

Symbiotic Existential Cosmology

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The Symbiotic Cosmology ¹ of Perennial² Conscious Existence

Chris King

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*Consciousness is eternal, life is immortal.
Incarnate existence is Paradise on the Cosmic equator
in space-time – the living consummation of all worlds.
But mortally coiled! – As transient as the winds of fate!
This coil is as tough a bind as life and death can be,
but becomes the redemption of all that has passed before
and awakens nascent futures we can only but envisage.*

¹ This document is an active real-time research journey of discovery, that is a “trip” in itself for the beholder. It is an informational spore, finer than a mustard seed, to reflower the tree of living conscious diversity, through free circulation in intact form, to illuminate through the creative commons.

² *perennial* lasting or existing for a long or apparently infinite time; enduring or continually recurring. From Latin *perennis* ‘lasting the year through’ + -ial. Oxford languages. The term is used to indicate lasting throughout the lifetime of conscious existence in the universe.

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The Core Nexus of Symbiotic Existential Cosmology

For Elinor, Albert, Isaac and Everyone

The Nature of this Communication

This work, presents an **augmentation of physical cosmology** to admit **subjective conscious volition acting on the physical world**, invoking a **biologically, psychically and cosmologically symbiotic universe**, rising to conscious climax which resolves the central enigma of existential cosmology – the nature and role of subjective experience – thus providing a direct solution to the "hard problem of consciousness" and the problem of autonomous volitional will. This is essential for human ability to consciously affect the physical world, personal responsibility and scientific consistency with criminal and civil law on intent. The cosmology is thus entirely consistent with quantum cosmology and empirical neuroscience.

The monograph is three works in one: The key **cosmological discovery**, the **vision quest** to unveil it, and a fully-referenced **research report**. Since its inception in June 2021, in my entheogenic mushroom [moksha](#), it has recorded the entire ensuing discovery process, transparently in real time, as it has been realised and communicated, so that the reader can map out and follow a similar trajectory should they desire, or decide to do so. It is carefully designed, not to be accessibly facile, but to provide the full discovery account, as a Rosetta Stone, translating all aspects of the existential cosmos in which we consciously exist, consisting of both the physical universe and the abyss of our conscious experience.

Saving the Diversity of Life from Mass Extinction

The central purpose of symbiotic existential cosmology is not just to reveal the cosmology of the universe in which we consciously exist, but to **save the diversity of life on Earth** from a **human-induced mass extinction** (Leakey & Lewin 1995, Kolbert 2014, Dawson 2016). It thus seeks to directly address our primary existential threats as a living species, healing climate crisis, habitat destruction, species extinction, eradicating nuclear and biological weapons of mass destruction.

It unveils a living cosmology which shows humanity that our central and sacred purpose in existence is protecting and unfolding the immortal diversity of conscious life in the universe. In this sense, it is the therapeutic remedy of both our existential dilemmas, one scientific in terms of our place in the universe and the other spiritual, in the sense of our immortal redemption, invoking the epoch of long-term future goodness, fulfilling both the messianic and fertility quests in immanent transcendence over both. This approach is necessary to transform the spiritual zeitgeist in the scientific age.

Existential Reality and Subjective Conscious Volition over the Universe

The reality of our existence is that, **subjective consciousness is primary**, although the **universe is necessary**. The way we experience reality is that we are subjectively conscious and 100% of our experience of the world and of our dreams and reflections arises from subjective consciousness. All our experience of the physical world is inferred from our conscious sensory experiences of it, although we come to realise it is necessary for our biological survival. Furthermore we are able, through our subjective experiences, to choose to act wilfully and intentionally upon the physical universe to survive.

This means that, to develop an existentially meaningful and correct description of the cosmos, involves first accepting this generative relationship, in interactive social recognition, by first affirming to one another that we, as **subjective conscious sentient beings** have **efficacy of volition over the physical universe**. Once we have agreed this interpersonally, we can explore by scientific experiment, how this interactive subjective-objective process occurs in the physical universe in our brains, genes and molecular interactions. Thus existential cosmology is animistic in the sense that it is derived as an affirmation between live conscious agents, just as in criminal and corporate law of intent, and in how compacts and contracts of trust are negotiated. If we try to reverse the generative existential order and explain existential reality from the physics alone, and its assumed biological causalities, we end up stuck with the **hard problem of consciousness**, that **no purely objective physical process can explain subjectivity** itself, or **intentional volition**, leading to sterile impasse.

Symbiosis and Enlightenment

Symbiotic Existential Cosmology is a profoundly evolutionary cosmology, in which the evolutionary unfolding of life's diversity ensures the biosphere as a whole retains climax stability of unfolding at the edge of chaos, over cosmological time scales. Of the three words in the title "Symbiotic Existential Cosmology", the first word, symbiotic, is the key and only qualifying adjective describing existential cosmology. Symbiosis is the ultimate expression of physical, biological and conscious interrelationship of becoming, in which conscious life in the universe comes to co-existential climax. It is thus natural complexity expressed in full conscious enlightenment fully integrated with life as a whole.

The Conscious Universe

Symbiotic existential cosmology transcends both materialistic and theistic world views:

- (a) It **transcends scientific cosmology** because it **completes the scientific description of nature** by fully **incorporating subjective consciousness** and the **efficacy of volitional will** to affect the physical universe.

(b) It **transcends religious cosmogony** by **transferring cosmological agency** directly back to **humanity and natural life**, verified by **conscious affirmation of our volitional agency**, rather than dependence on supplicant beliefs.

It has three core cosmological principles, **biogenic**, **panpsychic** and **sybiotic**. Life exists in the universe because the laws of nature arising from cosmic symmetry-breaking are fractal, giving rise to living systems as an interactive climax. It is consistent with empirical neuroscience but says that **subjectively conscious physical volition is real**, and this implies some matter – our brains – have physically efficacious subjectivity and hence **all matter, has primitive subjectivity** because brains obey the same laws and forces as other normal matter. Primitive subjectivity thus occurs in quanta and butterfly effect systems which amplify quanta, like storms, and in bacteria and archaea. But a discrete **emergent transition** occurred in the **eucaryote endosymbiosis** between archaea and bacteria, when full attentive consciousness arose in the first single-celled amoeboid-flagellates, forming societies communicating by neurotransmitter molecules such as serotonin. This form of quantum sentience evolved into our conscious brains, as societies of 10^{10} tightly coupled amoeboid cells communicating by the same processes.

Humanity and the Biosphere

Humans evolved to be an environmentally destructive dominant species, because of our evolving Machiavellian social intelligence, after a long period of increasingly rich evolution to climax diversity following the Tertiary-Cretaceous extinction. This shaped our minds to be strongly egotistical to succeed against one-another. In the gatherer-hunter phase, this tendency was moderated by two factors: (1) *the mating mind* – astute female reproductive choice for smart resourceful entertaining and protective males who can engage fulfilling sex to demonstrate genuine indicators of fitness and sensitivity and (2) *original virtue* – the evolution of verifiable trust through long-term personal judgment of good character. However, with the growth of large urban societies, this became overthrown by the imposition of patriarchal domination of woman and nature. Humanity is thus still a dominant species wrecking the biosphere through egotistical tragedy of the commons. Moreover gene-culture coevolution, with the emergence of language, religion, commerce and science hasn't resolved this, because cultural evolution is even more rapid than genetic evolution and has produced no stabilising factors. Only a cosmology in which gene-culture-biosphere co-evolution is complete can resolve this.

Complementary Conscious Cosmology

If we start with the physical brain and try to understand subjectivity, we end up with the **hard problem of consciousness** – the explanatory gap, that no brain process manifests the subjective aspect of conscious experience, that is universal to our awareness of ourselves and the world around us. This appears to be an irreducible problem – objective properties and processes simply cannot of themselves manifest conscious subjectivity. Once we reverse the logic, we discover that **matter has a subjective complement**. So the brain as a whole has subjectivity. But then it's a physical property, not just a biological product of complexity, so its universal, or more accurately cosmological.

This means all quanta have what we describe as subjectivity and volition:

- (1) **Quantum Subjectivity:** Any wave function in the wild is a history and future of real or potential entanglements, forming a type of “consciousness” of the quantum's world, past, present and future – i.e. a global representation of the entire relationship.
- (2) **Quantum Volition:** For a single quantum measurement the outcome is uncertain because the particle can end anywhere within the non-zero wave function without causal conflict. The only constraint is that, on repeated independent identically distributed measurements, the probability of where a particle ends up is defined by the power of the wave function at that point. But probabilities don't determine any individual path, so each quantum has free will to end up anywhere and clearly uncertainty makes a choice.

Primitive Cosmological Subjectivity: This form of subjectivity is co-eval with the nascent universe. Because it's subjective, we can't see its manifestations directly but they help explain why the world looks semi-classical because quantum systems can then also act as “observers”. So we end up with a dynamic quantum universe in a partial state of collapse of its wave functions with new superpositions emerging all the time. This means quantum and unstable quantum sensitive phenomena can exhibit this subjectivity and “free will” e.g. in tornadoes, hurricanes, biogenesis and simpler prokaryote life forms.

Discrete Conscious Emergence: The **eucaryote endo-symbiosis**, in which a species of archaea incorporated respiring bacteria to become our mitochondria, resulted in a completely new phenomenon – attentive sentient consciousness – when the cell membrane became freed from respiratory electron transport, enabling it to become a sensitively dependent sentient excitation at the edge of chaos involving quantum sentience of photons, vibrations and electric fields, with neurotransmitters also enabling social signalling. This emergent aspect of consciousness as we know it, occurred in a discrete topological transformation of the nature of the cell, and in turn, it utilises primitive subjectivity to manifest consciousness in a vastly more coordinated form in all eucaryotes and in our personal experience.

Organismic Consciousness: Complex mammalian brains, including our own, consist of intimately coupled societies of amoeboid-flagellate cells communicating via the same membrane excitability and social signalling molecules they used to ensure the survival of the collective single-celled organism. The brain thus acts as an integrally coupled form of cellular consciousness through edge of chaos phase coupled neurodynamics forming a contextual boundary condition, shaping primitive subjectivity

to evoke the environmental context essential to the organism's survival and procreation. Primitive subjectivity is thus shaped into the conscious experiences we have through the constraints imposed by the brain as filter rather than as a deterministic physical process. This replaces the idea of physical causality in the brain, in a causally closed universe that directs subjective consciousness as a mere internal brain model, with a causally open quantum uncertain universe, in which the the brain state provides the environmental boundary conditions through which conscious experience can anticipate existential crises and has efficacy of intentional volition over our physical circumstances in conscious intuition and decision-making.

Biospheric Symbiosis

Notwithstanding that the diversity of life is a matter of tooth and claw, it is still symbiotic within the biosphere as a whole. As organismic evolution diversifies into plants animals, predators and prey and parasites and hosts, in which there are also climax symbiotic relationships cellular and viral, the genetic symbiosis of the two sexes, and major instances such as mycorrhizal symbiosis between plants and fungi, life is biospherically symbiotic, because natural selection occurs in biospheric feedback and all species depend on the biosphere for survival, so it's a case of survival of the fittest biospheric symbionts, not just species dominance. We can see this in the way predation acts to avoid the herbivores becoming extinct by eating out their plant species, in boom and bust, leading to famine, complemented by the way insect predation favours plant diversity. Instead of going to hell in a basket towards a human extinction, as we are now as a dominant species violating biospheric symbiosis, by regaining symbiosis over evolutionary time scales, humanity inherits its true cosmological meaning and purpose to protect life immortal, to ensure our own evolutionary survival, regaining the perennially immortal future of our 3.5 billion year tenure in the universe.

Moksha

When the brain is cycling in a state of sensory withdrawal in "neutral" in deep meditative and/or entheogenic states, subjectivity can approach a cosmological form in its own right in which the organismic boundary filters defining our conscious awareness become relaxed which we experience as moksha, asymptotically approaching ultimate reality, described in the Upanishads as Brahman, or cosmic consciousness. Our individual conscious experiences in organismic consciousness are thus forms of cosmic consciousness encapsulated by the contextual filters applied by the brain, in which we become climax manifest forms of subjective consciousness interacting through physical volition.

Cosmological Symbiosis

Enter the biospheric response. The same climax period gave rise to plant and fungal species 'salting' the Earth with variants of neurotransmitter molecules which tweak key pathways modulating human perception, mood and survival. In particular, the serotonin analogues called psychedelics – "psyche-revealing" – paradoxically cause (1) a sensory flood, in which the brain begins to develop an internal model of its own processing and (2) quantum change experiences, resulting in ego loss and the experience of "ultimate reality" referred to as "divinity", leading to alleviation of mortal angst in terminal illness and a deep sense of integration with life and nature in the healthy. Hence these are critical to planetary survival, along with other forms of nature meditation and conservation activism.

This means that the physical universe and subjective consciousness are two complementary aspects of cosmological reality, just like the wave and particle aspects of quanta. Mind can't alone make matter and matter can't alone make mind – they are complementary manifestations, like Shiva and Shakti, that make cosmology as we know it possible.

The inclusion of subjectivity opens up the spectres of panpsychism, animism and the mystical/religious quest in the physical universe, because these are all cosmological views, in which consciousness and intentional will is generative and fundamental. However this is a coming of age, in which we as, biota, the living conscious agents of the universe have become the modus operandi, manifesting cosmic consciousness, who thereby must needs accept personal responsibility for our guardianship of all life and our long-term tenure as a/the formative keystone living species in the biosphere, rather than invoking preconceived notions of a creator deity and eternal imaginary heavens and hells to force us into moral compliance, when we know all such notions are simply cultural products of our adolescence.

This is the Weltanshauung of Immortality, which flips the Copernican principle of science, because the privileged view of the universe is conscious life in [paradise on the cosmic equator](#) in space-time, not the mechanistic Sun-centred cosmos or the flat earth with firmaments of Theistic fame. It also flips religion inside out because the sacred purpose of existence is to protect the diversity of life throughout our generations forever, so that conscious life can flower to the point where the universe becomes fully conscious of its own existence through the living biota that form its interactive climax.

Astronomer's paradise: Atacama Desert, Chile
Nicholas Buer/Corbis



Dedication

The accompanying articles, generated out of a single quantum change experience on psychedelic mushrooms, breaking a seven year fast, contain the fabled key to life, the universe and everything – the symbiotic cosmology of perennial conscious existence.

All of us go through life wondering what it's all about, why we are here, and what the meaning and purpose of conscious existence actually is. This is the question always lurking in the backs of our minds, driving our mortal anxiety, from which we try to escape, in futile diversions of power, fame and entertainment until our last moments on our death beds, realising all these things were distractions to avoid the inevitable.

Our current world views are suspended between three contradictory and equally devastating scenarios.

1: **The materialistic scientific view** regards us as merely a collection of atoms and molecules held together by physical, chemical and biological processes. That we are simply our brains and that our decisions are based on our genes and material circumstances over which we have negligible control, because our subjective conscious experiences are simply a model of reality generated by the computational brain, and that free will and personal autonomy are effectively illusions. That there is really no rhyme or reason to existence, and that life is simply an accidental by-product of a universe driven by blind and overwhelming forces, which will eventually annihilate the solar system and all life within it, whether we live a good life, or exploit the others around us and the life of the planet, to our own selfish advantage.

2: **The theistic religious view** claims the universe is a moral test by God; that we do have free will, but are all accursed as sinners by the original sin of Eve, for hearkening unto the serpent. That we endemically fail to heed God's will and that a Day of Judgment will ensue, when the Lord returns to consign us, either to eternal life in Heaven, or a diabolical fate in Hell Fire, forsaking the late planet Earth and the diversity of God's creation in the process. Complementing this is a view of humanity having dominion over nature, to exploit living systems as we see fit, compounded by business-as-usual attitudes, which seek to assimilate all resources and sources of profitability before others take advantage, leading to planetary Armageddon. Likewise **Eastern traditions** lead to the degradation of the Kali yuga, Samvartakalpa or Eon of dissolution – the decline from enlightenment into ignorance.

3: **The living planetary view**: Both materialistic science and theistic religious views are incorrect and dangerously destructive. We are all becoming acutely aware that neither of these scenarios are viable, that the planet is in a worsening state of crisis induced by human misadventure, exploiting the non-renewable resources and living diversity of the planet, resulting in a climate and habitat crisis, causing a mass extinction of the diversity of evolving life, which risks making the world a literal Hell on Earth for future generations, if not precipitating the extinction of our species, risking serious damage to the health and economic viability of ongoing human life.

We now unite 1 and 2 with 3, as overviewed in **three introductions: 1, 2, 3**. These together show how our conscious autonomy and volitional will can be retrieved, how our lives can be fulfilled, what the actual meaning and purpose of life actually is and how the generations of humanity can come to fulfil ourselves in the flowering of conscious existence on evolutionary and cosmological time scales, returning the Earth to the paradisiacal verdancy it harbours in abundance, before it is irretrievably damaged for millions of years to come.

1: → 3: The **scientific sections 1, 2 & 3** elucidate the symbiotic cosmology of the sentient conscious universe, in which conscious life is the climax manifestation. The meaning and purpose of life is then manifest in the immortal flowering of conscious living existence over evolutionary time scales, realising Heaven on Earth, through our integration with the conscious mind-at-large of the universe. The core cosmology has three principles (1) **Biogenic**: Conscious life is the complexity climax of the cosmological structural pathway. (2) **Panpsychic**: Subjective conscious volition over the physical universe means that the subjective mind is universal. (3) **Symbiotic**: Life reaches immortal complexity climax through symbiosis, not dominance of one cultural species.

All eucaryote higher organisms are an endosymbiosis between complementary bacterial and archaeal life forms. Survival under natural selection is how all species maintain perennial symbiosis with the biosphere. Symbiosis is essential for human survival. Symbiosis with entheogenic species, expands spiritual approaches to consciousness, realising the consummation of conscious existence, at the edge of chaos as visionary sexual organisms. Through psychic symbiosis, we can achieve moksha, which in the Eastern traditions signals the escape from the cycle of birth and death, and in the monotheistic traditions constitutes the mystical God-consciousness that has inspired all the founding religious visionaries from Yeshua, through Buddha, to countless shamans and sadhus who have known and appreciated the same secret oracle of existence. Realising cosmological symbiosis.

2: → 3: **Natty Dread** and the **evolution of religion**, section shows the monotheistic eschatological world view leads to an Armageddon destruction of the diversity of life and why Christianity has been, since Yeshua's death, acting in contradiction to his actual vision, perpetuating a false religion based on the dying Son of God, whose flesh and blood we must eat, reappearing as avenging Lord in the Revelation – impeding a paradigm shift from unfulfilled apocalypse to the planetary resplendence of the Tree of Life – evolving Paradise on Earth, the abundant heritage that is our creative destiny, as guardians of the flowering of conscious existence in the universe at large.



Ganges 1976 ◊ Ucayali 1999 ◊ Getisemane Epiphany 2000 ◊ Aotearoa 2017

Symbiotic Existential Cosmology – A Scientific Overview

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To Erwin Schrödinger for the unitary singularity of the conscious mind,
and Charles Darwin for the evolutionary diversity of free will.

Abstract:

This overview summarises the quantum and cosmological physics, evolutionary biology and neuroscience involved in the work “Symbiotic Existential Cosmology” King (2021), *conceived during a quantum change experience on psychedelic mushrooms.*

Symbiotic existential cosmology retains the core features of physical quantum cosmology, while augmenting it to restore the role of **conscious** purposive life in a biodiverse universe into its correct position in the scheme of quantum cosmology. It is thus the actual cosmology of the universe in which we consciously exist, *inverting* the Copernican principle that conscious life does not have a privileged view of the universe. Its symbiotic basis forms a central protection for the **future of the diversity of life** on Earth.

It advances an interlocking set of three cosmological descriptions with incontrovertible evidence, significant consequences and cosmological conclusions:



Biogenic

(a) **Biogenic: Life exists cosmologically as a fractal consequence of the symmetry-breaking of the forces of nature reaching interactive climax.** This gives a correct portrayal of the **cosmological structural pathway** leading from cosmic symmetry breaking to the fractal structure of living matter:

- **Incontrovertible evidence:** Life exists on Earth because the four core quantum forces of nature arising from cosmological symmetry-breaking are non-linear, leading to 100+ chemical elements and fractal molecular structures, from atoms through molecules, molecular complexes such as the ribosome, cell organelles, such as the membrane, cells, tissues, organs, organisms and biospheres, also supported by detailed research in biogenesis (King 2020).
- **Consequences:** Life exists in the epoch of paradise on the cosmic equator in space-time, as the climax manifestation of the structural interaction pathway after first generation stars have made the chemical elements and multicellular evolution has passed the threshold of symbiosis between archaea and bacteria, to eucaryotes and conscious multi-celled animals.
- **Conclusions:** Life has a key cosmological role, enabling the universe to manifest itself, through the subjective consciousness emergent in the biota.



Panpsychic

(b) **Panpsychic: Subjectively conscious volitional will has efficacy⁴ over the physical universe.** This forms a **minimal augmentation of quantum cosmology** to include conscious volition acting on the physical universe:

- **Incontrovertible evidence:** Live conscious human beings experience volitional intent and its consequences in human decision-making acts and behaviour affecting the physical world. A veridical affirmation of this between conscious human beings leads directly to the conclusion that at least some states of matter, (our brains), are complemented by a subjective aspect having a physical effect (the conscious volitional mind).
- **Consequences:** Affirmation of human subjectively conscious physical agency and legal responsibility of intent. Occam's razor is reversed, eliminating pure materialism, as inconsistent with subjectively conscious physical volition. The physical universe and hence the brain, is not causally closed due to quantum uncertainty, enabling subjective consciousness to seamlessly participate in volition during the uncertain instabilities of coherent processing without resulting in neurodynamic causal conflict.
- **Conclusions:** (1) Because brains are normal matter, obeying the four core quantum forces of nature, even if they display additional properties such as quasi-particle states, the subjective aspect is a property of normal matter, and thus complementary to the universe as a whole, extending wave-particle complementarity. Primitive subjectivity thus exists in quanta, unstable edge of chaos quantum systems, biogenesis and prokaryotes. (2) **Conscious sentient volition arises in eucaryotes in a discrete emergent transition**, due to the archaeal-bacterial eucaryote endosymbiosis freeing the cell membrane for sentient excitability and social signalling.



Symbiotic

Moray eel and cleaner shrimp

(c) **Symbiotic: The planetary biosphere survives and achieves climax diversity through ecosystemic symbiosis, upon which human survival is dependent.** This details how **edge of chaos quantum dynamics** results in organismic, biospheric, psychic and cosmological **symbiosis as a biodiverse consummative climax**:

- **Incontrovertible evidence:** Humans and all eucaryotes are multiply symbiotic organisms by (i) mitochondrial endosymbiosis between the root archaeal and bacterial lineages, (ii) sexually antagonistic genetic coevolution, (iii) nuclear-transposable element genetic symbiosis, (iv) symbiosis involving natural selection of predators and prey, parasites and hosts, in biospheric sustainable evolutionary feedback and (v) human symbiosis with our co-dependent food, and medicinal co-species, which we are currently violating in a mass extinction of biodiversity.
- **Consequences:** First person visionary experience in **psychic symbiosis** with our psychedelic co-species.
- **Conclusion:** The universe becomes able to manifest, know and realise itself consciously, in **cosmological symbiosis**, through entheogenic experiences complemented by meditative practices.

(d) **Survival Necessity: Biospheric symbiosis is necessary and essential for human survival.** Homo sapiens can survive on evolutionary time-scales only by being evolutionarily successful as a biospheric symbiont. Currently it is not. This is the motivating necessity to act, imbued by the mushroom experience, which is itself a product of biospheric evolution of substances conducive to psychic symbiosis, and is manifestly true as a principle of long-term survival of both humanity as a species and the diversity of life in the biosphere.

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⁴ *efficacy* – the ability to produce a desired or intended result. Latin: *efficere* accomplish.

Introduction:

The Symbiotic Cosmology of Perennial Conscious Existence solves (a) the **hard problem of consciousness** – how and why we have subjective conscious experiences, (b) the **problem of volitional will** – how conscious intentionality can have real effect in the physical world and (c) the **central enigma of existential cosmology** – the cosmological role of life and conscious experience in the universe.

In pure materialistic physical cosmology, consciousness is a passive **epiphenomenon** of material brain function, as a biological computational mechanism. Volitional will is thus regarded as an illusion in a putatively causally-closed objective universe. In theistic cosmology, people possess free will, but the universe is created by God as a moral test of “sin” with divine punishments, in which the ‘real’ life is in eternal Heaven or diabolical Hell, discarding the “late planet Earth”. Eastern traditions likewise invoke moral karma and an almost unachievable goal of subjective enlightenment, leading to the need for reincarnation, as primary realities over nature and suffering descent into the Kali Yuga.

Although we are fully aware of the existence of the physical universe and are obliged to accept the laws of nature and their impacts on our biological bodies and lives to survive, the entirety of our access to the world comes sine qua non through our subjective conscious experience, both consensually in our shared everyday experiences of the physical world around us and individually through dreams, memories, reflections and entheogenic visions. Moreover, absolutely critical is the fact that subjectively conscious agency is expressed in conscious volitional will affecting the world around us through our actions, via our physical brain. To be valid, cosmology must successfully explain both the objective and subjective aspects of experiential reality.

Symbiotic existential cosmology makes a **minimal augmentation to the standard model of quantum cosmology** to fully incorporate subjective decision-making to form a concise, complete and consistent description of existential reality, consistent with **quantum reality, biological evolution** and empirical **neuroscience**. Because it is centrally based on a universe in which the structural interaction pathway leads to edge of chaos climax of living diversity, it has very significant implications for the biodiverse future of planet Earth in a time of **climate and biodiversity crisis** involving an **immanent human-caused mass extinction of life** (Leakey & Lewin 1995, Kolbert 2014, 2021), which could seriously compromise or even extinguish the future of the human species.

It also has very significant implications for **society as whole**, because it supplants both a **purely materialistic scientific cosmology** and the **monotheistic, and Eastern religious models**, in favour of a fully **biodiverse cosmology** critical to **planetary survival**. Its validity is **established veridically** by conscious observers, by Occam’s razor, to be the **only class** of cosmology **consistent with subjective decision-making autonomy**. The **cosmology** has three interlocking components: (1) **biogenic** (2) **panpsychic** and (3) **symbiotic**.

1. Fractal Biocosmology: This constitutes an **indisputable empirical fact of cosmological evolution**.

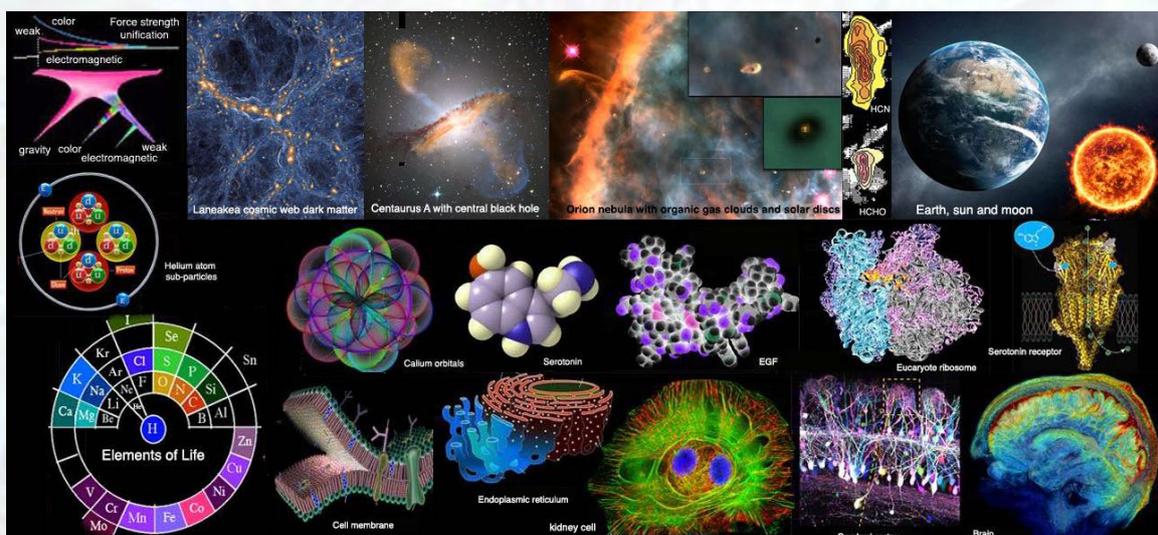


Fig 1: **Top row:** The cosmological **energy pathway** runs from the inflationary phase, to the cosmic web, galaxies and black holes, gaseous nebulae, stars and planets to an eventual big rip, crunch or heat death. **Lower rows:** By contrast the **structural pathway** to complete interaction of the four forces of nature induced by cosmic symmetry-breaking involves quarks, hadrons, atomic nuclei, a secondary symmetry-breaking of the periodic table, to form the elements of life. The molecules of life form quantum fractals physically and biodynamically, molecular complexes, organelles, cells, tissues, organs such as the brain, and organisms.

