demands that we determine to regard it, in the full sense, as a truth event. That is the first decision. It is the second, however, that Spivak's work reminds us is so pressing and so vexed. For the question of deciding what sort of truth the *Zong* names remains unresolved and returns us, in Spivak's deconstructive terminology, to the problematics of the undecidable. Kant's way of framing and resolving this dilemma is to demand that we view such an event as something *non singularum, sed universorum*. Spivak offers a series of reformulations and suggests that the problem is one of deciding whether we should incline to a theoretical or a strategic (or strategematic) reading of such a truth event, of determining whether it speaks to the epistemic truth of a global, worldly situation, or whether it declines to speak in such a code, withholding itself from our critical recoding, maintaining a cryptic silence. Most everything I have said... inclines to the former set of choices, proceeds on the determination that the *Zong* speaks to and of a situated and epistemic set of catastrophic world truths, and assumes, in Benjamin's terms, that it is possible "to assemble large-scale constructions out of the smallest and most precisely cut components... to discover in the analysis of the small individual moment the crystal of the total event" (pp. 166-167)

**Closure to alternative perspectives:** The phrase "epistemic closure" has been used in [electoral commentary](#) in *The Washington Post* (3 March 2012). A [blogger](#) offers a further clarification in relation to shock at US election results in 2012, as follows:

The reason folks are reluctant to address it is because it doesn't comport to their ideological narrative; it's disconcerting information that clashes (blatantly) with a worldview that can perhaps be best described as epistemic closure... For me, one of the things I've noticed about some of the reactions to President Obama's re-election is that it's similar to reactions experienced by members of malignant cults once the truth is made all too clear. Shock, anger, denial, etc. You know; how could they be so wrong? How could they have come to believe what they did? That's why it's always good to look at multiple sources of information, even those you may disagree with. Confirmation bias is perhaps a normal human condition, but when such things lead to the aforementioned epistemic closure, false-consensus effect, and willful rejection of any ideas that might disrupt one's worldview, there's a problem. Remember; the first rule of any malignant cult is to isolate its adherents from any conflicting data or information that disagrees with the views projected by the cult itself. After awhile, the cult adherent does this mental trick by themselves, voluntary. [George Orwell](#) certainly noticed this in "1984" as *blackwhite*. The ability to not only accuse your political opponent of impudently saying that "black is white" contrary to logic, but to be able to convince oneself that "black is white" if the situation demands it.

#### Other usage:

- **Revolution:** A sense of "epistemic revolution" has been distinguished by Anoushiravan Ehteshami and Mahjoob Zweiri (*Iran's Foreign Policy: From Khatami to Ahmadinejad*, 2011):

...the quest for democratic freedom is a century old, and it strikes deep roots in Iran's history and culture. But the Iranian revolution has intensified this quest in an unprecedented way, for a variety of reasons. I suggest that the real engine of the demand for freedom, particularly among the 70 per cent of the population that is under the age of 30, is primarily driven by what I call "epistemic revolution". It means that there has been an unprecedented increase in the number of educated people and the people's discourse about religion, society, culture and politics has reached a new height. (p. 13)

- **Quantum entanglement:** A valuable understanding of system-epistemic entanglement is under exploration by Saurav Dwivedi (*Bimodal Quantum Theory*)
- **Community:** An understanding of "ecosystemic community" is the theme of a blog ([Ecosystemic Community and Our Future](#))
- **Epidemics:** A consortium [Episystem.net](#) (a joint initiative of University of Stirling, University of Glasgow, Heriot-Watt University, University of Sussex and University of York, together with CEFAS, HPS, IAH and VLA) is concerned with designing social ecosystems to control spread of epidemics. It defines "epistemic" as a complex system of interacting biological, environmental, economic and social factors affecting emergence and spread of infectious diseases
- **Semantic web:** A workshop has been organized by Fabien Gandon (*Semantic web, social web: typical graphs of epistemic networks*, Laboratoire d'Informatique de Nantes Atlantique, 2012) described as follows:

The web is becoming a domain where on the one hand there is friction between the social semantics of exchanges between users who exchange and on the other hand formal semantics of applications that interoperate on it. We will see how the formalisms of graphs of the semantic web can offer a space to integrate and manage social data particularly when considering the scenario of special interest communities are managed in the context of monitoring operations.

