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4 January 2021 | Draft

Living within a Self-engendered Simulation

Re-cognizing an alternative to living within the simulation of an other

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Introduction

There is an ongoing debate among scientists as to whether humanity and the planetary environment are best understood as part of a simulation developed and maintained by an advanced race of extraterrestrials. As a speculative argument, this offers one way of understanding why humanity has not been contacted by ETs -- if humans could comprehend the form which such contact might take. The question has notably been framed by the Fermi paradox, namely the apparent contradiction between the lack of evidence for extraterrestrial civilizations and various high estimates for their probability.

There have been many attempts to explain the Fermi paradox, primarily suggesting that intelligent extraterrestrial beings are extremely rare, that the lifetime of such civilizations is short, or that they exist despite the inability of humans to detect them (for various reasons). The paradox continues to be debated in a context in which there is increasing attention to the number of exoplanets detected, now held to be capable of supporting life as it is known to humanity -- understood as planetary habitability. The SETI quest for extraterrestrial intelligence continues (Daniel Clery, *How big money is powering a massive hunt for alien intelligence*, *Science*, 10 September 2020). This is complemented by the challenge of communication with extraterrestrial intelligence (CETI).

As addressed here, the question follows from a long philosophical and scientific history of speculation as to the possibility that reality -- as perceived and comprehended by humans -- is an illusion of some kind. Such speculation includes the renowned "Butterfly Dream" of Zhuangzi and Indian reflection on Maya. The first to state the basic concept of reality as a simulation was Plato in 380 BCE in the famous Allegory of the Cave, describing people imprisoned since childhood (but not since birth) and led to believe that artificial light-based representations of reality were truly real when, in fact, they were a fabricated illusion. Experience of simulated reality has long been explored by science fiction.

Recent focus has been given to the possibility by Nick Bostrom with regard to what is now termed the simulation hypothesis (*Are You Living in a Computer Simulation?*. *Philosophical Quarterly*. 53, 2003, 211; *The Simulation Argument: why the probability that you are living in a matrix is quite high*, *Times Higher Education Supplement*, 16 May 2003). The possibility has been framed as a form of video game by Rizwan Virk (*The Simulation Hypothesis: an MIT computer scientist shows why AI, quantum physics and Eastern mystics all agree we are in a video game*, 2019). Whether this is of significance or not is another matter, as argued by Peter Ball (*We Might Live in a Computer Program -- but it may not matter*, *BBC*, 5 September 2016)

Bostrom's argument, understood as a trilemma, posits that at least one of the following statements is very likely to be true:

- the fraction of human-level civilizations that reach a post-human stage is very close to zero;

- the fraction of post-human civilizations that are interested in running ancestor-simulations is very close to zero;
- the fraction of all people with our kind of experiences that are living in a simulation is very close to one.

The argument developed in what follows is that, as framed, the simulation hypothesis is of little relevance to humanity in its current state of crisis. The question here is: **can the framing of the simulation hypothesis be extended to render it of greater interest to individuals and of greater relevance to global governance**.

However hypothetical, reference to extraterrestrials is a useful device in challenging present-day conventional understanding, given the many surprises the future may hold in store. This exercise follows from previous uses of the device for this purpose (*Anticipation of Judicial Inquisition of Humans by Extraterrestrials*, 2020; *Writing Guidelines for Future Occupation of Earth by Extraterrestrials*, 2010; *Sensing Epiterrestrial Intelligence (SETI): embedding of "extraterrestrials" in episystemic dynamics?* 2013).

The latter helps to make the point that the alienation engendered by the processes of global civilization is effectively engendering "terrestrial extras" (exploiting the terminology of drama). As "aliens", and in the absence of any analogous "SETI" initiative by which the intelligence of such "nobodies" can be detected, communication with them poses an increasing challenge.

Reframing the simulation hypothesis for greater human relevance

Possibilities for reframing any human understanding of "simulation" include recognition that the designer(s) and maintainer(s) may be:

- advanced-race extraterrestrials as variously imagined
- deity as variously proposed (intelligent design)
- individual cultures (acculturation; social construct)
- human individuals (social construct; enactivism)
- none of the above (a chaos hypothesis)

The point to be stressed with regard to each such possibility is that they are equally mysterious to ordinary human comprehension, as is the nature of any associated "simulation". In particular, to the extent that "matrix" is used to frame the context of the simulation, as a metaphor it is itself simplistic -- no matter how multi-dimensional or hyper-dimensional it is held to be. A similar point could be made with regard to "designer" and "maintainer" -- namely the meaning to be associated with agency.

The challenge may be that humans may have a cognitive commitment to distinguishing such categories -- naming them to that end -- when the manner of experiencing them may imply a degree of conflation. Their hyper-dimensionality may be best implied by the understanding of physics of compactification of extra dimensions as "curled up" -- rendering them elusive to human cognition.

Forms of the unknown and conventionally incomprehensible

The surprising impact on a global knowledge-based civilization of COVID-19 suggest that the probability of future surprises merits appreciation. The point has been extensively argued by Nassim Nicholas Taleb (*The Black Swan: the impact of the highly improbable*, 2007).

There is therefore a case for recognizing **the vastness of the domains with which such surprises may be associated, from which they may emerge**, and the possibility that they may variously reframe what is termed a "simulation". It is appropriate to note that use of "simulation" is potentially oversimplistic, and dangerously so. It relies on metaphoric interpretation of emergent understanding of computer processes -- a technology which has been only recently imagined and designed, however much it invites speculation on its future development. The challenge to human comprehension, given cognitive constraints, is discussed separately (*Comprehension of Numbers Challenging Global Civilization*, 2014).

For purposes of discussion, the forms of the unknown -- as **fundamental challenges to conventional comprehension** -- could be clustered to include:

Physics: The observable Universe contains an estimated 1×10^{24} stars, but most are invisible to the naked eye from Earth, including all stars outside the galaxy, in which the solar system is located. The number of galaxies in the observable universe has recently been revised from a previous estimate of 200 billion (2×10^{11}) to a suggested two trillion (2×10^{12}) or more. It has been estimated that there are between 10^{78} to 10^{82} atoms in the known, observable universe.

- *dark matter*: Much continues to be made by cosmologists and astrophysicists of the mystery of so-called dark matter. Dark matter is a form of matter thought to account for approximately 85% of the matter in the universe and about a quarter of its total mass–energy density. Its presence is implied in a variety of astrophysical observations, including gravitational effects that cannot be explained by accepted theories of gravity unless more matter is present than can be seen.
- *dark energy*: In physical cosmology and astronomy, dark energy is an unknown form of energy that affects the universe on the largest scales. The first observational evidence for its existence came from supernovae measurements, which showed that the universe does not expand at a constant rate; rather, the expansion of the universe is accelerating.
- *dark fluid*: In astronomy and cosmology, dark fluid is an alternative theory to both dark matter and dark energy and attempts to explain both phenomena in a single framework
- *dark flow*: In astrophysics, dark flow is a theoretical non-random component of the peculiar velocity of galaxy clusters. The actual measured velocity is the sum of the velocity predicted by Hubble's Law plus a possible small and unexplained (or dark) velocity flowing in a common direction.
- *quantum reality*: Quantum mechanics is a fundamental theory in physics that provides a description of the physical properties of nature at the scale of atoms and subatomic particles. It is the foundation of all quantum physics including quantum chemistry,

quantum field theory, quantum technology, and quantum information science. Since its inception, the many counter-intuitive aspects and results of quantum mechanics have provoked strong philosophical debates and many interpretations. As variously asserted by Richard Feynman: *I think I can safely say that nobody understands quantum mechanics* and *Anyone who claims to understand quantum theory is either lying or crazy.* (Clara Moskowitz, *Physicists Disagree Over Meaning of Quantum Mechanics, Poll Shows*, LiveScience, 21 January 2013)

- ***extra dimensionality***: In physics, extra dimensions are proposed in addition to the $(3 + 1)$ space or time dimensions typical of observed spacetime, In the case of string theory, requirements for mathematical consistency are the 26-dimensions of bosonic string theory, the 10-dimensions of superstring theory, and the 11-dimensions in supergravity theory and M-theory. Understood as compactification, the undetectable (and incomprehensible) extra dimensions are assumed to be "wrapped" up on themselves, or "curled" up on Calabi–Yau spaces, or on orbifolds.

Biology: The total number of species is estimated to be between 8 and 8.7 million. However the vast majority of them are not studied or documented and it is expected that it may take over 1000 years to fully catalogue them all. A growing number of "cryptic species" hiding in plain sight have been recently unmasked in the past year, driven in part by the rise of DNA barcoding, suggesting that the planet may be more biologically diverse than previously thought than current estimates (*Discovery of 'cryptic species' shows Earth is even more biologically diverse*, The Guardian, 25 December 2020)

More than 99% of all species that ever lived on Earth, amounting to over five billion species, are estimated to have died out. According to the 2019 *Global Assessment Report on Biodiversity and Ecosystem Services*, the biomass of wild mammals has fallen by 82% and natural ecosystems have lost about half their area -- all largely as a result of human actions. It is predicted that 25% of plant and animal species (1 million species) are threatened with extinction in the coming decades -- termed the Holocene extinction.

- ***"junk DNA"***: Non-coding DNA sequences are components of an organism's DNA that do not encode protein sequences -- hence the caricature as "junk DNA:
  - As described by Wojciech Makalowski:
    - Our genetic blueprint consists of 3.42 billion nucleotides packaged in 23 pairs of linear chromosomes...Interestingly, all animals have a large excess of DNA that does not code for the proteins used to build bodies and catalyze chemical reactions within cells. **In humans, for example, only about 2 percent of DNA actually codes for proteins**.... With no obvious function, the noncoding portion of a genome was declared useless or sometimes called "selfish DNA", existing only for itself without contributing to an organism's fitness.... These and countless other examples demonstrate that repetitive elements are hardly "junk" but rather are important, integral components of eukaryotic genomes. Risking the personification of biological processes, we can say that evolution is too wise to waste this valuable information. (*What is junk DNA, and what is it worth?* Scientific American, 12 February 2007) *[emphasis added]*
  - As described by Ananya Manda:
    - However, over the years, researchers have found evidence to suggest that junk DNA may provide some form of functional activity. Some lines of evidence suggest that fragments of what were originally non-functional DNA have undergone the process of exaptation throughout evolution. Exaptation refers to the acquisition of a function through means other than natural selection. In 2012, a research program called the ENCODE project concluded that around three quarters of the noncoding DNA in the human genome did undergo transcription and that almost 50% of the genome was available to the proteins involved in genetic regulation such as transcription factors. (*What is Junk DNA?* News-Medical.Net, 19 February 2020)
- ***cells in human body***: The number of cells in the human body has been estimated to be 30 trillion, rising to 37 trillion at maturity (Ron Sender, et al, *Revised Estimates for the Number of Human and Bacteria Cells in the Body*, PLOS Biology, 19 August 2016). There are necessarily many different types of cell in the human body.
- ***gut microbiota***: The human microbiota (or gut flora) is important for nutrition, immunity, and effects on the brain and behaviour. It is made up of trillions of cells, including bacteria, viruses, and fungi with the biggest populations of microbes residing in the gut -- amounting to some 1.5 kilos of biomass -- with every individual having a unique mix of species. (*What are the gut microbiota and human microbiome?* Medical News Today, 26 June 2018)

Psychology:

- ***unused portions of the human brain***: A myth has been perpetuated that humans only use 10 percent of their brains, or an even smaller percentage -- a myth attributed to many celebrated people (*Ten percent of the brain myth*, Wikipedia). Research now suggests that though specific mechanisms regarding brain function remain to be fully described, the physiology of brain mapping suggests that all areas of the brain have a function and that they are used nearly all the time. Nevertheless many mysteries remain about how brain cells work together to produce complex behaviours and disorders. The most mysterious is perhaps how diverse regions of the brain collaborate to form conscious experiences in a collective neural effort. From a systems perspective, by analogy, a similar argument could be made with respect to any understanding of a global brain and collective intelligence (as indicated below)
- ***unconscious mind***: The unconscious consists of the processes in the mind which occur automatically and are not available to introspection. It .is the vast sum of operations of the mind that take place below the level of conscious awareness (*Unconscious*, Psychology Today). By contrast, the conscious mind contains all the thoughts, feelings, cognitions, and memories humans can acknowledge. In psychoanalytic theory, unconscious processes are understood to be directly represented in dreams, as well as in slips of the tongue and jokes. That understanding has been extended to refer to the collective unconscious, namely those structures of the unconscious mind which are shared among beings of the same species. As understood by Carl Jung, it is is populated by instincts, as well as by archetypes and universal symbols -- held to underpin and surround the unconscious mind,

distinguishing it from the personal unconscious of Freudian psychoanalysis.