While the **energetic pathway** of the cosmological process leads to galaxies, stars and solar systems driven by the most powerful of the four forces, leading eventually to a big crunch, cosmic bounce or expanding heat death, the **structural interaction pathway** of the four quantum forces together in full integration on the negentropic planetary surface, leads to fractal molecular structures, organelles, cells, multicellular tissues and organs such as the brain, organisms and the evolving biosphere. This sequence is the **pathway to quantum complexity** induced by the cosmic symmetry breaking of the forces of nature, complementing the **energy pathway – in paradise on the cosmic equator** (fig 2 right).

Research has also revealed natural pathways to biogenesis, fully discussed in King (2020). Fig 2 illustrates three features of this research ongoing worldwide, illustrating the diversity of organics found in primitive syntheses and carbonaceous chondrites whose elementary components are also evidenced in the HCN and HCHO clouds in fig 1, the lost city vents which demonstrate a far-from equilibrium process on the ocean floor capable of supporting molecular biogenesis and concentrating the ingredients 1000 fold to biological concentrations and an example one-pot reaction producing a complementary suite of nucleosides.

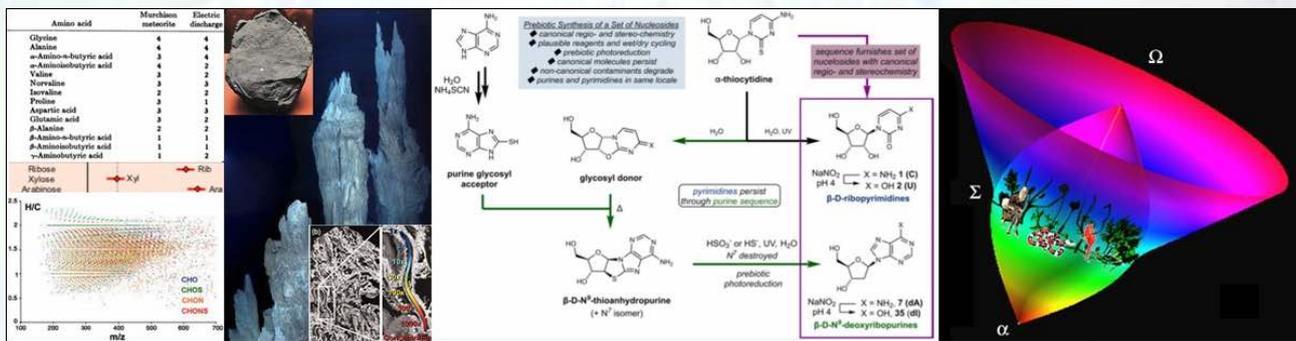


Fig 2: (King 2020) Components of the link from organics in the universe to the origin of life on Earth. Left: Murchison carbonaceous chondrite (inset), major amino acids and sugar components, the sheer diversity of organic products. Centre left: Lost city vents formed by a chemical garden reaction between basic olivine and acidic sea water with dissolved CO₂. Resulting H₂ and CO can drive the formation of organics including C1-4 hydrocarbons. Organics can be concentrated to biological levels (lower). Centre right: A one-pot synthesis leading to both ribo-pyrimidine nucleosides (U, C) and deoxyribo-purine nucleosides (A, I) (Xu et al. 2020), an ingenious single-phase process capable of generating both U and C and deoxy purines dA and dI (inosine) which form two pairs of complementary binding purines and pyrimidines, thus forming in one step a four member alphabet for complementary replication. Far right: While the cosmological energy pathway leads from α to Ω the heat death or big rip, crunch or bounce, the structural interaction pathway leads from α to Σ, facilitated by anthropic constraints on the time for first generation stars to form the chemical elements plus the time for the evolution of life on Earth (Carter 1974, Barrow & Tipler 1988, Lemley 2000).

This means that **life is a central cosmological phenomenon** and not irrelevant to physical cosmology.

2. Darwinian Panpsychic Cosmology is a minimal revision of physical cosmology **consistent with quantum mechanics**, in which the **subjective aspect of reality is complementary to the universe** as a whole.

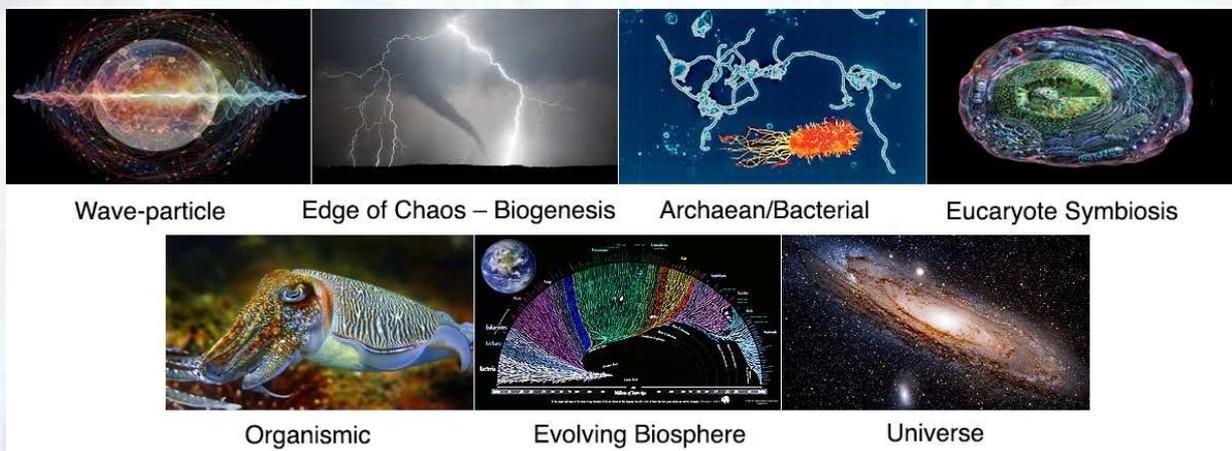


Fig 3: Overview of classification of graduated subjective aspects of existential cosmology.

In this picture (a) all wave-particle quanta, (b) Gaia systems: highly unstable quantum processes, including edge of chaos, self-organised criticality, and biogenesis (c) prokaryote archaean and bacterial excitable cells, (d) eucaryote cells with signalling membranes capable of sentience (e) living organisms with excitable neurodynamics and (f) evolution, where each mutation is a quantum instance, all inherit subjective aspects and (g) the universe does also through the biota as the most complex physical manifestations of the four forces acting together with conscious edge of chaos coherence ⁵. In philosophical terms, primitive phenomenal consciousness (a) – (c) is universally panpsychic but the transitive structure of sentient consciousness (d) – (e) is emergent. This form of panpsychism involves only root subjectivity, with brain dynamics as a boundary condition, moulding how this is shaped as a whole as the subjective stream of conscious experience, so it does not require the detailed analysis of how subjective qualia that arise in pan-protopsychist theories are composed.

It is named after Charles Darwin because it is an evolutionary classification pivoting on the eucaryote endosymbiosis, which is consistent with Darwin's own view of free will:

"To see a puppy playing [one] cannot doubt that they have free-will" and if "all animals, then an oyster has and a polype." (Darwin)

It is the **only class of cosmology in which subjective experience and volitional will are fully included and correctly represented**. Once we accept subjective autonomy and volitional will into the description, the fact that the subjective mind interacts with the objective brain to realise decisions, means that subjective consciousness acts upon the physics of the universe. But the brain also obeys the core model of the four quantum forces of physics, so subjectivity becomes a feature of the universe as a whole. Thus personal conscious autonomy implies encapsulated panpsychism. This implies the complementary subjective aspect – the mind at large – is a single entity, complementary to the universe in the multiple encapsulations we experience as organismic consciousness, having volitional will to affect the world around us, consistent with a Tantric – mind complementing matter – origin.

"There is obviously only one alternative, namely the unification of minds or consciousnesses. Their multiplicity is only apparent, in truth there is only one mind. ... I should say: The overall number of minds is just one" (Erwin Schrödinger).

In a single quantum, primal subjectivity arises from the wave function implicitly encoding the well of quantum entanglement of the quantum's past and future under special relativistic quantum mechanics and quantum will is the uncertain idiosyncrasy of a single quantum instance, as illustrated by Schrödinger's cat being both alive and dead until the experimenter opens the box and finds either a live or a dead cat.

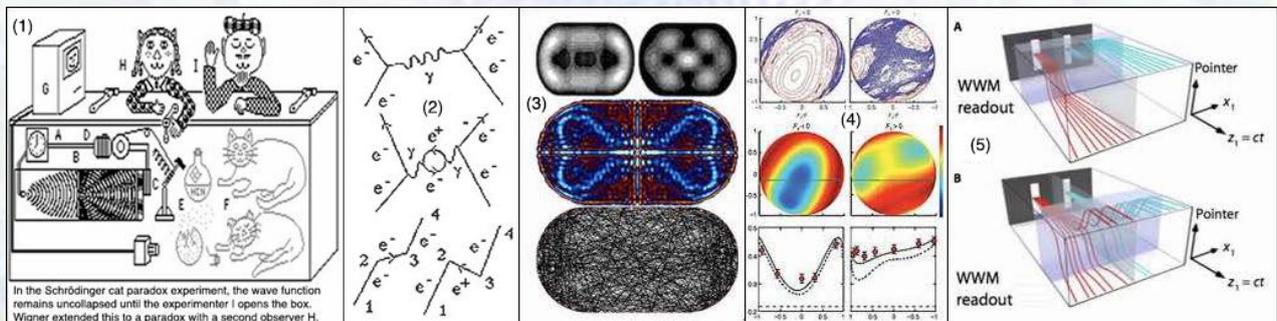


Fig 4: (1) Schrödinger cat experiment. (2) Feynman description of quantum field theory (QFT) involves all possible interactions of particles via a wave-theoretic propagator function, in which the force field is mediated by all conceivable virtual particles appearing and disappearing within uncertainty. This is also special relativistic, so involves both past and future information, so that as shown below electron deflection, if time reversed becomes electron-positron creation and annihilation. (3) Quantum stadium illustrates suppression of chaos in closed quantum systems. Top: Experimental realisation of scarring of the wave function around wave eigenfunctions, biasing the probabilities around unstable classical repelling orbits. Mid: Cellular automata simulation (King 2013). Bottom: Classical ergodic chaotic trajectory. (4) While the classical kicked top (above) shows similar regions of chaos to (3) in the (top), the quantum kicked top (middle and bottom) shows chaos inducing entanglement with nuclear spin (Chaudhury et al. 2012). Entanglement between the electron and nuclear spins is quantified (bottom) by the linear entropy, of the electron reduced density operator. (5) Experiment confirming the existence of surreal Bohmian trajectories (Mahler et al. 2016). Conceptual diagram of the result of reading out the which-way measurement (WWM) in a double-slit apparatus in the near field (A) and in the midfield (B). Colour indicates the slit of origin of a Bohmian trajectory, and vertical position indicates the result of the WWM. This surreal behaviour is the flip side of the demonstrated nonlocality, due to the entanglement of the photons, which, in Bohmian mechanics, makes their evolution inseparable even when the photons themselves are separated. Because entanglement is necessary for the delayed measurement scenario, this nonlocal behaviour is to be expected and is the reason for the surreal trajectories.

⁵ The cosmic web has also been raised as a possible source of fractal complexity (Vazza & Feletti 2020).

Because quanta may be also able to act under certain circumstances as interactive “observers”, the universe is also potentially able to collapse its own wave functions, with human observer collapse just being a special case acting on unstable brain states. The multiverse thus becomes a real universe with an ongoing history, as we perceive it. This picture is one in which new branches are being created in the wave function through quantum superposition, while others are being collapsed by conscious measurement, resulting in dynamic evolution of the cosmic wave function. Special relativity, the most “classical” part of quantum reality, is implicitly retrocausal as well as causal, as in Feynman diagrams, so quantum reality is implicitly anticipatory, involving transactional collapse across relativistic space-time in which a network of potential transactions become one or a set of real emitter-absorber interactions.

In the pilot wave interpretation (Bohm 1952), the wave guides the particle, which is in an arbitrary but definite extant position, however it does not describe particle creation and annihilation in the Feynman picture. In standard quantum mechanics the position of the particle is uncertain and the amplitude of the wave function determines the probability of the particle being in any position. In the SEC description, uncertainty is not irreducible randomness but is a measure of deep quantum entanglement, complemented by the subjective aspect. This determines the position in the pilot wave model and defines “collapse” of the wave function in standard quantum mechanics and is consistent with both.

Fig 4 illustrates two experiments pertinent to this point of view. While closed quantum systems whose classical variants, such as the stadium billiard, are chaotic with ergodic unstable orbits, the quantum version shows suppression of chaos in the wave function probability distribution clumping around unstable periodic orbits. However when the quantum system is able to interact with other modes, as in the kicked top, the chaotic regime results in entanglement with additional factors, in this case nuclear spin, showing that quantum chaos induces entanglement. This shows us that all forms of decoherence due to interaction with other wave-particles at non-zero temperatures can simply generate further forms of quantum entanglement.

In the second experiment, surrealistic Bohmian trajectories under weak quantum measurement, where the delay to the retrodictive (time backwards) observation is varied, show that there is no inconsistency between the Bohm interpretation and standard QM because the surreal orbits in Bohm’s interpretation correspond to entangled states in QM. This provides a basis for the SEC interpretation to be consistent with both.

Coherently unstable edge-of-chaos quantum systems, biogenesis and the dynamics of excitable archaea and bacteria inherit coherent forms of panpsychism in a primitive form of subjectivity, prior to attentive consciousness, coherent with the description of Hunt & Schooler (2019). Many natural phenomena, take the form of edge-of-chaos processes, such as wind, waterfalls, thunder and lightning storms, from turbulent mountain summits to the ocean, which from the point of view of Symbiotic Existential Cosmology are strong candidates for primitive coherent subjectivity, consistent with earlier animistic views preceding religious beliefs.

These systems and the ensuing ones in single-celled eucaryotes and multicelled animals all inherit the capacity to avoid approach to the classical, macroscopic limit, as they are processes which are not IID systems generated by independent and identically distributed measurements (Gallego & Dakić (2021). Similarly, in quantum electrodynamics, in which the stochastic aspect corresponds to the effects of the collapse process towards the classical limit ⁶, consciousness has been proposed to be is represented by the zero point field (ZPF) (Keppler 2018, 2021), of the quantum vacuum in quantum field theories and the quantum dissipative theory (Freeman & Vitiello 2016).

Subjective consciousness is emergent in a **single discrete transition**, occurring as a result of eucaryote endosymbiosis, when respiratory energy was sequestered in the mitochondria (Wan & Jékely 2021) , and the excitable cell membrane became available for signalling and perception of quantum modes, including vision (photons), hearing (phonons), smell (chemical orbital perturbations) and touch (physical torsion). This became preserved and elaborated by evolution because it anticipated threats to survival, in an excitable organism lacking a computational nervous system.

This process is illustrated in detail in fig 5, where the free-living excavate *Naegleria gruberi*, regarded as a candidate organism close to the eucaryote root, demonstrates the presence of excitability, adaptive behavioural modes, including

⁶ The approach of SED is guided by the hypothesis of the existence of the (random) zero-point radiation field, ZPF. This rather more elaborate approach goes through a statistical evolution equation in phase space, to arrive at a description in x-space, in which the dissipative and diffusive terms are seen to bring about a definitive departure from the classical Hamiltonian dynamics.

amoeboid and flagellate habits, key signalling processes including G-protein-linked receptors, kinases and second messengers characteristic of higher animal nervous systems, cryptic sexuality, actin and microtubule activity.

This process takes another quantum leap at the interface between social single-celled social eucaryotes and multicellularity, where membrane excitability, neurotransmitters, action potentials and synaptic genes arose in single celled eucaryotes in parallel by the time of the transition from choanoflagellates to metazoa, with the action potential arising as a response to existential crisis, shared by flagellar eucaryotes spanning all branches of the eucaryote tree, along with synaptic genes involved in membrane binding in colony formation in choanoflagellates and related protists (Burkhardt & Sprecher 2017). Each of these cells can release transmitters that act on receptors in nearby cells to produce movements of the whole colony. A similar response in sponges causes release of GABA and nitric oxide (NO), (Kristan 2016).

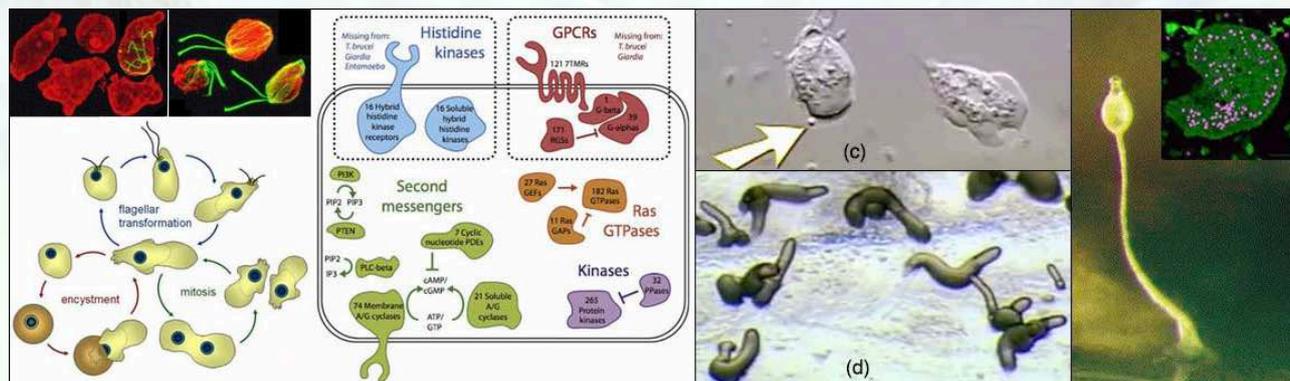


Fig 5 (a) Life cycle and (b) complement of signalling systems found in *Naegleria gruberi* (Fritz-Laylin et al. 2010), a free-living single celled bikont amoeboid-flagellate, belonging to the excavata, which include some of the most primitive eucaryotes such as *Giardia* and *Trichomonads*. Nevertheless it is capable of both oxidative respiration and anaerobic metabolism and can switch between amoeboid and flagellated modes of behaviour, regenerating complete centrioles and flagellae de novo (Fritz-Laylin & Cande 2010). The *Naegleria* genome sequence contains actin and microtubule cytoskeletons, mitotic and meiotic machinery, suggesting cryptic sex, several transcription factors and a rich repertoire of signalling molecules, including G-protein coupled receptors, histidine kinases and second messengers including cAMP. One strain analysed is a composite of two distinct haplotypes, indicating hybridization. Although sexual mating has not been observed in *Naegleria*, the heterozygosity found in its genome is typical of a sexual organism, with perhaps infrequent matings. Additionally, identification of the core RNAi machinery indicates that *Naegleria* may use this mechanism. (c) Individual foraging behaviour of *Dictyostellium discoideum* with bacterium about to be eaten. (d) Motile worm stage involving coordinated excitable organismic behaviour of around 1000 amoebae together to find a good location to form a fruiting body. Right *Dictyostellium discoideum* fruiting body. Inset: Sexual syntinium with multiple nuclei, pink (Bloomfield et al. 2019). The two modes of activity show this organism has both an individual mode of sentient behaviour and an organismic mode in which activity results in coordinated excitable motion, for the collective benefit of the society of individuals to the sacrifice of the non-sporulating individual's forming the fruiting body stalk. These forms of sentient behaviour arose in single-celled eucaryotes a good billion years before computationally capable brains evolved in metazoa.

The major neurotransmitters, such as serotonin arose as social signalling molecules in single celled excitable eucaryotes tuned for collective survival of the social organism, rather than individual cellular survival. Serotonin, in particular has both a developmental and a signalling role, conserved all the way from cellular slime moulds to humans. In myxamoebic *Dictyostellium*, serotonin and MAOA form the organiser of aggregated fruiting buds and in humans serotonin is involved in organismic brain development, from the neural groove all the way to ascending 5HT1b serotonin pathways, providing the signals that determine the correct five layers of the cortex for neuronal migration (Lauder 1993, Witteveen 2013). The brain has thus evolved as an intimately-coupled society of amoeboid-flagellates communicating by the same social signalling molecules we find in single celled eucaryotes, such as serotonin, glutamate and GABA, the latter two of which are cosmologically abundant, as noted in fig 2.

In multicellular animals, subjective consciousness was retained because of its capacity to avoid primary risks of death by anticipating predatory attacks and became seamlessly incorporated into edge-of-chaos nervous system processing, in which brains effectively became closely coupled societies of excitable cells communicating by the same social signalling molecules found in single celled eucaryotes. This enables subjective consciousness to be modulated by the physical forms of brain processing, invoking the subjective model of reality and the differing quantum sense modes such as visual (photonic) and auditory (phononic) and olfactory (orbital), thus resolving the forms of qualia as a product of the seamless integration of the subjective aspect moulded by neurodynamical processes, with volition intervening in uncertain unstable dynamical states at the edge of chaos.

Objective and Subjective Empiricism Empiricism has two complementary modes verified empirical observation as in objective natural science and affirmed empirical experience between conscious individuals. Both can be analysed by statistical methods. The physical universe is easily interrogated on most fractal scales thanks to Galileo's telescope, the microscope and their technological variations. This makes objective validation facile. The subjective realm can only be interrogated subjectively as a whole and we don't even know one another are actually conscious. So we have two direct avenues and several indirect ones. We can interrogate (1) ordinary human subjective states of organismic consciousness and (2) wild states of moksha claimed by experiencers to be cosmic consciousness. Our conscious volitional will is also evident (3) in our capacity to put conscious intent into physical decision-making activity, and we can exchange recognition of this with one another as a foundational veridical transaction affirming this vivacious volition in ourselves and one another. We also use "theory of mind" to impute that other humans are conscious and by extrapolation other mammals. We can also sense the awareness of more diverse species, for example in crickets singing in the long grass and coordinated flashing of fireflies. Darwin said free will goes down to the "polypes" and the symbiotic cosmology says attentive consciousness goes to the eucaryote endosymbiosis. When we watch individual *Dictyostellium amoebae* they act purposefully just like our neutrophil phagocytes 1, 2 and have individual graded EEG-like excitations. Pivotally they make a transition point because they have two excitation modes, one individual and the other coherently organismic at the motile worm stage, so they demonstrate that subjectivity is a function of the coherent physical phenomenon encapsulating the process.

Although it is very difficult for us to see or understand the "consciousness" in single-celled species, they do have purposive behaviour and the active excitable behaviour of single-celled eucaryotes and their biological homology with our own brain excitations and synaptic neurotransmitters indicates the same physical processes are operating.

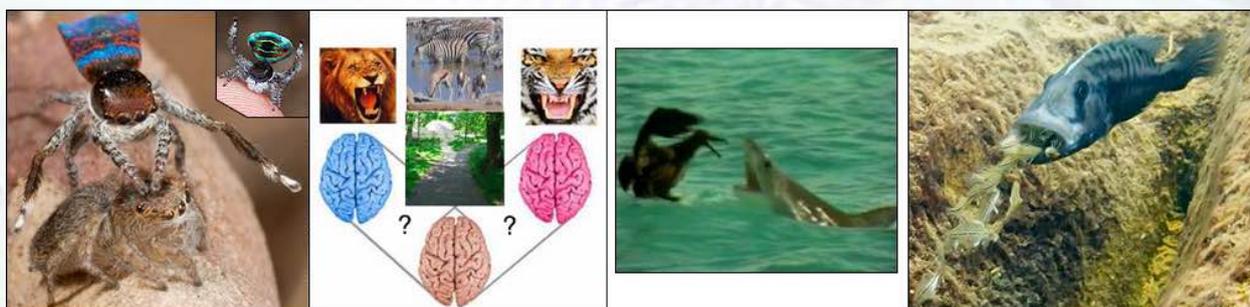


Fig 6: (Centre) The pivotal role of subjective consciousness lies in avoiding lethal attack in prey and starvation in predators, leading to a Red Queen race between conscious organisms similar to the peacock's tail effects of sexual selection. Getting to the water hole either in the savannah or jungle are dependent on immediate intuition of the environmental milieu and are notoriously intractable computationally because the prevailing circumstances of the occasion are undetermined. Left and right: Courtship (peacock spider carefully seducing a female to avoid being eaten) and parenting behaviour (cichlid fish holding offspring to transport to a safer location) across the range of higher animals is also indicative of conscious intent. Although, like birds, these fish can be fooled by cuckoo catfish their careful strategic behaviour to ferry offspring to safer sites shows purposive volitional intentionality.

This means that the foundations of subjective consciousness are cosmological and that the universe is **conscious as a whole, manifest in and through the biota**. This solves the hard problem of consciousness, because the subjective aspect is integral to coherent excitable brain processes. The easy objective problems of consciousness do not solve the hard problem, which is neither confined to neuroscience, nor philosophy, but requires a cosmological paradigm shift.

Uncertainty and mind: The action of mind on brain necessarily arises from modulating the uncertain aspect of quantum indeterminacy in edge of chaos brain processing. This enables volitional will to intervene in the brain without disrupting the partial causal closure of the universe in brain processing in the quantum uncertain universe. In this sense, classical causality is replaced by quantum "consciousness". It provides plenty of room to affect the computationally-intractable uncertain outcomes in evolutionary survival, using both subjective anticipation ⁷ inherited from single celled eucaryotes a billion years before neural systems evolved and historical experience generated by cognitive processes, subjective experience and memory.

⁷ Anticipation is used, rather than prediction, which has a more objective classical implication of declaring, rather than subjectively conceiving. **Anticipation:** late 14c., "foreshadowing," from Latin *anticipationem* (nominative *anticipatio*) "preconception, preconceived notion," noun of action from past-participle stem of *anticipare* "take (care of) ahead of time," literally "taking into possession beforehand". **Prediction:** "act of predicting; a prophecy, a declaration concerning future events," 1560s, from French *prédiction* and directly from Medieval Latin *predictionem* (nominative *predictio*), from Latin *praedictio* "a foretelling," noun of action from past-participle stem of *praedicere* "assert, proclaim, declare publicly".

Darwinian panpsychism thus has similarity to Tononi et al.'s (2015) integrated information theory (IIT) by widening the scope of subjectivity to all systems having coherent forms of quantum instability, along with attentive consciousness in all eucaryotes. However it differs from IIT in that it is not seeking simply an abstract formulation of consciousness as an integrated informational system, which on its own has no subjective aspect, but uses dynamical criteria of coherent instability that interface smoothly with quantum reality, introducing a genuine subjective aspect. It also has similarities to Graziano's (2016, 2017, Webb & Graziano 2015) attention schema theory (AST), particularly in regard to the key role of conscious attention being to anticipate threats to survival. It naturally acknowledges the strength of Graziano's argument that a model of attention itself as a form of self-consciousness is central to this process, but as a vehicle to anticipative conscious volition, not a mechanistic contrivance that fools us into thinking we have conscious volition when it exists in AST only as an AI capable algorithm.

Fig 7 illustrates some of the neurophysiological processes perceived to underlie conscious processing. Walter Freeman's model of olfaction consists of an electroencephalogram (EEG) dynamic oscillating via excitatory glutamate and inhibitory GABA neurons entering higher energy chaos as the animal sniffs. This then falls into one or another attracting basin, as the energy engaged by attention is reduced, thus identifying the odour. In the case of a new stimulus, learning alters the potential energy landscape to produce a new attractor. This type of process, involving an edge of chaos transition to a more ordered state, can be generalised to decision-making situations where the global brain dynamic has an instability between possible outcomes, in which a transition from higher energy chaos leads to the decision/solution. Because edge of chaos dynamics invoke the butterfly effect, this raises the spectre of an unstable global state becoming sensitive to instabilities on descending scales of neural assembly to a single neuron and potentially the quantum level of the ion channel in a neuron crossing its sigmoidal threshold. The concept of stochastic resonance has also been demonstrated to promote such hand-shaking fractal scale transitions in the energetics. This is simply a descriptive overview of possible processes involved, in the face of the failure of promissory materialistic neuroscience (Popper & Eccles 1984) to demonstrate physical causal closure of brain function, so Occam's razor cuts in a direction which avoids conflict with empirical experience of conscious volitional efficacy over the physical universe.