The disclosure in 2013 of the level of [invasive internet surveillance](#) by NSA/PRISM suggests that this system could be appropriately understood in epistemic terms. This follows from the argument of Max Urchs (*Events of Epistemics*, 2000, pp. 229-240), as cited above, namely that: *The most characteristic feature of epistemics is that they "gain information" about the world.*

Although "epistemic" is presented above as distinct from more frequent use of "epistemic", the NSA/PRISM initiative reinforces the valuable argument for vigilance made by Dan Sperber and colleagues (*Epistemic Vigilance*, *Mind and Language*, 2010). With respect to

"epistemic", Mircea Oancea (*Resolution and Consistency in Dialogical Reasoning*, 1999) describes the development of the approach of Peter Gardenfors (*Knowledge in Flux: modelling the dynamics of epistemic states*, 1988) in the domain of argumentation.

Given the problematic "success" of the Human Genome Project, it could be asked whether the NSA/PRISM initiative is effectively framed as a Human Memome Project -- with a failure to anticipate any consideration of epimemetics, and the comprehension of memetic analogues to "protein folding".

## Re-cognizing "supernatural": superstition as superposition?

**Fundamental assumptions:** The focus of this argument is on "intelligent life" as it might relate in some way be distinct from conventional "terrestrial" understanding. Perhaps appropriately, there remains considerable uncertainty as to what is to be meant by life, although there is a strong presumption that it is necessarily associated with organic molecules. The prevailing assumption is of a very particular understanding of "life", "intelligence" and "identity" which in all probability is unlikely to be upheld as sacrosanct by the future - or by many obliged to live in the present.

This assumption continues to be challenged, especially in the light of quantum insights expressed in formulations to which few can relate experientially (Derek Abbott, et al, *Quantum Aspects of Life*. 2008). The same could be said of "intelligence", notably in the light of one contribution to the latter compilation by Edward W. Piotrowski and Jan Sladkowski (*Quantum Transmemetic Intelligence*, 2008). The authors open with a quotation relevant to this argument from the "surrealist" Adolfo Bioy Casares (*The Invention of Morel*. 1940):

When all the senses are synchronized, the soul emerges...  
When Madeleine existed for the senses of sight, hearing, taste, smell, and touch,  
Madeleine herself was actually there.

The authors refer to Madeleine again in their conclusion:

*Morel*, brought to existence by Casares' vivid imagination, neglected the fact that Madeleine is a being of intelligence that is not representable by classically [computable functions](#). Does a quantum mathematics that, among others, investigates quantum-computable functions wait for its discovery? Will the paradoxes following from [Gödel and Chaitin theorems](#) survive? The specific character of [quantum models of consciousness](#) and thinking that consists in information barrier between conscious and unconscious activities (e.g computing) suggests a possibility for a complete understanding of the physical world. Would the dream of the Theory of Everything come true via a Quantum Metatheory of Everything. Quantum (artificial) sensors are already being used, mostly in physical laboratories. Humans have already overcome several natural limitations with the help of artificial tools. Would [quantum artificial intelligence](#)/life ever come to existence? Adherents of [artificial intelligence](#) should welcome a great number of new possibilities offered by quantum approach to AI.

Of interest in this respect is speculation regarding a hypothesized self-aware entity in the cosmos -- a [Boltzmann brain](#) -- arising due to random fluctuations out of a state of chaos (*Big Brain Theory: have cosmologists lost theirs?* *The New York Times*, 15 January 2008). This could be compared to speculations regarding the emergence of "global consciousness" from a "global brain". Recently announced approaches to artificial intelligence, as described by Douglas Heaven (*Not like us: Artificial minds we can't understand*, *New Scientist*, 10 August 2013), highlight the nature of a current shift in focus:

So have we worked out how to replicate human thinking? Far from it. Instead, the founding vision has taken a radically different form. AI is all around you .. We have built minds, but they are not like ours. Their reasoning is unfathomable to humans -- and the implications of this development are now attracting concern. As we come to rely more and more on this intelligence, we may need to change our own thinking to accommodate it... The AI we have ended up with is alien -- a form of intelligence we've never encountered before.

Especially interesting is the manner in which the previous requirement for "explainability" has been abandoned in order to achieve this breakthrough.