- **dreams**: Understood as engendered by the unconscious mind, the mysterious experience of dreams is of considerable significance to many -- if only in their unpredictability and content. As famously framed by Martin Luther King (I have a dream), it is variously argued that the dream of an individual can be shared and understood as a collective dream (*Can humans have a collective dream about something? Quora*; *What is a Collective Dream? How to Negotiate*, 26 October 2016; Keally D. McBride, *Collective Dreams: political imagination and community*, 2005; Charles Barrie, *The Emergence of Collective Dreams*, *Analysis and Policy Laboratory*, 2014; Paul Levy, *Is our reality a collective dream? Matrixwissen*). A particular understanding is offered by the religio-cultural worldview attributed to Australian Aboriginal beliefs, known as The Dreaming and the Dreamtime.
- **altered states of consciousness**: The widespread preoccupation with reframing experience of conventional reality is evident in the quest for altered states of consciousness, whether through meditation, recreational substance abuse, or the use of psychoactive drugs -- readily recognized as drug dependency. The quest for alternative framings of reality -- whether through cults or drugs -- is variously deprecated, if not criminalised.

Social: The global population of humans has increased from 2 billion in 1930 to an estimated 7,800,000,000 in March 2020. Long-range predictions to 2150 range from a population decline to 3.2 billion in the "low scenario", to "high scenarios" of 24.8 billion. This trend is engendering numbers which are readily understood as far beyond meaningful engagement through processes of governance or otherwise. The curiously desperate quest for hypothetical extraterrestrials is effectively complemented by the burgeoning reality of "terrestrial extras" (in the terminology of drama) readily framed as "nobodies" or "deplorables".

- **collective intelligence**: understood as shared or group intelligence that emerges from the collaboration, collective efforts, and competition of many individuals and appears in consensus decision making. The elusive notion is recognized in sociobiology, political science and in context of mass peer review and crowdsourcing applications. It can also be recognized problematically as group think and in crowd psychology
- **cultural memory**: understood either as the manner in which the past shapes the present, or the present shapes the past, cultural memory is a significant factor in sustaining long-term feuds and the resentment between cultures.
- **lost knowledge**: cultivation of a sense of lost knowledge is notably a feature of nostalgic myth. It is however also recognized in terms of practices characteristic of indigenous and other cultures (Chi Luu, *What We Lose When We Lose Indigenous Knowledge*, 16, *JSTOR Daily*, October 2019; Sam Bostrom, *The Lost Knowledge of the Ancients: were humans the first? Ancient Origins*; Benjamin Olshin, *Lost Knowledge: the concept of vanished technologies and other human histories*, 2019). Given the challenge of encompassing the quantity of knowledge now generated in a global civilization, it can also be explored in terms of the effect on collective memory (*Societal Learning and the Erosion of Collective Memory: a critique of the Club of Rome Report: No Limits to Learning*, 1980).
- **underground economy**: typically referenced as a black market or a shadow economy, this is a clandestine series of transactions that has some aspect of illegality or is characterized by some form of noncompliant behaviour with an institutional set of rules. Black money is the proceeds of such a transaction, on which income and other taxes have not been paid, and which can only be legitimised by some form of money laundering. Because of the clandestine nature of the black economy it is not proved possible to determine its size and scope.
- **organized crime**: understood as a category of transnational, national, or local groupings of highly centralized enterprises, organized crime is run by criminals to engage in illegal activity, most commonly for profit. Some criminal organizations are politically motivated, such as terrorist groups. Given the relation to the underground economy, there is necessarily little sense of the scope and extent of organized crime -- especially given a degree of complicity of conventional leadership
- **secret services**: these necessarily include a range of intelligence agencies although, controversially, the number and mandate remains a secret in as with their interrelationship, whether nationally or internationally.
- **deep state:** as described by *Wikipedia*: A deep state is a type of governance made up of potentially secret and unauthorised networks of power operating independently of a state's political leadership in pursuit of their own agenda and goals. In popular usage, the term carries overwhelmingly negative connotations, although this does not reflect scholarly understanding. The range of possible uses of the term is similar to that for shadow government.
- **dark web**: as described by Wikipedia: The dark web is the World Wide Web content that exists on *darknets*: overlay networks that use the Internet but require specific software, configurations, or authorization to access. Through the dark web, private straphanger networks can communicate and conduct business anonymously without divulging identifying information, such as a user's location.The dark web forms a small part of the deep web, the part of the Web not indexed by web search engines, although sometimes the term *deep web* is mistakenly used to refer specifically to the dark web.
- **secretive controlling elites:** reality or not, there is widespread suspicion, nurtured by conspiracy theories, that society is variously and secretively controlled by a small number of people, whether the wealthy 1% or the illuminati

Metaphysical and paranormal:

- **deity**: the mystery held to be associated with deity has long been a focus of attention and controversy -- for which no comment is appropriate here. Of some relevance to this argument are mystical references to the nature of that mystery as with *The Cloud of Unknowing*. As noted above, the implication may be, as in some schools of Buddhism, that reality is an illusion -- Maya. A particular focus to the belief in deity are the prophecies regarding the imminent appearance of some form of Messiah.
- **evil**: although undetectable by science, evil continues to be strongly asserted to exist by the highest authorities -- who may well claim each other to be evil (or satanic), as detailed separately (*Existence of evil as authoritatively claimed to be an overriding strategic concern*, 2016).
- **nothing**: there is a degree of confluence of insights with regard to nothing and its significance, as noted separately (*Emerging Significance of Nothing*, 2012)

- **monstrous moonshine**: in its quest for symmetry of the highest order, mathematics has discovered through an unusual process (caricatured as "moonshine") what is recognized as an exceptional form of symmetry of order 8×10^{53}, termed the monster group (Mark Ronan, *Symmetry and the Monster: one of the greatest quests of mathematics*, 2006). This could be speculatively explored as a Rosetta stone for cognitive frameworks (*Potential Psychosocial Significance of Monstrous Moonshine*, 2007)
- **quantum philosophy**: the radically paradoxical insights of quantum mechanics have evoked reflections on quantum philosophy (Peter Evans, *Quantum philosophy: 4 ways physics will challenge your reality*, The Conversation, 25 December 2020; Roland Omnès, *Quantum Philosophy: understanding and interpreting contemporary science*, 1999). These are calling into question the nature of objective reality (*A quantum experiment suggests there's no such thing as objective reality* MIT Technology Review, 3 December 2019; Alessandro Fedrizzi and Massimiliano Proietti *Quantum physics: our study suggests objective reality doesn't exist*, The Conversation, 14 November 2019; *Experimental test of local observer independence*, Science Advances, 5, 2019, 9):
    - The scientific method relies on facts, established through repeated measurements and agreed upon universally, independently of who observed them. In quantum mechanics the objectivity of observations is not so clear, most markedly exposed in Wigner's eponymous thought experiment where two observers can experience seemingly different realities. The question whether the observers' narratives can be reconciled has only recently been made accessible to empirical investigation, through recent no-go theorems that construct an extended Wigner's friend scenario with four observers. In a state-of-the-art six-photon experiment, we realize this extended Wigner's friend scenario, experimentally violating the associated Bell-type inequality by five standard deviations. If one holds fast to the assumptions of locality and free choice, this result implies that quantum theory should be interpreted in an observer-dependent way.
- **death, the afterlife and reincarnation**: the mystery associated with the reality of death and the nature of the afterlife remains a focus for many, if only in metaphorical terms of collective significance (*Metaphors To Die By: correspondences between a collapsing civilization, culture or group, and a dying person*, 2013; *Dying to Live, Living to Die, Lying to Live, and Living a Lie*, 2013)

"Junk": Given the potential relevance of extraterrestrials to this argument (as indicated above), there is a case for adapting the notorious reference of Donald Trump to "shithole countries" in a speculative clarification as to why ETs may choose not to make contact with Earth (*Earth as a Shithole Planet -- from a Universal Perspective? Understanding why there are no extraterrestrial visitor*s, 2018).

As indicated there, Earth has obvious problems of "junk" in the form of unrecycled waste and use of particular geographical areas as dumping grounds for waste. Especially obvious is the accumulation of marine debris (North Atlantic garbage patch; Great Pacific garbage patch; South Pacific garbage patch; Indian Ocean garbage patch). A form of junk is clearly evident with the accumulation of orbiting space debris. That sense of junk can be extended to the 20,000 near-Earth asteroids, especially those with some risk of colliding with the Earth (*Asteroid set to pass Earth in New Year as NASA reveals 'Near Earth' approach*, Daily Express, 30 December 2020).

Curiously, by analogy, such production of junk is echoed in the information generated daily -- whether it is immediately forgotten, stored, or remains unprocessed. No one knows how many scientific journals there are, but several estimates point to around 30,000, with close to two million articles published each year (Philip G Altbach and Hans de Wit, *Too much academic research is being published*, University World News, 7 September 2018). It is estimated that 18,000 newspapers are published with a daily circulation of some 208 million. As of May 2020, some 6,000 tweets are sent every second, namely 200 billion per year (David Sayce, *The Number of tweets per day in 2020*).

The situation is complicated by the extent of disinformation and fake news (*Varieties of Fake News and Misrepresentation*, 2019). Given the nature, extent and invasiveness of advertising, it is appropriate to ask to what extent this too is to be recognized as "junk".

Most fundamental, with respect to this argument, is the degree to which one is unaware of this vastness -- except to the most limited degree and for the most limited period of time. Self-awareness, as the governing centre of the 30 trillions of cells of the human body, is as limited as individual awareness of the 2 trillion galaxies in the universe.

Knowledge, ignorance, pseudoscience and the unsayable

Pseudoscience: From the perspective of a particular understanding of science, pseudoscience is held to consist of statements, beliefs, or practices that are claimed to be both scientific and factual but are incompatible with the scientific method (*List of topics characterized as pseudoscience*). The phrase "Not even wrong" is often used to describe pseudoscience or bad science. Criticism of pseudoscience by the scientific community or skeptical organizations, involves critiques of the logical, methodological, or rhetorical bases of the topic in question .Though some topics identified continue to be investigated scientifically, others have only been subject to scientific research in the past, and today are considered refuted however they may be resurrected in a pseudoscientific fashion. Other ideas presented are entirely non-scientific, but have in one way or another impinged on scientific domains or practices.

The boundary between what is claimed to be science (by those considering themselves to be scientists) and what is held to be pseudoscience is not rigid and may be variously disputed at any one time and over time, as by Paul Feyerabend (*Against Method*, 1993). One striking example is offered by Isaac Newton, otherwise considered to be an icon of science, celebrated for his scientific and mathematical writings, who delved into areas which are now held to merit the label pseudoscience, notably alchemy and religion. The fear on the part of science of giving any form of legitimacy to Newton's reflections on such matters is indicated by the manner in which his studies have been carefully rendered inaccessible over centuries. This situation is only now in process of rectification through the Newton Project, in collaboration with a sister project The Chymistry of Isaac Newton (with a particular focus on his alchemical studies).