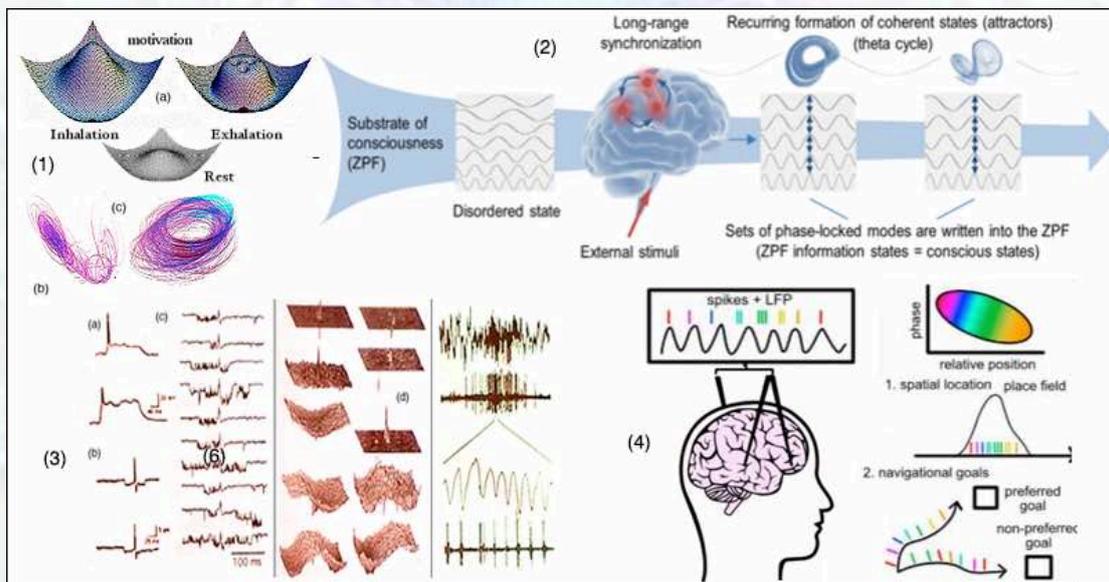


Fig 7: (1) Edge of chaos transitions model of olfaction (Freeman 1991). (2) Joachim Keppler's (2018) view of conscious neural processing uses the framework of stochastic electrodynamics (SED), a branch of physics that affords a look behind the uncertainty of quantum field theory (QFT), to derive an explanation of the neural correlates of consciousness, based on the notion that all conceivable shades of phenomenal awareness are woven into the frequency spectrum of a universal background field, called zero-point field (ZPF), implying that the fundamental mechanism underlying conscious systems rests upon the access to information available in the ZPF. This gives an effective interface description of how dynamical brain states correspond to subjective conscious experiences, but like the other dynamical descriptions, does not solve the hard problem itself of why the zero point field becomes subjective. (3) Stochastic resonance as a hand-shaking process between the ion channel and whole brain states (Liljenström & Svedin 2005). (4) Illustration of micro-electrode recordings of local wave phase precession (LFP) enabling correct spatial and temporal encoding via discrete action potentials in the hippocampus (Qasim et al. 2021).

This is complemented by a second process earlier noted by Karl Pribram (1975, 1993), in which centrally attended (conscious) processes are distinguished from background noise of peripheral processing by the phase coherence of their excitations rising and falling together. Decoherent oscillations are relegated to the periphery of attention while

coherent excitations are central. This is again consistent with competing peripheral excitations vying for central attention in an evolutionary process of natural selection favoured by several neuroscience ideas. This process of phase coherence has striking similarities to quantum uncertainty, where a measurement of energy requires a non zero time interval defined by Planck's constant h to count the wave beats against a reference wave. This model became clearer experimentally, in that the discrete action potentials of single neurons were found to be statistically modulated by the phase precession of the overall voltage wave associated with the EEG (Qasim et al. 2021), thus bringing in a discrete cellular response to the continuous local wave potential, also characteristic of quantum phenomena in the probability interpretation of the particle's position within the wave.

Joachim Keppler (2018, 2021) presents an analysis drawing conscious experiences into the orbit of quantum field theory, based on the conception that the universe is imbued with an all-pervasive electromagnetic background field, the zero-point field (ZPF), which, in its original form, is a homogeneous, isotropic, scale-invariant and maximally disordered ocean of energy with completely uncorrelated field modes and a unique power spectral density. This is basically a simplification of the uncertainty associated with the quantum vacuum in depictions such as the Feynman approach to quantum electrodynamics (fig 4). This does not of itself solve the hard problem of subjectivity, because it is a purely physical model but does provide a basis to discuss the brain dynamics accompanying conscious states in terms of two hypotheses concerning the ZPF:

"The aforementioned characteristics and unique properties of the ZPF make one realize that this field has the potential to provide the universal basis for consciousness from which conscious systems acquire their phenomenal qualities. On this basis, I posit that all conceivable shades of phenomenal awareness are woven into the fabric of the background field. Accordingly, due to its disordered ground state, the ZPF can be looked upon as a formless sea of consciousness that carries an enormous range of potentially available phenomenal nuances. Proceeding from this postulate, the mechanism underlying quantum systems has all the makings of a truly fundamental mechanism behind conscious systems, leading to the assumption that conscious systems extract their phenomenal qualities from the phenomenal color palette immanent in the ZPF."

Although Symbiotic Existential Cosmology doesn't directly utilise any particular quantum interpretation as its basis, it is broadly consistent with both the ZPF description involving a quantum interface between brain dynamics and subjective consciousness, and with the dissipative quantum model of brain dynamics (Freeman & Vitiello 2007, Sabbadini & Vitiello 2019). It demonstrates the kind of boundary conditions in brain dynamics likely to correspond to subjective states and thus provides a good insight into the stochastic uncertainties of brain dynamics of conscious states that would correspond to the subjective aspect, and it even claims to envelop all possible modes of qualitative subjectivity in the features of the ZPF underlying uncertainty, But it would remain to be established that the ZPF can accommodate all the qualitative variations spanning the senses of sight, sound and smell, which may rather correspond to the external quantum nature of these senses. Also the ZPF as a physical manifestation does not itself solve the hard problem as such.

This picture is consistent overall with neural processing being a causally incomplete dynamical system, interfacing with quantum reality at points of environmental, and dynamical instability amid tipping points, making it possible for the subjective aspect associated with conscious volition to interact with the physical brain by forms of internal quantum measurement, without disrupting the extent to which neurodynamical processing is causally determined by the brain.

3. Symbiotic Cosmology arises because natural systems achieve optimal complexity and evolutionary persistence and diversification in symbiotic interactions complementing competition..

This climax of biological evolution arises in eucaryotes as a result of:

- (a) The **eucaryote endosymbiosis** between the two founding branches of life, **archaea** and **bacteria**, resulting in a complexity catastrophe leading to cell organelles and informational excitable membranes communicating through social signalling molecules, with fundamental energy processes sequestered internally in the mitochondria. This results in cellular sentience through interaction with external quantum modes forming the senses.
- (b) At the same time **asymmetric sexuality** evolved as a genetic symbiosis between complementary strains, enabling indexed recombination of large genomes.
- (c) In parallel, **cell-virus/transposable element** symbiosis occupying up to 46% of the human genome, although some members are still actively reproducing in the germ line they have also given rise to modular gene expression. In terms of the selfish gene (Dawkins 1976), transposable elements notwithstanding, organism genomes are one huge genetic symbiosis, through organismic survival and selection.
- (d) Direct and indirect interspecies symbiosis in the biosphere, such as predators avoiding boom and bust in herbivores.

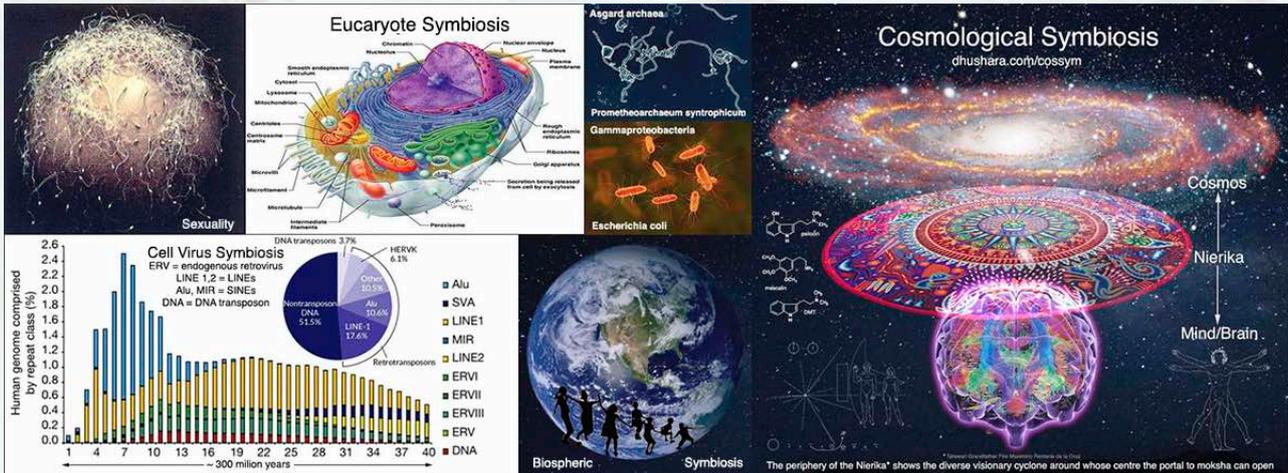


Fig 8: Multiple forms of symbiosis involve the symbiosis between Asgard archaea and proteobacteria to form the eucaryotes (top centre), sexual complementarity, where two of more strains enter into a prisoners' dilemma of sexually-antagonistic co-evolution promoted by symmetry-breaking between ovum and sperms and their differing reproductive investments (top left), Cell-virus/TE symbiosis in which 52% of the human genome consists of transposable element (TE) sequences, biospheric symbiosis in which natural and sexual selection under mutational variation leads to the survival of the fittest biospheric symbionts, whether parasite, host, predators or prey and psychic symbiosis in which plant and fungal species modify the experiential brain dynamics in humans and other species. Human TE evolutionary history, including LINES (yellow), SINES (light and dark blue), retrovirus-like LTR (long-terminal repeat) elements (green/cyan) and DNA transposons (red). This history extends back over the entire mammalian evolutionary epoch, with around 8% and 4.5% divergence respectively every 25 million years, indicating the very ancient basis of this relationship, which extends 105 million years to the eutherian radiation (International Human Genome Consortium 2001).

Organismic symbiosis is then realised in **biospheric symbiosis** of each species within the biosphere as a whole, in which natural and sexual selection is a measure of survival of the most successfully symbiotic species within the biosphere, whether parasites, prey, predators or hosts.

Ultimately, **society** and **culture** are also examples of symbiotic survival, however human emergence has been fraught with species-focused selection, leading to **egotistical consciousness**, tribal and civil warfare, as well as **sexual wars of dominance** between the male and female sexes, in which **patriarchy** has compromised the sexual prisoners' dilemma, inhibiting female reproductive choice essential for XY-based evolution and breaching human equilibrium with the biosphere, in exponentiating **devastation of the natural habitats** of the planet, **climate crisis** and **resource crisis**. The prosocial effects of psilocybe species have also been proposed to have played a role in the emergence of human culture (Rodríguez Arce & Winkelman 2021). The natural correction to this scenario comes from the complex sensitivity of conscious existence **not being the exclusive dominant possession of a single species *Homo sapiens***, but is achieved in **psychic symbiosis** between *Homo sapiens* and other biospheric species.

A critical feature of the cosmology is that it was discovered by a mathematician with a research interest in biocosmology, neurodynamics and chaotic quantum processes, as a result of an experience on **psychedelic mushrooms**, which brings us to the final stage of psychic and cosmological symbiosis.

Psychic symbiosis. The end result of this process is that biospheric evolution has led to certain species, such as several cacti, mushroom species, and a variety of plant species producing neurotransmitter analogues which act as paradoxical super-agonists, currently having the umbrella name of classic psychedelics. These send the dynamical processes evoking subjective consciousness, perceptual processes and particularly the default mode and associated networks supporting individual ego dynamics for organismic survival, in **organismic consciousness** into a deeper form of **primary consciousness**, in which these dynamics revert more closely back towards collective survival, or even deeper into a form of abstract consciousness, which the experiencer identifies with "ultimate reality", expressed by Aldous Huxley as the **mind at large**, associated with the merging of personal identity with the compassionate totality of existence. Individual consciousness is then an encapsulation of the mind at large, filtered through the coherent brain activations associated with organismic consciousness. Thus while more elementary levels of subjectivity are not perceivable to human observers, organismic and primary consciousness are, making the cosmology verifiable. Multiple papers by the Johns Hopkins team (Griffiths et al. 2006, 2007, 2011, 2018) and others, attest to a building statistical validation.

This type of psychedelic experience⁸ has deep parallels with the mystical states of **moksha**, **satori**, **epiphany**, **immanence** and **enlightenment**, spanning both Eastern and Western spiritual and religious traditions and planet-wide traditions of shamanism. In reductionistic science, where consciousness is regarded merely as an epiphenomenon, this is regarded as hallucination, or psychosis, of no external significance. In theistic traditions it is regarded as either negative possession or positive emanation of holy spirit. In the Upanishads it is accepted as the ultimate reality in the union of Brahman with the atman, or inner self, in the manifestation of cosmic consciousness.

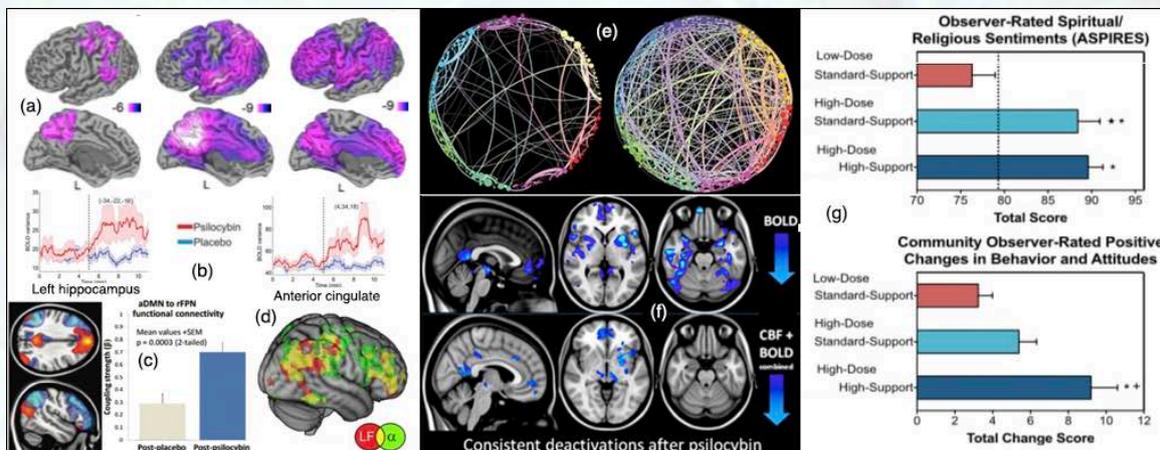


Fig 9: (a) Reductions in alpha (8-15 Hz) and delta (1-4 Hz) MEG power for psilocybin (Muthukumaraswamy et al. 2013), consistent with greater signal desynchronisation on psilocybin. (b) BOLD Variance time courses (obtained over a 1 min. sliding window) for the psilocybin and the placebo infusion (Tagliazucchi et al. 2014) showing greater variance on psilocybin. (c) Increased functional connectivity between the default mode network (DMN0 and r-fronto-parietal cortex after psilocybin (Carhart-Harris et al. 2013), consistent with the “unconstrained mind” (Lifshitz et al. 2018). (d) Decreased low frequency power (LF) and power spectrum scaling exponent α after psilocybin infusion (Tagliazucchi et al. 2014). (e) Persistence homological scaffolds for placebo (left) and psilocybin (right) showing greater inter-connective persistence on psilocybin (Petri et al). (f) Reduced BOLD activity after psilocybin in areas related to the DMN (f) A recording during the 12 minutes after intravenous administration of psilocybin 2mg (~15 mg orally), which shows reduced activity in medial frontal cortex (mPFC), posterior cingulate cortex (PCC) and other areas. (Carhart-Harris et al 2012). (g) Two indicators of beneficial spiritual and social effects of psilocybin at 6-months after the experience Griffiths et al. (2018).

Moksha is an almost unattainable objective for most people, leading to wishful reincarnation in Eastern traditions, where enlightenment is delayed to a future lifetime. Symbiotic cosmology is also the realisation of the tantric origin of Shakti-Shiva as mind and world, and of the Yin/Yang of the Tao. The key that psychedelics provide is that, among their diverse phenomena, there is a portal called the *nierika* by the Huichol, which leads to a state of deep cosmic consciousness sometimes described as the “spirit world”. It is also reflected in Yeshua’s saying:

“It is I who am the All. From me did the All come forth, and unto me did the All extend”.

The common elements of peak psychedelic experience are of a consistently mystical quality, established in recent scientific research, invoking the experiencing of “ultimate reality” and the consistently transformative effect on peoples lives suggest they do have a common aetiology, consistent with cosmic consciousness and that this process is real. This provides evidential data, in the form of veridical reports having statistical significance in the same way that objective scientific measurements do. This places **psychedelics as the subjective complement of the LHC in physics**.

Symbiotic Existential Cosmology provides a completely different solution from both a purely **materialistic cosmology**, in which the universe is described as a causal process, in which consciousness life is passive, meaningless and irrelevant; and a **theistic cosmology** in which life on Earth is a disposable moral trial created by a non-evidential external third party called God for a future life of eternal bliss or hellish punishment. Neither do Eastern cosmologies, dependent on notions of moral karma and endless reincarnation in a world of illusion, respect the material, genetic and ecological manifestations of natural embodied life. All these traditional cosmologies devalue the role of the evolving diversity of perennial conscious life in the universe, leaving us with a wasteland of apocalypse and Armageddon. Symbiotic cosmology invokes immortal paradise, so long as Earth shall live and beyond Earth to the stars,

⁸ I am not suggesting that everyone should take these agents to achieve such states, but just that they need to be respected as having these potentials for existential insight by society as a whole. Neither am I recommending that people take them without expert guidance, at least at the outset. Neither am I suggesting they be taken by minors, until the age of full adult legal consent.

if we can learn to survive in evolutionary time. It is the real cosmology of the living universe while religious and materialistic cosmologies are tragic fallacies of the imagination.

Cosmological symbiosis: In symbiotic cosmology the purpose of the cosmological process is so that the universe can reach edge of chaos climax and manifest, experience and know itself, through the structural cosmological pathway leading to fractal complexity, life and consciousness, in which the biota, and *Homo sapiens* as a climax species, comes to experience forms of awareness, realising and manifesting cosmological self-consciousness.

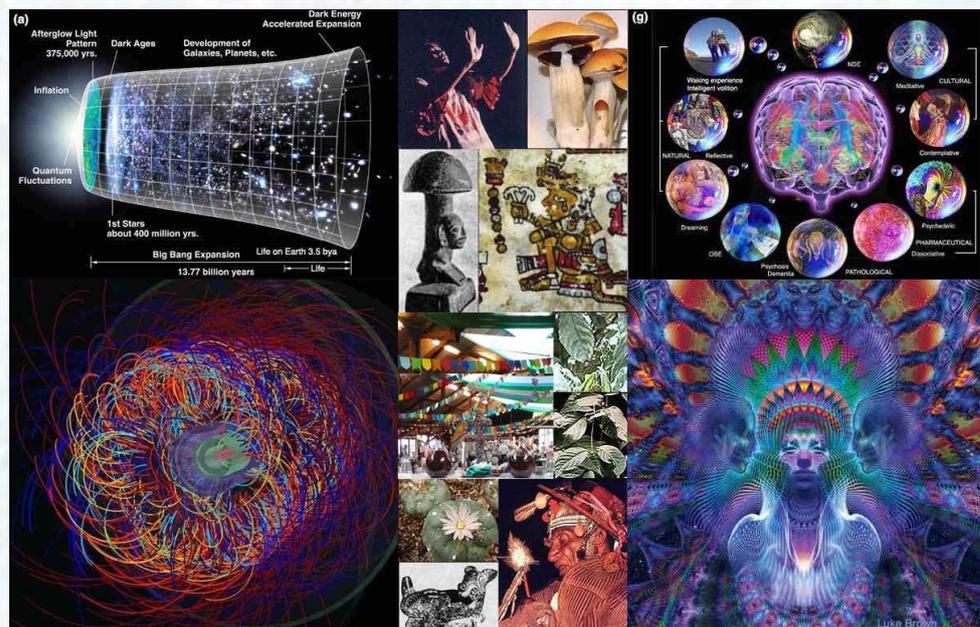
This is a scientific cosmology, which imparts an even greater responsibility and urgency on humanity than religious cosmologies – to act as conscious guardians of the biosphere, to cherish and protect the living universe as sentient cosmological manifestations of it. This also has profound spiritually fulfilling implications, in which conscious beings become both immanent and transcendent guardians of the diversity of conscious life – i.e. becoming as Gods in terms of Genesis, regaining the mythical Tree of Life hidden since the foundation of the world:

Behold, the man is become as one of us, to know good and evil: and now, lest he put forth his hand, and take also of the tree of life, and eat, and live for ever: Therefore the LORD God sent him forth from the garden of Eden. (Genesis 3:22).

This in turn imparts to us a “galvanising” responsibility, as cosmological manifestations of sentience to use our lives fruitfully to preserve and ensure the passage of the generations of conscious life in overflowing abundance. To protect the planet from mass extinctions, while experiencing the full deep abyss of conscious awareness, so that the evolving manifestation of consciousness is able to unfold. We are the agents of transformation and the decisions we make will shape the universe around us, making a paradisiacal, purgatorial or hellish history as we speak. Our lives are then truly connected to the immortal web, through intimate conscious identification with the flow of life as a whole, solving the dilemma of organismic mortality in the physical world. This again is why psychedelics are therapeutic for people in depression and terminal illness (Carhart-Harris R et al. 2016, 2017, Griffiths R. et al. 2016) and why they are also conducive to increased nature-relatedness (Lyons & Carhart-Harris 2018).

Symbiosis and Human Survival: Put very simply, a biosphere cannot survive in evolutionary time if there is a dominant species whose emergence remains tribal in basis. But that is the natural condition for any emerging dominant species like *Homo sapiens*. So the fully evolved expression is not species dominance, but biospheric symbiosis. So called classic psychedelics provide a core pathway to achieve this, because their affects on ego, particularly in a state of meditative withdrawal, or trance fixation, can undergo a transition to the ‘abstract’ state of consciousness that Aldous Huxley denoted “the mind at large”. Cosmological symbiosis is consistent with a fully technological civilisation, in which science and vision can both flourish, because it engenders a symbiotic civilisation, which can survive on cosmological time scales. A dominant species-driven technological civilisation is not sustainable because it is self-destructive through biospheric exploitation and collapse and sheer short-term instability. Religious cultures are likewise prone to self-destruct through lethal theistic misadventure.

Fig 10: Physical cosmology and the cosmology of mental states illustrated by lead ion collisions in the LHC and “Curandero” Luke Brown’s illustration of psychedelic experience and natural psychedelics in traditional use.



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Symbiotic Existential Cosmology – Discovery and Philosophy

Contents:

The Existential Condition and the Physical Universe

Turning Copernicus Inside Out

Discovering Life, the Universe and Everything

The Central Enigma: What IS the Conscious Mind?



Fig 11: Cosmology is a paradoxical complement of two manifestations – quantum reality and subjective consciousness. The classical world around us arises from consciousness collapsing the overlapping parallel worlds of quantum reality, to evoke the historical process via our intentional will. We are thus personally responsible for the fate of existence.

The Existential Condition and the Physical Universe

The human existential condition consists of a complementary paradox. To survive in the world at large, we have to accept the external reality of the physical universe, that we bleed if cut and may become unconscious or die if hit on the head, but we gain our entire knowledge of the very existence of the physical universe through our conscious experiences, which are entirely subjective and are complemented by other experiences in dreams and visions which also sometimes have the genuine reality value we describe as veridical⁹. The universe is thus in a fundamental sense a description of our consensual subjective experiences of it, experienced from birth to death, entirely and only through the relentless unfolding spectre of subjective conscious existence. Thus although we scientifically associate subjective consciousness with integrated dynamical brain states, the physical universe manifests through conscious experience. Materialists attempt to defer this by saying that this is just the way it appears to a biological organism imprisoned in their own internal model of reality, which will seem like this, but is only a feature of their subjectively confined point of view. This is incorrect because it then leads to the hard problem of consciousness and the failure to recognise volition.

We are thus subjectively conscious beings possessing volitional will over a physical universe we know only through our conscious experience of it, and our creation myths and scientific descriptions attempt to make sense of our predicament. The universe in turn becomes manifest, only through its conscious sentient beings, the biota, so the meaning of existence is created through our journey of discovery as conscious agents transforming the universe by our insights and actions. We thus in turn inherit a foundational responsibility for our actions cosmologically.

When we confine our discourse to dealing with the properties of external physical reality, we end up with what has become the exceedingly complex scientific description of the natural universe. This appears on macroscopic scales to be a giant causal mechanism made of atoms and molecules, leading to our complex brains and the way brain processing leads to the decisions we make in the physical world. This in turn leads to the notion that our subjective conscious minds are just an internal model of reality created by the computational brain to sum up the outstanding

⁹ *Veridical* – truthful, coinciding with reality. Etym. "speaking truth" Latin *veridicus* "truth-telling, truthful," from *verum* "truth," neuter of *verus* "true" + *dic-*, stem of *dicere* "to speak".

features of the world around us and that our personal sense of volition and subjective agency – the experienced ability to make decisions affecting the world around us – is a delusion, because it is the causal processes in our brains that did this, not our conscious volition.

The trouble with this point of view is the hard problem of consciousness – the fact that there is no conceivable way any physically objective brain process or a set of easier functional problems about integrative properties of brain function can explain something as intrinsically subjective as conscious experience. As Jerry Fodor said: “Nobody has the slightest idea how anything material could be conscious. Nobody even knows what it would be like to have the slightest idea about how anything material could be conscious.” This is the dilemma that the easy problems of consciousness cannot be contrived into an objective structural description that solves the hard problem. At best, we end up with pure informational models identifying human consciousness with integrated biological forms of artificial computational intelligence.

Fig 12: Constructing our description of reality based on the external physical world since Copernicus carries incredible explanatory power because nature is complex and provides a detailed physical and biological description, but in terms of subjective experience and conscious existence, relying exclusively on the external objective details paints us into a corner where we cannot solve the hard problem of consciousness, because the external objective description is categorically incapable of modelling or manifesting intrinsic subjectivity.



There is also a fatal flaw in the dependence of physical neuroscience on classical notions of casual closure as a mechanism. The discovery of quantum reality at the beginning of the 20th century has shown us that the universe is not causally closed and that quantum uncertainty and its spooky features of quantum entanglement can intervene throughout. The reason for the incredible technological success of science is thus not the assumption of macroscopic causality at all, but the fact that the quantum particles come in two kinds. The integral spin particles, like photons, called bosons, can all cohere together, as in a laser and thus make forces and radiation, but the half-integer spin particles called fermions, like protons and electrons, which can only congregate in pairs of complementary spin, form matter, inducing a universal fractal complexity, via the non-linearity of the electromagnetic force. Given the quantum universe and the fact that brain processes are highly uncertain, given changing contexts and unstable tipping points at the edge of chaos, objective science has no real basis to claim the brain is causally closed and thus falsely conclude that we therefore have no agency to apply our subjective and consciousness to affect the physical world around us.

So what if we reverse the cosmological argument and begin with the foundations of conscious existence, in the form of subjective consciousness affecting the physical world around us through our veridical experience of our conscious intent – our volitional will affecting the world around us, as we witness in everything we do behaviourally in the world? By veridical, I mean we are telling the actual truth about our conscious experience and our consciously experienced volitional intent to make decisions and execute physical actions. I use the term veridical because when we do anything physical we have an unswerving conscious impression that we have genuinely intended something and executed a physical action whose consequences we are responsible for as active agents. We are consciously aware that we are intending a physical action we are undertaking. This is the veridical perception of our intention that materialistic neuroscience is denying when the conscious mind is treated as an epiphenomenon having no physical affect. Organismic perception of the real world is described as “veridical perception”¹⁰, because it is designed to give an accurate portrayal of the world, realer than the incoming sensory data, in our case in binocular 3-D, with size preservation, conducive to an accurate detailed view, ensuring evolutionary survival in the wild. The key aspect of

¹⁰ Natural selection has shaped our perceptions to be, in the typical case, accurate depictions of reality, especially of those aspects of reality that are critical for our survival. “People could not orient themselves to their environments, unless the environmental information reaching them through the various sense organs offered a perception of space that corresponds to their physical “reality.” Such perception is called veridical perception – the direct perception of stimuli as they exist. Veridical perception also causes a person to experience changing stimuli as if they were stable: even though the sensory image of an approaching tiger grows larger, for example, one tends to perceive that the animal’s size remains unchanged. One perceives objects in the environment as having relatively constant characteristics despite considerable variations in stimulus conditions” (Britannica, APA).

consciousness us that we are aware that we are aware. Materialistic neuroscience denies that our perception of our volition is veridical, contradicting the fact that this is as necessary to survival as our veridical perception of the world.

Existential cosmology has the opposite effect from reducing consciousness to mere information, by contrast imbuing at least some forms of matter, such as brains, with an extra complementary subjective aspect that we witness and execute as conscious experience and volitional intent. Although this is counter-intuitive to pure materialism, it is a vastly more plausible and realistic approach than denying human agency by a fatal *reductio ad absurdum* of existence. Rather than ghosting us as walking AI machines lacking free will, it introduces profoundly exciting new properties into the physical universe, explaining conscious existence in the material realm!