**Waveforms:** In a universe on whose nature physicists are encouraged to speculate, however fantastic may be those speculations to the ignorant, the fundamental nature of information is recognized as "informing" the tangible (as noted above). So framed it is a matter of speculation how Terra (as an instance of such "in-formation") should constrain the capacity of intelligent life to exist when the universe is held to be permeated by [waveforms](#) extending across spacetime from which such instances emerge and by which they are sustained for a time. This implies a degree of continuity and connectivity within which Terra is embedded -- rendering questionable any conventional notion of "extra-terrestrial".

There is clearly scope for reframing both life and intelligence in terms of wave forms, especially given the extensive research into the significance of wave forms for consciousness. How intelligent identity "rides" such waves, or embodies them, is a matter for the future - partially framed by speculation regarding the metaphysics of [quantum mysticism](#)". However it is already clear that artificial intelligence may be understood in these terms. Does the brain "have" brain waves, or do brain waves "have" a brain -- or is the matter inherently uncertain?

**Super-natural:** The argument has stressed the limitations of conventional modes of detection, and the disciplines of the natural sciences which rely on them. The case was made for recognizing the "experiential abundance" in which humans can participate variously to a

degree -- [Henryk Skolimowski](#) (*The Participatory Mind: a new theory of knowledge and of the universe*, 1994). A case was also made for recognizing the dynamics neglected by the conventional convenience of frozen categories and the challenge of engaging with them through the favoured modes of thinking -- in contrast to "unfreezing categories" (*Framing the Global Future by Ignoring Alternatives: unfreezing categories as a vital necessity*, 2009).

Irrespective of the arguments of religion, it is clear that through quantum insights a degree of credibility is being given by (some) humans to what is appropriately to be understood as "super-natural". It calls for a degree of imagination to dissociate from what has hitherto been hailed and privileged by science as "natural". Individuals are being encouraged to believe in this super-natural reframing as being of the greatest credibility -- however it may be refined by the future.

**Superposition vs. Superstition:** It is curious that this reframing calls upon the notion of [quantum superposition](#). This holds that a physical system -- notably an electron -- exists partly in all its particular theoretically possible states simultaneously. When measured or observed, however, it gives a result corresponding to only one of the possible configurations. An associated notion, equally "fantastic", is that of [quantum entanglement](#).

Curiously "superposition" is comparable with another term which could also be understood as privileging one sense of "place" over another, namely "superstition" -- a memetic form of superimposition. The cognitive process can be understood in terms of synonyms: overlay, mask, obscure, veil, conceal. Most curious is the manner in which another synonym, "occult" (a verb in astronomy, associated with [occultation](#)) also denotes the esoteric.

Although derived from the Latin verb *super-stare* (to stand over, stand upon, survive), superstition is the pejorative term for belief in [supernatural causality](#), namely that one event leads to the cause of another without any natural process linking the two events -- in contradiction with natural science. It could of course be asked how this understanding of causality is related to that of quantum mechanics and quantum entanglement -- and why the ignorant should find one or the other more credible.

**Betwixt and Between:** The argument here is that individuals are now called upon to live between various "worlds", of varying credibility according to the "concrete proof" available to them:

- local vs global (to the extent that it can be meaningfully understood)
- specialized knowledge and the integration of a variety of skill sets (to the extent that the integration is recognized as coherent)
- the tangible "nature" with which the natural sciences have been preoccupied and the "super-natural" now proposed as more appropriate
- the reality advocated by secular atheists and the "super-natural" variously advocated by religions (in only too evident conflict)
- the world of modernity and traditional folk-culture wisdom (with its associated superstitions)

Given the quarrelsome dynamics these imply, individuals are effectively obliged to dwell within the dynamics between these various extremes, as argued separately (*Living as an Imaginal Bridge between Worlds: global implications of "betwixt and between" and liminality*, 2011).

**Uncertainty and irrationality:** The claims for "rationality" are increasingly incredible in a global civilization in which the possibility of rational decision-making increasingly acquires the status of a myth, despite the urgency of many crises, as presented through rational argument (*Ungovernability of Sustainable Global Democracy?* 2011). "Irrationality" is now recognized as a powerful driving factor in the destabilizing dynamics of financial speculation.