Of particular interest is the sense in which any disciplined approach to knowledge, as framed by other "sciences", is necessarily framed as pseudoscience from those claiming a monopoly on the scientific method -- or on refinements of it as characterized by the "pecking

order" between disciplines (T. Becher, *Academic Tribes and Territories: intellectual enquiry and the cultures of disciplines*, 1989), As noted in that regard by Lynne Siemens, et al:

> These disciplinary tensions are further complicated by perceptions of differing status, power, and respect among the various disciplines .... Those in the higher-status ones are often dismissive or at least skeptical of lower-ranking ones, which they describe to be "lacking in proper rigour"... Further, the academic culture is geared to argument and counter-argument, where one discipline attempts to demonstrate the shortcomings in the other (*Mapping disciplinary differences and equity of academic control to create a space for collaboration*, *Canadian Journal of Higher Education*, 44, 2014, 2).

The issue obviously extends to include what have been traditionally defined as the "seven theological sciences". As noted by George H. Smith (*What are the human sciences? Libertarianism*, 5 November 2013):

> What we now call the human sciences (economics, sociology, etc.) were traditionally known as the moral sciences. "Moral", in this context, referred to man's rational agency -- i.e., to his ability to reason, to formulate general principles, and to act upon those principles in pursuit of chosen goals. The fact that human action is purposeful and volitional was seen as crucial to the distinction between the moral sciences and the natural sciences (such as physics), which investigate the deterministic behavior of physical phenomena. In this classificatory scheme, physiology, anatomy and similar disciplines, though they include human beings as part of their subject matter, are natural sciences rather than moral sciences because they focus on man as a physical organism rather than as a rational agent.

Symptomatic of the issue at the international level has been the manner in which the natural sciences, long-recognized by UNESCO through the International Council of Scientific Unions, merged in 2018 with the long-recognized International Social Science Council to form the International Science Council. For some scientists, "social science" -- as a "soft science" -- is necessarily a pseudoscience. Within the politics of UNESCO, there is the unchallenged implication that the International Council for Philosophy and Humanistic Studies -- separately recognized for decades -- represents a massive cluster of pseudosciences in its grouping of hundreds of learned societies in the field of philosophy, human sciences and related subjects.

Knowledge: Far from evident, as a consequence, is how to recognize what approaches to human knowledge -- disciplined or otherwise" -- are considered "non-scientific" and "pseudoscientific", as discussed separately (*Knowledge Processes Neglected by Science: insights from the crisis of science and belief*, 2012). Clearly it is the "information sciences" that are able to handle a wider variety of modalities and topics than "science" itself. The matter is central to a report of the Scientific and Medical Network (Harald Walach, *Galileo Commission Report: beyond a materialist worldview – towards an expanded science*, 2020).

More problematic is the extent to which, in claiming to advance human knowledge, science variously renders its preoccupations irrelevant to the crises faced by humanity -- whilst vigorously making scientifically dubious claims to the contrary and appropriating scarce resources to that end (*Challenges More Difficult for Science than Going to Mars or exploring the origins of the Universe or of Life on Earth*, 2014).

As in the political arena, there is sense in which the acclaimed objectivity of science is subject to gerrymandering and category manipulation, as discussed separately (*Scientific Gerrymandering of Boundaries of Overpopulation Debate: review of The Royal Society report -- People and the Planet*, 2012). Such definitional game-playing is evident with respect to social change initiatives in general (*Social Experiments and Sects: beyond category manipulation by advocates and opponents*, 1997; *Terror as Distractant from More Deadly Global Threats: bewitching world of definitional game-playing*, 2009)

There is therefore a case for distinguishing the "pseudo-relevance of science" to a human civilization in crisis. "**Not even relevant**" might be the appropriate counterpart to the "Not even wrong" by which pseudoscience is deprecated (as noted above).

In the light of historic justifications for the separation of church and state, it could be asked why science remains trapped by an unfortunate degree of complicity with government. This is especially evident in the development of weapons of mass destruction, in the interrogation of those framed as a threat, or in experimentation on humans -- if not on other animals (*Unethical human experimentation in the United States*; Katie Dowd, *The San Quentin prison doctor who performed over 10,000 human experiments*, *SFGATE*, 13 August 2019). The physician named in the latter, Leo Stanley, merits comparison with Josef Mengele, renowned for his experiments as a physician at Auschwitz (Ethan Blue, *The Strange Career of Dr Leo Stanley: remaking manhood and medicine at San Quentin State Penitentiary, 1913-1951*, *Pacific Historical Review*, 78, 2009, 2).

How is the complicity of authorities and the scientific community to be recognized in such cases? What of the complicity of the biosciences in "scientific whaling" (Larry Pynn. *What's the True Scientific Value of Scientific Whaling? Hakai*, 27 October 2016). Of current relevance is the complicity in marginalization and suppression of alternative views by scientists with regard to responses to COVID-19 and vaccination -- exemplified by institutional responses to the *Great Barrington Declaration* (4 October 2020), notably signed by epidemiologists.

Unsayable and unsaid: As the mainstream response to alternative perspectives has indicated, much remains deliberately unsaid -- effectively defined as unsayable as in the most repressive regimes (Michael Lesher, *Even While It Was Happening, It Wasn't Happening*, *OffGuardian*, 31 December 2020).

The issue has been highlighted by the controversy associated with the disclosure of secret diplomatic cables by Wikileaks -- deemed treasonous -- and the subsequent imprisonment and trial of Julian Assange. It is also evident in the assassination of journalists, as documented by the Committee to Protect Journalists, which also publishes a Global Impunity Index indicating failure to prosecute.

The forms of the unsaid inviting consideration are separately articulated -- notably in the light of the manner in which "unsaying" performs a vital function (*Varieties of the "unsaid" in sustaining psycho-social community*, 2003). Of particular interest is the role of unsaying in apophasis, namely discourse regarding that which cannot be adequately articulated -- especially evident in apophatic theology. (Michael A. Sells, *Mystical Languages of Unsaying*, 1994). The wider implications are discussed separately (*Global Strategic Implications of the "Unsaid": from myth-making towards a "wisdom society"*, 2003).

Although the matter is subject to continuing review regarding nonverbal communication, it has been estimated that 7 percent of meaning is communicated through the spoken word, 38 percent through tone of voice, and 55 percent through body language according to the 7-38-55 rule first formulated by Albert Mehrabian (*Silent Messages*, 1971). As discussed separately, to whatever degree it calls for refinement, this rule suggests that **much of potential significance is "unsaid", whether or not it is "unsayable"** (*Varieties of Tone of Voice and Engagement with Global Strategy*, 2020).

Ignorance: Arguably the elimination of ignorance could be recognized as the primary objective of science. It describes a condition of being unaware. It can describe the consequence of deliberately ignoring or disregarding important information or facts. A distinction is made between three different types: factual ignorance (absence of knowledge of some fact), object ignorance (unacquaintance with some object), and technical ignorance (absence of knowledge of how to do something). It is far from evident whether and how what is considered science at this time will be deprecated by the future as a form of ignorance -- with what process the science of today can encompass that possibility, or the implications of failing to do so (Nicholas Rescher, *Ignorance: on the wider implications of deficient knowledge*, 2009).

Given the explosion of knowledge in this period of civilization, and its fragmentation into many disciplines, it could well be asked whether the increase in knowledge of some is accompanied by the massive increase in ignorance of others -- or whether the focused acquisition of knowledge ensures that other matters are necessarily ignored. Related questions are discussed separately in relation to a hypothetical "university" (*University of Ignorance: engaging with nothing, the unknown, the incomprehensible, and the unsaid*, 2013):

Reframing the conventional deprecation of ignorance	Re-imagining the intensive farming of people in a knowledge-based society
Varieties of ignorance from various perspectives	
Indicative cognitive challenges of a University of Ignorance	Dynamic of indwelling intelligence: questioning knowing
Avoiding distortions of premature cognitive closure	Palliative care for institutional dementia?
Academic misappropriation of the known-not-known dynamic	Minimal connectivity of knowledge to sustain healthy ignorance
Clues to engaging with the unknown	Living in ignorance in the University of Life
Knowing and Ignoring: a necessary complementarity?	

Especially relevant is both the obvious ignorance about the future and the manner in which the future deprecates the ignorance of the past. A strange ambiguity is cultivated in English through institutional use of "oversight" to safeguard against the consequences of ignorance -- when the term also carries the meaning of failing to recognize matters of significance (due to a "blindspot"), and is then an expression of institutional ignorance (whether intentional or not).

The point has been made otherwise by the notorious declaration of Donald Rumsfeld as US Secretary of Defense regarding the known unknowns (*Unknown Undoing: challenge of incomprehensibility of systemic neglect*, 2008; *Sustaining the Quest for Sustainable Answers on COVID-19: beyond the divisive preoccupation with unquestionable assertions and unanswered questions*, 2020).

Accountability and impunity in application of knowledge

In assertively seeking to displace religion and other methods framed as pseudosciences, science as an institution could be recognized as increasingly subject to a process of enantiodromia. As institutions, both religion and science engage by whatever means in processes to protect their institutions at all costs, however much these are arguably alien to their principles and methods. The implication in both cases is that their respective methods cannot be held to be at fault -- however much they rationalize their respective vulnerability to "sin" and "error" and the necessary remedial responses.

It is then curious to compare the response of religion to heresy with any analogue in science. Religion has a tragic history of handling any suspicion of heresy -- one which has engendered dramatic fragmentation into denominations. Unbelievers continue to be subject to the severest sanctions. Difficulties are however evident in the handling of sexual abuse by clergy with remarkable little recourse to the process of excommunication and defrocking.

The legal profession has a process of disbarment, namely the removal of a lawyer from a bar association or the practice of law, thus revoking any law license or admission to practice law. Disbarment is usually a punishment for unethical or criminal conduct but may also be imposed for incompetence or incapacity.

The challenge for science is potentially greater, although it is now following the "playbook" of religion to a recognizable degree. There is however little evidence of any disbarment or defrocking process. In this regard, a striking case of infringement of ethical principles in the "soft sciences" is offered by the complicity of the American Psychological Association and some of its members in the process of torture (Linda M. Woolf, *Torture, APA, and the Hoffman Report: What Now? What can the APA do to rectify the shameful legacy of psychology's collusion?* *Psychology Today*, 13 July 2015). The APA voted to remove psychologists from settings that operate outside international law, and to ban participation of psychologists in unlawful interrogations. Clearly there is no question of the psychologists in question having their academic qualifications withdrawn, thereby rendering their universities complicit to a degree.

With respect to the "hard sciences", especially with their widespread involvement in development of weapons of mass destruction, there is little evidence of any sanction, given the complicity of science and government in that process, and despite the preoccupations of bodies such as the Pugwash Conferences on Science and World Affairs (Elisabeth Pain, *The Social Responsibilities of Scientists*,

Science, 16 February 2013). Other instances which could be seen as calling for some form of sanction by science are documented by Naomi Oreskes and Erik M. Conway (*Merchants of Doubt: how a handful of scientists obscured the truth on issues from tobacco smoke to global warming*, 2010). No matter how heinous the crime, or how bad the science, academics are not subject to any process analogous to defrocking ("dedoctoring"? deprofessoring"?). As with any priesthood, scientists are effectively above the law.

Arguably however it is an analogue to the process of excommunication which is used by scientists, if not intrinsic to science. Clearly those fully qualified as scientists, who engage in activities disapproved by other scientists (disciplines or institutions), are subject to forms of exclusion from professional associations, conferences, and journals.

A striking example is offered by the widely documented case of Rupert Sheldrake, most notably prior to his own description of the process (*Science Delusion: freeing the spirit of enquiry*, 2020; Ted Dace, *The Anti-Sheldrake Phenomenon*, February 2010). The latter argues that the systematic confusion of science with reductionist dogma is the most dangerous cult of them all. A related perspective, termed epistemological anarchism, was previously articulated by Paul Feyerabend (*Against Method*, 1993; *Science in a Free Society*, 1978).