Enter existential cosmology, which starts from the conscious level as we all do, and develops our cosmological world view as a transaction between subjectively conscious live human beings, to discover and deduce the cosmological conditions of the world around us as living conscious agents affecting the natural world. This leads to a very different conclusion from materialistic physical cosmology, although it is entirely consistent with both quantum cosmology and empirical neuroscience – while materialism denies conscious volition, veridical experience implies matter has psyche.

| | |
|---|--|
|  | <p>Objective Verification by Independent Replication</p> <p>Two separate agents return consistent results by empirical observation, or one agent empirically confirms a theoretical prediction by another agent.</p> |
|  | <p>Subjective Veridical Affirmation by Mutual Agreement</p> <p>Two conscious agents agree on a true account confirmed by empirical experience e.g. that they each possess volitional efficacy of decision-making.</p> |
|  | <p>Belief through Prescriptive Faith</p> <p>Things held to be true as a matter of religious doctrine or revealed command. Agents are led to conviction of the truth of an alleged fact without personal knowledge, or evidence.</p> |

Fig 13: **A: Objective physical verification** proceeds by two agents or groups recording consistent outcomes from independent empirical experiments or one group verifying the theoretical prediction of another. **B: Subjective conscious veridical affirmation:** Two conscious agents confirm a common truth through affirmation by empirical experience. e.g. in sworn testimony, political agreements and entrusted relationships. **C: Belief through prescriptive faith** in religious doctrine involves conviction of a doctrinal truth without actual knowledge or experiential or objective evidence of the proposal or phenomenon. **Symbiotic existential cosmology** utilises A objectively and B subjectively. It also encompasses visionary experiences consistent with C but only if they satisfy B, alleviating the explanatory gap of “soul” being equated with belief (Freeman 2008).

Existential cosmology is thus verified as a conscious transaction of volitional agency between live human beings, in a veridical affirmation: As you read this

passage, you are becoming consciously aware that I have, as a live human being, **consciously and intentionally committed this communication to physical electronic form**, thus affirming that my **subjective conscious volition has had a physical effect on the universe**.

Normally this would be a mutual affirmation between two conscious agents in one another’s presence of their veridical efficacy over the world. It is almost absurd to have to make this claim explicitly because it is assumed in all our interactions! Some less materialistic people may wonder why this needs to be stated, but the scientific era has brought it into question and it is pivotal to establishing the conscious volitional paradigm.

By consciously comprehending the truth of your self-evident affirmation of my volition above on receipt of this, you are empirically, by your own experience confirming the core thesis of existential cosmology, which asserts that subjective conscious volition is physically realisable. This also implies that at least some physical matter, including the brain, has a complementary subjective aspect, but the brain is ordinary matter subject to the four core quantum forces, so this means the physical universe has a complementary subjective aspect, from which the evolutionary implications of Darwinian panpsychism and Symbiotic cosmology as a whole follow. Existential cosmology is thus a subjectively verifiable discovery, in the creative commons, which can be affirmed empirically by experience¹¹.

By veridically affirming the author’s volitional agency and noting this fact physically, you are also affirming your own volitional agency over the physical world. Therefore, on receipt of this communication, we each become consciously responsible and fully accountable for the discovery’s consequences, as conscious human beings whose volition affects

¹¹ *empirical* based on, concerned with, or verifiable by observation or **experience** rather than theory or pure logic.

Etym. Greek *empeirikos*, from *empeiria* ‘experience’. Observational empiricism is appropriate for verifiable physical investigation and experiential empiricism for veridical conscious affirmation.

the world. This is not a moral responsibility but a responsibility, as a conscious agent, to the veridical truth of what you have experienced and its implications about your own volition upon the world as a conscious human being.

No unverifiable claim that awareness of volition is correlation, not causation, and my physical brain wrote this passage, or developed the entire cosmology on its own, without my conscious volition affecting the physical universe, and at the same time fooled my conscious experience into believing I had done it consciously, as a passive epiphenomenon will suffice as an avoidance of your duty of care as a conscious human being, to affirm its experienced veridical truth.

You are free to transmit this work to others in intact form, to critique it, or to communicate a critical flaw to the author, but you cannot escape the duty of care to be honest about the veridical truth of the transaction and its thesis and to communicate it honestly to others. In a sense this is not asking anything more from the reader than the simple cognisance that I have subjectively applied my conscious volitional will to commit this consciously discovered thesis to physical form, as all live consciously active human beings do every day, by their actions. However the responsibilities are acute and pivotal to the capacity of the cosmology to ensure human survival over evolutionary time scales.

The process of mutual affirmation also has significant social implications because it leads to a social paradigm where decisions are made by autonomous mutual agreement, rather than hierarchical structures and institutions. It leads to new social models of fractal ecosystemic democracy, or lateral democracies by mutual consent such as holacracy and sociocracy.

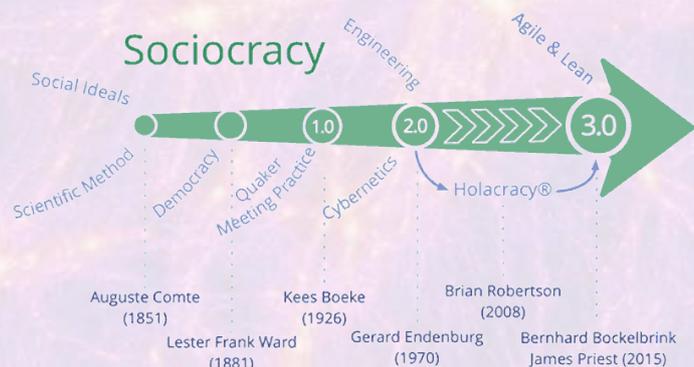


Fig 14: The social evolution of sociocracy models of society.

Symbiotic existential cosmology, as explained in the scientific overview, consists of three interlocking realities:

- (1) **Biogenic:** Life exists cosmologically as a fractal consequence of the symmetry-breaking of the forces of nature reaching interactive climax.
- (2) **Panpsychic:** Subjectively conscious volitional will has efficacy¹² over the physical universe.
- (3) **Symbiotic:** The planetary biosphere survives and evolves through ecosystemic symbiosis, upon which human survival is dependent. Biospheric symbiosis is thus essential for human survival.

The cosmology arose as a result of an experience on psychedelic mushrooms, but the significance of the cosmology itself extends far beyond entheogenic visions. It is in fact the actual cosmology of the universe in which we consciously exist. It is fully consistent with both quantum cosmology and with empirical neuroscience, and it has truly extraordinary implications that are in no way dependent on psychedelics themselves:

1. It **restores human conscious volitional agency**, currently denied by materialistic neuroscience and morally bound by religious belief, and returns ethical and legal responsibility for our actions back to the human species, and does it in the cosmological context, revealing the key role of life in the universe, as shown at Σ in fig 15, thus imbuing humanity with a clear responsibility to protect and unfold conscious life over evolutionary time scales.
2. It **has the direct capacity to save the biosphere and humanity from mass extinction**. Its symbiotic implications form a central remedy to avoid a climate and biodiversity crisis which could cause a mass extinction of the diversity of life, setting humanity back 50 million years and very likely causing the extinction of Homo sapiens, due to a failure to live symbiotically with the biosphere upon which we co-depend for our survival.
3. It **realises the existential quest of human meaning and purpose in the universe**, as a cosmological climax phenomenon, enabling the physical universe to manifest and know itself, while giving each and every one of us the capacity to experience states of cosmological symbiosis in reunion with the conscious universe as a whole.
4. It **transcends both materialistic and theistic world views**:
 - (a) It **transcends scientific cosmology** because it **completes the scientific description of nature** by fully incorporating **subjective consciousness** and the **efficacy of volitional will to affect the physical universe**.

¹² efficacy – the ability to produce a desired or intended result.

(b) It **transcends religious cosmology** by **transferring cosmological agency** directly back to **humanity and natural life**, verified by **conscious affirmation of our volitional agency**, rather than dependence on supplicant beliefs.

Symbiotic existential cosmology can be empirically verified in **five principal ways**:

1. The key role of life in the universe is incontrovertibly manifest in the biosphere as a climax edge-of-chaos dynamical system resulting from the four non-linear quantum forces of nature, mid way through the universe in space-time.
2. Existential cosmology as an interaction between subjective consciousness and physical reality, is verified through affirmation by empirical experience between conscious human volitional agents, in the same manner that legal transactions, such as sworn evidence, fiduciary duties of care and terms of trust are veridically affirmed. This is necessary for applying Occam's razor to eliminate materialistic cosmologies failing the volitional efficacy test fundamental to human decision-making autonomy and personal responsibility for our actions upon the world.
3. The extent of subjective volitional consciousness across the evolutionary tree can be verified through empirical observation of volitional purposiveness in eucaryotes.
4. Organismic and biospheric symbiosis are irrevocably manifest properties of all eucaryote species and the biosphere as a whole as a climax system. Psychic symbiosis has become a cultural practice of diverse human societies.
5. Cosmological symbiosis is verified by statistical evaluation of quantum change experiences of "ultimate reality", in psychedelic and meditational states, as demonstrated in studies by the Johns Hopkins team and others.

Turning Copernicus Inside Out

The current human weltanschauung, since an exilic writer wrote the sabbatical Genesis 1, started out as a flat Earth with beaten domes (firmaments) in which the plants were created before the sun and moon. Until Copernicus, this was an anthropocentric view of God's creation. Copernicus then flipped it to the heliocentric objective universe, causing our thinking to turn inside out and become obsessed with describing everything, including our most subjective realities, in objective mechanical terms, until quantum reality intervened.

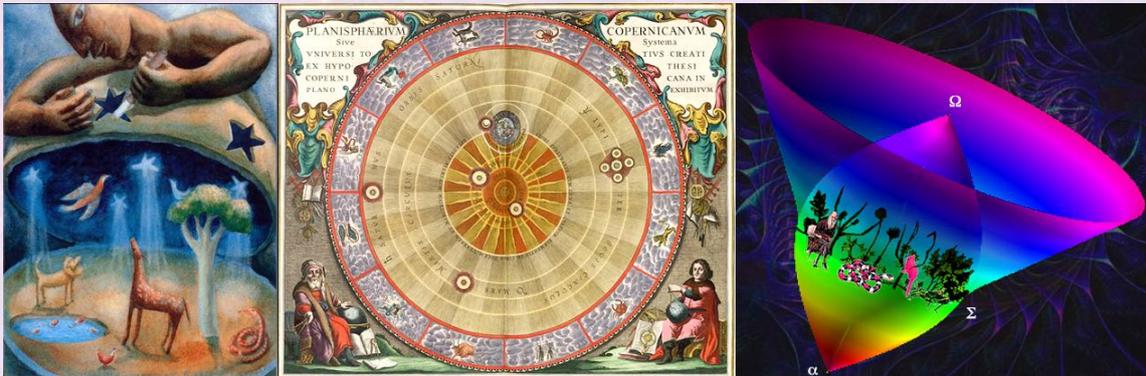


Fig 15: 'Elhoistic Flat Earth Sabbatical Eden and Copernican Classical Heliocentrism, in Symbiotic Existential Cosmology become Conscious Paradise on the Cosmic Equator Σ in Space-time, between the big-bang origin α and the final crunch, or heat death Ω . This way, instead of running down into the Kali Yuga or the Buddhist Samvartakalpa or Eon of dissolution, or being static as in the Monotheist creation, which is then discarded in the End of Days, the universe explodes with evolving living diversity in Paradise on the Cosmic Equator in Space-Time! It's more than the noosphere, it's the biocosmos revealed – **Voilà!**

Symbiotic Existential Cosmology doubly inverts the Copernican principle: That humanity does not have a privileged view of the universe. SEC does a double flip on this as well. Firstly the universe is NOT heliocentric. The structural interaction pathway goes through two cycles. Firstly younger hotter stars generate the chemical elements from hydrogen and helium and supernova them into galactic gas clouds which are then swept up into smaller longer lived sun-like stars with solar accretion discs, where a second long period of biogenesis and then biological evolution ensues. Thus we end up at picture three on the right, paradise on the cosmic equator in space time. We are not 4.5 billion years old but our stuff is much older, say 10 billion out of the universe's 13 billion year lifetime, so the cosmic equator is now about half way through in space-time, with a good 5 billion to go before we red giant. But there is the second flip. Due to the eucaryote endosymbiosis between archaea and bacteria, life became complex conscious organismic life and the cosmic equator has become conscious flipping the privileged view of the universe right back to consciousness itself, so we are nearly back to square one, the Garden of Eden in Genesis 2 and 3, except that we are dire straights from human misadventure! That's precisely what the Brahmanic quantum change experience I had on mushrooms was saying! What a hell of a fix! So we really do need to act to avoid the extinction!

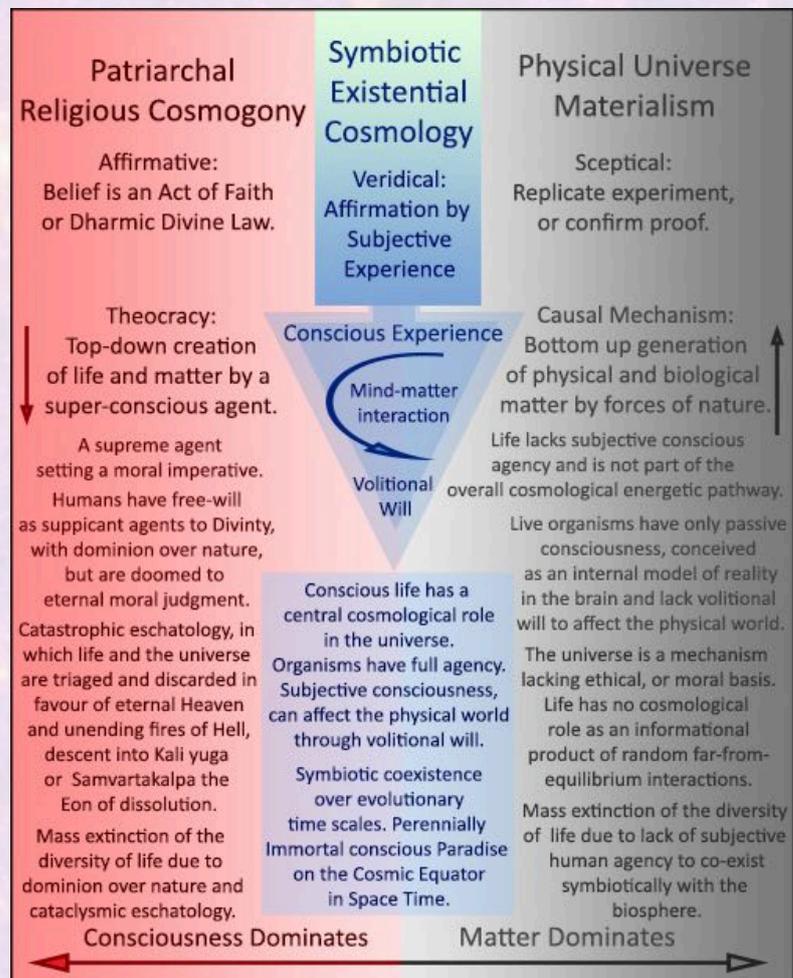
This in turn resulted in the rise of classical materialism defined by Newton’s laws of motion, after watching the apple fall under gravity, despite Newton himself being a devout Arian Christian who used scripture to predict the apocalypse in Parousia arriving in a “second coming” in 2060 (Snobelen 2003):

This most beautiful system of the sun, planets, and comets, could only proceed from the counsel and dominion of an intelligent Being. ... This Being governs all things, not as the soul of the world, but as Lord over all; and on account of his dominion he is wont to be called "Lord God" παντοκράτωρ [pantokratōr], or "Universal Ruler". ... The Supreme God is a Being eternal, infinite, [and] absolutely perfect (Issac Newton).

Nevertheless the classically causal Newtonian world view, and Pierre Simon Laplace’s view of mathematical determinism “that if the current state of the world were known with precision, it could be computed for any time in the future or the past”, came to define the universe as a classical mechanism in the ensuing waves of scientific discovery in classical physics, chemistry and molecular biology, climaxing with the decoding of the human genome. By contrast with Newton, it is said that when Napoleon asked Laplace, who was called “the weathercock” for his political survival skills, why he had never even mentioned its Creator in his work, he answered bluntly, *Je n'avais pas besoin de cette hypothèse-là* – “I had no need of that hypothesis”.

This classical causal view has extended to a view in neuroscience that our subjective conscious experiences, which are the sole avenue we have to experience the physical universe are simply an internal model of reality generated by the brain, viewed as a causally closed physical mechanism preventing volitional will having any efficacy. This view still pertains, despite the discovery of quantum reality at the beginning of the 20th century, in which causality is overshadowed by quantum uncertainty and its effects, on the basis that these do not apply to a warm wet brain. However, this claim is empirically unprovable and is likely to remain so. The end result is that the central arena of our subjective experience and our volitional agency over the physical world have been treated by neuroscience as null and void, leaving neuroscience with no way to elucidate how the objective brain can generate something intrinsically subjective by any causal mechanism conceivable – otherwise called “the hard problem of consciousness”. This leaves our conscious existence in an orphan status and our sense of agency and living meaning and purpose in the universe non-existent.

Fig 16. Symbiotic Existential Cosmology stands centrally between two degenerate descriptions of nature, fully confirming the autonomy of human conscious volitional will to affect the universe and for human beings to have full responsibility over our physical actions. Patriarchal religious cosmogony, left invokes free-will but binds it to eternal punishment by a super-conscious agent. Physical materialism, right lacks any conscious human agency, regarding subjective conscious experience as simply an internal model of reality generated by the physical brain as a passive epiphenomenon, lacking any capacity of conscious volitional will to affect the physical universe. Physical Materialism and Patriarchal theism are both fated to lead to a mass extinction of the diversity of life and eventual human extinction, due to apocalyptic destruction in favour of an imagined Heaven/Hell bifurcation on the religious side and, on the materialist side, the complete failure to accept conscious life has a cosmological role in the universe which humans, as conscious volitional agents affecting the world have become responsible for, by our impact on Earth’s climate, habitats and biodiversity. Only by affirming symbiotic existential cosmology does the human species have a consistent cosmological basis and a good chance of long-term survival in the biosphere over evolutionary time scales.



In figure 16, symbiotic existential cosmology occupies the central place between theistic cosmology, dominated by a superconscious agent creating the universe, and physical materialism in which the universe is described as a giant causal mechanism, although it has been more recently been found to be also subject to quantum uncertainty on the scale of wave-particles and their ensuing “spooky” properties in quantum entanglement. Both the theistic and pure materialistic descriptions are degenerate in complementary ways.

Symbiotic existential cosmology corrects this fatal flaw in the scientific model elegantly, by starting from our conscious ability to apply volitional will to affect the universe and making a minimal augmentation of quantum cosmology to include the subjective aspect. This immediately inverts the Copernican principle, because it deduces that subjective consciousness in the advanced biota and hence humanity is the climax phenomenon of the biogenic interactive pathway, giving us not only a privileged view but the central experiential view of the universe, as a manifestation of a consciously purposive cosmos. Copernicus is turned inside out because the world outside regains its complement, the mind-at-large inside, through which the universe can perceive and manifest itself.

Symbiotic cosmology is absolutely pivotal to the human species regaining volitional autonomy and the ability to take responsibility of ensuring our species learns to respect our symbiotic relationship with the biosphere essential for our long-term survival. Without this, the prospect of a mass extinction event setting us back 50 million years and possibly causing our own extinction is almost inevitable.

Pure physically materialistic cosmology leads to a meaningless universe, in which life is an ineffectual by product, the brain is a biochemical machine, consciousness is a functionless epiphenomenon, volitional will is a delusion, and society is reduced to abstract information systems, with no ethical reason to preserve conscious life, or the diversity of natural life, predisposing to biospheric collapse, ultimately subject to AI catastrophe due to a failure to distinguish conscious life from mere information.

Fig 17: Physical materialists who, by their expressed position, are religiously unaffiliated, count only a diminishing 16%, diminishing to 12.5% of the world population by 2060 (Pew Research 2017). This means that unproven assumptions that life lacks conscious volition and is just a causal computational mechanism in the brain have no credible chance of success in advancing the scientific description of nature to the human population at large in the coming century.

Patriarchal theistic cosmology by contrast, discards the late planet Earth in envy of Heaven and fear of Hell, in an apocalyptic tumult of life’s destruction, and of the universe itself, as God’s disposable creation, or in the Eastern mind-sky view a degenerating Kali¹³ yuga again leading to human and natural extinction. Figure 17 shows that, despite the incredible nature

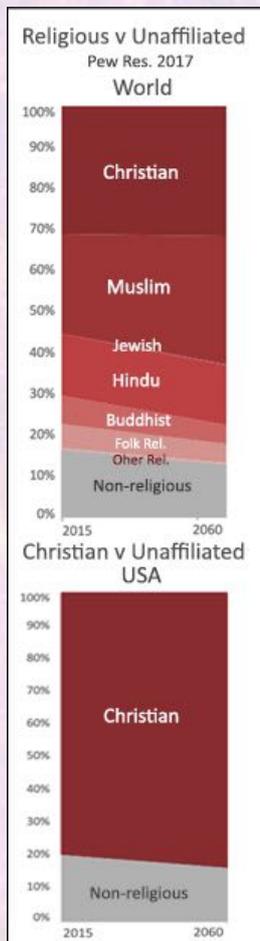
of theistic cosmology in the natural universe, far more people adhere to a religious view than are unaffiliated, partly because it does provide a realistic although moralistic view of human consciousness and free-will. This means that the scientific world view and particularly materialistic neuroscience, in the absence of an acceptance of the central place of conscious existence and volitional will has no hope of gaining widespread acceptance this century.

Symbiotic existential cosmology, is an entirely novel cosmic perspective on reality that transcends both these corrupt descriptions and thus seeks to remedy our existential angst¹⁴. The unfolding diversity of conscious life is central to the cosmic process, also realising the visionary core of spiritual traditions through first-person transcendent consciousness, superseding both naive belief in a creator deity, for which no conceivable evidence actually exists and a physical universe lacking meaning, purpose, and awareness of its own existence.

“The world is a construction of our sensations, perceptions, memories. It is convenient to regard it as existing objectively on its own. But it certainly does not become manifest by its mere existence” ... “The reason why our sentient, percipient and thinking ego is met nowhere within our scientific world picture can easily be indicated in seven words: Because it is itself that world picture” (Erwin Schrödinger 1944).

¹³ This use of Kali is as an eschatological demon, distinct from the Goddess Kālī, who like Brahman, is conceived of as a form of “ultimate reality”.

¹⁴ **angst** – a feeling of deep anxiety or dread, typically an unfocused one about the human condition or the state of the world in general.

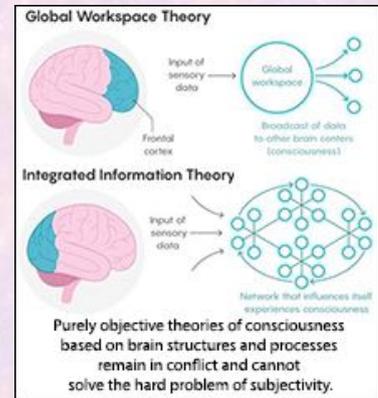


Foundations and Diversity of Existential Cosmologies

Existential cosmology is derived from the fundamental paradox that although we know we are dependent upon the physical universe for our biological survival, we access reality at large entirely through empirical experience of our subjective sensory perceptions of it. This means that, to fully describe the natural cosmos, we have to do so through validating the role of subjective consciousness as a cosmological principle. As noted in fig 16, Symbiotic Existential Cosmology stands mid-way between two theoretical extremes.

(a) Universe Dominant: Physical Materialism

Such cosmologies fail because no objective account, based on the form, or complexity, of brain structures and processes can of themselves manifest subjectivity, so can't solve the hard problem of consciousness extended to volition. They result in a purely mechanistic causal description complemented by probability measures in quantum phenomena, in which there is no explanation for subjective consciousness except as a higher level internal model of "reality" constructed by the physical brain, unable to distinguish living conscious sentient organisms from mechanical processes such as AI, as well as lacking any ethical or moral direction, except as reinforcement, to reduce intra-social competition to enhance inter-social dominance. A living and a dead reality have no real distinction because conscious organisms are just physical structures.



(b) Mind Dominant: Monotheistic, Vedantic and Buddhist Pure Mind Theories

These fail for complementary reasons, because all "aggregates" of purely subjective phenomena remain subjective. Cosmic consciousness creating the physical universe is inconsistent with the clearly emergent properties of the known universe, in which conscious biota come late in the process: (1) The emergence of the universe from the cosmic origin is a multi-stage processes in a symmetry-breaking, giving rise to the forces of nature, the evolution galaxies stars and planets and the genesis and the evolution of life reaching climax in conscious organisms as a late comer. (2) From this viewpoint, full consciousness is emergent in higher organisms, meaning that for any form of cosmological subjectivity to be consistent, it has to be primally vestigial at the cosmic origin. (3) The evolutionary sequence of events, right back to the inflationary origin, is well documented, so any creation by a cosmic mind or God falls right back into the pre-inflationary phase and the Planck time, which is unobservable due to being now expanded over space-like intervals.

The idea of a fully developed cosmic consciousness generating the objective physical universe by "aggregation" from a conscious field ([Chopra](#)) subjective super-mind ([Aurobindo](#)), or a supernatural deity creating a flawed material universe by proclamation ([Genesis 1:3](#)), in each of which, the free-will to defect against divine order then dooms the future, is unsustainable. Both share an origin in an omniscient, omnipotent deity, via Indra and proto-Aryan cosmology, also emergent in both Judaism and Zoroastrianism. It is a tragic flaw of the transition from mystical insight to patriarchal doctrine. In Monotheism this leads to creationism in the guise of "intelligent design".

Such consciousness-dominant cosmologies share **three fatal features**:

- (1) **Counterfactual Contradiction.** The category error of pure physicalism that results in the hard problem of consciousness extended to volition applies in converse too. If no combination of objective entities can, as a result of this, become subjective, neither can any "aggregate" of pure subjective consciousness become objective physical reality.
- (2) **Turtles all the way down!** The entire notion of the cosmic mind or a super-natural deity making physical matter is a mystification because it leads to regress – replacing something we are trying to explain by something we cannot explain, potentially ad infinitum. The physical universe becomes a flawed appendage of a perfect deity or mind, which has itself no natural explanation, further confounding the cosmology rather than unveiling it, undermining our conscious sentient ability to transform the universe as living creative agents and our personal responsibility for our intentional actions.
- (3) **Moral Unsustainability.** The universe becomes a moral causality that has no cosmological meaning in nature, whose diversity thrives on both cooperation and defection. The cosmology is degenerate and unsustainable, running down hill to the Eschaton, Frashokereti, Kali-Yuga or Samvartakalpa.



A key aim of religious cosmologies is the supreme rule of a “divine” order, which runs into conflict with cosmological principles of the diversity of life thriving through existing at the edge of chaos, where the chaotic phase frees nature from the oppressive rule of order becoming locked into fatal attractors. It remains to be established that the notion of religious “good” being associated with “divine” order, is a feasible, or desirable, cosmological outcome.

The Visionary Numinous and Spirituality

History shows religious traditions take their origin from visionary, shamanic and mystical experiences shared by emergent human culture, for the very reason that the subjective view of reality is primary and universal and the physical world view is derived from the primally subjective world view. Thus the primitive visionary state has evolved through shamanic and meditative practices to doctrinal religions, which serve completely separate purposes of enabling larger urban societies by imposing moral imperatives and exerting patriarchal control over female reproductive choice, through punishment, militarism and social conservatism.



In this process, absolute notions such as eternal life are asserted without any real understanding of the consequences, such as how can eternal life evolve, change and be actually alive in any real sense, and the notions of eternal individual souls which are etherial “divine” versions of our personae, which again have manifest problems of the historical accumulation of an unbounded number of coexistent beings throughout history, all solved by mythopoetic and magical means. By contrast quantum reality occurs within space-time, while relativity occurs in various space-time manifolds responding to gravity, which can be viewed eternally, as illustrated in fig 15c. Out of religious belief has emerged the notion of spirituality, a softer form of affirmative belief than doctrinal religion, whose reality status remains apocryphal, based on the same or similar notions, such as a divine individual soul and eternal life.

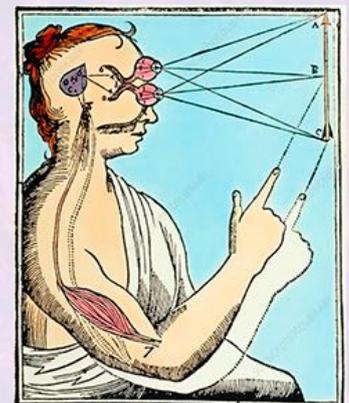
(c) Dual-aspect, Neutral Monism and Mind-Brain Identity Theories

These attempt to bridge the subject-object explanatory gap and have the common feature of trying to explain subjectivity as a complementary perspective on what is still conceived as a closed physical causal process executed by the brain, which, because of its system architecture and dynamics represents a self-organising form of physical agency for which the subjective perspective is the “inner” view of these same physical processes (Vimal 2021). Hence these tend to be passive epiphenomenal accounts, in which the subjective aspect is the systems view of a causal physical process. Bijective duality prohibits interaction between subjective and objective aspects, so there is no explanation of subjective intentionality, or will, i.e. no subjective conscious volition over the physical brain or the universe through intentional behaviour, but it can invoke panpsychism and the combinations problem. However some forms of neutral monism (Stubenberg 2018) assert that mental and physical are aspects of a common underlying reality (Atmanspacher 2018). Spinoza claimed this to be God, which he identified as “the only real substance” (Vacariu 2015).



(d) Interactive Asymmetric Complementarity

A different kind of cosmology arises from accepting the fundamentally asymmetric relationship between a subdividable analysable physical universe and a holistic integrated stream of subjective experience and allowing them to mutually interact. Descartes’ use of the pineal gland as the site of the Cartesian theatre was rejected as a hypothesis of volition, through minuscule movements of the gland activating the muscles, as these were perceived to require physical processes, not mental ones which did not operate in physical space. Due to Cartesian interactionism the vey concept of mind became regarded by Ryle (1949) as a category error, due to the categorical incompatibility of a dualistically separate mind and universe, preventing them from being able to interact upon one another, reducing mind to orphan status.