Somewhat reminiscent of the [Uncertainty Principle](#) basic to quantum mechanics, the mode of existence on which many must now rely is characterized by uncertainty and partial comprehension (*Living with Incomprehension and Uncertainty*, 2012; *Towards the Dynamic Art of Partial Comprehension*, 2012; *Being Neither a-Waving Nor a-Parting: considering both science and spirituality*, 2013).

**Superposition via Superstition?** Given the extent to which people feel obliged to fall back upon irrationality, folk wisdom, and its superstitions, it has to be asked whether living "betwixt and between" offers a degree of experiential engagement with the subtleties neglected by the "natural sciences" but made evident to a degree by quantum speculation. Although specific superstitions may be appropriately deprecated, **does that openness to a "super-natural" reality enable a form of popular experiential engagement with the emergent worldview cultivated by the sophistication of physics, otherwise difficult to explain?** A version of that question might be asked of the "combinatory play" associated with humour, creativity and bisociation, as noted above -- characteristic to a degree of so-called [crazy wisdom](#), but also implying "superposition" and "surreal" association.

Such arguments have been designed to draw attention to the possibility that **"epiterrestrial intelligence" might "live" according to modalities better understood in terms of waveforms, but recognized to a degree through what has been deprecated as "superstition"** -- here reframed as having some of the cognitive attributes, fluidity and openness associated with "superposition".

**Reframing superstition:** It is not the purpose of this argument to affirm this as unquestionable -- especially since this cognitive mode may imply a questioning attitude to uncertainty (Garrison Sposito, *Does a generalized Heisenberg principle operate in the social sciences? Inquiry*, 1969). Rather the concern is to note the experiential credibility associated with many superstitions for a high proportion of the population -- meriting a degree of consideration of its viability over centuries:

- **angels:** aside from the belief widely accorded to them in one form or another, the existence of [angels](#) has evoked reflection of relevance to this argument (Gregory Bateson and Mary Catherine Bateson, *Angels Fear: towards an epistemology of the sacred*, 2004; Matthew Fox and Rupert Sheldrake, *The Physics of Angels: exploring the realm where science and spirit meet*, 1996; M. D. Faber, *The Psychological Roots of Religious Belief: searching for angels and the parent-god*, 2004).
- **fairies:** belief in [fairies](#) (dwelling in the "faerie realm"), or spirits, is a characteristic of many cultures -- typically described as metaphysical, supernatural or preternatural. Related beliefs accord significance to haunting (*List of reportedly haunted locations in the world*). Although the existence of "spirits" is readily deprecated in a secular culture, how is the existence of "evil", so firmly

asserted by Barack Obama, to be reconciled otherwise with the rational worldview of the [US President's Council of Advisors on Science and Technology](#) (Barack Obama, "*Evil does exist in the world*", 2009)?

- **sacred rocks:** single [sacred rocks](#) are well-known in many cultures, notably as a focus for pilgrimage and ritual. Evoking an aura of mystery, spirits of various kinds are typically believed to be associated with them. [Megalithic configurations of rocks](#) may provide a focus for similar beliefs (cf. *Enstoning in Memorials and Monuments*, 2012). Of potential relevance are myths relating to the "withdrawal into the stones" of elder races, as in the case of the Celtic [Tuatha De Danan](#), or identification of their ancestors with rock formations by indigenous peoples -- echoed to a degree in the significance associated with tombstones
- **songlines:** whether in the form of [ley lines](#), or the [dreaming tracks](#) of indigenous Australians, or the [configurations significance to feng shui](#), all are variously believed to offer a mode of engagement with other modalities

The point to be stressed is that engagement with such beliefs is widespread -- as well as being a focus for tourism, and as a widely appreciated theme of imaginative movies. The argument could be variously extended to dreams ([Stephen Hawking](#) (Ed.), *The Dreams That Stuff Is Made Of: the most astounding papers of quantum physics -- and how they shook the scientific world*, 2011) as discussed separately (*Enstoning through Imagination, Dreams, Drugs and Imbibing*, 2012).

## Embodiment of extended intelligent identity in time

**Identification with cycles:** The suggestion that it is not "where" epiterrestrials are located but "how", and that the latter is better understood through wave forms, highlights a degree of strangeness to their embodiment in time -- or to their embodiment of time. This might also imply that it is less a matter of "whether" epiterrestrials exist, but rather "when" (as in speculation regarding Boltzmann brains).