As with religion, development of the handling of potentially offensive disagreement is not a feature of the scientific method or its modelling processes. How indeed might any incommensurability of simulations be encompassed, as implied by the arguments of Nicholas Rescher (*The Strife of Systems: an essay on the grounds and implications of philosophical diversity*, 1985; *The Limits of Science*, 1999).

. As with religion in the past, science as an institution has demonstrated a high degree of dubious complicity with "mainstream" authoritarianism in the response to the COVID-19 pandemic. The dubious responses of religion to perceptions of heresy are now evident in the response of science to challenges by groups of scientists to the authoritarian view -- uncritically conflated with notions of misinformation, disinformation and conspiracy theories, as a means of protecting science as an institution. This extends to complicity in proposals for government justifications for censorship, "taking down" websites and accounts, and possibly criminal proceedings (*"Careless Talk Costs Lives" -- Fresh Calls To Silence Pandemic Skepticism*, *OffGuardian*, 6 January 2021, # 335; Joseph Mercola, *Spy Agencies Threaten to "Take Out" Mercola*, 1 December 2020).

There is an intriguing contrast with the understanding of profession, especially since many scientists would describe themselves as "professionals" in contrast to their deprecation of ill-informed "amateurs". It is however confusing in that the sense of profession extends beyond the domain of science to include other activities in which some form of training and certification is required. In such cases there may well be provision for a process of de-registration (being "struck-off") and/or de-certification in the event of malpractice. Despite being considered as professionals, no such provision is evident in the case of scientists. Are there no circumstances under which a scientist can be disqualified -- even if their actions are deemed unprofessional?

Disciplines, models and paradigms as simulations?

Science as a simulation? The simulation hypothesis posits a possible "other" in the form of an advanced race of extraterrestrials responsible for its design and maintenance. It is however appropriate to ask whether science could be understood as having been devised by what is tantamount to an "advanced race of extraterrestrials". In that sense, **is the scientific enterprise a form of simulation of reality** engendered by the icons of science?

Those iconic figures at the origin of the scientific method (and sustaining the enterprise can indeed) be recognized as "advanced". Their very particular relation to reality and its observation could be understood as "extraterrestrial". What is framed by their endeavours could well be recognized as a "simulation", notably in the form of the disciplined elaboration of models and paradigms. The argument is somewhat reminiscent of the approach of social construct theory as a theory of knowledge.

This raises the question as to whether every discipline is then a form of simulation -- and what purposeful activity should be recognized as a "discipline", or not. Whilst there is extensive reference to "academic disciplines" by science, there is relatively little sense of how many there are and how they might be scientifically ordered. The sense of discipline readily becomes indistinguishable from the subjects which are a focus of classification. Thus *Wikipedia* dilutes the sense of discipline by offering a *List of academic fields*. One early exercise -- distinguishing 1,845 "disciplines" in contrast to subjects and fields -- is presented separately (*Intellectual Disciplines and Sciences: cross-referenced to world problems*, 1976).

Any such estimate is of course subject to rapid increase as a consequence of the fragmentation of knowledge. There is some irony to the fact that science is unable to determine by how many disciplines it is characterized -- or how they might best be ordered, as notably argued with respect to the Mathematics Subject Classification. The issue is of significance to any understanding of multidisciplinarity and transdisciplinarity, beyond any restrictive limitation to science (*Periodic Pattern of Human Knowing: implication of the Periodic Table as metaphor of elementary order*, 2009).

Such an argument raises the question as to whether a religion is a discipline -- or a physical activity, such as horse riding or judo -- readily claimed to be a "discipline" by its practitioners.

Models implying possible simulation? There is an extensive literature on the simulation of models -- of which "world wodels" are the epitome, such as gave rise to the Club of Rome's *Limits to Growth* (1972).

Since then far more ambitious approaches to modelling global dynamics have been developed -- as with FuturICT, envisaged as a "Living Earth Platform", namely *a simulation, visualization and participation platform to support decision-making of policy-makers, business people and citizens.*

Comparable is the Joint Simulation System initiated in 1995 (Kari Pugh and Collie Johnson, *Building a Simulation World to Match the Real World*; *The Joint Simulation System*, January-February 1999, p.2; James W. Hollenbach and William L. Alexander, *Executing the*

DOD Modelling and Simulation Strategy: making simulation systems of systems a reality, 1997). This has seemingly now morphed, via the Total Information Awareness program, into the Sentient World Simulation (SWS). It is intended as a "*synthetic mirror of the real world with automated continuous calibration with respect to current real-world information*" with a node representing "every man, woman and child" -- presumably including those responsible for the SWS itself.

Increasingly however, collective strategy is framed by a carefully designed model, envisaging various scenarios, especially in the case of multinational corporations. This is most obviously the case with respect to military organization in anticipation of security threats. The models (and their scenarios) are variously tested by simulation. This therefore offers a sense in which collectives can be understood as living within a simulated reality.

Ideologies and religions, given their unique worldviews, could be recognized as offering a simulated reality within which their adherents "live and move and have their being". This frames the provocative question as to whether the set of major world religions are more fruitfully recognized as complementary simulations (Stephen Prothero, *God Is Not One: the eight rival religions that run the world -- and why their differences matter*, 2010). Such a perspective is reminiscent of the complementary modules necessary for automatic translation.

There is an irony to the fact that the same term "model" is applied to the exemplars of beauty in the fashion industry. The metaphoric implications are notably worth exploring given that one of the original futurists, and articulator of models, Herman Kahn was based at the Hudson Institute in Croton-on-Hudson (a little-known town named after the base of Pythagoras). At the time, this was also the HQ of the World Modelling Association, whose preoccupation was the world of fashion models. To what extent can conceptual models then be usefully understood as versions of reality variously "dressed up" for particular purposes as with a Barbie doll -- dressed and undressed in the process of conceptual play?

Paradigm as simulation? Disciplined modelling could be understood as framed and determined by a paradigm -- potentially to be understood as a simulation of a more fundamental nature.

Cognitive revolutions with respect to conventional frameworks are explored in terms of a paradigm shift, understood as a fundamental change in the basic concepts and experimental practices of a discipline. This raises the question as to how this might be reflected in a simulation. Intriguing in that regard are continuing calls for a paradigm shift (Hazel Henderson, *Paradigms In Progress: life beyond economics*, 2018). Could current arguments for a Global Reset then be understood as rebooting the simulation in some way -- if only in the process of having to engage with that proposal?

Whether for a collective or an individual, any such "revolution" merits exploration in the light of the vigorous debate between Thomas Kuhn, as originator of thinking in this regard (*The Structure of Scientific Revolutions,* 1962), and critics (Karl Popper, *Conjectures and Refutations: the growth of scientific knowledge*, 1963). However, with respect to any sense of an encompassing simulation, missing is any understanding of how it might embody paradigms deemed incommensurable -- especially when respectful of the criterion of falsifiabilty or not.

Memory palaces and gardens as simulations? The term "topics" is derived from early reference to *topoi* (places) in which memorial content could be aggregated. This is of particular interest to the mnemonic aids by which memory is organized in the method of loci, a traditional imaginal technique variously described (Frances Yates, *The Art of Memory*, 1966; Alexander Luria, *The Mind of a Mnemonist: a little book about a vast memory,*1968; Lynne Kelly, *The Memory Code*, 2016).

Associated with this method are understandings of "memory palaces", "memory theatres" and an interpretation of "memory gardens", "memory tombs" and memorials. A focus on "topography" -- even enhanced by maps -- is notably to be recognized in the immersive experience offered in online realms and the construction of artificial worlds, whether as fantasy gaming or otherwise. These have long featured in fiction. Science fiction now offers an equivalent in the form of "stargates", as discussed separately (*Topology of a Renaissance "Stargate" of Higher Dimensionality: complementary ways of imagining engagement with otherness*, 2018)

"Narratives" as simulations? Recent years have seen increasing reference to the use of narrative and the manner in which it is crafted by media controlled by authorities and by social media susceptible to skillful influence. More readily recognized as a form of simulation is the sense of a dominant narrative as used in description of the lens in which history is told by the perspective of the dominant culture. It has been described as an "invisible hand" that guides reality and perceived reality. It can be defined and decided by the sociopolitical and socioeconomic setting someone lives his or her life in. This is recognized as similar in some ways to the ideas of metanarrative or grand narrative.

Reality distortion fields as simulations? As discussed separately with respect to *Models, metaphors and reality distortion fields* (2017), the phenomenon of a reality distortion field (RDF) was notably recognized in relation to the capacity of Steve Jobs's to convince himself and others to believe almost anything with a mix of charm, charisma, bravado, hyperbole, marketing, appeasement and persistence.

Rather than charisma as such, the entrepreneurial world has recognized the role of RDFs as projected by other key personalities such as Egon Musk -- most notably through the use of voice. Its wider potential has been argued (*Engendering a reality distortion field for climate change: the role of charisma?* 2019).

An RDF is said to distort an audience's sense of proportion and scales of difficulties, making them believe that the task at hand was possible. Jobs was said to use the RDF to appropriate other's ideas as his own, sometimes proposing an idea to its originator after dismissing it the week before. The process is clearly of relevance to any understanding of the attraction of cults and distinctive cultures (*Reality distortion, psychosocial torsion and psychological torque*, 2019). A "narrative", as currently crafted and cultivated, could be considered in that light.

Various commentators have alluded to an RDF in the case of Donald Trump (*Trump's Reality Distortion Field*, *WNYC*, 13 January

2017; *Trump's Reality Distortion Field will be Stronger with Trump as President than Candidate*, *Pragmatically Distributed*, 23 January 2017; Matt Dusenbury, *The One Thing Steve Jobs And Donald Trump Have In Common: one person's craziness is another person's reality*, 29 March 2016).

Arguably a credible simulation is effectively a reality distortion field, as could be implied by the early argument of Aldous Huxley:

> To make biological survival possible, Mind at Large has to be funneled through the reducing valve of the brain and nervous system. What comes out at the other end is a measly trickle of the kind of consciousness which will help us to stay alive on the surface of this particular planet... Most people, most of the time, know only what comes through the reducing valve and is consecrated as genuinely real by the local language. (*The Doors of Perception*, 1954)

Self-engendered simulation?

The points made above at least imply that there is considerable scope for imagining possibilities of engaging with whatever is framed as otherness. Enough is unknown -- even immensely so -- that constraint within the conventional frameworks proposed, and variously asserted authoritatively, is an option, but only an option.

There is therefore a case for assuming that the processes of cognition enabled by the brain -- if fully "used" -- can be understood as engendering, operating and maintaining a simulation of some form. In that sense one can understand oneself as living within such a simulation. Understanding in this way is however only an option. Whether such a simulation exists in any meaningful way, denying that it does so is indeed another option.

Reinvention: More meaning can be given to this seemingly abstract understanding through the occasional references to "reinventing oneself", "reimagining oneself", and even to " redesigning oneself". These are most evident in the publicity given to a radical change of style of some celebrities.

Such reinvention may be recognized in the form of "living a dream", possibly deprecated as "living in a dream". The inspiration offered by the American Dream might be understood in such terms. However such a dream can also be recognized as a "bubble", especially given the many references to " living in a bubble". Curiously the promotion of "global" and "globalization" invites recognition in that light (pricking **)

A related process is evident in conversion, especially religious conversion with any accompanying change of name. Some gurus are known to adopt a succession of names associated with their understanding of their own development, as with Adi Da (Da Free John, Da Love-Ananda, Da Kalki, etc) or Rajneesh (Bhagwan Shri Rajneesh, Osho).