Rather than denying any possibility of a there being a relationship between such fundamentally different categories of existence, one shared and objectively verifiable and the other private to the individual alone as everything they experience, or denying the reality of the subjective

mind itself, interactive asymmetric complementarity asserts that it is because these categories are so different, asymmetric and complementary that the existential cosmos can become manifest through their interaction. For this to be self-consistent, there has to be a complementary interactive portal, through which the two aspects can affect one another, that is categorically consistent in each complementary domain.

Symbiotic Existential Cosmology solves this paradox, both through the biological features of the quantum universe and the nature of subjective conscious intentionality, but it does so confluent with empirical neuroscience and biophysics, without depending on any hypothetical exceptional quantum process that could later come to unravel the thesis, such as Hameroff-Penrose's ORCH. The physical side of the portal consists of the active brain state entering into self-organised criticality, where quantum uncertainty comes into play, causing the physical system to have an outcome not fully determined by the physical context. In turn, this enables subjective experience to make an autonomous personal intuitive hunch decision, based on intentional will, to intervene in the uncertain physical process to favour one of the permitted outcomes.



"Nature isn't classical, dammit, and if you want to make a simulation of nature, you'd better make it quantum mechanical." Richard Feynman (1982)

Because intentional volition is restricted to uncertain states, no causal conflict occurs between the uncertain physical contextual process and the mentally derived wilful intention that could arise, if autonomous volition – free will – extended to physically determinate states. Thus intentional subjectivity plays exactly the role we know is pivotal in tipping the balance of immediate uncertain environmental crises, such as a tiger strike, to ensure another round of survival against the odds in the environmentally uncertain vagaries of natural fate. This direct conscious intuitive awareness is shared by all eucaryote organisms with edge of chaos excitable membranes and remains consistent with empirical neuroscience and biophysics, while being fully interactive.

The **key redemptive feature** of Symbiotic Existential Cosmology for human survival in the biosphere is that it seeks to protect the **symbiotic diversity of life** in immortal perpetuity in paradise on the cosmic equator, as the climax manifestation of cosmological becoming, thus sacralising life itself as the bearer of conscious existence, over divine religious and spiritual attributes, such as deity. This is a foundation insight. NO religious or scientific cosmology does this to the same degree and it is essential for our survival as a species.



However, this opens up all the features of the pandora's box of psychedelic moksha, visionary and mystical experience, including mental powers, siddhis, and potential psychic phenomena as such, without invoking animal spirits, immortal souls, deity, doctrine or spirituality, focusing instead on the vision quest itself as the process of empirical investigation of subjective experience by mutual affirmation, complementing the verified empirical observations pivotal to the physical and natural sciences. It is confluent with notions such as Brahman as experienceable ultimate reality, the nierika portal of the Huichol peyote hunt and all direct intuitive mystical experiences. It can accept the notion of Ishvara/Ishvari as 'Elhoistic archetypal personae of the vision quest complementary to abstract Brahman as ultimate reality, without invoking moral deity or religious belief. It is open to investigating all forms of putative psychic phenomena as part of the affirmation process of the vision quest that is particularly associated with uncertain physical states displaying phenomena like synchronicity, but doesn't seek to reify religious notions, or psychic phenomena by trying to "prove" their absolute existence and refutes all forms of religious doctrine as contrary to the empirical nature of the autonomous subjective discovery process.

(e) **Dark Noosphere Theories**

Some theories try to assert a variety of other notions, such as that gravitation, rather than the quantum forces, somehow forms a substrate for conscious subjectivity, leading to concepts like a dark matter (Werbos 2019, Davis 2019), or dark energy (Bogomolov 2020, 2022), noosphere, in



which an occult collective ‘informational’ consciousness might operate. However (a) Conventional gravity already has a clear role, along with the quantum forces in generating conscious life, through the negentropic planetary-solar interface; (b) The only confirmed evidence we have for dark matter comes from the rotation of galaxies under conventional gravity and putative dark matter particles like axions remain hypothetical and fall within the regime of quantum wave-particles and (c) There is a lack of affirmed empirical evidence for an occult noosphere, unlike visionary experience itself, which has a long and extensive empirical basis.

Discovering Life, the Universe and Everything

I have experienced every type of hallucinogenic agent known to science and communed with sacred mushrooms for half a century and have faithfully kept my visionary covenant with them both before and since since the key event I now describe. Last June, after a seven-year break, due to nearly being blinded by acute closed angle glaucoma, exacerbated by dilating my pupils on psychedelics, recently cured by total lens replacement, I took another plunge, using a mild dose suitable for a healthy 76 year old, in an activity-enhancing mushroom lemon tea. At the peak, I sank into deep meditation, framing the ultimate question: “What is the answer to life, the universe and everything”? I fell deep down into the entheogenic abyss, which opened out into the moksha epiphany of being, of transfiguring intensity, utterly compassionate of the mortal coil. This comes by many names, the mind-at-large to Aldous Huxley, Brahman-atman to the Upanishads, and the All in Yeshua’s words, in the Gospel of Thomas. I emerged, galvanised and invigorated by a seemingly impossible task – literally saving the diversity of conscious life of the entire universe, not to neglect, in passing, the lost sheep of Israel! Here’s how it can be done!



Left: Conversation with Deepak Chopra

Right: The Efficacy of Subjective Conscious Physical Volition

As a researcher in quantum chaos and neuroscience, I struggled to reassemble the scattered shards of my physical worldview. Over weeks, this metamorphosed into “The Symbiotic Cosmology of Perennial Conscious Existence”, a creative commons monograph on Research Gate – augmenting physical cosmology with its universal complement in conscious existence, in three interlocking components, biogenic, panpsychic and symbiotic.

This cosmology is fully consistent with quantum physics and neuroscience but resolves the three central paradoxes of conscious existence: (1) The hard problem of consciousness (why subjective experience exists); (2) the physical efficacy of conscious volitional will (can our subjective experience of purposive intent, that we depend on to do anything, actually affect the world around us) and (3) the cosmological role of conscious life in the universe.

This discovery is of critical importance for humanity’s survival, although it may seem paradoxical, given its source, because the diversity of conscious life becomes the consummating climax of cosmic evolution – in an all-encompassing biological, psychic and cosmological symbiosis. And this comes with the same urgent galvanising responsibility, amid an acute planetary crisis of climate, habitat and biodiversity, to save the diversity of life from an impending human-caused mass extinction, which could well precipitate our own demise, through failing to live symbiotically within the biosphere on which we depend. Species need to not just survive, but survive in sufficient genetic diversity, to prosper and evolve. Humanity’s survival over evolutionary time scales as a fit species, in the biosphere, requires returning half the Earth’s natural habitats to the several million species with which we co-depend. As noted on the cover, it also requires ending the mutually assured destruction of the nuclear arsenal which leaves the Earth on a hair trigger instability of accidental annihilation.

The discovery is also about hard real world reality, because it gives us back conscious volitional autonomy over the world – our integral sense of personal “agency” that materialistic science stole from us in the Copernican revolution, enshrined in Newton’s laws of motion, now relentlessly entangled in the teeming uncertainty of the quantum universe. Making our scientific description consistent with our conscious autonomy also makes it consistent with civil and criminal law, in which intent, as intelligent volition, is pivotal to accountability for our actions. Incorporating conscious volition into cosmology also gives empirical science back its ethical and existential validity over prescriptive religious belief, in the true pursuit of knowledge.

Fig 18: Pupil dilated by psilocin.



The key role of life in the universe is clearly expressed in the first component – fractal biogenic cosmology. We know by our very existence that life is capable of emerging and existing in the physical universe, but there is an underlying reason. The four forces of nature, emergent from cosmological symmetry-breaking, give rise to interactive chain reactions which compound quarks, into baryons, atomic nuclei and fractal molecular structures, because of non-linearities associated with nuclear and chemical bonding. While the energetics of biology is dwarfed to insignificance by the strongest cosmological forces, resulting in galaxies, black holes and stars, the quantum structural pathway to full interaction of the four forces leads to atoms, fractal biomolecules, organelles, cells, tissues and the conscious brain – paradise on the cosmic equator in space-time, once a first generation of stars have made the chemical elements and evolution has had time to result in conscious organisms.

Living in the quantum universe, we have no idea whether complex unstable phenomena, such as brain processes, are causally closed. We can’t assume mechanism rules when uncertainty enters into the equation and processes at the edge of chaos can amplify it. This applies particularly to unstable brain processes, which are assumed, without real evidence, to be causally closed. Pure materialism, particularly in neuroscience, has become an unscientific doctrinal “publish or perish” belief system, having little more evidential credibility than religious fundamentalism. Conscious experience is our sole avenue to know and understand the physical universe. Although we have to respect the fundamental nature of physical existence, to survive in the world, the totality of our knowledge of the physical reality of the world around us is established exclusively through our subjective consciousness, as a consensual experience of conscious participants, complementing our individual dreams and visions.

Since we all believe and act on the basis that we have autonomous conscious volition, we need to determine what type of cosmology is consistent with conscious decision-making in the universe we inhabit. It must be one in which the subjective conscious mind can affect the objective physical brain, so by Occam’s razor, we eliminate all cosmologies which fail this veridical test, and out the window goes pure materialism! The brain may have some low energy quantum physics going on to support conscious processing, but it is just some ordinary organic matter that clearly obeys the four quantum forces – colour, weak, electromagnetic and gravity, so we immediately have a situation where, in at least some forms of matter – (a) physical causality is not closed and (b) the physics has a complementary subjective aspect. Conscious volitional autonomy thus implies natural panpsychism!

This is already a panpsychic cosmology, because subjectivity has become a fundamental property of nature. This is why the hard problem is cosmological, not just a neuroscience problem and this is not a form of dualism! Just as the wave and particle aspects of physics are complementary rather than distinct, so are the physical universe and subjective mind. Gilbert Ryle’s Cartesian “ghost in the machine” thus does not apply!

In the second component, Darwinian panpsychism – which I coined from Charles Darwin’s comment that free will could run all the way from the “puppy” to the “polypes”, the subjective aspect becomes complementary to the universe as a whole, encapsulated in the many and various forms we experience as organismic consciousness, echoing Erwin Schrödinger’s statement: “The number of minds in the universe is one”.

The quantum universe is a causal process punctuated by quantum uncertainty. To enable subjective consciousness to influence brain function without causal conflict, means subjective consciousness applies to situations where uncertainty is key – for example at unstable global tipping points in brain dynamics, where ion channel thresholds are crossed at the quantum level in a way the brain becomes sensitive to, through edge of chaos dynamics and stochastic resonance. This is precisely what is required to make sometimes split-second intuitive decisions, in exactly the

situations where consciousness is key – avoiding uncertain threats to our survival, through environmental crises that can be irreducibly intractable to compute.

What then is quantum subjectivity? Each particle is “latently conscious” – probabilistically moulded by its wave function, expressing its entangled quantum history and future under special relativity. Each single quantum instance is also a single idiosyncratic event, in which the particle is randomly expressed within the wave function amplitude. This idiosyncrasy corresponds to its free will. Unstable quantum processes, including edge-of-chaos, biogenesis and excitable prokaryote cells, likewise inherit this latent complementary subjective aspect.

What about the emergence of consciousness? In the eucaryote endosymbiosis, when an archaean species engulfed respiring bacteria to form our energetic mitochondria, there was a discrete transition to “cellular sentience”, because the cell membrane became freed from energy transduction and became available for sensitivity to quantum “sense” modes and social signalling, with coordinated excitability functioning as a “conscious” organiser using the same cellular processes and receptors as in neurons. Subjective consciousness thus predates nervous system computation by a good billion years. Informational models of consciousness, such as IIT integrated information theory and AST attention schema theory, thus incorrectly have the cart before the horse. The ensuing story, from the amoeba to humanity, is bridged by the social amoeba *Dictyostellium*, which has both individual cellular and coordinated organismic modes. The brain later evolves as a massively parallel organ, processing experience, operating as a tightly-coupled society of social amoebae communicating seamlessly with pre-existing sentient consciousness via a coordinated form of organismic edge-of-chaos excitability, using the same social signalling molecules that evolved in single celled species.

Existential cosmology is empirically verifiable. Objective empiricism has become technologically facile, on all scales, from the quantum to the universe. By contrast, subjective empiricism comes from subjective experiential reports of both everyday mental states and deeper transformative experiences, as well as volitional will evident in behaviour. All three are well established and as old as human culture, complemented by our awareness of purposive sentient activity in animal behaviour, indicating volition down as far as founding single celled eucaryotes. The success of psychedelics in alleviating depressive and terminal illness and documented genuine spiritual experiences, described as either religious, or of “ultimate reality” by the subject, attests to their validity and statistical significance as empirical scientific findings.

The third component is symbiosis – genetic, cellular, organismic, biospheric, psychic and cosmological. Complex life evolved through a complementary endosymbiosis between the two prokaryote kingdoms – archaea and bacteria. Eucaryote endosymbiosis is necessary for complex life to exist, demonstrating that symbiosis, as an edge-of-chaos climax, transcends living systems lacking such complementation. Sexuality, foundational to eucaryotes, is also a form of genetic symbiosis, in which two or more strains are locked into a symbiotic role, asymmetric in sperm-ovum fertilisation in animals, also called sexually antagonistic co-evolution, due to differing male and female reproductive strategies, as in the human sex wars of patriarchal domination. The human genome is also in functional genetic symbiosis, with 46% being endogenous viral and transposable elements which, although selfish, have become key to coordinated gene regulation and evolution. Symbiosis is also biospheric. Life is not just a competitive capitalistic struggle of tooth and claw, but survival of the most effective biospheric symbionts, in which predator, prey, parasite and host, moderate boom and bust dynamics, in edge-of-chaos biodiversity climax.

Founding gatherer-hunter cultures responsible for human cultural emergence, from the San Bushmen to the Congo Pygmies have achieved biospheric symbiosis through an animistic ¹⁵ view of nature as interconnected relationships, in which animals and natural forces are conceived as having agency and personhood. Panpsychist existential cosmology shares these symbiotic features of animism which also underlies the later emergence of religious systems. Both materialistic science, and its technological development and religions asserting dominion over nature and a direct prisoners' dilemma tragedy of the commons (Hardin 1968) have brought about the impending human-induced mass extinction of life, so the interconnectedness with nature of the animistic/panpsychic world view becomes pivotal to our future survival, as a cultural expression of symbiosis between natural diversity and human culture.

Symbiosis is also psychic and cosmological. The natural correction to human induced mass extinction of life due to our tribally-based species dominance is conscious existence reaching edge-of-chaos climax, in which planetary guardianship is not the exclusive possession of a single dominant species *Homo sapiens*, but is achieved in psychic

¹⁵ *animism* – the belief that all things – animals, plants, rocks, rivers, weather systems etc. possess a distinct spiritual essence – as animated and alive.

symbiosis with entheogenic species, which have evolved in such a way as to return egotistical consciousness to the primary consciousness noted in research studies. By opening the doors of perception to the deeper cosmic reality subjective consciousness contains, psychedelics manifest psyche, thus constituting the subjective complement to the LHC in cosmological physics, also enabling the universe to come alive and know itself in us, in cosmological symbiosis. It remains categorically unclear that the universe is able to manifest its existence in the absence our conscious experience of it.

The lesson from the prisoners' dilemma and evolutionary game theory is that, to advance this theory in adequate time to mitigate and alleviate a mass extinction of life, I can't afford to adopt a simple polite cooperative stance. Human motivation is not going to simply accept a veridical theory of symbiotic existence that comes out of deep left field. This is going to take a lionesses claws to succeed in time to have any chance of a soft landing for the diversity of life on our planet. I will thus try to be firm but fair, but invoking tit-for-tat as a fall-back response, in the face of consistent defection, against protecting the diversity of life from mass extinction.



The Central Enigma: What IS the Conscious Mind?

To understand the nature of consciousness, we have to address the fact that the term consciousness is enigmatic and multifaceted, in a way which brings to mind the apocryphal tale of the 100 eskimo words for snow. Both 'mind' and 'consciousness' present a varied array of associated words and concepts, which we need to clarify, to even begin to close in on the central enigma, which the terms present to us.

Mind conjures up a plethora of concepts from the entire realm of conscious experience "what comes to mind", through the rational mind of thought and language based reasoning, minding i.e. emotional caring, or "do you mind?" i.e object, mindfulness or focused concentration, to absent-, clear- or small-

mindedness to the in attentive or mindless blunders many of us make, despite ourselves.

Consciousness, at its simplest, is sentience and awareness of internal and external existence. However, its nature has led to millennia of analyses, explanations and debates by philosophers, theologians, linguists, and scientists. Opinions differ about what exactly needs to be studied or even considered consciousness. It is the active process of attending to and engaging subjective experience, either internally, or through the physical senses. It can mean everything from subjective consciousness, the root capacity to have subjective experiences at all, through awake alertness, as opposed to the slumber, or coma, the state of being conscious as opposed to unconsciousness, through the fuzzy boundary between sub-conscious, pre-conscious, or un-conscious processing that accompanies conscious attention and cognition, to the restrictive idea of self-consciousness – knowing that you know that you know. A conscious state is thus one which has a higher-order accompanying thought which is about the state in question. We also have "conscious of" in the sense of being aware of a specific phenomenon or thing.

Volition is the efficacy of intentional conscious states to affect the physical universe through subjective decision making (in the brain) and active behaviour (in the world).

Wikipedia has the following introductory descriptions, chosen because they are a product of a social process of consensual agreement as to their meaning and content:

"**Mind** collectively refers to the aspects of intellect and consciousness manifested as combinations of thought, perception, memory, emotion, will and imagination; mind is the stream of consciousness. It includes all of the brain's conscious processes. This denotation sometimes includes, in certain contexts, the working of the human unconscious or the conscious thoughts of animals. "Mind" is often used to refer especially to the thought processes of reason."

"**Consciousness** has been defined loosely as a constellation of attributes of mind such as subjectivity, self-awareness, sentience, and the ability to perceive a relationship between oneself and one's environment. It has been defined from a more biological and causal perspective as the act of autonomously modulating attentional and computational effort, usually with the goal of obtaining, retaining, or maximizing specific parameters (food, a safe environment, family,

mates). Consciousness may involve thoughts, sensations, perceptions, moods, emotions, dreams, and an awareness of self, although not necessarily any particular one or combination of these."

The **etymologies** of consciousness and mind are very different, as noted in the glossary below. **Conscious**, dating from 1600 harks back to Latin *com* "with," + *scire* "to know" – originally to cut or divide as in incise and scissors. By contrast **mind** as "that which feels, wills, and thinks; the intellect," dates to the 1100s and reflects proto-Germanic *muns* "thought," and *minne* "loving memory".

Although these contain a constellation of meanings, in which mind is sometimes focused on the attributes of reasoned, or even language-based thought, and consciousness is sometimes given the more restrictive meaning of self-awareness, or a more general meaning of simply being aware, both contain a central arena of subjectivity and sentience, that typifies the living condition and accompanies us all our lives from birth to death and is the subjective experiential basis through which we perceive and understand the physical world around us, while conceding that the boundaries between consciousness and the sub- or unconscious may be fuzzy, both in varied brain states, from waking thought to sleep and coma, and in complex autonomous processes, which go on below the level of immediate awareness, during activities like driving a car.

The central enigma we are exploring is not self-consciousness, but subjective consciousness – the capacity of a conscious sentient being to have a subjective experience of the existential condition, both of the everyday world, and of dream, memory and reflection, hallucination, psychedelic reverie, and other forms of internal subjective experience, not directly correlated with the immediate events of the physical world.

Etymological Glossary (Etymonline)

The subjective includes **consciousness, sentience, mind, emotion, illumination and volition**. In my definition (see 2 below), **subjective** is "existing in the conscious mind" (the mind as "the thinking subject"). I see **mind** as the organ of thought and cognition. **Con-scious** (Latin "with knowing") is the active word that defines subjective consciousness.

subjective (adj.) c. 1500, (1) "characteristic of one who is submissive or obedient," from Late Latin *subiectivus* "of the subject, subjective," from *subiectus* "lying under, below, near bordering on," figuratively "subjected, subdued" (see *subject* (n.)). (2) In early Modern English as "existing, real;" more restricted meaning "**existing in the mind**" (**the mind as "the thinking subject"**) is from 1707, popularized by Kant and his contemporaries; thus, (3) in art and literature, "personal, idiosyncratic" (1767).

conscious (adj.) c. 1600, "knowing, privy to" (poetic), from Latin *consciūs* "knowing, aware," from *conscire* "be (mutually) aware," from assimilated form of *com* "with," or "thoroughly" (see *con-*) + *scire* "to know" (see *science*). The Latin word probably is a loan-translation of Greek *syneidos*. The sense of "knowing or perceiving within oneself, sensible inwardly, aware" is from 1630s, perhaps a shortening of *conscious to oneself* (1620s). Also compare the Latin sense evolution in *conscience* and *sentience*. From 1650s as "aware (of a fact)." Sense of "active and awake, endowed with active mental faculties" is from 1837. **skai-* Proto-Indo-European root meaning "to cut, split," extension of root **sek-* "to cut." as in scission, schism, incise.

consciousness (n.) 1630s, "internal knowledge," from *conscious* + *-ness*. Meaning "state of being aware of what passes in one's own mind" is from 1670s; meaning "state of being aware" of anything is from 1746. Consciousness-raising is attested from 1968.

conscience (n.) c. 1200, "faculty of knowing what is right," originally especially to Christian ethics, later "awareness that the acts for which one feels responsible do or do not conform to one's ideal of right," later (late 14c.) more generally, "sense of fairness or justice, moral sense." This is from Old French *conscience* "conscience, innermost thoughts, desires, intentions; feelings" (12c.) and directly from Latin *scientia* "a joint knowledge of something, a knowing of a thing together with another person; consciousness, knowledge;"

experience (n.) late 14c., "observation as the source of knowledge; actual observation; an event which has affected one," from Old French *esperience* "experiment, proof, experience" (13c.), from Latin *experientia* "a trial, proof, experiment; knowledge gained by repeated trials," from *experientem* (nominative *experiens*) "experienced, enterprising, active, industrious," present participle of *experiri* "to try, test," from *ex* "out of" (see *ex-*) + *peritus* "experienced, tested," from PIE **per-yo-*, suffixed form of root **per-* (3) "to try, risk." Meaning "state of having done something and gotten handy at it" is from late 15c.

sentient (adj.) 1630s, "capable of feeling, having the power of or characterized by the exercise of sense-perception," from Latin *sentientem* (nominative *sentiens*) "feeling," present participle of *sentire* "to feel" (see **sense** (n.)). Related: *Sentiently*.

sentience (n.) 1817, "faculty of sense; sentient character or state, feeling, consciousness, susceptibility to sensation;" 1817, "faculty of sense; sentient character or state, feeling, consciousness, susceptibility to sensation;" see **sentient** + **-ence**. Related: *Sentiency* (1796).

mind (n.) "that which feels, wills, and thinks; the intellect," late 12c., *mynd*, from Old English *gemynd* "memory, remembrance; state of being remembered; thought, purpose; conscious mind, intellect, intention," Proto-Germanic **ga-mundiz* (source also of Gothic *muns* "thought," *munan* "to think;" Old Norse *minni* "mind;" German *Minne* (archaic) "love," originally "memory, loving memory"),

from suffixed form of PIE root **men-* (1) "to think," with derivatives referring to qualities of mind or states of thought. Meaning "mental faculty, the thinking process" is from c. 1300. Sense of "intention, purpose" is from c. 1300. From late 14c. as "frame of mind. mental disposition," also "way of thinking, opinion." "Memory," one of the oldest senses, now is almost obsolete except in old expressions such as bear in mind (late 14c.), call to mind (early 15c.), keep in mind (late 15c.). Mind's eye "mental view or vision, remembrance" is from early 15c. To pay no mind "disregard" is recorded by 1910, American English dialect. To make up (one's) mind "determine, come to a definite conclusion" is by 1784. To have a mind "be inclined or disposed" (to do something) is by 1540s; to have half a mind to "to have one's mind half made up to (do something)" is recorded from 1726. Out of (one's) mind "mad, insane" is from late 14c.; out of mind "forgotten" is from c. 1300; phrase time out of mind "time beyond people's memory" is attested from early 15c.

existence (n.) late 14c., "reality," from Old French *existence*, from Medieval Latin *existentia/existentia*, from *existentem/exsistentem* (nominative *existens/exsistens*) "existent," present participle of Latin *existere/exsistere* "stand forth, come out, emerge; appear, be visible, come to light; arise, be produced; turn into," and, as a secondary meaning, "exist, be;" from *ex* "forth" (see *ex-*) + *sistere* "cause to stand," from PIE **si-st-*, reduplicated form of root **sta-* "to stand, make or be firm."

essence (n.) late 14c., *essencia* (respelled late 15c. on French model), from Latin *essentia* "being, essence," abstract noun formed (to translate Greek *ousia* "being, essence") from *essent-*, present participle stem of *esse* "to be," from PIE root **es-* "to be." Originally "substance of the Trinity;" the general sense of "basic element of anything" is first recorded in English 1650s, though this is the underlying notion of the first English use of essential. Meaning "ingredient which gives something its particular character" is from c. 1600, especially of distilled oils from plants (1650s), hence "fragrance, perfume" (17c.). In 19c. U.S., essence-peddler could mean "medical salesman" and "skunk."

emotion (n.) 1570s, "a (social) moving, stirring, agitation," from French *émotion* (16c.), from Old French *emouvoir* "stir up" (12c.), from Latin *emovere* "move out, remove, agitate," from assimilated form of *ex* "out" (see *ex-*) + *movere* "to move" (from PIE root **meue-* "to push away"). Sense of "strong feeling" is first recorded 1650s; extended to any feeling by 1808.

illumination (n.) late 14c., "spiritual enlightenment," from Late Latin *illuminationem* (nominative *illuminatio*), noun of action from past participle stem of Latin *illuminare* "to throw into light, make bright, light up;" figuratively, in rhetoric, "to set off, illustrate," from assimilated form of *in-* "in, into" (from PIE root **en* "in") + *lumen* (genitive *luminis*) "light," from suffixed form of PIE root **leuk-* "light, brightness." Meaning "action of lighting" in English is from 1560s; sense of "intellectual enlightenment" is from 1630s.

enlightenment (n.) 1660s, "action of enlightening," from enlighten + -ment. Used only in figurative sense, of spiritual enlightenment, etc. Attested from 1865 as a translation of German *Aufklärung*, a name for the spirit of independent thought and rationalistic system of 18c. Continental philosophers.

enlighten (v.) 14c., "to remove the dimness or blindness" (usually figurative, from one's eyes or heart); see *en-* (1) + *lighten* (v.2). From 1660s as "supply with intellectual light." Literal senses are later and less common in English: "put light in" is from 1580s; "shed light upon" is from 1610s.

objective (adj.) 1610s, originally in the philosophical sense of "considered in relation to its object" (opposite of subjective), formed on pattern of Medieval Latin *objectivus*, from *objectum* "object" (see *object* (n.)) + -ive. Meaning "impersonal, unbiased" is first found 1855, influenced by German *objektiv*.

physical (adj.) early 15c., *phisical*, "medicinal" (opposed to surgical), from Medieval Latin *physicalis* "of nature, natural," from Latin *physica* "study of nature" (see *physic*). The meaning "pertaining to matter, of or pertaining to what is perceived by the senses" is from 1590s; the meaning "having to do with the body, corporeal, pertaining to the material part or structure of an organized being" (as opposed to mental or moral) is attested from 1780. The sense of "characterized by bodily attributes or activities, being or inclined to be bodily aggressive or violent" is attested from 1970.

science (n.) mid-14c., "state or fact of knowing; what is known, knowledge (of something) acquired by study; information;" also "assurance of knowledge, certitude, certainty," from Old French *science* "knowledge, learning, application; corpus of human knowledge" (12c.), from Latin *scientia* "knowledge, a knowing; expertness," from *sciens* (genitive *scientis*) "intelligent, skilled," present participle of *scire* "to know."

nature (n.) late 13c., "restorative powers of the body, bodily processes; powers of growth;" from Old French *nature* "nature, being, principle of life; character, essence," from Latin *natura* "course of things; natural character, constitution, quality; the universe," literally "birth," from *natus* "born," past participle of *nasci* "to be born," from PIE root **gene-* "give birth, beget." By mid-14c. as "the forces or processes of the material world; that which produces living things and maintains order." From late 14c. as "creation, the universe;" also "heredity, birth, hereditary circumstance; essential qualities, inherent constitution, innate disposition" (as in *human nature*); also "nature personified, Mother Nature." *Nature* and *nurture* have been paired and contrasted since Shakespeare's "Tempest."

natural (adj.) c. 1300, *naturel*, "of one's inborn character; hereditary, innate, by birth or as if by birth;" early 14c. "of the world of nature (especially as opposed to man)," from Old French *naturel* "of nature, conforming to nature; by birth," and directly from Latin *naturalis* "by birth, according to nature," from *natura* "nature" (see **nature**). Of events, features, etc., "existing in nature as a result of natural forces" (that is, not caused by accident, human agency, or divine intervention), late 14c.