Some insights into this modality are evident through various explorations of cycles, whether circadian, lunar, solar, or otherwise. The focus is clearly evident with respect to climate cycles and business cycles. There is clearly a challenge to rendering longer-term cycles comprehensible in the present (*Engaging Macrohistory through the Present Moment*, 2004).

Especially suggestive of any epiterrestrial modality is the manner in which the identity of an individual may be associated to a far higher degree with a cycle, as discussed separately (*Emergence of Cyclical Psycho-social Identity: sustainability as "psychically" defined*, 2007). This implies a cognitive shift from "body-centeredness" to a form of "virtual-centeredness".

**Extended identity:** Any association of identity with a wave, implies that that identity is extended by the wave, "along" the wave, to "limits" which are themselves somewhat of a mystery, as partially argued separately (*Liberation of Integration, Universality and Concord -- through pattern, oscillation, harmony and embodiment*, 1980). The pattern of ripples from a stone dropped into a pond offers one image of an "extended" identity through a pattern of associations -- a meta-pattern that connects in the terms of Gregory Bateson:

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). Is an epiterrestrial to be partially understood as such a meta-pattern with which quality and intelligent life are associated? Could it be especially associated with the [tacit knowledge](#) of [Michael Polanyi](#) (*The Tacit Dimension*, 1966), the [implicate order](#) and [holomovement](#) of David Bohm (*Wholeness and the Implicate Order*, 1980), or the "quality without a name" of Christopher Alexander (*The Timeless Way of Building*, 1979):

There is a central quality which is the root criterion of life and spirit in a man, a town, a building, or a wilderness. This quality is objective and precise, but it cannot be named,

The search, which we make for this quality, in our own lives, is the central search of any person, and the crux of any individual person's story. It is the search for those moments and situations when we are most alive.

**Music as an identity vehicle:** A further indication is offered by music, especially given the degree to which it can be said to be a vehicle for the extended identity of many -- who may well live "through" music of whatever variety. That diversity effectively functions as a carrier for identity, rather than any conventional focus on the listener. The latter is embedded in a [soundscape](#), as in any forest. The subtlety is suggested by the work of [Douglas Hofstadter](#) (*Gödel, Escher, Bach: an Eternal Golden Braid*, 1979; *I Am a Strange Loop*, 2007).

In addition to the entrainment of identity by that music, there are the implications of the harmonies engendered between separate tones, forming melodies with which an individual may readily identify. As argued above, whereas the notes may be distinguished as well-defined categories according to various tuning systems, it is the harmonic relationship between them which is potentially suggestive of the nature of epiterrestrial identity -- possibly as overtones.

Fundamental insights into such relationships are offered in the work of [Ernest G. McClain](#) (*Myth of Invariance: the origins of the gods, mathematics and music from the Rg Veda to Plato*, 1976; *Meditations through the Quran: tonal images in an oral culture*, 1981). Discussed [separately](#) with respect to the *Rg Veda*, related insights are offered from dance, using the non-Boolean logic of quantum mechanics, by [Antonio T. de Nicolas](#) (*Meditations through the Rg Veda*, 1978)

Therefore, from a linguistic and cultural perspective, we have to be aware that we are dealing with a language where tonal and arithmetical relations establish the epistemological invariances... Language grounded in music is grounded thereby on context

dependency; any tone can have any possible relation to other tones, and the shift from one tone to another, which alone makes melody possible, is a shift in perspective which the singer himself embodies. Any perspective (tone) must be "sacrificed" for a new one to come into being; the song is a radical activity which requires innovation while maintaining continuity, and the "world" is the creation of the singer, who shares its dimensions with the song. (Antonio de Nicolas, *Meditations through the Rg Veda*, 1978, p. 57)

Do such considerations offer indications towards the **cognitive implications** of music, song, and poetry for the expression and embodiment of more fruitful relational dynamics and vehicles of collective identity (*A Singable Earth Charter, EU Constitution or Global Ethic?* 2006; *Poetic Engagement with Afghanistan, Caucasus and Iran: an unexplored strategic opportunity?* 2009)?