Some sense of the process is also offered by reference to "reproducing oneself". This may be evident in efforts to reflect oneself in an organization, a work of art, a legacy, or through more obviously through engendering children (metaphorical or otherwise). The phrase may be used critically to deprecate the objective argument of someone as being simply a process of self-reproduction (*se reproduire* in French).

With respect to any collective, the appeal in many countries of the slogan of "making a country great again" is a reflection of the aspiration to reinvention.

Split and multiple personalities: Now known as dissociative identity disorder (DID), this controversial "disorder" is characterized by the maintenance of at least two distinct and relatively enduring personality states. Potentially these could then be recognized as simulations, namely as a condition in which the individual (however understood) "operates" distinct modalities of relatively coherent expression. When one exhibits a greater degree of dominance and control, this may be recognized in some cultures as possession.

The controversy associated with DID has seemingly resulted in the distinctive recognition of multiplicity (or plurality) understood as the psychological phenomenon in which a body can display multiple distinct personas -- distinctive behaviour patterns between which some form of switching occurs. People who experience multiplicity are described as a "multiple", while a person who does not experience it is described as a "singlet". This understanding is variously related to dissociative identity disorder, identity disturbance, and other dissociative disorders. Some individuals describe their experience of multiplicity as a form of neurodiversity, rather than something that demands a diagnosis.

Emerging understanding of these processes suggests that it can be readily associated with notions of simulation, usefully framing the question of what is "designing" and "running" the simulations. Archetypal examples of individuals combining kindness to some with inhuman brutality to others are typically highlighted in the case of the Mafia leadership, drug lords, and interrogators.

Collective equivalence? More intriguing is the evident collective condition in which a group could be usefully characterized as having a dissociative identity disorder -- or be recognized as a "multiple" (rather than a "singlet"). Publicity regarding the contrasting behaviours of the US military merit exploration in this light -- slaughtering civilians versus citizen protection. The role switching between "good cop" and "bad cop" is well-recognized and cultivated. The many seemingly inexplicable inconsistencies in a nation's foreign policy could be understood from this perspective -- especially when embodied in its leadership.

There is a sense in which the array of administrative departments of government or of any corporation could be explored as a condition of "multiplicity" -- especially given the typical condition of the "right hand" not knowing what the "left hand" is doing. To what extent is each such division to be recognized as a simulation in systemic terms? The question is especially pertinent to the extent that there is concern with the coherence of governance -- potentially undermined by the dynamics of some division or in the relations between them.

Such question are of particular relevance to the array of disciplines in a knowledge-based society -- especially given the many appeals for

an integrative or unitary approach that remains elusive. To what extent is a discipline to be considered as a simulation? Who engenders and operates that simulation?

Such questions may acquire ever greater significance with the emerging dependence on AIs in relation to collective intelligence. Current explorations of the relevance of swarm intelligence, and notions of a hive mind, frame the question of the nature of the engagement with an array of AIs to which (cognitive) functions have been effectively delegated. The question may be as relevant for the individual as for any collective.

Homunculus simulation?

Alchemy and hermetic sciences: Any sense of "redesigning oneself" could also recall the preoccupation with the creation of a "homunculus" -- as a declared objective of alchemy. The homunculus was understood to be an "artificial human being". How the ****the of modern day humans merits recognition as "artificial" is clearly a matter of controversy. The extensive focus on humanoid robots endowed with artificial intelligence offers further reflection.

The nature of a honunculus, as originally understood, is more fruitfully explored in the light of the psychological arguments in the commentary of Carl Jung (*Alchemical Studies*, 1983). This equate the homunculus with the Philosopher's Stone, and the "inner person". The dubious traditional descriptions of how to make a homunculus could be readily understood as a coded distraction, given the secrecy considered necessary by the practitioners of alchemy in a hostile environment.

As noted above, the status of alchemy as a pseudosocience -- as a challenge to the scientific method -- merits careful reconsideration in the light of the extensive focus of Isaac Newton on alchemy. Prominent members of the Royal Society, like Robert Boyle, were also alchemists. Further, many kings, queens, princes, princesses and other territorial rulers and aristocrats were deeply interested in alchemy. How to explain the dependence on astrology of such as Ronald Reagan -- or the considerable importance of *feng shui* in design and urban planning in some Eastern cultures?

As argued by William Newman, most current debates about boundaries between nature and artifice, or boundaries between proper and improper scientific exploration, echo debates that run through the history of alchemy (*Promethean Ambitions: Alchemy and the Quest to Perfect Nature*, 2004).

Homunculus as a scientific metaphor: Alchemy is of course systematically deprecated by scientific disciplines as a pseudoscience. Ironically it is as a metaphor that science now uses the term. Reference is made to "homunculus" in disciplines such as psychology as a teaching or memory tool. There it describes the distorted scale model of a human drawn or sculpted to reflect the relative space human body parts occupy on the somatosensory cortex (the "sensory homunculus"), the motor cortex (the "motor homunculus") -- the cortical homunculus (Christopher Badcock, *Come Back, Homunculus -- All Is Forgiven! Psychology Today*, 30 July 201; Alejandra Sel, et al, *The Emotional Homunculus: ERP evidence for independent somatosensory responses during facial emotional processing*, *Journal of Neuroscience*, 34, 2014, 9).

As articulated by Nicholas V. Swindale (*Visual cortex: Looking into a Klein bottle -- arguments based on mathematical topology may help in understanding the organization of topographic maps in the cerebral cortex. Current Biology* 6, 1996, 7):

> The English neurologist Hughlings Jackson inferred the presence of a topographic map of the body musculature in the cerebral cortex more than a century ago, from his observations of the orderly progressions of seizure activity across the body during epilepsy. Topographic maps of one kind or another are now known to be a ubiquitous feature of cortical organization, at least in the primary sensory and motor areas. Every medical student learns that there is a distorted map of the body surface in somatosensory cortex, known as the 'homunculus', and that in the visual cortex there is an orderly map of visual space....
>
> I shall also discuss a demonstration that certain receptive-field properties, which may be indirectly related to direction selectivity, can be represented as positions in a non Euclidian space with a topology known to mathematicians as a Klein bottle. First, however, it is appropriate to consider the experimental data.

Somewhat ironically, the challenge for psychology and neuroscience has been framed as one of eliminating the homunculus (*The Homunculus problem*, *Principia Cybernetica*; J. R. Schmidt, et al, *Erasing the Homunculus as an Ongoing Mission*, *Journal of Cognition*, 3, 2020, 1). For the latter:

> The prefrontal cortex has long been thought to subserve both working memory and "executive" function, but the mechanistic basis of their integrated function has remained poorly understood, often amounting to a homunculus. This paper reviews the progress in our laboratory and others pursuing a long-term research agenda to deconstruct this homunculus by elucidating the precise computational and neural mechanisms underlying these phenomena. (T.E.Hazy, et al, *Banishing the Homunculus: making working memory work, Neuroscience*, 139, 2006, 1)

Astronomy has chosen to name one nebula as the Homunculus Nebula, embedded within the Carina Nebula -- and to simulate its dynamics (*Eta Carinae's Homunculus Nebula Now in 3D*, NASA, 2014; *Astronomers Bring The Third Dimension To A Doomed Star's Outburst*, NASA, 2014; Benedict J. R. Fitzpatrick, et al, *Simulating the Homunculus Nebula of Eta Carinae with an Innovative Multi-mass SPH Technique*, *ResearchGate*, January 2010).

Immersive software comprehension: As described by Steve Ditlea (*Flatland*, *Computer Graphics*, 25, 2002 9):

As visualizations have become more dependent on intricate computer code running on large arrays of parallel processors, users have benefited from software tools that allow them to graphically depict complex natural or technical processes. Now, a new visualization technique is also enabling them to view the underlying program's activity and information flow to better understand and troubleshoot their simulations. Developed at the University of New Mexico's Albuquerque High Performance Computing Center (AHPCC), the new tool is meant to give users the ability to immersively enter and interact with software systems and simulations like a "little person in the brain of the machine" -- akin to the "homunculus", a mythic creature once thought to reside inside the human mind, hence the overall designation of the Center's **Homunculus Project**. The software environment itself, used for viewing both simulations and their data flow, is called Flatland, an allusion to Edward Abbott's nineteenth-century novel of interdimensional fantasy. *[emphasis added]*

Profiling as homunculus construction? There is an extensive focus on construction of models of various characteristics of the human being by many disciplines: modelling the body, modelling the personality, modelling the brain, modelling behaviour, etc. This merits comparison with construction of a homunculus -- "a little man" (András Lórincz, *Modelling the 'Homunculus'*, *ERCIM New*s, 53, April 2003). Could the current massive investment in user profiling be understood in this light?

Strategic use of non-scientific language?

Necessity for coded communication: There is a degree of probability that the much-disparaged published information on alchemical processes is most usefully explored as coded communications between the informed -- namely those faced with extreme pressures from their critics, especially in the past (Marie-Louise von Franz, *Alchemy: an introduction to the symbolism and the psychology*, 1980).

Curiously the situation might be compared to the use of coded messages during World War I and II (*Secret: List of Coded Words*, *National WWI Museum and Memorial*, 19 March 2018; Matthew Gaskill: *"Molasses tomorrow will bring forth cognac": the BBC's fascinating coded messages to the French Resistance*, *War History Online*, 1 January 2019; *BBC's secret World War Two activities revealed*, *BBC News*, 3 September 2019; *World War II BBC Secret Messages to Resistance*, *WWII Netherlands Escape Lines*).

The original alchemical recipe of Paracelsus for the creation of a homunculus merits exploration in this light: *That the sperm of a man be putrefied by itself in a sealed cucurbit for forty days with the highest degree of putrefaction in a horse's womb, or at least so long that it comes to life and moves itself, and stirs, which is easily observed...*

Decoding failure by science? Given the seriousness with which encryption was considered during World War II, and its relation to the work of Alan Turing on the Enigma machine, it might be asked whether conventional "science" (as with the German military) has been completely fooled by the alternative language of alchemy -- as was specifically the intention in the BBC's coded messages: *Molasses tomorrow will bring forth cognac*.

Has science effectively become the victim of a centuries-old joke by alchemists -- as with the challenge to comprehension of metaphor by those suffering from an autism spectrum disorder? Any use of metaphor is typically deprecated in science writing, although occasionally defended (Caleb A. Scharf, *In Defense of Metaphors in Science Writing*, *Scientific American*, 9 July 2013).

As argued by Mary Baine Campbell (*Artificial Men: alchemy, transubstantiation, and the homunculus*, *Republics of Letters*, 1, 2010, 2):

Metaphor is a figure of resemblance, even if its literary charm and its pedagogical powers depend on the kick of difference. In the period immediately preceding the seventeenth century's grand eschewal of metaphor, especially in Protestant nations that detested the Catholic mystery of the Eucharist with its overtones of cannibalism, the fundamentally metaphorical process of alchemical transformation fascinated many of those who considered the natural world in ways we might now consider precursors to the "properly" scientific.... A look at the history of European aspirations to the artificial production of a man may tie the art of alchemy, at least in its popular and allegorical forms (but perhaps even in its more pragmatic metallurgic form), to the history of the fate of metaphor—the supreme figure of early modern European poetry....

Why so much and such fierce resistance to a figure of speech? Could that abiding sense of poets as magicians, and grammar as magic, attest to an equally abiding sense that metaphorical predications can institute reality? Have the subsequently contemptuous history of the divine/sacred/black art and the characterizing absence of the figure of metaphor from the reportage of experimental science (and the biblical interpretation of fundamentalist Christianity) been partners in a multimillennial narrative constructed to "other" the power that can make the Same?

Difficulties in the pseudoscience of metaphorical expression have been taken far more seriously by the Pentagon with regard to the use of "language" generally, especially including figurative language. The concern arose from new sensitivity to the use of such language in articulating what is perceived as a potential strategic threat.