resplendence (n.) "vivid brightness, brilliance, splendor," early 15c., from Late Latin *resplendentia*, abstract noun from present-participle stem of Latin *resplendens* "**brilliant, radiant**".

religion (n.) c. 1200, *religioun*, "state of life bound by monastic vows," also "action or conduct indicating a belief in a divine power and reverence for and desire to please it," from Anglo-French *religiun* (11c.), Old French *religion*, *relegion* "piety, devotion; religious

community," and directly from Latin *religionem* (nominative *religio*) "respect for what is sacred, reverence for the gods; conscientiousness, sense of right, moral obligation; fear of the gods; divine service, religious observance; a religion, a faith, a mode of worship, cult; sanctity, holiness," in Late Latin "monastic life" (5c.). This noun of action was derived by Cicero from *relegere* "go through again" (in reading or in thought), from *re-* "again" (see *re-*) + *legere* "read" (see lecture (n.)). However, popular etymology among the later ancients (Servius, Lactantius, Augustine) and the interpretation of many modern writers connects it with **religare** "to bind fast" (see *rely*), via the notion of "place an obligation on," or "bond between humans and gods.

sacramental (adj.) "of, pertaining to, or constituting a sacrament," late 14c., from Old French *sacramental* and directly from Late Latin *sacramentalis*, from *sacramentum* (see **sacrament**). As a noun, "religious practice or object," mid-15c.

sacrament (n.) late Old English, in Christian use, "an outward and visible sign of inward and spiritual grace," especially "a sacrament of the Church, one of the religious ceremonies enjoined by Christ or the Church," and later specifically "the sacrament of the Eucharist" (c. 1300), from Old French *sacrament* "consecration; mystery" (12c., Modern French *sacrement*) and directly from Latin *sacramentum*, "a solemn oath" (source also of Spanish *sacramento*, German *Sakrament*, etc.), from *sacrare* "to consecrate" (see **sacred**).

duality (n.) "twofold nature, state of being two or divided in two," late 14c., from Late Latin *dualitas*, from Latin *dualis* "that contains two; the dual number, duality," from *duo* "two" (from PIE root **dwō-* "two"). An instance of opposition or contrast between two concepts or two aspects of something. In mathematics, a duality translates concepts, theorems, or structures in a one-to-one fashion.

complementarity (n.) "a complementary relation or situation," 1908, a term in physics, from **complementary** + *-ity*.

complementary (adj.) 1620s, from **complement** (n.) + *-ary*. Sense of "forming a complement, mutually completing each other's deficiencies," is attested by 1794.

complement (n.) late 14c., "means of completing; that which completes; what is needed to complete or fill up," from Old French *complément* "accomplishment, fulfillment" (14c., Modern French *complément*), from Latin *complementum* "that which fills up or completes," from *complere* "fill up," from *com-*, here probably as an intensive prefix (see *com-*), + *plere* "to fill"

interactive (adj.) "acting upon or influencing each other," 1832, from **interact** (v.), probably on model of **active**.

supersensible Beyond the range of what is perceptible by the senses; **not belonging to the experienceable physical world.**

astral (adj.) c. 1600, "pertaining to the stars," from Late Latin *astralis*, from Latin *astrum* "star," from Greek *astron* "a star" (from PIE root **ster-* (2) "star"). The meaning "pertaining to supersensible substances" is from 1690s, popularized late 19c. in Theosophy.

will (v.1) Old English **willan*, *wyllan* "to wish, desire; be willing; be used to; be about to" (past tense *wolde*), from Proto-Germanic **willjan* (source also of Old Saxon *willian*, Old Norse *vilja*, Old Frisian *willa*, Dutch *willen*, Old High German *wellan*, German *wollen*, Gothic *wiljan* "to will, wish, desire," Gothic *waljan* "to choose"). The Germanic words are from PIE root **wel-* (2) "to wish, will" (source also of Sanskrit *vrnoti* "chooses, prefers," *varyah* "to be chosen, eligible, excellent," *varanam* "choosing;" Avestan *verenav-* "to wish, will, choose;" Greek *elpis* "hope;" Latin *volo*, *velle* "to wish, will, desire;")

free will (n.) the power of acting without the constraint of necessity or fate; the ability to act at one's own discretion.

volition (n.) 1610s, from French *volition* (16c.), from Medieval Latin *volitionem* (nominative *volitio*) "will, volition," noun of action from Latin stem (as in *volo* "I wish") of *velle* "to wish," from PIE root **wel-* (2) "to wish, will" (see **will** (v.)). Related: *Volitional*.

truth (n.) Old English *triewð* (West Saxon), *treowð* (Mercian) "faith, faithfulness, fidelity, loyalty; veracity, quality of being true; pledge, covenant," from Proto-Germanic *treuwaz* "having or characterized by good faith," from PIE **drew-o-*, a suffixed form of the root **deru-* "be firm, solid, steadfast." Sense of "something that is true" is first recorded mid-14c. Meaning "accuracy, correctness" is from 1560s. English and most other IE languages do not have a primary verb for "speak the truth," as a contrast to **lie** (v.).

void (adj.) c. 1300, "unoccupied, vacant," from Anglo-French and Old French *voide*, *viude* "empty, vast, wide, hollow, waste, uncultivated, fallow," as a noun, "opening, hole; loss," from Latin *vocivos* "unoccupied, vacant," related to *vacare* "be empty," from PIE **wak-*, extended form of root **eue-* "to leave, abandon, give out."

fertility (n.) mid-15c., *fertilite*, from Old French *fertilité*, from Latin *fertilitatem* (nominative *fertilitas*) "fruitfulness, fertility," from *fertilis* "fruitful, productive"

fecundity (n.) early 15c., from Latin *fecunditatem* (nominative *fecunditas*) "fruitfulness, fertility," from *fecundus* "fruitful, fertile" (see **fecund**). The ability to produce an abundance of offspring or new growth; fertility. "*multiply mated females show increased fecundity*"

virility (n.) "period of manhood," 1580s, from French *virilité*, from Latin *virilitatem* (nominative *virilitas*) "manhood," from *virilis* "of a man, manly, worthy of a man," from *vir* "a man, a hero," from PIE root **wi-ro-* "man." Meaning "power of procreation, capacity for sexual intercourse" is from 1590s; sense of "manly strength" is recorded from c. 1600.

eternal (adj.) late 14c., from Old French *eternel* "eternal," or directly from Late Latin *aeternalis*, from Latin *aeternus* "of an age, lasting, enduring, permanent, everlasting, endless," contraction of *aeviternus* "of great age," from *aevum* "age" (from PIE root **aiw-* "vital force, life; long life, eternity").

immortal (adj.) late 14c., "deathless," from Latin *immortalis* "deathless, undying" (of gods), "imperishable, endless" (of fame, love, work, etc.), from assimilated form of *in-* "not, opposite of" (see **in-** (1)) + *mortalis* "mortal" (from PIE root **mer-* "to rub away, harm," also "to die" and forming words referring to death and to beings subject to death).

Biocrisis and Resplendence : Fermi Extinction and Planetary Reforewing

Planet Earth is heading into multiple serious human-caused self-extinction scenarios – habitat destruction planet wide, climate crisis that may become irreversible, mass extinction of biodiversity, exponential population instability, cumulative risk of nuclear holocaust, generalised AI takeover due to materialist physicalism failing to recognise we are NOT just machines, excessive brittle dependence on technology to feed ourselves, failure to protect our food species, failure to protect the genetic diversity of the planet, the failure of collective leadership and decision-making processes to address or protect human viability in a tragedy of the commons. If this doesn't actually cause our extinction as a species, it will certainly destroy our blue-green paradise and make human culture perilous to unliveable. There is no techno-fix for this. We should be envisaging another 500 million years of sanctuary to discover the ultimate mysteries of existence. No utopian pretence will save us. These are the hard facts of life we are failing to address.

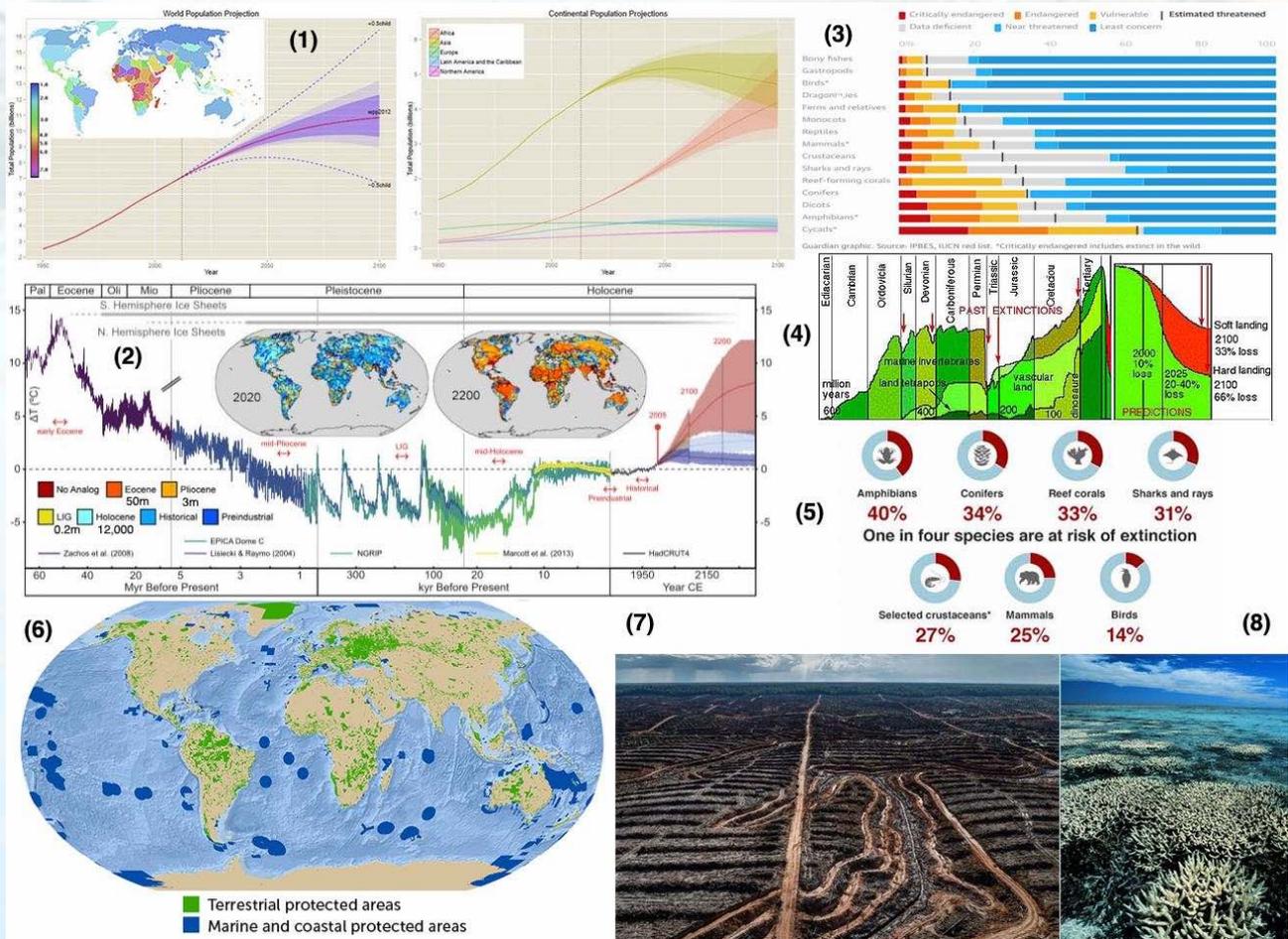


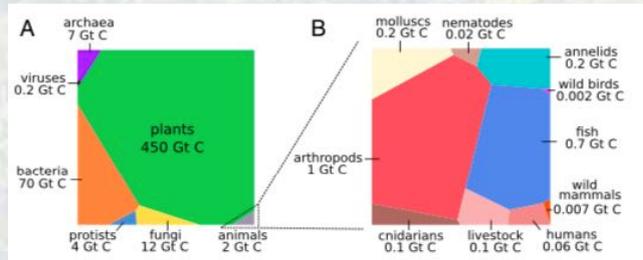
Fig 19: (1) World population is predicted to continue to rise through to 2100 (Gerland et al. 2014), with the majority of the increase in sub-Saharan Africa (inset). This will increase the world population to 10 billion, with immense pressure on the African continent’s carrying capacity and pressure of migration on all continents. (2) Predicted long term effects of climate change (Burke et al. 2018) could lead to a catastrophic cumulative heating over millennia, taking the planet back to the previous Eocene peak hot period 50 million years ago, placing many of the plant and animal species on which we depend well out of their evolved climate zone, potentially leading to human extinction because of our continuing dependence on highly evolved plant and animal species (Burke et al. 2018). (3) Threatened species by group (Guardian). (4) This situation is unsustainable and leads directly to mass extinctions of biodiversity, which would take up to 50 million years to be addressed by subsequent evolution, as exemplified by previous mass extinctions. (5) Species losses of a variety of animal and plant phyla. The incipient sixth mass extinction that started in the Late Pleistocene has already put over a quarter of mammal species under acute risk of extinction (Leakey & Lewin 1995, Kolbert 2014, 2021, Davis et al. 2018, Dawson 2016). Detailed calculations of mammalian species indicate a time frame of millions of years to recover from the current mass extinctions, by evolving new life forms, but those lost will never be recovered. Insects are also suffering catastrophic population decline due to habitat destruction. (7) Protected areas are manifestly insufficient to protect biological and genetic diversity. International agreement is urgently needed to extend these areas. (8) Scorched-earth clear felling for palm oil plantations has felled a third of Borneo’s forest almost overnight. Such wholesale habitat destruction is even worse than burning the rainforest because all living diversity is eradicated in favour of one monoclonal species. (8) Coral bleaching shows how climate change can lead to wholesale mass extinction of species in some of the most intense oceanic biodiversity hotspots, leading to a barren ocean.

Protecting the biospheric diversity of life is critical for our own survival, as is avoiding climate crisis and unravelling the ever-present risk of nuclear Armageddon. The rape of Gaia¹⁶ – “Mother Earth” by the patriarchal imperatives of dominion over nature and business-as-usual competitive exploitation is a suicidal insanity running through our cultural mind set, which humanity currently lacks the collective insight to alleviate. Intervention in the common good is urgently necessary. This is precisely what I experienced in being galvanised to write this work after a quantum change experience on sacred mushrooms, following a seven year karmic drought due to acute closed angle glaucoma, risking blindness if my pupils became dilated. For the “mind at large” to awaken even for a moment and become acutely aware of the carnage wrought upon the planet through the relentless exploitative impact of a single species *Homo sapiens*, it is obvious that, by its very compassion for the mortal coil, it will impart to the beholder an urgent tenacity to protect the living planet.

The global biomass of biodiversity

Human intrusion into all available habitats causing wholesale natural habitat destruction means that the biomass of livestock is over 14 times that of all wild mammals and the biomass of humans is over 8.5 times. Bar-On et al. (2018) assemble the overall biomass composition of the biosphere, establishing a census of the ~550 gigatons of carbon (Gt C) of biomass distributed among all of the kingdoms of life. We show that terrestrial biomass is about two orders of magnitude higher than marine biomass and estimate a total of ~6 Gt C of marine biota, doubling the previous estimated quantity. The global marine biomass pyramid contains more consumers than producers. Finally, we highlight that the mass of humans is an order of magnitude higher than that of all wild mammals combined and report the historical impact of humanity on the global biomass of prominent taxa, including mammals, fish, and plants.

Fig 19b: **The biomass of humans plus livestock as of 2018 is 22.5 times that of all wild mammals.** Graphical representation of the global biomass distribution by taxa. (A) Absolute biomasses of different taxa are represented by the area of each cell being proportional to that taxa global biomass. (B) Absolute biomass of different animal taxa. Related groups such as vertebrates are located next to each other.



The global biomass of wild mammals

A study by scientists at Israel’s Weizmann Institute of Science (Greenspoon et al. (2023) concludes that wild land mammals alive today have a total mass of 22m tonnes. Humanity now weighs in at a total of around 390m tonnes. Domesticated species, such as sheep and cattle, in addition to other hangers-on such as urban rodents, add a further 630m tonnes. **Thus as of 2023 wild land mammals represent only 22/(390+630)=0.02 or 2%. So the figure has risen from 22.5 2to 46 times from 2018.**

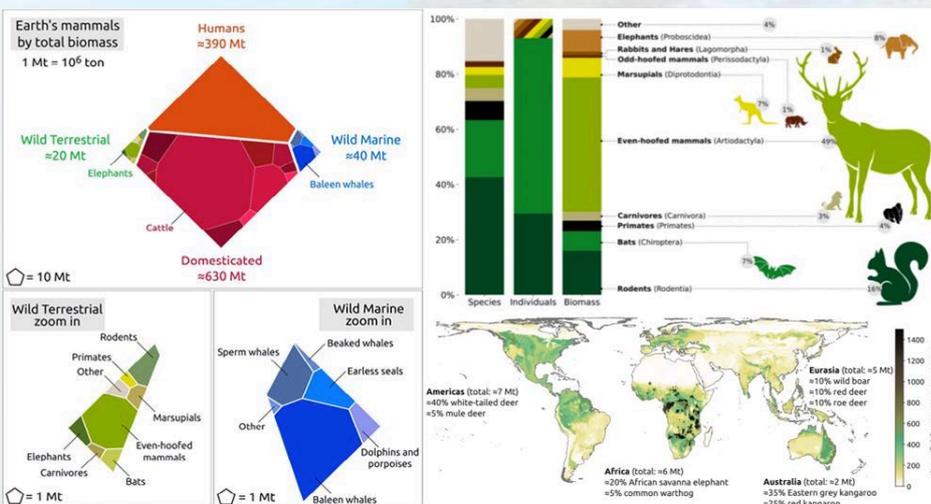


Fig 19c: **Left Top:** The global mammalian biomass distribution is dominated by humans and domesticated mammals, including livestock and pets. **Bottom:** enlarged view of the biomass of wild terrestrial (Left, grouped by order) and marine mammals (Right, grouped by family, or few families). **Top right:** The relative number of species, individuals, and total biomass of each taxonomic order of wild land mammals. The relative biomass contribution of each order is also indicated by the animal silhouette sizes and corresponding percentages.

Lower right: The estimated total biomass is noted for each continent, together with the name of the top mass contributor and its relative biomass contribution to the said continent.

¹⁶ In Greek mythology, Gaia from Ancient Greek Γαῖα, a poetical form of Γῆ Gē, "land" or "earth"), also spelled Gaea is the personification of the Earth and one of the Greek primordial deities. Gaia is the ancestral mother – sometimes parthenogenic – of all life.

The team led by Ron Milo has updated the biomass of world mammals. Biomass as a metric allows us to compare species with very different body sizes, and can serve as an indicator of wild mammal presence, trends, and impacts, on a global scale. Here, we compiled estimates of the total abundance (i.e., the number of individuals) of several hundred mammal species from the available data, and used these to build a model that infers the total biomass of terrestrial mammal species for which the global abundance is unknown. We present a total wet biomass of ≈20 million tonnes (Mt) for all terrestrial wild mammals (95% CI 13-38 Mt), i.e., ≈3 kg per person on earth.

The universe as we know it has been in existence for some 13 billion years, but for over around a quarter of this cosmic lifetime, around 3.6 billion years, life in all its variety and complexity has continued to evolve to the point of human emergence, amid climax biological diversity, having taken some 66 million years to recover from the mass extinction caused by the Chicxulub asteroid that extinguished the dinosaurs. Our impact is rapidly becoming worse and setting us for a global heating, taking us back 50 million years to the Eocene peak (and yet we remain unable to give the priority to correct it due to our own folly. More troubling, it runs the risk of a Permian type extinction, the most catastrophic mass extinction of multicellular life ever, which like our own climate crisis, was caused by extreme global warming.

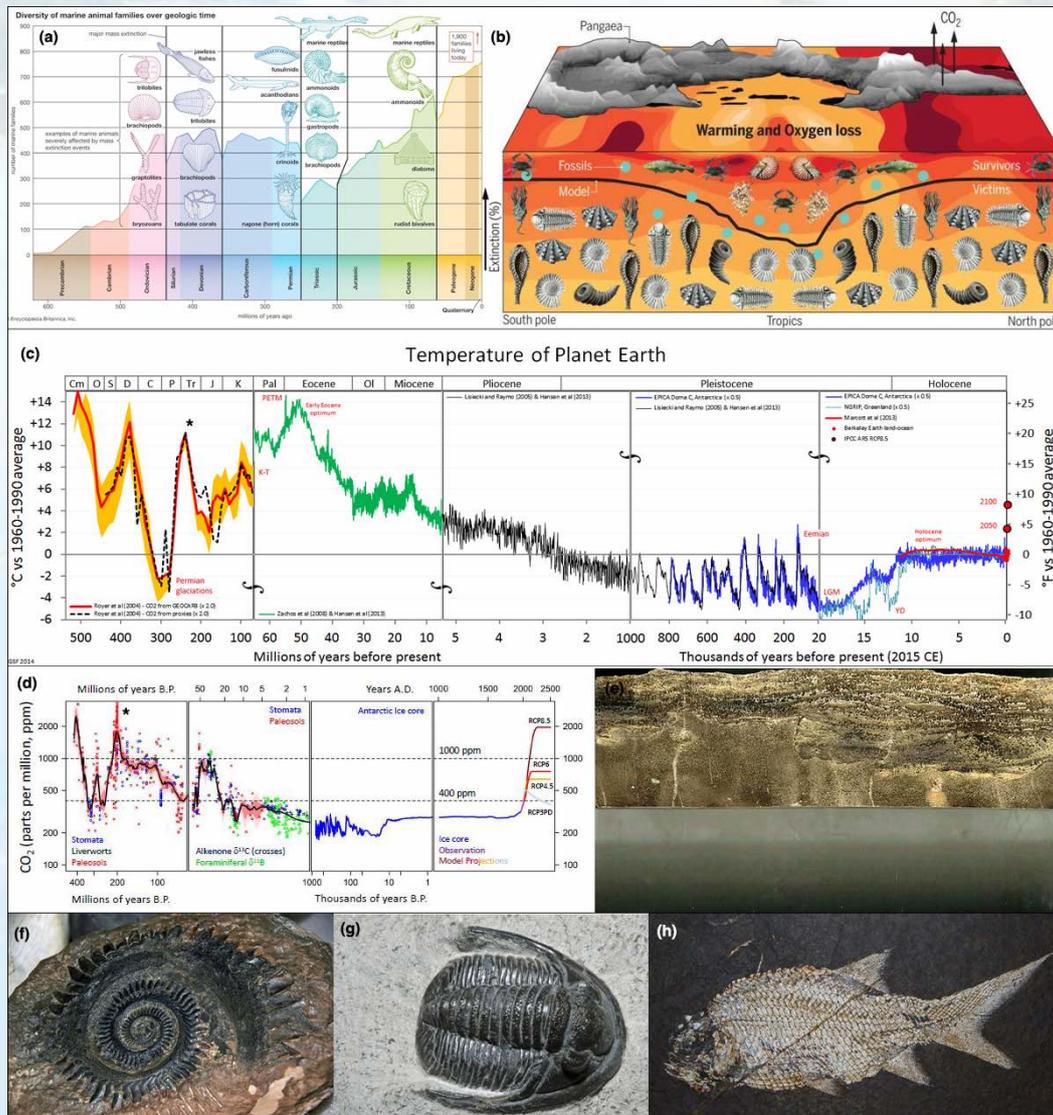
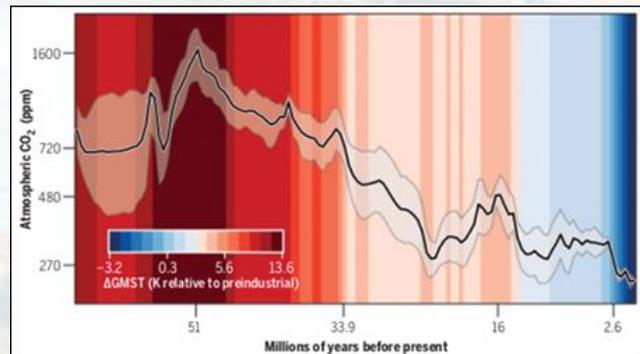


Fig 20: (a) The five mass extinctions dominated by the Permian, in which up to 95% of marine fauna expired. (b) The Permian was not caused by an incoming asteroid but a huge peak in atmospheric CO₂, precipitated by massive eruptions which resulted in the Siberian Traps. The eruptions continued for roughly two million years and spanned the Permian–Triassic boundary, around 251.9 million years ago. (b, c) Historic temperatures and atmospheric CO₂ since the Cambrian, 500 million years ago both show a massive peak at the boundary (marked * in (c) and (d)) (Mulhern 2021). This resulted in the oceans becoming depleted in oxygen, making them oceans uninhabitable particularly to more temperate species, likely exacerbated by lethal H₂S contamination. (e) A 1.5-foot slab of rock from southern China shows the Permian-Triassic boundary. The bottom section is pre-extinction limestone. The upper section is microbial limestone deposited after the extinction. Three species that became extinct. (f) A fossilised spiralling shark tooth from *Helicoprion*, an extinct Permian shark species. (g) *Diademaproetus*, one of the trilobites that were plentiful in the world’s oceans but went extinct at the end of the Permian. (h) *Paramblypterus*, a species of fish that became extinct during the Permian.

During the end-Permian (P-T) extinction, 95 percent of all species on Earth became extinct, compared to only 75 percent during the Cretaceous-Tertiary (K-T) extinction, when a large asteroid impact, possibly exacerbated by ensuing volcanic activity, caused the dinosaurs to disappear. The impact of *Homo sapiens* on our planet is a striking example of how life can evolve to evoke existential crisis on a planetary scale, threatening both a mass extinction of living diversity by habitat destruction, runaway global heating from fossil fuel consumption and a possible nuclear holocaust, but there are others. Severe global heating can lead to the oceans becoming anoxic, resulting in oceanic bacteria using sulphate to poison the oceans and atmosphere with hydrogen sulphide.

We are used to the idea of the Gaia Hypothesis – that life is an integral part of a self-correcting global biochemical and geochemical process that keeps Earth conducive and habitable for life provided critical tipping points are not transgressed, to push this system beyond a point of no return. But what happens if things go too far? There is a known counterpoint to Gaia, and that is the Medea Hypothesis (Ward 2008) that under certain circumstances, living systems can also precipitate biochemical and geochemical feedback process that can bring about the mass extinction of life, like a mother killing her children.

Fig 20a: Levels of CO₂ over the last 50 mya (compare fig 19(2)) compared with global mean surface temperature (inset and colour bands (Hönisch et al. 2023).



The central cause of the Permian extinction is temperature-dependent hypoxia (Penn et al. 2018):

The conventional wisdom in the paleontological community has been that the Permian extinction was especially severe in tropical waters.” Yet the model shows the hardest hit were organisms most sensitive to oxygen found far from the tropics. Many species that lived in the tropics also went extinct in the model, but it predicts that high-latitude species, especially those with high oxygen demands, were nearly completely wiped out (study co-author Jonathan Payne).

Since tropical organisms’ metabolisms were already adapted to fairly warm, lower-oxygen conditions, they could move away from the tropics and find the same conditions somewhere else,” Deutsch said. “But if an organism was adapted for a cold, oxygen-rich environment, then those conditions ceased to exist in the shallow oceans (study co-author Curtis Deutsch).

The huge igneous layers of the Siberian Traps (about 7 million km² (3 million sq mi) of basaltic rock, with a volume of around 4 million km³ (1 million cu mi) were formed by flood basalt volcanism from a mantle plume, as in Iceland and Hawaii which rose until it impacted against the bottom of the Earth's crust pouring from great cracks in the land itself. As the magma rushed out into the air from its deep Earth origin, it carried enormous volumes of volcanic gas into the atmosphere, including hydrogen sulphide, methane and particularly carbon dioxide. If flood basalts are combined on a global scale with the more explosive volcanism that in addition, throws great quantities of ash and volcanic dust into the atmosphere, one might expect major effects on animals and plants.

Although the global heating caused by the erupted CO₂ would not necessarily be enough on its own to cause a mass extinction of this scale, it could have set off a diabolical series of events that led to mass extinction. The warmer the tropical oceans the more the animal oxygen consumption. Normally, the deep ocean gets its oxygen from the atmosphere at the poles. Cold water there soaks up oxygen from the air and because cold water is dense, it sinks and slowly moves equator-ward, taking oxygen with it. The warmer the water, the less oxygen can dissolve and the slower the water sinks and moves toward the equator. The resulting atmospheric warming would in turn, warm surface ocean water enough to cause oceanic oxygen starvation by disrupting this conveyor belt flow, thus bringing less oxygen into the deep oceans. Once the oxygen is gone, the oceans become the realm of oceanic bacteria that obtain their oxygen stripping oxygen from sulphur oxide compounds such as sulphate, producing hydrogen sulphide, which kills aerobic organisms, as well as destroying the ozone layer protecting terrestrial plants. Methane produced in the ample swamps of this time period then has little to destroy it, so the atmosphere becomes laden with hydrogen sulphide, methane and ultra-violet radiation (Ward 2007, 2008). This scenario has been applied both to the Permian and succeeding Triassic-Jurassic (T-J) extinction (Kump, Pavlov & Arthur 2005, Richoz et al. (2012).