## Correspondences: "epi", Euler identity, and sexual dynamics?

**Epi and Euler:** As to the nature of an "epiterrestrial context", as it might be framed, there is a delightful coincidence to a degree of correspondence -- if only for mnemonic purposes -- between "epi" (from the Greek επι) and the so-called Euler identity. This equation has been named as the "most beautiful theorem in mathematics" and has tied in a nomination by mathematicians for the "greatest equation ever" (Robert P. Crease, *The greatest equations ever*, *PhysicsWeb*, October 2004). It may be presented as follows in two variants:

Euler Identity	
some variants	legend
$e^{\pi i} + 1 = 0$	<ul style="list-style-type: none"> <li>• <b>e</b> is Euler's number, the base of natural logarithms,</li> <li>• <b><math>\pi</math></b> is the ratio of the circumference of a circle to its diameter</li> <li>• <b>i</b> is an imaginary number defined by its property <math>i^2 = -1</math>. This is consistent with 3 variants: <math>i^0 = 1</math>, <math>i^1 = i</math>, <math>i^3 = -i</math></li> </ul>
$e^{\pi i} = -1$	

In a much quoted comment with reference to the above by Benjamin Peirce: *It is absolutely paradoxical; we cannot understand it, and we don't know what it means, but we have proved it, and therefore we know it must be the truth.* In the light of the arguments of George Lakoff and Rafael E. Núñez (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2000), metaphor has been exploited to facilitate its comprehension (*Understanding Without Proof*, 2004; *Intuitive Understanding of Euler's Formula*, 2010; Chris Fields, *Metaphorical Motion in Mathematical Reasoning: further evidence for pre-motor implementation of structure mapping in abstract domains*, 2013).

**Sexuality as a comparable mystery:** Attention is drawn by mathematicians to the fact that the identity holds the four (or five) most important numbers in mathematics, interrelated by the four (or five) most important operations. An experience of "beauty" is repeatedly associated with the identity, as specifically addressed by Gian-Carlo Rota (*The Phenomenology of Mathematical Beauty, Synthese*, 1997). Given the argument by Lakoff and Núñez that "the embodied mind brings mathematics into being" and the attention they give to the identity, there is a case for exploring it speculatively through a metaphor most intimately associated with human dynamic preoccupation, namely sexual attraction (to "beauty") and what it engenders through fulfillment.

With respect to the "numbers", this might recognize:

- **0** as the preoccupation of male sexual attraction (and female concern), perhaps understood through the powerful symbolism associated with *yoni* and *yin*. It could be said that the dynamic is driven by the strange attraction of the nothingness of a hole -- with all the mystery attached to both "nothing" and "hole" (*Emerging Significance of Nothing*, 2012; Roberto Casati and Achille C. Varzi, *Holes and Other Superficialities*, 1994)
- **1** as the preoccupation of female sexual attraction (and male concern), perhaps understood through the powerful symbolism associated with *lingam* and *yang*, further elaborated by western psychoanalysis
- **$\pi$**  as indicating (or embodying) the "sexual" relation between 0 and 1, through the visual symbols of a circle and its diameter respectively. It could be construed to imply a degree of self-reflexivity in suggesting the potential relation between 0 and 1.
- **i** as indicative of the inexplicable, imaginative fantasies fundamental to the framing of the interaction, and any intuition regarding its potential. The process of sex could be readily recognized as an "imaginary number".
- **e** as indicative of embryonic emergence consequent on an inherently experiential interaction, typically with a degree of escalation -- with the symbol understood as a partially completed circle (0), with superposition (or penetration) of a rotated diameter (1).

With respect to the "operations", the identity might suggest:

- addition (+), the requisite role of **yang** in the identity
- subtraction (-), the questionable role of **yang** in the identity, in the absence of **yin**
- equality (=), a requisite degree of equilibrium for a desirable outcome
- multiplication (signified by the juxtaposition of  **$\pi$**  and **i**)
- **exponentiation**, as indicative of the escalating excitation and "growth" in the process of interaction

No consideration is given to the extraordinary coincidence that mathematics shares use of the term "conception" with the successful outcome of the sexual process. For mathematicians, creativity gives rise to concepts (possibly in the form of categories). In the sexual case, it engenders intelligent life. The identity could be explored as the most succinct expression of *The Act of Creation* (1964), as articulated by Arthur Koestler.