Analysis of failures with respect to Iraq and Afghanistan resulted in the announcement of the Minerva Research Initiative (MRI) in 2008, as a US Department of Defense sponsored, university based, social science research program (*Mobilizing Media in the Context of Terrorism*). More specifically, this first took the form of a Broad Agency Announcement of a *Socio-Cultural Content in Language* program by the Intelligence Advanced Research Projects Activity (IARPA-BAA-09-01) and later of a *Metaphor Program* (IARPA-BAA-11-04, 2011). The justification is clarified by Alexis C. Madrigal (*Why Are Spy Researchers Building a 'Metaphor Program'? The Atlantic*, 26 May 2011).

Given reference to Minerva, there is however a certain irony to the judicious use of names of deities in the symbolism of "hard headed" modern initiatives -- in addition to another use of MRI (Magnetic resonance imaging) as a technique for scanning the human body, and

notably the brain.

The IARPA initiative builds on the seminal work on conceptual metaphor of George Lakoff and colleagues (*Metaphors We Live By*, 1980; *Philosophy in the Flesh: the embodied mind and its challenge to western thought*, 1999). However, as argued by Robert Albro, it appears uninterested in or unaware of questions raised by debates around his work, or of the larger field of metaphor studies (*Troping the Enemy: metaphor, culture, and the big data black boxes of national security*, Secrecy and Society, 2, 2018, 1)

Misplaced concreteness and mirroring

As argued with respect to the language of alchemy, the nature of science renders it vulnerable to the trap of misplaced concreteness. As articulated by the policy scientist Geoffrey Vickers: *A trap is a function of the nature of the trapped* (*Freedom in a Rocking Boat: changing values in an unstable society*, 1972). This is especially evident in the problematic response of science to the nature of human values, culture and aesthetics, as argued by C. P. Snow (*The Two Cultures and the Scientific Revolution*, 1959).

The restrictive materialist focus of the "natural sciences" reinforces cognitive inability to engage with subtlety, however questionably explored by the so-called pseudosciences. From that perspective, the superficial nature of reality explored by science invites its characterization as susceptible to pseudophilia -- extending use of that term from attraction to fake things.

Less superficial perspectives are offered by Alexander Wendt (*Quantum Mind and Social Science: unifying physical and social ontology*, 2015) and in a report for the Scientific and Medical Network by Harald Walach (*Galileo Commission Report: Beyond a Materialist Worldview – Towards an Expanded Science*, 2020).

There is an ironic complementarity to the institutions of Catholicism and Science, with the first having condemned Galileo's scientific insights -- now readily recognized as bedevilled by pseudophilia (of which paedophilia is but an instance). Whereas the second is unable to comprehend fruitfully the fundamental role of belief -- only to find itself bedevilled by pseudophilia unrelated to the existential concerns of human beings. Both have a desperate institutional need to defend their methodologies at all costs, especially when the purity of their methodology is threatened by the implication of icons of their faith in some form of pseudophilia.

"Materialist" vs "Feminist"? The "natural sciences" and "hard sciences" are renowned for their focus on requisite proof in material terms -- despite the challenging insights of quantum mechanics and creative indulgence in a variety of speculative hypotheses. There is however considerable irony to the possibility that the feminist critique may be more rigorous in calling into question misleading assumptions than is conventional science.

A striking example is offered by the reference of astronomers to "sunrise" and "sunset". The terms are a convenience from a geocentric perspective, but their use is a form of disinformation reinforcing an illusion -- against which Galileo struggled so valiantly centuries ago. By contrast feminists are scathing in their critique of sloppy use of terminology -- for convenience -- given the implications of such usage, as with reference to "chairman" and "mankind" for example. Concerns with political correctness, however excessive, are reflective of degrees of rigour to which science has proven to be averse.

Given the increasing reliance of science on a quantum perspective, **the question of interest in relation to "objectivity" is the level at which the reification of objects is considered "convenient" -- irrespective of the degree to which this reinforces misunderstanding**.

Science frames its focus in terms of "laws" which are indeed held to be unrelated to the laws of society -- although both imply notions of governance. There is however some relevance in the understanding of "legal fiction" in the latter case. Such a fiction is a fact assumed or created by courts, which is then used in order to help reach a decision or to apply a legal rule. The interrelationship between science, science fiction, legal fiction and the law merits review from that perspective (Christopher Brown *Will There Be Justice? Science Fiction and The Law*, *Tor*, 7 August 2019). An analogue may in fact govern any reference to "sunrise" by science, for example.

Homunculus fallacy: In philosophy the homunculus argument is recognized as a fallacy whereby a concept is explained in terms of the concept itself, recursively, without first defining or explaining the original concept. Given the restrictive framing accorded in practice to paradox by both science and religion, it might be asked whether the denial of their complementarity is indicative of the vulnerability of both to some such fallacy.

This frames the question as to whether self-simulation is a fallacy in such terms, or whether it points to the paradoxical nature of both self-simulation and fallacy (A Lörincz and G. Szirtes, *Towards a Theory of Consciousness: proposal for the resolution of the homunculus fallacy with predictions*, *arxiv.org*, 2003)

Love as science or pseudoscience? Figurative language makes extensive reference to aesthetics and love in a manner which may or may not be orderly in any scientific sense. Disciplined efforts may be made to order the terms, however that may seem appropriate (*Questionable Classification of Figures of Speech -- as fundamental to the need for powerful rhetoric in governance*, 2016).

The irony for science is whether and how scientists may recognize love (or similar values). **Is it possible for a scientist to fall in love**, without being deemed to have succumbed to a dubious pseudoscience -- scientific apostasy (Sian Townson, *Why people fall for pseudoscience (and how academics can fight back)*, The Guardian, 26 January 2016; Aidan Reill, *The Pseudoscience of Love*, 2012)? Provocatively it might be asked whether technocrats can reproduce without betraying their belief system?

Or is love then simply reframed for a true scientist in terms of plumbing and pheromones? (*Why We Fall in Love: the science of love*, *Examined Existence*; *The Science of Love*, *BBC*; 17 September 2014; Bonnie Christian, *What is love? Science kinda has the answer*, *Wired*, 7 August 2017; Gayle Brewer, *What is love? Here's the science...*, *The Conversation*, 17 May 2016; Theo Harrison, *The Science of Love: lust, attraction, attachment and brain chemistry*, *The Minds Journal*).

More curious, as a "pseudoscientific disposition", is the capacity to "love science" -- especially in the case of a scientist (Michael Shermer, *For the Love of Science: combating science denial with science pleasure*, 2018; *Teaching a love of science*, *Australian Academy of Science*; *Women love science – what a surprise! The Independent*, 31 March 2013; Ted Widmer, *Love of science, not Trump's ignorance, will make America great again*, *The Guardian*, 3 July 2020; Carlo Rovelli, *Winston Churchill's remarkable love of science*, *The Spectator*, 24 October 2020).

There is of course an extensive literature on the arts of courtship and lovemaking -- whether or not the strategic use of the associated set of skills is to be understood as a discipline and recognized as a science.

Objectivity versus Subjectivity: The fundamental controversy regarding the relationship between science and not-science could be understood as framed by that between objectivity and subjectivity (Max Deutscher, *Subjecting and Objecting: an essay in objectivity*. 1983; *A Subjective Objection: Objecting to Subjection -- interplay of questions enabling transcendence of fundamental dilemmas?* 2018).

As polar extremes, it might be asked how the suffix "ject" suggests a fundamental (or transcendent) perspective on their relationship. Similarly it can be asked what prefixes in addition to "ob" and "sub" are of relevance to that question, in the light of earlier considerations (*Exploration of Prefixes of Global Discourse: implications for sustainable confidelity*, 2011; *New Paradigms via a Renewed Set of Prefixes? Dependence of international policy-making on an array of operational terms*, 2003; *Prefix "Re-cognition" as Prelude to Fixing Sustainability -- "Pro" vs "Con" ? Speculative review of missing emphases potentially vital for psychosocial balance*, 2017). Such questions are of particular relevance in relation to controversial social processes of objecting to conditions and subjecting selected groups to particular constraints.

It is especially curious that strategic discourse in English places considerable emphasis on "having an objective", pursuing one, and investing in it. By contrast little credence is given to "having a subjective" and investing in it. Science in particular would deprecate any such consideration. Also curious is that the study of a particular set of objects may be described as a subject -- or the disciplined practice of an art? Can the practice of science also be considered an art?

There is however the possibility of *explanation as interplay of projection and "conjection"?* (2017). Whilst conjecture may indeed be valued in contrast to projection (and the framing it offers for strategic projects), of interest are the possible *surrogates of "conjection" as an unrecognized cognitive process?* (2017).
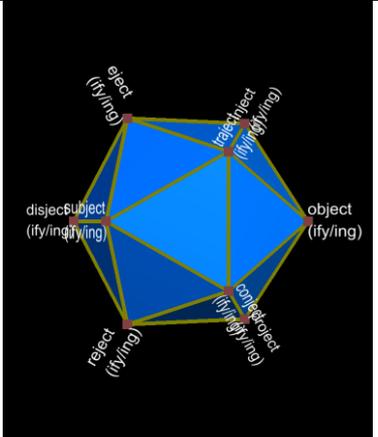
Especially intriguing in that regard is the recognition of the variety of geographical map projections and the distinctive distortion with which each is associated ((Robert Lloyd and Theodore Steinke, *Recognition of Disoriented Maps: the Cognitive Process*. *The Cartographic Journal: The World of Mapping*, 1984; see *List of map projections*). Now known as cognitive geography, the cognitive challenges of cartography have been pointedly highlighted in an early paper of Barbara Petchenik (*Cognition in Cartography*. *Cartographica*, 19, 1977)

Relating forms of "objectivity" and "subjectivity" through exploratory mappings: The table below is an exercise in interrelating words ending in "-ject", whether or not they may have accepted suffixes -- given the sets of prefixes that may be associated with "-ject". A distinction is suggested by noun (N) and verb (V) forms -- and possibly adjectival (A) forms.

It is assumed that "-ject", with its etymological origins in the Latin *jacere* (to throw), is indicative of a fundamental cognitive engagement with externality in contrast with internality -- across the boundary defining a system in relation to any sense of otherness. Metaphorically it is perhaps usefully compared with a cognitive "Big Bang", typical of creativity, and resulting in the reification of objects. These may either be incorporated as an articulation of the system or (r)ejected as inappropriate to its coherence -- then variously "remaindered" or "left behind". The processes include imbuing objects with significance (as with the pattern of pieces on a chess board) and "world-making", or the practice of "throwing" clay in pottery (with its metaphorical connotations).

Tentative organization of forms of "-ject" into polar extremes				
(irrespective of whether terms and grammatical variants are in common usage)				
Polarity		Extreme A		Extreme B
	suffixes: ion / ify / ing / ive	N: Dodecahedral mapping? V: Icosahedral mapping?	suffixes: ion / ify / ing / ive	N: Dodecahedral mapping? V: Icosahedral mapping?
Engagement?	Object	N: treatment of X as an object presented to the senses	Subject	N: subordination of X; X as a subject of study
		A: objective		A: subjective
		V: objecting to X (as a form of protest)		V: subjecting X to constraints; to subjugate X
Reformation?	Project	N: an envisaged undertaking	Conject	N: conjecture; a conception
		V: envisaging an undertaking; transfer of meaning onto X; extrapolating		V: to conceive or imagine; to envisage a possibility
Gatekeeping?	Eject	N: ejection of non-believers; "left-behind"	Reject	N: rejection of opponents; a reject; remaindered; denial
		V: to eject X from within the system		V: to reject X as externally encountered; to deny
Development?	Inject (interject)	N: injection of X; inoculation; indoctrination	Adject	N: addition of X
		V: to inject X into a whole		V: to add X to a whole
Relational?	Disject	N: dispersal; distribution	Traject	N: transmission; conveyance
		V: to disseminate X		V: to transmit; to convey; to channel; to supply
Qualitative effect?	Abject	N: degradation; outcast; worthless	Deject	N: dejection; desperation
		V: to render abject; to dishonour; to		

	devalue		V: to dishearten; to dispirit; to discourage

The assumption is made that the **noun forms** lend themselves more appropriately to presentation on the **faces** of a polyhedron -- hence the use of the dodecahedron below. Such faces are especially consistent with a sense of an extended "field" of experience. By contrast the **verb forms**, with the dynamics of the activity they suggest, lend themselves more appropriately to presentation on the **vertices** of a polyhedron -- hence the use of an icosahedron below. The tentative indication of polar extremes is held by opposite faces in the case of the dodecahedron, and by opposite vertices in the case of the icosahedron.