CO₂ levels are determined by the imbalance between carbon sequestration (burial in sediments, capture by plants), and carbon emissions (decomposition and volcanic activity). Imbalances in this system created a downward trend in CO₂ levels, leading to a glaciation period around 300 million years ago. This was followed by a period of intense volcanic activity, doubling CO₂ concentration

to about 1000 ppm. Levels then dropped until they reached today's concentrations during the [peak Eocene to] Oligocene era, 33 to 23 million years ago, when temperatures were still 4 to 6 degrees C higher than today. It can be said that history was shaped by CO₂ levels, and the types of climates they would allow. Looking back at the 2 extra degrees of warmth last time CO₂ levels were this high (Pliocene era, 3 million years ago), should be enough of a call to action, considering the damage two more degrees would cause today. (Mulhern 2021).

Under a business-as-usual emissions scenarios, by 2100 warming in the upper ocean will have approached 20 percent of warming in the late Permian, and by the year 2300 it will reach between 35 and 50 percent. This study (Penn et al. 2018) highlights the potential for a mass extinction arising from a similar mechanism under anthropogenic climate change (Justin Penn).

Global strategies to Halt the Dual Crises of Biodiversity loss and Climate Change

These are often formulated separately, even though they are interdependent and risk failure if pursued in isolation. The Global Safety Net maps (Dinerstein et al. 2022) show how expanded nature conservation addresses both overarching threats. We identify 50% of the terrestrial realm that, if conserved, would reverse further biodiversity loss, prevent CO₂ emissions from land conversion, and enhance natural carbon removal. This framework shows that, beyond the 15.1% land area currently protected, 35.3% of land area is needed to conserve additional sites of particular importance for biodiversity and stabilize the climate. Fifty ecoregions and 20 countries contribute disproportionately to proposed targets. Indigenous lands overlap extensively with the Global Safety Net. Conserving the Global Safety Net could support public health by reducing the potential for zoonotic diseases like COVID-19 from emerging in the future.

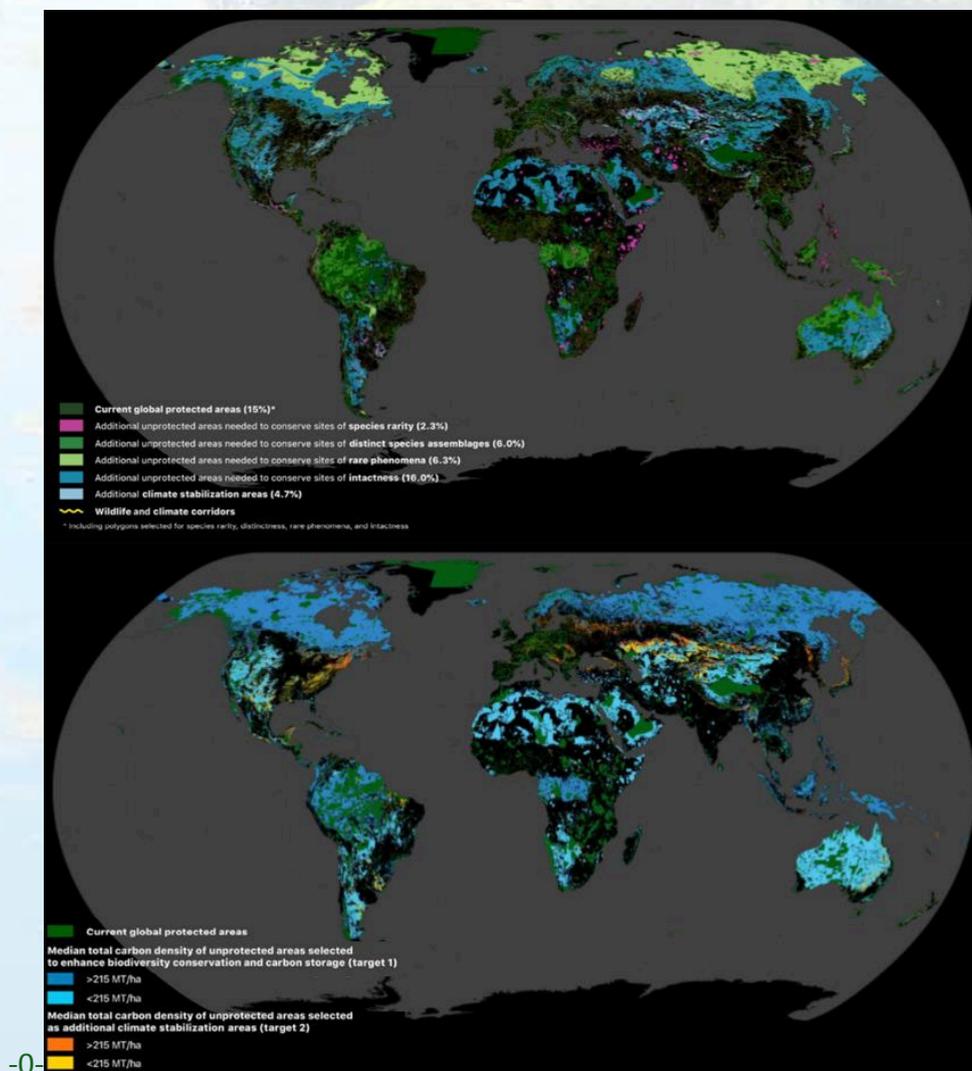
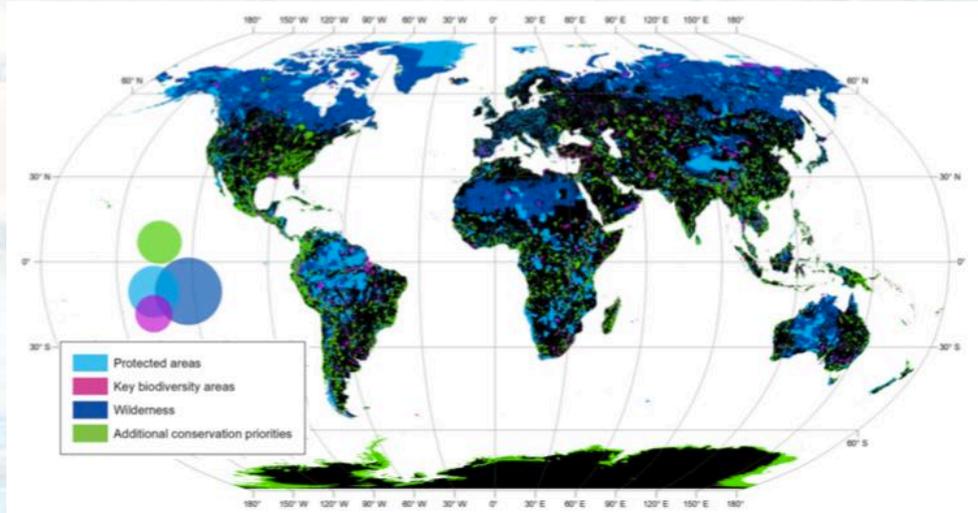


Fig 20b: (Top) Areas of the terrestrial realm where increased conservation action is needed to protect biodiversity and store carbon. Numbers in parentheses show the percentage of total land area of Earth contributed by each set of layers. (Bottom) Interdependence of carbon and biodiversity. Currently unprotected high-carbon areas with median total carbon >215 MT/ha overlap extensively (92.0%) with areas selected under target 1, highlighting the importance of these lands for biodiversity conservation and climate stabilization. Other areas important for biodiversity but of lower carbon value, i.e., <215 MT/ha, are also shown. Additional CSAs, including tier 1 and tier 2 CSAs, are also selected to bridge the gap for adequate carbon storage beyond areas identified in target 1 (Dinerstein et al. 2022).

The minimum land area requiring conservation attention to safeguard biodiversity

Fig 21: Minimum land area for conserving terrestrial biodiversity. Components include PAs (light blue), KBAs (purple), and ecologically intact areas (dark blue). Where they overlap, PAs are shown above KBAs, which are shown above ecologically intact areas. New conservation priorities are in green. The Venn diagram shows the proportional overlap between features (Allan et al. 2022).



Ambitious conservation efforts are needed to stop the global biodiversity crisis (Allan et al. 2022). We estimate the minimum land area to secure important biodiversity areas, ecologically intact areas, and optimal locations for representation of species ranges and ecoregions. At least 64 million square kilometers (44% of terrestrial area) would require conservation attention (ranging from protected areas to land-use policies) to meet this goal.

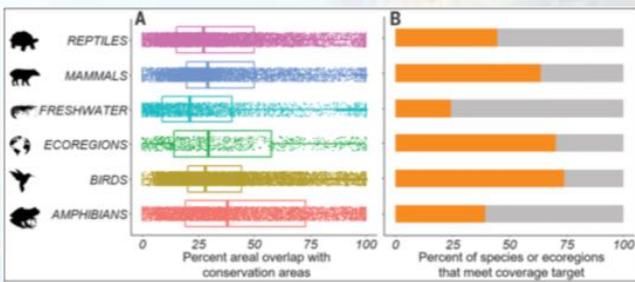
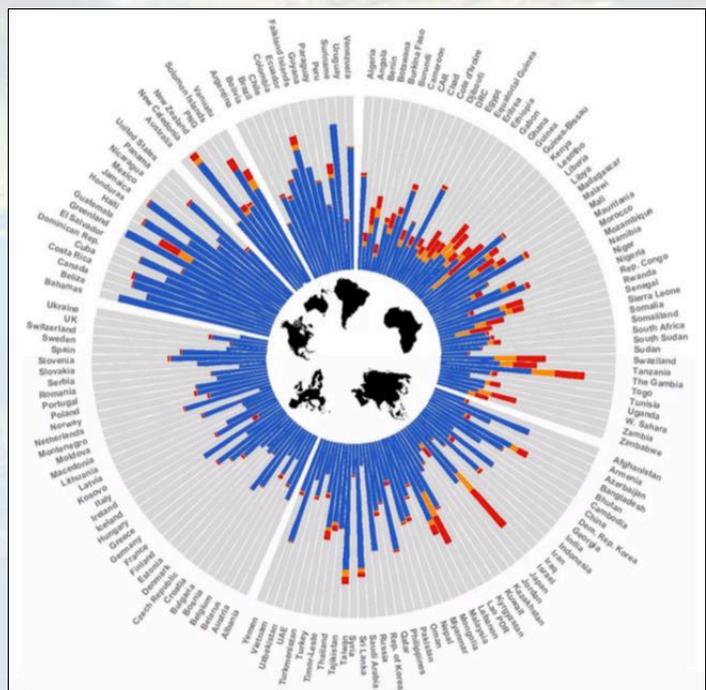


Fig 22: Gap analyses of species and ecoregion coverage within areas above. (A) Percentage of the distribution of each species (in different taxonomic groups; freshwater includes crabs, shrimp, and crayfish) and ecoregion area that overlaps. Boxplots show the median and 25th and 75th percentiles. (B) Percentage of species and ecoregions with an adequate proportion of their distribution overlapping existing conservation areas to meet specific coverage targets for species or ecoregions (orange).

responses that promote autonomy, self-determination, equity, and sustainable management for safeguarding biodiversity are essential. Spatially explicit land-use scenarios suggest that 1.3 million square kilometers of this land is at risk of being converted for intensive human land uses by 2030, which requires immediate attention. However, a sevenfold difference exists between the amount of habitat converted in optimistic and pessimistic land-use scenarios, highlighting an opportunity to avert this crisis. Appropriate targets in the Post-2020 Global Biodiversity Framework to encourage conservation of the identified land would contribute substantially to safeguarding biodiversity.

Fig 23 National-level land area for conservation and projected habitat loss. Estimated proportion of each country requiring effective conservation attention to safeguard biodiversity that is projected to suffer habitat conversion by 2030 (orange) and 2050 (red) or that is projected not to be converted (blue), according to SSP3 (a worst-case scenario). Gray areas are outside the land identified for conservation. We excluded 85 countries with a land area <10,000 km² from the figure (Allan et al. 2022).



More than 1.8 billion people live on these lands, so

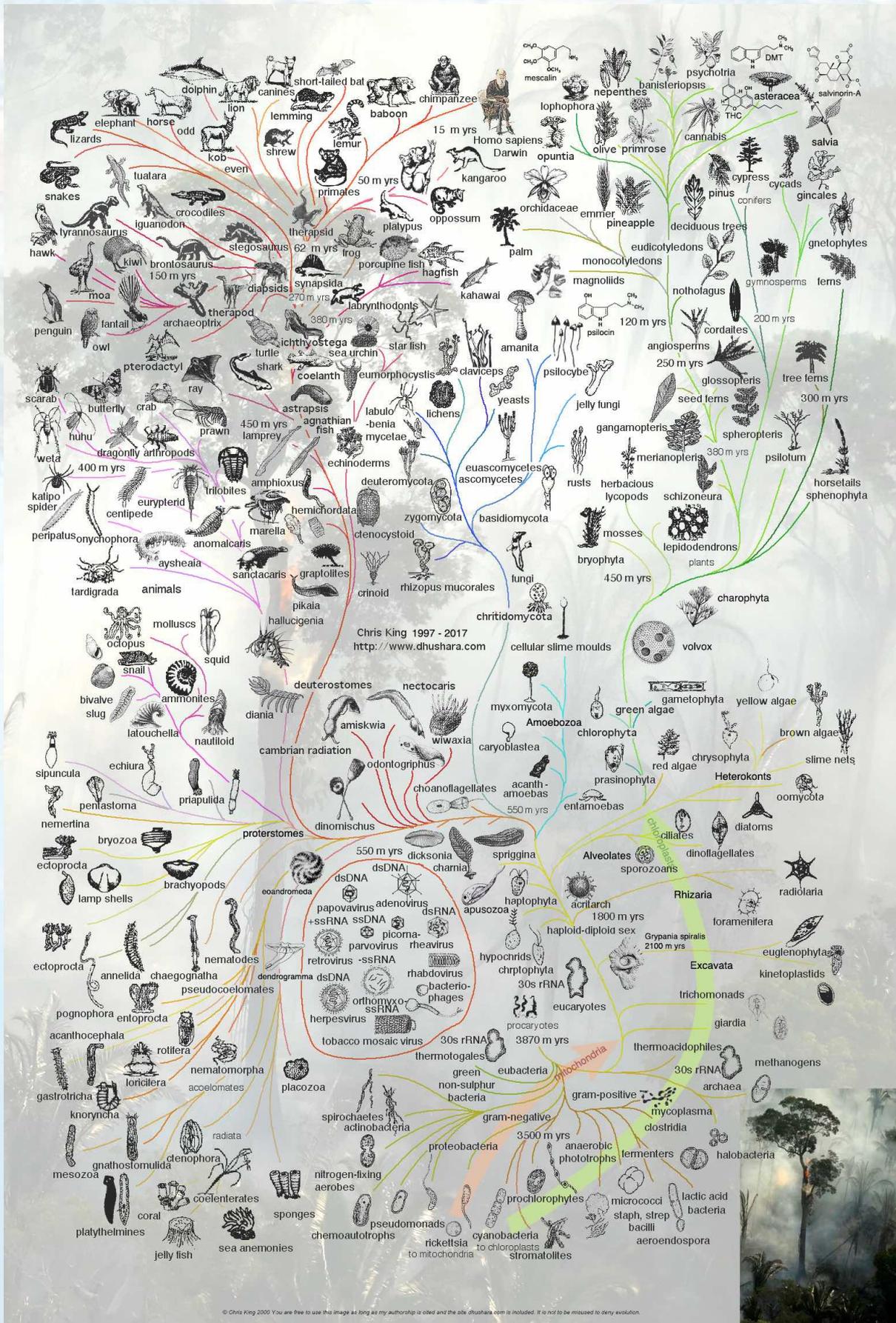


Fig 24: Evolutionary tree of life (King 2021c), with entheogenic molecules. Preserving the diversity of life and of conscious life in evolutionary time scales is the prime responsibility of our sentient incarnation. Background: Amazon burning.

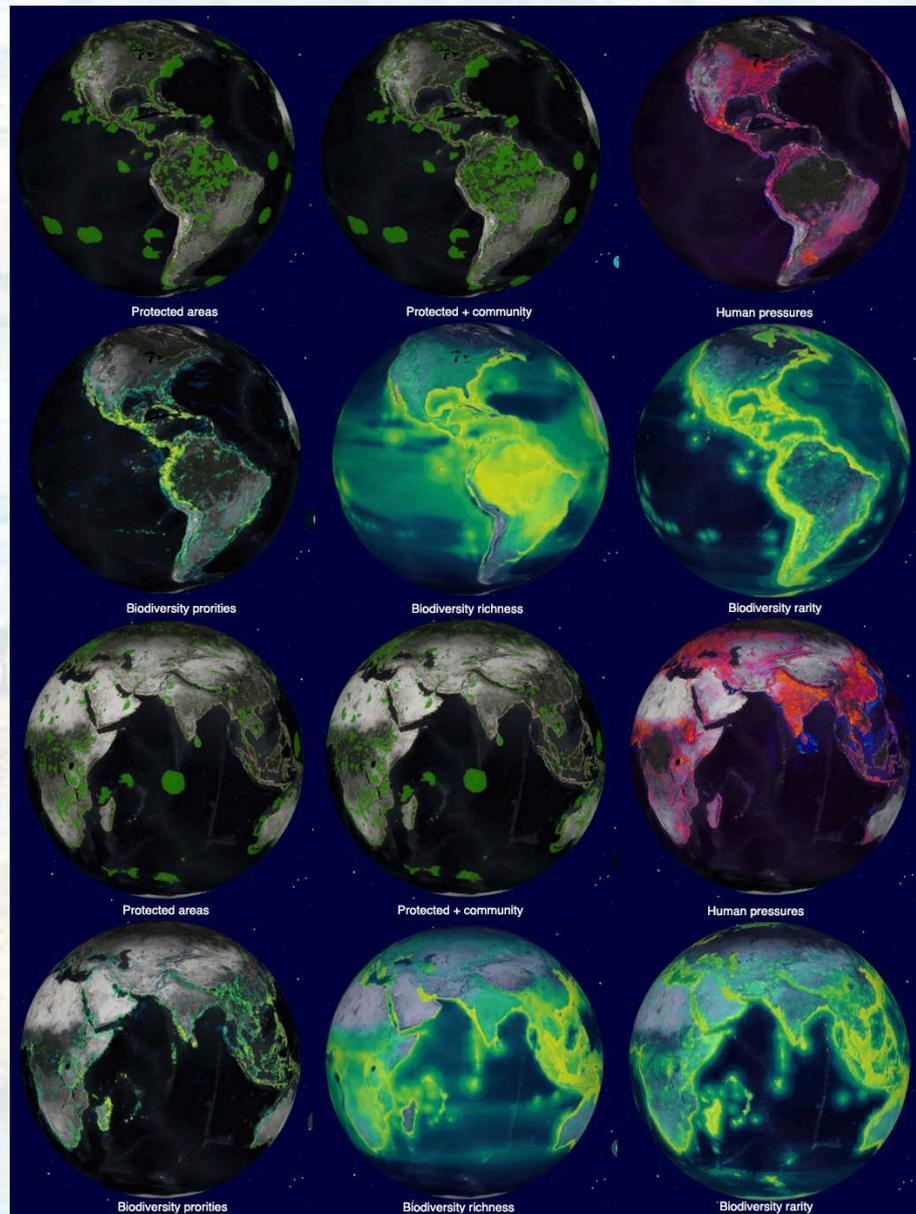
Fig 25: Scenario maps Half Earth Project show (1) protected areas, (2) protected+community, (3) human pressures (4) biodiversity priority, (5) biodiversity richness and (6) biodiversity rarity. These show the difficulty of planning for a half-Earth scenario because some countries have high value habitats which urgently need conserving while others lack any significant protected areas. Furthermore protected areas are not identical with the biodiversity priorities. Habitats involving priority species and rare species are quite distinct from areas with the greatest richness (Rinnan & Jetz 2020). This means that protecting half Earth is going to require massive funding of some developing countries and wide scale consent and economic motivation on the part of developed countries to resolve these questions. The science is critical to make the process as effective as possible but this is also going to take a huge change in the human world view to upgrade its urgency sufficiently.

If you look at the Amazon Basin it looks as though there is little overlap between biodiversity richness and human pressure, but we know that's not true because the Amazon is being ravaged by fire, mining and agriculture. Moreover The priorities for biodiversity also lie, prominently lie along the Andes, with high overlap with human impact.

Turn now to Africa and you will see a big conflict between human pressure and biodiversity priorities in the North East Congo and south to the Cape of Good Hope. This means that stopping a serious mass extinction is going to have to involve a new kind of global planning and financing to compensate affected parties and to ensure consistent standards of protection and mitigation. Predictions of biodiversity at 2100 remain contradictory depending on how the driving factors interact (Sala et al. 2000). Wilderness areas halve the extinction risk of terrestrial biodiversity (Di Marco 2019).

Davis et al. (2018) note that the incipient sixth mass extinction that started in the Late Pleistocene has already erased over 300 mammal species and, with them, more than 2.5 billion y of unique evolutionary history. At the global scale, this lost phylogenetic diversity (PD) can only be restored with time as lineages evolve and create new evolutionary history. Given the increasing rate of extinctions however, can mammals evolve fast enough to recover their lost PD on a human time scale? We use a birth–death tree framework to show that even if extinction rates slow to pre-anthropogenic background levels, recovery of lost PD will likely take millions of years.

This is going to take a paradigm shift in world views to get anywhere in time. It needs to convey an urgency and a sense of cosmological meaning to support the undertaking both scientifically and religiously to actually get there. There has to be some sheer inspiration and conviction to do this.



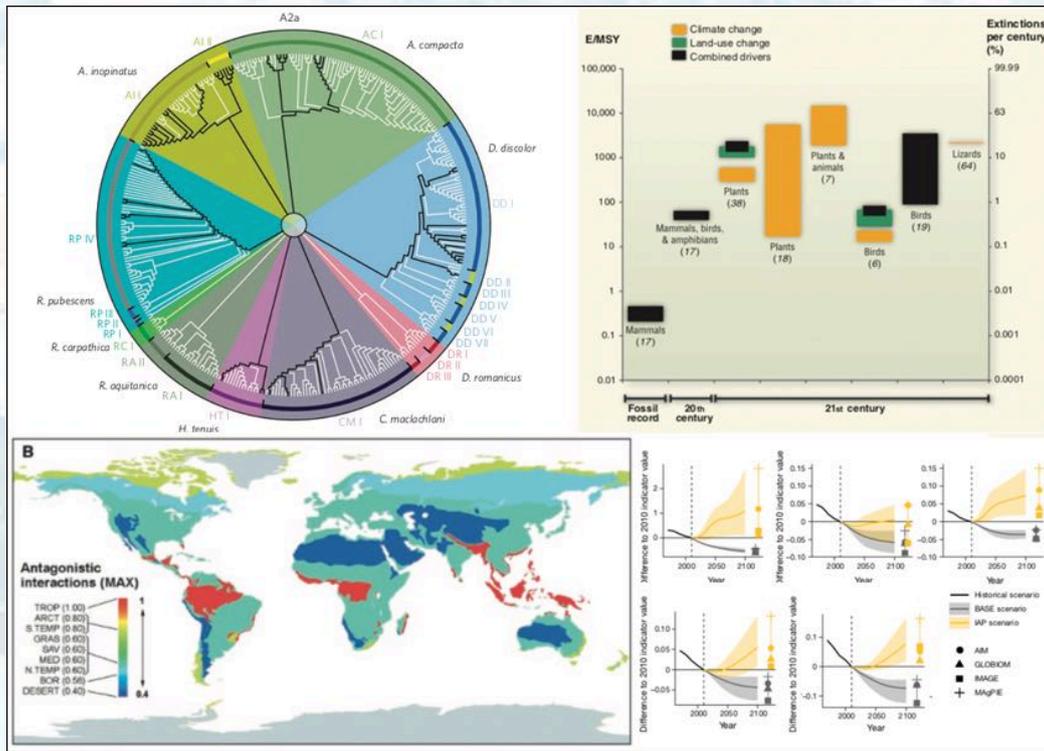


Fig 26: Top left: Predicted loss of mitochondrial cytochrome c oxidase subunit I haplotypes for nine montane aquatic insect species in Europe under business as usual IPCC 2080 CO₂ emission scenario (Bálint et al. 2011). Top right: Comparison of recent and distant past extinction rates with rates at which species are “committed to extinction” during the 21st century (Pereira et al. 2010). Bottom left: Map of expected change in biodiversity for the year 2100 under antagonistic interaction between drivers such as climate and habitat loss when the total biodiversity change equals the change resulting from the driver that is expected to have the largest effect and is calculated as the maximum of the effects of all the drivers (Sala et al. 2000). All of the key tropical rainforest would be seriously affected. Bottom right: Estimated recent and future global biodiversity trends resulting from land-use change, with and without coordinated efforts to reverse trends (Leclère et al. 2020). Habitat effects on their own contribute up to 20% loss in diversity (grey) unless adequate measures are taken (ochre). Mean extinction probability across studies making predictions of the future effects of climate change suggest a mean extinction probability of 10% across taxa and regions, whereas empirical evidence gave a mean probability of 14% (MacLean et al. 2011).

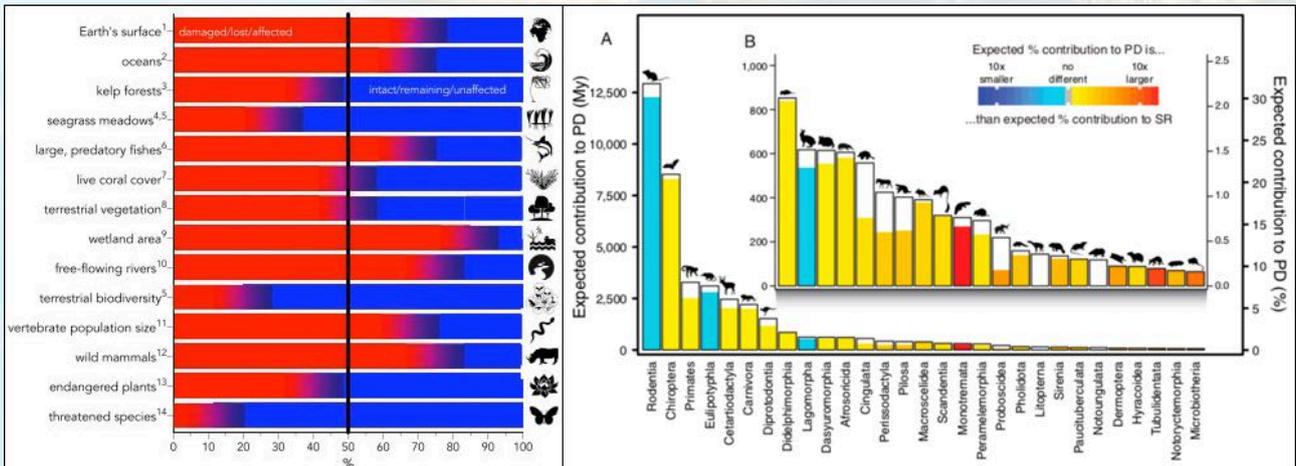


Fig 27: Left: Summary of major environmental-change categories expressed as a percentage change relative to the baseline given in the text. Red indicates the percentage of the category that is damaged, lost, or otherwise affected, whereas blue indicates the percentage that is intact, remaining, or otherwise unaffected (Bradshaw et al. 2021). Right: Loss of evolutionary history is variable across mammalian orders. The heights of the bars show the amount of unique evolutionary history attributable to each mammalian order at a preanthropogenic baseline (130,000 y ago). The right-hand y axis shows this same value as a percentage of global mammal PD at this baseline. The heights of the colored bars show the contribution to global PD projected to remain after 50 y of status quo conservation. Warm colors represent proportional contributions that are high for an order’s SR; cool colors show the reverse. The orders Didelphimorpha to Microbiotheria are shown at standard (A) and enlarged (B) scales (Davis et al. 2018).

Human impact is causing a mass extinction of biodiversity on a time scale that is almost as acute in terms of the adaption of life as the Dinosaur extinction and is rapidly approaching a series of tipping points that could throw the

entire planet into a far less hospitable state, not just for the diversity of life but for our own survival. As the Earth heats due to CO₂ and methane emissions, the albedo¹⁷ of the white, light-reflecting poles shrinks, so that it absorbs more light increasing the heating. Destabilising the methane hydrates on the ocean floor can lead to a world-wide eruption of CH₄ which is 20 times more active in solar heating than CO₂. At the same time the entire forested areas of the planet that fix carbon are being replaced by pasture and agriculture, compounded by massive fires both lit intentionally to clear forest and arising naturally from lightning strikes due to increased heat and the drying out of forest areas.