**Sexual dynamics:** However fanciful the metaphor, it should be remembered (as noted above) that **mathematics has as yet proven totally incapable of any appropriate representation of sexual dynamics and their attractors -- despite their fundamental role in**

**the dynamics of the global system**, so "systematically" modelled otherwise. Despite remarkable skills in "pattern recognition" and "curve fitting", it seems to have been impossible to explore the dynamics of "sexy" curvature as an attractor (ironically exemplified by "models") -- even though such "beauty" may be the primary driver of human life.

The failure is all the more curious in that mathematics has long recognized the role of a complementary constant to pi ( $\pi$ ), namely phi ( $\phi$ ), specifically associated with what is appreciated as beauty through the golden ratio (golden mean) proportion, as discussed separately (*From global to helicoidal -- from pi to phi?* 2010). Static geometry is primarily associated with  $\pi$ , whereas the dynamic geometry of nature is based on  $\phi$  (Mark Freitag, *Phi: That Golden Number*). The mathematical relationship between the two is associated with Fibonacci numbers, and the elegance of the associated spiral.

It could be assumed that mathematicians are strangely unconscious of any "sexual" dynamics, when they engage in them, as implied by the argument of Chris Fields (*From "Oh, OK" to "Ah, yes" to "Aha!": Hyper-systemizing and the rewards of insight, Personality and Individual Differences*, 2011). The selective attention has been discussed separately (*Scientific Gerrymandering of Boundaries of Overpopulation Debate: review of The Royal Society report -- People and the Planet*, 2012). Such hypersystematizing and conceptual gerrymandering could be understood as reinforcing other problematic "terrestrial" mindsets (*Cyborgs, Legaborgs, Finaborgs, Mediborgs: meet the extraterrestrials - them is us*, 2013).

The metaphorical argument regarding sexual dynamics can be taken even further in that the identity is a special case of Euler's formula from complex analysis (Paul J. Nahin, *Dr. Euler's Fabulous Formula: cures many mathematical ills*, 2006). This states that for any real number x:

$$e^{ix} = \cos x + i \sin x, \text{ where the values of the trigonometric functions sine and cosine are given in radians.}$$

The particular instance occurs when  $x = \pi$ , then:

$$e^{i\pi} = \cos \pi + i \sin \pi, \text{ which reduces to } e^{i\pi} = -1 + 0, \text{ namely } e^{i\pi} + 1 = 0$$

It has been suggested that this could also be explored substituting  $\phi$  for  $\pi$  (Odin Noble, *Introduction to the Euler Identity*). With  $\pi$ , it is "tempting" to see the "particular instance" of the identity as the "culmination" (or consummation process) of dynamics, described by the formula (for various values of x) -- phases associated with the characteristic (reciprocated) body movements constituting the phases of attraction between male and female. Any attempt to describe the periodicity of such (wave-like) motions, as essential to the attractors they constitute (and their visual rendering), would require use of sine and cosine functions. Of that attraction the statement regarding the Euler identity by Benjamin Peirce is equally valid: *It is absolutely paradoxical; we cannot understand it, and we don't know what it means, but we have proved it, and therefore we know it must be the truth.*

The Euler "formula" could also be explored as Einstein's "combinatory play" (noted above) -- a form of "cognitive foreplay" culminating in Koestler's *Act of Creation* (1964). Its cyclic dynamic also suggests a way of comprehending the Taoist *Circulation of Light Meditation*, namely the *Neidan* practice of inner alchemy, as more generally discussed (*Circulation of the Light: essential metaphor of global sustainability?* 2010).

Is this indicative of the requirement for imaginative comprehension of "epiterrestrial" intelligent life and the paradoxical nature of the integrity it constitutes? Is such comprehension indicative of a form of maturity, as previously speculated (*Self-reflective Embodiment of Transdisciplinary Integration (SETI): the universal criteria of species maturity?* 2008).

Curiously this metaphorical argument invites further speculation with regard to the isolated individual (1) in relation to globalization (0), echoing that between sperm and ovum, as partially considered separately (*Engendering Invagination and Gastrulation of Globalization: reconstructive insights from the sciences and the humanities*, 2010; *Global Governance via a Double-breasted Strange Attractor: cognitive implication in a dynamic sexual metaphor*, 2009).