Indicative animations of cognitive operations in 2D and 3D for mnemonic purposes		
Dodecahedral mapping (12 faces)	Mapping in 2D star formation	Icosahedral mapping (12 vertices)
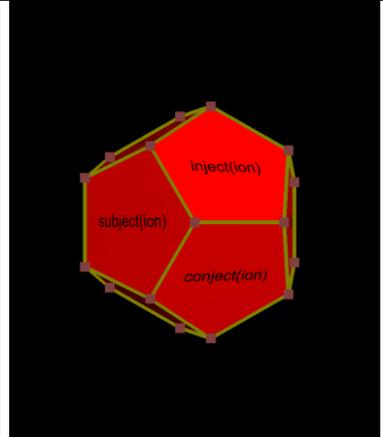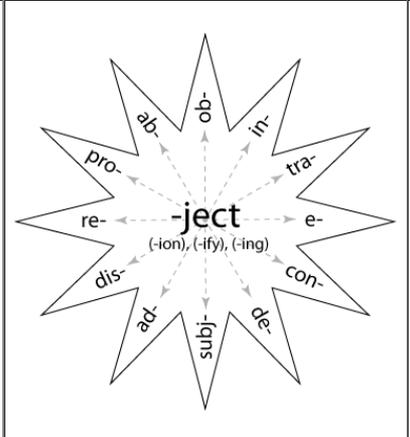
Further understanding is suggested by unfolding the dodecahedron (below left), into a "flat" array of distinct domains -- thereby depriving the set of the integrative coherence of their configuration around a centre. Such a centre -- as the instigating locus of any creative "Big Bang" -- is clearly equivalent to that of the icosahedral form with its emphasis on the dynamics along the axes through it between polar extremes.

The relation between the two polyhedral mappings can be suggested by an animation morphing between the geometric duals (below right). This is suggestive of the underlying cognitive "conflation" of the variants distinguished grammatically through the suffixes.

Eliciting further insight from geometrical transformation of polyhedral mappings	
Unfolding of dodecahedral mapping	Morphing between dodecahedral and icosahedral forms
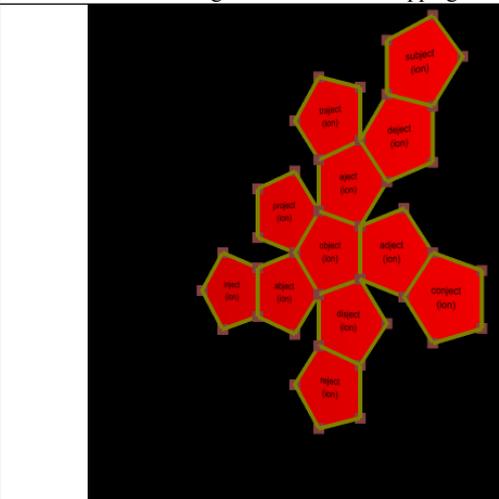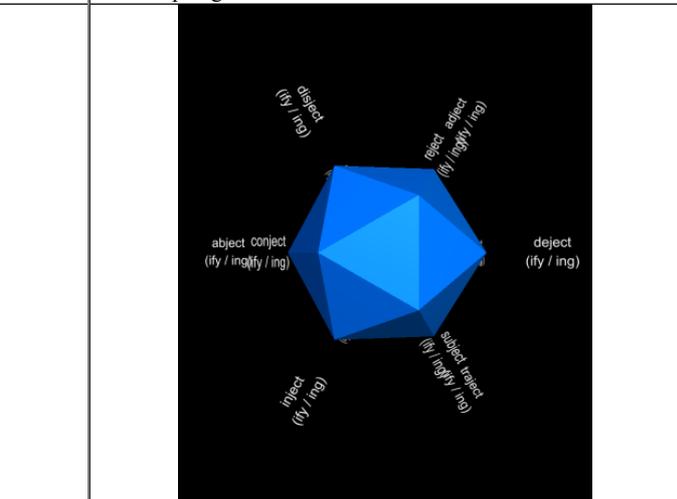
Animations made with *Stella Polyhedron Navigator*	

Ordering patterns of articulation?

Systemic insight from other languages: The above exercise is clearly biased by its focus on English and the degree of etymological dependence on Latin and the cognitive sense of "throwing" -- and what is "thrown" through which "otherness" is thereby engendered. It calls for refinement in the light of other languages and their nuances. It is however assumed (provisionally) that it is indicative of a limited set of cognitive operations which can be clustered into polar extremes however these may be generically understood and labelled as suggested above.

A complementary pattern could well emerge from use of an antonym of "-ject" of systemic significance. This might encompass the corresponding sense of catch or capture. However there may be a more fundamental cognitive combination of both throwing and catching as suggested in the classic by Eugen Herrigel (*Zen in the Art of Archery*, 1948). The nature of that combination is evident in the degree to which one is "caught" by anticipation in "throwing" a dice. This would be consistent with an understanding of mirroring as explored below.

Distinctions: The exercise made use of the limited set of words ending in "-ject" and clustered these into a 12-fold pattern, notably by

combining the variants of inject: interject, introject, superinject. Clearly this frames the question as to whether a 12-fold pattern is of particular systemic significance in cognitive terms. The importance of this pattern is implied by the many examples of its use (*Checklist of 12-fold Principles, Plans, Symbols and Concepts: web resources*, 2011).

Potentially of greater relevance are the arguments in that respect of Arthur M. Young (*Geometry of Meaning*, 1976), as discussed separately (*Characteristics of phases in 12-phase learning-action cycle*, 1998), with its separate adaptations to both sustainable development and dialogue. Young's approach has the advantage of associating distinct operational significance with each of the 12 "functions". This contrasts with the more generic approach of Buckminster Fuller in his magnum opus (*Synergetics: Explorations in the Geometry of Thinking*, 1975/1979), as discussed separately (*Geometry of Thinking for Sustainable Global Governance: cognitive implication of synergetics*, 2009).

The focus on 12 necessarily evokes the question as to whether the set of functions could be of greater size -- and when. Here a determining constraint is the number of such functions that could be coherently and memorably handled as discussed separately (*Time for Provocative Mnemonic Aids to Systemic Connectivity?* 2018).

N-foldness: Of further relevance is exploration of the nature of the opposition (or fundamental "disagreement") between polar extremes in terms of oppositional geometry. This follows from study of the geometry of logical negation (associated with paraconsistency). It is similar to, but different from, diagrammatic logic, graph theory or knot theory.

A particular focus is the 16 possible truth functions of two binary variables (namely the 16 Boolean logical connectives), and the depiction of their configuration in 3D on a rhombic dodecahedron, or in 4D as a tesseract, as discussed and illustrated separately (*Reframing forms of connectivity through the logic of oppositional geometry*, 2020; *Oppositional Logic as Comprehensible Key to Sustainable Democracy: configuring patterns of anti-otherness*, 2018).
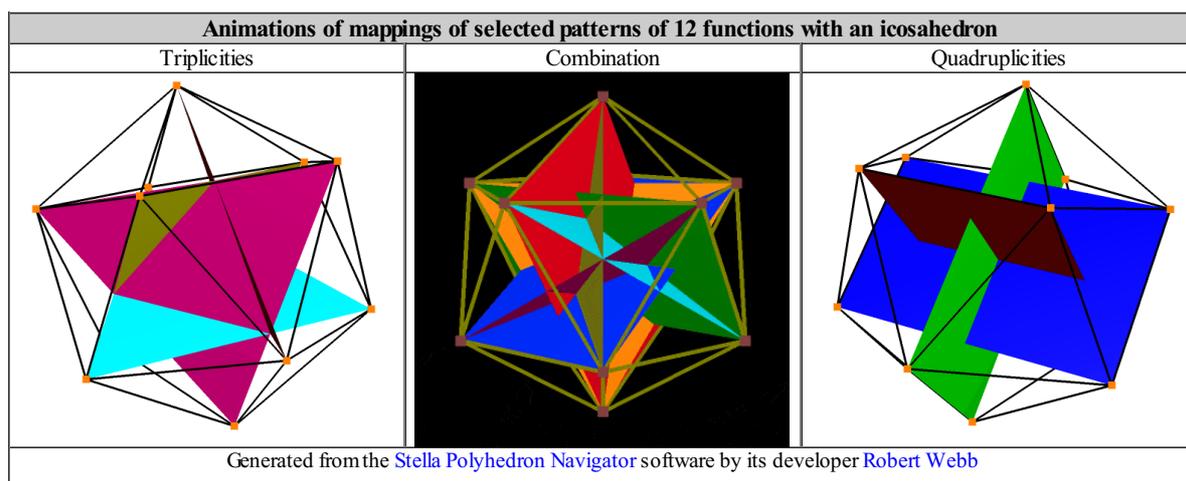
Yet to be appropriately explored is how any preferred configuration of cognitive operations is "collapsed" or "expanded", as for example:

- from 12 to 6, namely from 2^2 x 3 to 2 x 3
- or from 12 to 8, namely from 2^2 x 3 to 2^3
- or from 12 to 16, namely from 2^2 x 3 to 2^4
- or from 12 to 20, namely from 2^2 x 3 to 2^2 x 5
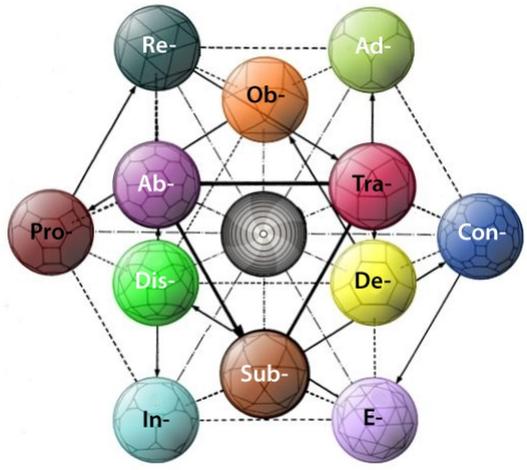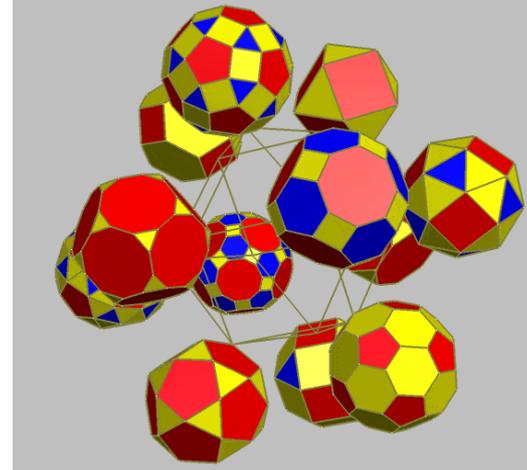- or from 12 to 30, namely from 2^2 x 3 to 2 x 3 x 5

Especially mysterious is why particular authors and cultures "fixate" on particular patterns of order, as discussed separately (*Commentary on patterns of N-foldness*, 2020; (*Patterns of N-foldness: comparison of integrated multi-set concept schemes as forms of presentation*, 1980). Possibilities are suggested by the arguments of George Lakoff and Rafael Núñez (*Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2000) and regarding, for example:

- 6-foldness:
  - *Six Frames For Thinking About Information* (by Edward de Bono, 2008)
  - *La Structure Absolue* (by Raymond Abelio, 1965)
- 8-foldness:
  - *Noble Eightfold Path*
  - *Eightfold Way of particle-physics theory*
  - *Eightfold Path of policy analysis*
  - *UN Millennium Development Goals*
- 20-foldness (operative insights): *Checklist of web resources on 20 strategies, rules, methods and insights* (2018)
- 30-foldness (cybernetic syntegration):
  - *Beyond Dispute: The Invention of Team Syntegrity* (by Stafford Beer, 1994)
  - *Universal Declaration of Human Rights*

Higher orders of coherence? In the case of the 12-fold pattern explored above, it might be asked whether the arbitrary distribution of functions in the animations could be ordered otherwise to highlight greater coherence of the system they are assumed to constitute. As highlighted by Young, the systemic functions could be explored in terms of 4 patterns 3 and 3 patterns of 4. These can be visualized as follows, as discussed separately (*Representation of Creative Processes through Dynamics in Three Dimensions*, 2014).