## Re-cognizing "human" in an "epiterrestrial" context

**Human incorporation as epiterrestrial:** The point is frequently made that humans can only "see" a very small proportion of the electromagnetic spectrum -- of which the remainder can only be rendered "visible" through various instruments (available only to the very few). The argument has suggested that, irrespective of any definition of "electromagnetic", there is a context in which humans are cognitively embedded which constrains that to which attention is typically given in navigating "terrestrial" challenges. Arguably other forms of "intelligent life" may be associated with "non-visible" domains within that context -- however "context" is understood in terms of dimensionality, given the 10 to 26 envisaged by *string theories*.

**Metaphorical framing:** In this sense **humans may be essentially epiterrestrial** -- but as a particular instance in a far broader spectrum of "intelligent life"-- however that might come to be understood by the future (possibly in the light of subtleties of category theory).

In developing this argument, extensive use has been made of indicative metaphor -- consistent with the challenge of "sensing" such possibilities through "combinatory play". However, even with respect to the sense of "identity" associated with being "human", *Kenneth Boulding's* words merit consideration:

Our consciousness of the unity of the self in the middle of a vast complexity of images or material structures is at least a suitable metaphor for the unity of a group, organization, department, discipline, or science. If personification is only a metaphor, let us

not despise metaphors - we might be one ourselves. (*Ecodynamics; a new theory of societal evolution*, 1978, p.345)

The comment of the poet John Keats is similarly relevant:

A man's life is a continual allegory -- and very few eyes can see the mystery of his life -- a life like the scriptures, figurative.

Understood in this way, humans are effectively embedded in an epiterrestrial context with other lifeforms -- best framed by metaphors in the absence of any other comprehensible mode of "definition", especially given the sense that their "existence" may have a quality of potentiality such as is formally described by probability functions. Such issues are fruitfully explored by Vasily Nalimov (*Realms of the Unconscious: the enchanted frontier*, 1982) as separately discussed (*Nalimov's probabilistic vision of the world*).

**Human identity:** The speculative comment with respect to the Euler identity may help to frame new ways of thinking about human embedding in an epiterrestrial context -- thereby refining a sense of the essence of human identity and of being human in a period in which many are faced with "nothing" and a "pointless" existence. This is discussed separately in a section on *Enabling a reconciliation between one and nothing: p and the mysterious Euler identity* (*¿ Embodying a Way Round Pointlessness ?* 2012).

If some such paradoxical relationship is fundamental to epiterrestrial intelligent life -- and to being human -- this is a challenge to the constraints associated with conventional framings of identity, as with the *UN Declaration of Human Rights*. It calls for imaginative consideration of other framings capable of embodying cognitive paradox (cf. *Universal Declaration of the Rights of Human Organization: an experimental extension of the Universal Declaration of Human Rights*, 1971).

Such considerations frame the issue of how the undefinable "exists" -- especially when it is the essence of intelligent life. The restrictive understanding of the embedding of human identity within a terrestrial context, suggests that it might be better considered as embedded within an epiterrestrial context within which other (wave) forms of intelligent life might also "dwell", offering an interpretation of the classical Biblical phrase: *in the world but not of the world* (John 15:19).

The challenge to comprehension takes a different form in the light of the imaginative enthusiasm of astrophysicists for the integrative framework of a "multiverse" (or "meta-universe") of "unimaginable" complexity -- with little indication of its implications for human identity. Individuals are however free to respond proactively to such imaginings with their own creativity, as separately explored (*Being a Poem in the Making: engendering a multiverse through musing*, 2012; *Enactivating Multiversal Community: hearing a pattern of voices in the global wilderness*, 2012).

Rather than framing the integrative challenge in terms of "external" intelligent life, this recognizes the complementarity of the "internal", as indicated above by a primary foundational relation (*Implication of Indwelling Intelligence in Global Confidence-building: sustaining the construction and dynamic of psychosocial reality through questioning*, 2012). This is variously associated with combinatory play and phenomenological grounding (recognized as *fundierung*).

Such speculative possibilities also encourage consideration of how the sense of being human and engaging with the world may evolve through centuries to come. Given the transition from Neanderthal to Cro-magnon, how might creative combinatory play and synaesthesia feature in a future cognitive mutation, as separately discussed (*Authentic Grokking: emergence of Homo conjugens*, 2003)?

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