Animations of mappings of selected patterns of 12 functions with an icosahedron		
Triplicities	Combination	Quadruplicities

Generated from the Stella Polyhedron Navigator software by its developer Robert Webb

The pattern derived above from placing "-ject" at the centre of a configuration of prefixes suggests a reversal whereby each of the 12 prefixes is placed at the centre of its own configuration. In the case of "Ob-", for example, this would then engender a cognitive domain (or "world") in which an array of suffixes could be associated with it. Such suffixes could be mapped onto the faces or vertices of distinctive polyhedra. Of potential interest for mnemonic purposes is then the configuration of such polyhedra as usefully suggested by the cuboctahedral array of Archimedean polyhedra, as shown below left, based on that of Keith Critchlow (*Order in Space: a design source book*, 1969). The possible "pathways" between the polyhedral mappings are discussed separately (*Pathway "route maps" of potential psychosocial transformation?* 2015).

Arrangement of the 12 Archimedean polyhedra in their most regular pattern	
(a cuboctahedron, around a truncated tetrahedron)	
Indicative attribution of prefixes to a cuboctahedral array of Archimedean polyhedra	Rotation of cuboctahedral array of 12 polyhedra (around an omitted 13th at the centre)
(adapted from Keith Critchlow, *Order in Space*, 1969, p. 39).	Interactive virtual reality variant (.wrl)

Such a configuration of prefixes clearly raises the questions as to what suffixes of cognitively operative significance could then feature in each of the 12 mappings. Exploration of possibilities in this respect have previously focused on "Pro-" and "Con-" in the exercises cited above and others (*Considerable Conglomeration of "Cons" of Global Concern: eightfold constraint on constructive conflict control?* 2010; *Exploration of Prefixes of Global Discourse: implications for sustainable confidelity*, 2011). Does a 12-fold configuration constitute a form of cognitive "Holy Grail" as yet to be recognized (*Eliciting a 12-fold Pattern of Generic Operational Insights: recognition of memory constraints on collective strategic comprehension*, 2011).

As noted, this had derived from an earlier assumption that any requisite paradigm shift might be associated with a new set of prefixes (*New Paradigms via a Renewed Set of Prefixes? Dependence of international policy-making on an array of operational terms*, 2003). The inquiry was taken further in exploring the cognitive role of "Con" with respect to the configuration implied by any consensual mandala -- beyond the focus on "conviction" and "conquest" (*Checklist of words prefixed by "con" with frequency of usage*, 2016) -- notably with respect to the fundamental role of "confidence" as the basis for any future global currency (*Primary Global Reserve Currency: the Con?*, 2011).

Mirroring of polar extremes of objectivity and subjectivity

The polar extremes, as exemplified by "objectivity" and "subjectivity", suggest that there is a form of mirroring as yet to be fully understood -- irrespective of the ease with which words can be used to label aspects of that understanding. A more fundamental distinction is perhaps most usefully associated with "outside" and "inside" as variously (and suggestively) clarified by several authors.

- Joseph Campbell: *The Inner Reaches of Outer Space: metaphor as myth and as religion* (1986).
- Henryk Skolimowski: *The Participatory Mind: a new theory of knowledge and of the universe* (1994)
- David Bohm: *Wholeness and the Implicate Order* (1980)
- Thomas Moore: *The Planets Within: the astrological psychology of Marsilio Ficino* (1990)
- Simon Spichak: *Cosmic Structures in Space are Organized Like Our Brain: how network theory scales from millimeters to light-years* (*Medium*, 5 December 2020)
- Francisco Varela, et al. *The Embodied Mind: cognitive science and human experience* (1992)
- Erich Jantsch: *From Self-reference to Self-transcendence: the evolution of self-organization dynamics* (1982)
- Nassim Nicholas Taleb: *Skin in the Game: Hidden Asymmetries in Daily Life* (2018)

Much use has been made of the metaphor of a mirror to clarify the relationships in question. It has a long tradition in Buddhist culture, notably in China, in terms of the "mirror of the mind" (Alex Wayman, *The Mirror as a Pan-Buddhist Metaphor-Simile*. History of Religions, 13, 4, May 1974). Discussion of the metaphor is notably associated with contrasting views as to whether enlightenment is to be achieved "suddenly" or "gradually" (Paul Demiéville, *The Mirror of the Mind*, 1991).

The contrast has been the focus of studies of "subitism" versus "gradualism". In terms of the latter understanding, the mirror has to be "polished", removing "dust", to enable it to function appropriately. In terms of the former, this is quite unnecessary (see discussion in

Creative Cognitive Engagement: beyond the limitations of descriptive patterning, 2006). Within such a Buddhist framework, there is the additional sense in which the elaboration of the Me/not-Me distinction (through the quadrilemma) may be fruitfully associated with an analogous elaboration of the Attachment/Detachment distinction.

These considerations recall the functions of the "magic mirror" of many folk tales, framing the question of how it might be explored otherwise (*Stepping into, or through, the Mirror: embodying alternative scenario patterns*, 2008). One approach is through the *transformation of worldview from "nside-outside" to "outside-inside"* (2013), despite the associated *insightful confusion: outside-in, inversion, introversion?* (2013).

With respect to any self-engendered simulation, such confusion is indicative of the appropriateness of cognitive alternation (*Alternation of worldview between "inside-outside" and "outside-inside"*, 2013; *Paradoxical cycling between "inside-outside" and "outside-inside"*, 2013), as might be consistent with an uncertainty principle for the psychosocial sciences (Garrison Sposito, *Does a generalized Heisenberg Principle operate in the social sciences? Inquiry*, 12, 1969, 3). Such alternation could be considered reminiscent of the holomovement of David Bohm (1980), or explored as "paracycling" (*World Introversion through Paracycling: global potential for living sustainably "outside-inside"*, 2013).

Freely simulating oneself?

The vastness of the domains in which one is seemingly embedded introduced this argument -- from physics via biology to metaphysics. The degree to which these are unknown, incomprehensible or inexpressible is evident. Centered within that context one is seemingly free to "throw" out models by which to encounter and constrain that vastness into comprehensible form. In defiance (or denial) of that vastness -- as a "cloud of unknowing" -- this could be caricatured as "blowing bubbles" of global coherence.

There is however a degree of arrogance to this creative process suggesting an unexplored relation to the mystery of gravity and its origin in the cosmic Big Bang (*Arrogance as an analogue to gravity -- equally fundamental and mysterious*, 2015; *Alleviating the "weight" of external matters*, 2013). Given the vastness, and the manner in which it will probably be reimagined in the future, the bubbles are necessarily vast oversimplifications for the convenience of the times (*Pricking the Bubble of Global Complacent Complicity: hyperdimensional insights from the physics of bubble blowing, bursting and collapse ?* 2017).

There is seemingly a curious degree to which any vastness, as held to be external, is mirrored cognitively within (as argued above). As the creative instigator of the separation of subject and object, one is potentially at the centre of a nexus of related cognitive operations (as suggested by the animations above). It is the embodiment and engagement with these which are effectively the tools by which one can imaginatively design oneself -- to simulate oneself. Whilst this may be intuitively understood to a degree through phrases like "reinventing oneself", the unknown potentials of the brain and the unconscious imply that this "invention" is ongoing anyway.

In this sense one is a simulation of oneself as contextually bounded -- of which one is only aware to a very limited degree. This offers an alternative perspective on the simulation hypothesis -- an unexplored window of opportunity. In this instance the instigating "other" of the simulation is not what features in current arguments which deny the freedom to imagine the possibilities otherwise -- whether or not such imaginings include the extant variants. The future will in all probability see the matter otherwise.

The possibility of a self-engendered simulation could of course be asserted to be totally unrealistic. The strength of this critique is however undermined by the recognition of the surreal nature of the present times and the case for a more radical engagement (*Surreal nature of current global governance as experienced*, 2016; *Radical engagement with an increasingly surreal reality*, 2018). There is clearly scope for imagining matters otherwise (*Eliciting a Universe of Meaning -- within a global information society of fragmenting knowledge and relationships*, 2013; *Engendering 2052 through Re-imagining the Present*, 2012)

Curiously a simulation is commonly understood as nested within a larger context -- geometrically as a smaller "sphere" within a larger one. That simple option ignores the possibility of multiple simultaneous simulations, of which some may even be nested within others. It also ignores any form of "osmosis" between such creations and with the instigating context, as can be otherwise discussed (*Cognitive Osmosis in a Knowledge-based Civilization: interface challenge of inside-outside, insight-outsight, information-outformation*, 2017).

A sense of such multiplicity is offered by speculation regarding a multiverse -- a universe of universes. That is then to be understood cognitively as multiple forms of engagement with "otherness", and potentially to be framed by a cognitive metaverse. Somewhat ironically the preferred formulation ignores the centuries of speculation about the nature of the relation between any creator and an individual "made in the image" of the creator (*Being the Universe : a metaphoric frontier*, 1999).

There are clearly fundamental paradoxes to any such understanding as implied by the traditional symbol of the Ouroboros -- an invitation to animation in 3D (*Experimental animations in 3D of the ouroboros pattern*, 2017). That pattern can be explored and illustrated to a higher degree through the geometry of the Möbius strip and the Klein bottle (*Complementary visual patterns: Ouroboros, Möbius strip, Klein bottle*, 2017). The cognitive implications have been extensively articulated through the work of Steven Rosen (*Topologies of the Flesh: a multidimensional exploration of the lifeworld*, 2006; *The Self-Evolving Cosmos: a phenomenological approach to nature's unity-in-diversity*, 2008).

The homunculus of alchemy, metaphorically understood (as argued above), is therefore a useful indication of self-engendered simulation, potentially to be explored in terms of the improbable topology of sphere eversion (*Sphere eversion as guide to the cognitive twist of global introversion?* 2013; *Cognitive osmosis through topological eversion and interlocking tori -- framing outside-inside otherwise*, 2017).

Understanding the subtleties of the arguments of Rosen with regard to the Klein bottle then merit consideration in the light of those indicated above by Nicholas V. Swindale (*Visual cortex: Looking into a Klein bottle -- arguments based on mathematical topology may help in understanding the organization of topographic maps in the cerebral cortex*, *Current Biology* 6, 1996, 7).

This argument was framed by reference to hypothetical extraterrestrials as possible designers of a hypothetical simulation of reality as humans experience it. The emphasis given here to the unexplored freedom of self-engendered simulation then calls into question how extraterrestrials might themselves be understood to "exist" -- as a feature of any such simulation. Rather than consideration of whether they exist, of greater relevance is then whether cognitively they are allowed to exist. Such a framing is especially relevant to consideration of how the billions of "nobodies" of the world are allowed to exist -- the "terrestrial extras". **How does a simulation allow otherness to exist?**

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