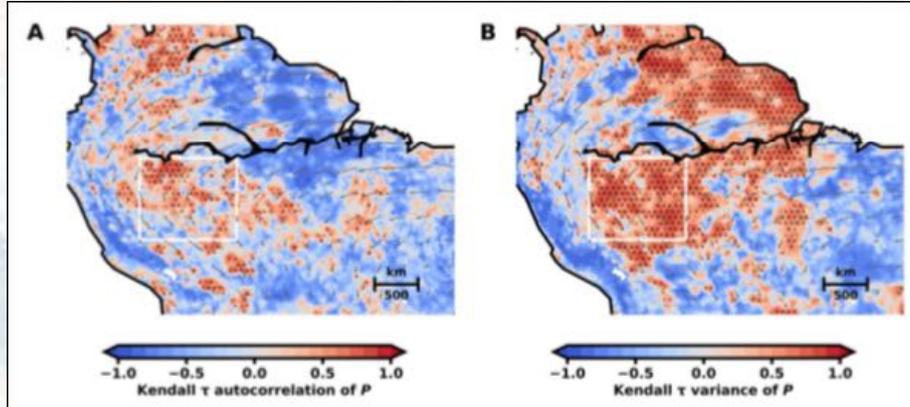


Fig 27b: Statistical early-warning signals that the Amazon monsoon is approaching a critical transition in response to deforestation and could continue to fail due to deforestation, resulting in cumulative desiccation. Large parts of southwestern Amazonia show a simultaneous increase in variance and autocorrelation. Regions with high autocorrelation correspond well with the main atmospheric moisture transport routes and the aerial river across the Amazon to the subtropics (Bochow & Boers 2023).

As I was writing this section on Boxing Day 2021, E O Wilson regarded as Darwin's heir passed away. Here are three statements he made about Biodiversity in interview about his book "The Meaning of Human Existence":

We are by instinct related closely to the survival of our distant ancestors by a driving need to strike nature as hard as we could, and to draw as much as we could from it. And we haven't lost that at all. And now we come to a higher-level recognition that we struck too hard, and too far, and we are threatening the world that we first entered so aggressively and successfully in Africa. And we somehow have got to pull back our instincts to exploit and subordinate and convert to our immediate welfare—because if we take too much more of the Earth's biodiversity we render the biosphere unstable. And we could, in the worst of circumstances, reach a tipping point in which the whole thing collapses—and we with it.

The living world the biosphere is a razor thin layer of organisms that have evolved over billions of years to create close to exactly the right combination of species and their interactions to maintain the conditions that they live in. Our minds and our bodies are particularly well designed by natural selection to live in those exact conditions and if we change it in any significant way, we die quickly, and so we should keep in mind that, when we destroy the living world by allowing species to go extinct, you're weakening the biosphere and eventually, you may reach a tipping point in which the whole thing starts to unravel, and when that happens pfutttt the end of everything.

Part of our problem is that we're a species that is narcissistic. We're intensely social and intensely interested in other people and that's how we keep our groups united and well coordinated. The result is that we're geniuses at social intelligence and really stupid when it comes to understanding how to manage the environment. We are a badly adapted species right now. We have created civilisations in which we lead and live on parts of the planet on our own. And we haven't gotten over our emphasis on forming groups and having groups compete with each other. IT's easy for us to think that the world was made for us and we don't really need to know about the 8 million or so species on this planet, even when we're told that keeping them intact and making sure they continue to live is probably necessary for our long-term existence.

The [Covid-19 pandemic](#) has shown us a world which cannot realistically modify business as usual exploitation to address the human impact on the biosphere that precipitated the pandemic through trafficking and exploitation of wild animals. This inability risks a potentially irreversible planetary tipping point. The fact that we can even temporarily be stopped in our tracks by a mere virus underscores the vulnerability of the human population to misadventure and the fragility of technological civilisation. By comparison with dealing with a pandemic, the cumulative problems of human impact are far more deleterious to both future quality of life and to the world's economic viability, and could result in the mortality of billions of people. The problems are made all the more intractable because action requires international cooperation to transform our energy and consumption economies,

¹⁷ *Albedo* is a quantity that indicates how well a surface reflects solar energy. ... the "whiteness" of a surface, with 0 meaning black and 1 meaning white. A value of 0 means the surface is a "perfect absorber" that absorbs all incoming energy.

but this is mired by national and political interests and resolute will can be unravelled all too easily by a single populist defector in a position of power, disrupting the capacity of the world to act cogently and scientifically.

Underlying the climate crisis is a much more serious and potentially devastating one for humanity's future quality of life, economic future and survival as a species, and that is the mass extinction (Leakey & Lewin 1996) of biodiversity, driven both by whiplash climate change and wholesale habitat destruction further exacerbated by deforestation and the burning of both the tropical rainforests and temperate forests of Earth, as well as the conversion of vast wilderness areas to monoculture. Whole geographical regions of the planet, both at cooler poles where temperatures changes are magnified and in the hotter drier tropics are likely to devastate their plant and animal diversity. The issues of biocrisis (King 2006-2020) and mass extinction are more serious than climate change or human induced pandemics and require a combined strategy of mitigation of habitat destruction, replanting of wilderness areas, conversion of food production and consumption to less polluting and carbon-intensive practices and collecting as much genetic diversity as possible in gene banks to conserve plant, bacterial, and fungal diversity. The fate of insects and other small multi-celled animals is also highly important for overall planetary fertility, as exemplified from honey bees to humming birds.

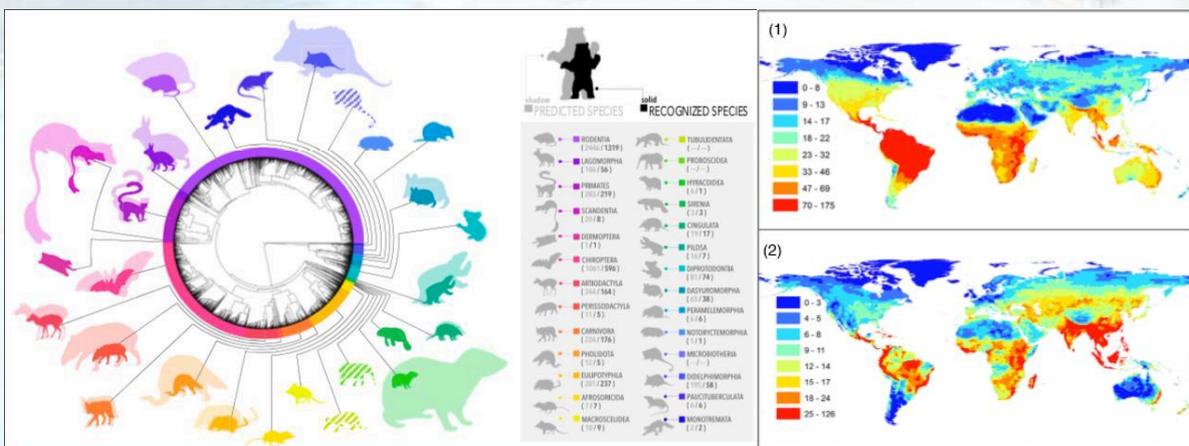


Fig 28: (Left) Phylogenetic distribution of hidden mammalian diversity estimated from consensus of delimitation results. Each silhouette represents a mammalian order with its shadow reflecting the ratio of predicted species to recognised species. Striped silhouettes represent orders with conflicting delimitation results that were not included in the predictive analysis (Parsons et al. 2022). The uncertainties may be much larger in other groups e.g. arthropods. (Right) Mutilation of the animal tree of life: (1) Monotypic genera (2) Endangered genera (Ceballos & Erlich 2023)

(a) **Half Earth** The biosphere needs immediate protection from human impact over a full half its surface and restoration by a clear dedicated program (Wilson 2016, Le Page 2018, Baillie & Zhang 2018, Dinerstein et al. 2019, Lambert 2020, Convention on Biological Diversity), and assisting diversity to replenish in the wilderness is essential for the long-term robustness of the biosphere's diversity and of human species over evolutionary time scales. Although we are stripping the biosphere, we are very small on the face of the planet and dependent on stable food supplies. Planetary changes crossing tipping points, would have a much more serious long term impact on the viability of human species, let alone the economy, than by adopting the precautionary principle. Climate change remains a serious long term risk to biodiversity and the human population. Changes in the ocean level, once initiated will continue for up to 1000 years due to changes in the planetary albedo as the white polar caps melt. They could render vast land areas uninhabitable to humans and for food production reducing the economic carrying capacity of the planet for human life for millennia to come, with increasing desertification in some areas and flooding in others all impacting on biodiversity. Pollution, from estrogenic chemicals to ocean plastics, also needs urgent containment.

(b) **Nuclear Holocaust** We remain in a situation of mutually-assured destruction due to a massive overkill of nuclear destructive power, which could also lead to a human and biodiversity genocide. This remains a key challenge and a dark comment on the patriarchal male-combat winner-take-all death-risking reproductive strategy, extrapolated to utopian proportions, which urgently needs to be addressed for the safety of the human species and the biosphere. This is human maleficence being appropriated to create a hair-trigger potential for mass destruction, rather than using this technology to avoid astronomical threats to biospheric survival. All sides are drawn into a Faustian pact, in which no one can agree to unwind the false security that the unilateral exercise of nuclear deterrent continues to have, leading to inexorable cumulative long-term risks of species extinction by accidental or malicious global holocaust.

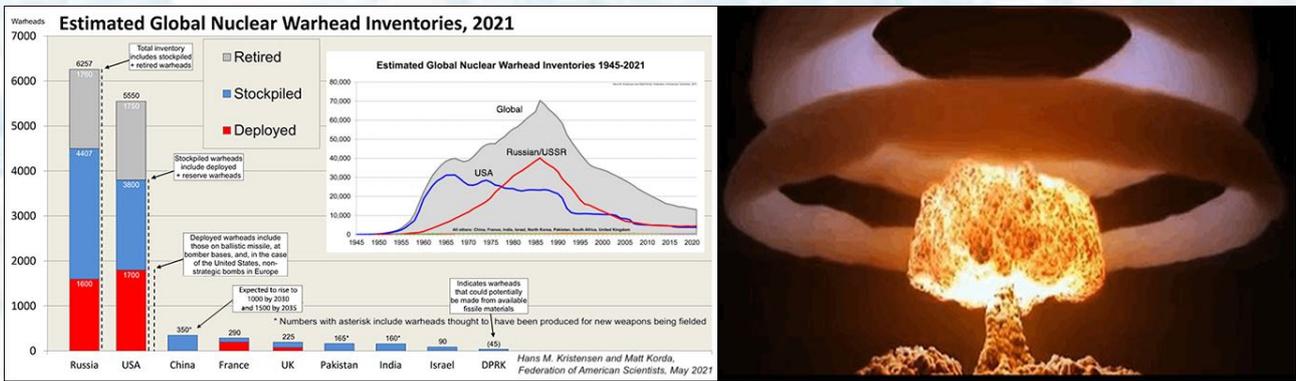


Fig 29: Left: Current state of world nuclear weapon stockpiles. Right: Tsar bomba 50 megatons [video](#). Black rose [video](#).

The Federation of American Scientists notes: *“Despite progress in reducing Cold War nuclear arsenals, the world’s combined inventory of nuclear warheads remains at a very high level: roughly 13,100 warheads as of early-2021. Of these, nearly 9,600 are in the military stockpiles (the rest are awaiting dismantlement), of which some 3,800 warheads are deployed with operational forces, of which up to 2,000 US, Russian, British and French warheads are on high alert, ready for use on short notice. ... All the nuclear weapon states continue to modernise their remaining nuclear forces, adding new types, increasing the role they serve, and appear committed to retaining nuclear weapons for the indefinite future”.*

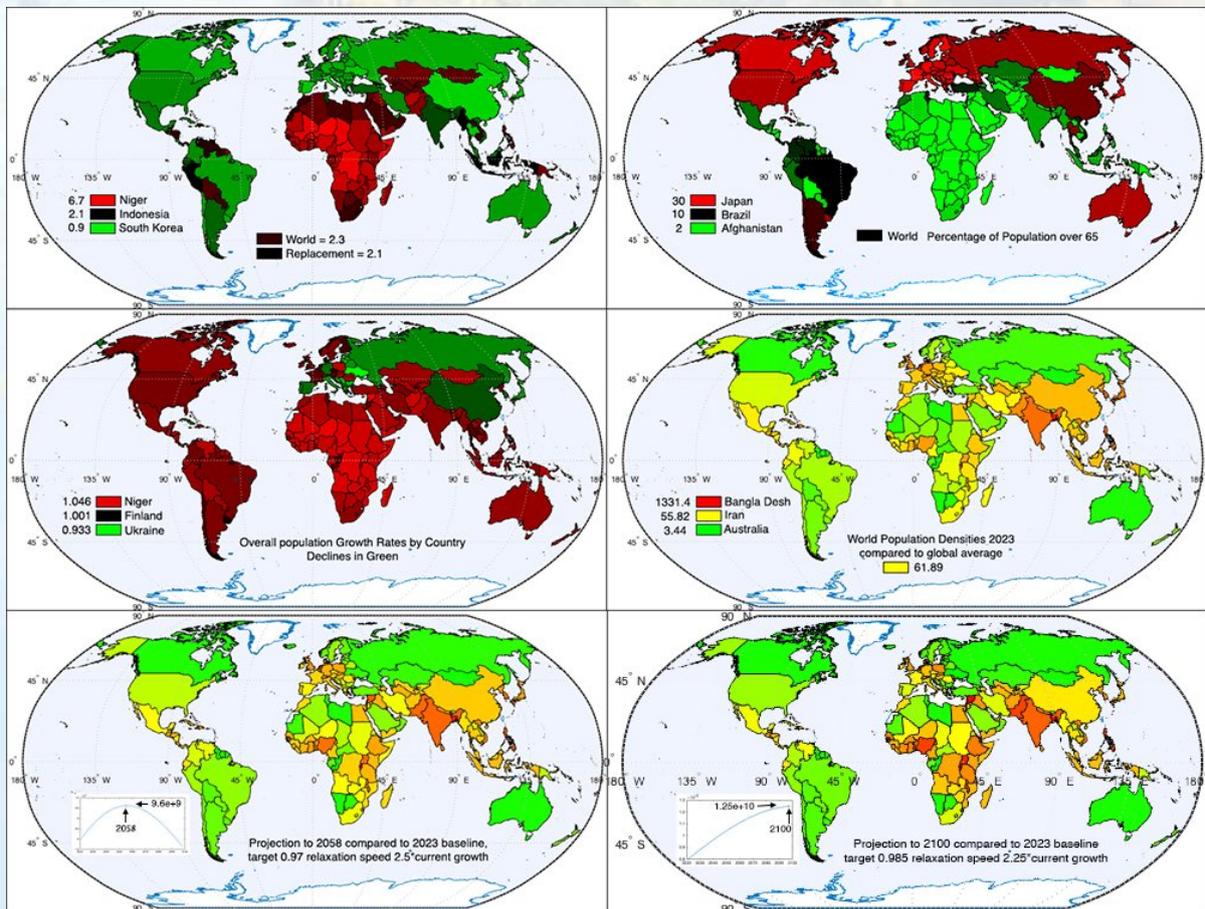


Fig 30: Predicting population (King 2023): (1) UN 2023 fertility rates by country indicate population growth in Sub-Saharan Africa leading to overpopulation with an accelerating trend towards potentially precipitous decline in developed countries. with unsustainably low fertility rates and ageing populations, confirmed by (2) Percentage of people over 65 in 2022 shows populations becoming critically aged due to longer lifespans and lower reproduction rates. (3) Overall population growth rates by country counting all factor, including births, deaths, and migration. (4) Current population densities showing extreme variations in densities between Bangladesh at 1331 and Australia at 3.4. (5) Predicted population densities modelled to be consistent with Watts (2023). In the business-as-usual case, it foresees existing policies being enough to limit global population growth to below 9 billion in 2046 and then decline to 7.3 billion in 2100. (6) Predicted population densities in 2083 consistent with the previous more severe population predictions of Gerland et al. (2014) illustrated in fig 19(1). Both models show a rise in population density in sub-Saharan Africa to peaks of 9.6 bn circa 2058 in (5) and 12.5 bn in 2100 in (6), moderated by population declines in Asia, Europe, the US and Brazil. Heat maps are non-linear, reducing the apparent effects due to the extremes of density between countries. For example the densities for Nigeria in (4), (5) and (6) are 225, 420 and 717 million respectively, reflecting the more severe 2014 prediction.

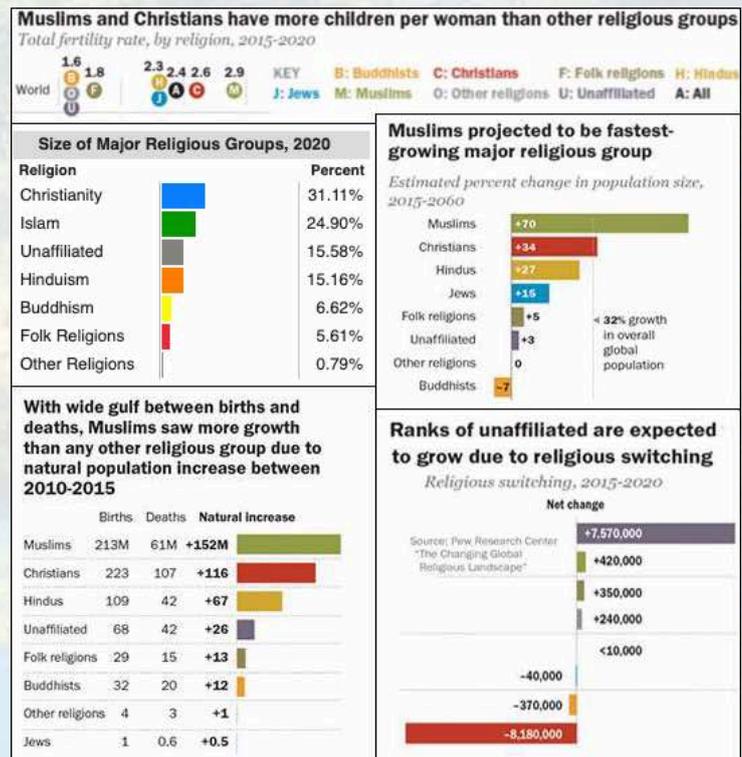
(c) **Population and Patriarchy** Population also remains a critical issue. As of 2023, (fig the issues arising from rapid population decline in developed countries and increasing risks of global conflicts over extreme inequalities and disruptive migration are becoming as serious as the spectre of overpopulation in a boom and bust dilemma. The most recent predictions are for an earlier peak reaching 9 or 10 billion people (Watts 2023) rather than unrestrained growth through to 2100 (Gerland et al. 2014), however the implications for wilderness areas, both in increasingly heavily populated sub-Saharan Africa and the Congo Basin and in the impacts of agri-development in the Amazon, combined with major climatic shifts in viable habitats and productive areas are serious threats. Since the total mass of domestic animals is nearly twice that of humans, a shift away from avid meat consumption, particularly of methane generating beef, is essential.

Symbiotic existential cosmology presents a perspective in which consciousness is not just a human faculty but is shared widely by the biota, conveying at its heart, a reverence for the continuity and sacredness of conscious life. Patriarchal religions and cultures claim to represent the sanctity of life, but have abused it, both by suppressing female reproductive choice to ensure male paternity certainty and by encouraging unrestrained reproduction of their adherents as a means to social and world dominance, accompanied by dire penalties, from stoning for adultery, through enforced female veiling, chaperoning by male relatives, female genital mutilation, limitations on female education, careers and freedom of the female race to associate, and choose their/our own futures and sexual partners.

As noted in Sexual Paradox: Complementarity, Reproductive Conflict and Human Emergence (Fielder & King 2017) this frustrates the evolutionary process towards higher intelligence we have experienced in our XY-chromosomal evolutionary emergence.

Inevitably, whatever the scenario modelled in fig 30, the data confirms that Muslim countries together have a current birth rate of 3.20 versus a worldwide rate of 2.26, and consequently the Muslim countries' share of the world population will rise from 21% to 27% in 2058, based independently on the growth rate projections, above, consistent with Pew Research (2017).

Fig 30b: Recent and future population growth of world religions (Pew Research 2017, Wikipedia).



Christianity and Islam together comprise a majority of the world population with religious believers constituting 84.5% of people. Heaven and Hell cosmology, discarding the living planet and natural diversity, in favour of a reliance on the after life, is in frank contradiction to, and conflict with, ensuring a sustainable and immortal Paradise on Earth. This is not just a crime against nature, it is a crime against humanity and reality itself.

Therefore the main thrust of Symbiotic Existential Cosmology is to change the religious weltanschauung, to that of the living immortality of life as a whole because transforming the religious paradigm is precisely the point of highest remedial capacity.

Both contraception and abortion have been opposed as violating the patriarchal God's invocation to go forth and multiply, playing a central role in driving the population explosion and hence planetary destabilisation. Muslim and secondly Christian birth rates are the highest on the planet. Abortion is opposed as a heinous sin, but the sanctity of life is not just for a single offspring but the viability of our species in a finite enclosed biosphere. Therefore upholding the sanctity of life depends on respecting the ability of the females of the species, who bear responsibility for the ongoing immortal continuity of human life, to make reproductive choices and choices whether to sustain a pregnancy in terms of their bodies, and their future responsibilities, as mothers of children they need to support. At the same

time, beginnings of a severe downturn in reproduction rates insufficient to maintain the population are in some developed countries turning into a flood that is also going to cause a population bust and seriously ageing populations, so both rampant opposition to abortion and the employment and career pressures on women in developed countries need to be removed, so that human population dynamics can become culturally and biologically sustainable.

The Fermi Paradox and Human Extinction

The Fermi paradox is the discrepancy between the lack of conclusive evidence of advanced extraterrestrial life and the apparently high likelihood of its existence. Enrico Fermi's name is associated with it because of a casual conversation in the summer of 1950 with fellow physicists Edward Teller, Herbert York, and Emil Konopinski. While walking to lunch, the men discussed recent UFO reports and the possibility of faster-than-light travel. The conversation moved on to other topics, until during lunch Fermi blurted out, "But where is everybody?"



Fig 30b: (Left) The night lighting of Earth shows planetary evidence of human civilisation visible from space. (Right) JWST galaxy survey shows many early-forming disc-like galaxies similar to the milky way, indicating that the circumstances for life are as favourable as in our own galaxy, but we have no evidence of life elsewhere in the universe other than life on Earth.

The following are some of the facts and hypotheses that together serve to highlight the apparent contradiction:

1. There are billions of stars in the Milky Way similar to the Sun.
With high probability, some of these stars have Earth-like planets in a circumstellar habitable zone.
2. Many of these stars, and hence their planets, are much older than the Sun. If Earth-like planets are typical, some may have developed intelligent life long ago.
3. Some of these civilisations may have developed interstellar travel, a step humans are investigating now.
4. Even at the slow pace of currently envisioned interstellar travel, the Milky Way galaxy could be completely traversed in a few million years.
5. Since many of the Sun-like stars are billions of years older than the Sun, the Earth should have already been visited by extraterrestrial civilisations, or at least their probes.
6. However, there is no convincing evidence that this has happened.

The Drake equation is an attempt to find a systematic means to evaluate the numerous probabilities involved in the existence of alien life where N is the number of technologically advanced civilisations in the Milky Way galaxy: $N = R_* f_p n_e f_i f_c L$ where R_* is the rate of formation of stars in the galaxy; f_p is the fraction of those stars with planetary systems; n_e is the number of planets, per solar system, with an environment suitable for organic life; f_i is the fraction of those suitable planets whereon organic life actually appears; f_c is the fraction of habitable planets whereon *intelligent* life actually appears; f_e is the fraction of civilisations that reach the technological level whereby detectable signals may be dispatched; and L is the length of time that those civilisations dispatch their signals. However, the fundamental problem is that the last four terms are unknown, rendering statistical estimates impossible.

Theories for the lack of evidence of other life in the universe, fall into three major categories:

- (1) **Extreme rarity:** Technological civilisations are extremely rare because extraterrestrial life or intelligence is rare or non-existent elsewhere, due to the extreme rarity of abiogenesis, eucaryogenesis and conscious intelligent organisms, or due to periodic extinction, by natural events, eliminating advanced civilisations as most vulnerable.
- (2) **Self-destructive culture:** It is the nature of intelligent life to destroy itself, or to destroy others.

(3) **Cosmic anonymity:** Other life forms may prefer to remain undetected, have only colonised small parts of galaxies or be unable to assimilate the resources to display evidence of their existence on galactic scales.

The last point may be pivotal. Organismic life, despite its sentient complexity, is the last, lowest energy cumulative interaction of the symmetry-broken forces of nature and the very idea of a biological organism commanding control of energy sufficient to advertise itself across galaxies may be simply a product of human technological hubris and the failure of the out humility to recognise that biological life is a very small player in the cosmic energy equation, although the most complex and conscious phenomenon in the universe.

Nevertheless, we need to heed the warning that, in the absence of knowing there is life elsewhere in the universe, we need above all to respect the sanctity of life on Earth and protect it from a human-caused mass extinction of biodiversity. As Brian Cox on the BBC ahead of COP26 warned, Earth's demise could rid galaxy of meaning Brian notes on the BBC that 'Unique events that led to civilisation mean its demise could 'eliminate meaning in the galaxy for ever'.

The "Great Filter", Hanson (1996), represents the variety natural phenomena that would make it unlikely for life to evolve from inanimate matter to an advanced civilisation. The most commonly agreed-upon low probability event is abiogenesis: a gradual process of increasing complexity of the first self-replicating molecules by a randomly occurring chemical process. Other proposed great filters are the emergence of eukaryotic cells or of meiosis or some of the steps involved in the evolution of a brain capable of complex logical deductions.

1. A planet capable of harbouring life must form in a star's habitable zone.
2. Replicative life must develop on that planet, able to reproduce, using such molecules as DNA and RNA.
3. Simple (prokaryotic) single-celled life must evolve
4. Simple cells (prokaryotes (archaea and bacteria) must evolve into more complex cells (e.g. eukaryotes).
5. Sexual reproduction, which greatly increases genetic diversity, must take hold.
6. Multicellular organisms must develop.
7. Complex organisms capable of using tools must evolve.
8. Those organisms must create advanced technology needed for space colonisation.
9. The spacefaring species must go on to colonise other worlds and star systems, while avoiding destroying itself.

Ward & Brownlee (2000) in their "Rare Earth" hypothesis state a series of worst case scenarios that may have made life on Earth vanishingly improbable and hence also explain why life elsewhere in the universe might not exist. They invoke a number of astronomical worst case claims that make Earth's history exceptional and pivotally cite both abiogenesis – the prebiotic origin of life; and eucayrogenesis – the origin of complex nucleated eucaryote cells as roadblocks, suggesting that nearly all planets might proceed no further than bacterial life.

The processes invoking abiogenesis are a frontier area of scientific discovery that remains to be fully resolved. Organics form a major component of galactic gas clouds such as the Orion Nebula, in which planetary star formation is occurring. Carbonaceous chondrites show presence of biological precursors such as amino acids and nucleotide bases and key steps in the biogenic pathway to replication have been elucidated.

However the endosymbiosis that gave rise to eucaryotes from species of archaea incorporating respiring bacteria in their cell interiors is a natural symbiotic interaction between the two primal cellular life forms that evolved on the planet. Kasting (2001) has refuted these claims of eucaryote improbability:

One point upon which virtually all molecular biologists agree is that the eukaryotic lineage is very ancient. ... The first unambiguously eukaryotic cells (identified by their large size and distinctive morphology) in the fossil record date back to only about 2.1 Gya, whereas molecular evidence for eukaryotes goes back to at least 2.7 Gya (Brocks et al. 1999). The paper also demonstrates that the 2.5-Gya Snowball Earth event (which probably occurred closer to 2.3 Gya) could not have triggered the origin of eukaryotes, as suggested. Eukaryotes appear to have evolved long before this putative catastrophe. So there is no reason to suppose that their appearance required an unusual climatic event.

Furthermore Brocks et al. (2022) note that:

Eukaryotic life appears to have flourished surprisingly late in the history of our planet. This view is based on the low diversity of diagnostic eukaryotic fossils in marine sediments of mid-Proterozoic age (around 1,600 to 800 million years ago) and an absence of steranes, the molecular fossils of eukaryotic membrane sterols. This scarcity of eukaryotic remains is difficult to reconcile with molecular clocks that suggest that the last eukaryotic common ancestor (LECA) had already emerged between around 1,200 and

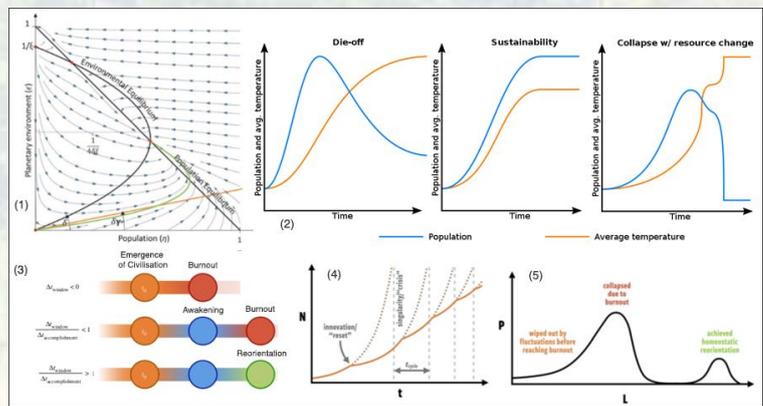
more than 1,800 million years ago. The protosteroids reveal an ecologically prominent 'protosterol biota' that was widespread and abundant in aquatic environments from at least 1,640 to around 800 million years ago and that probably comprised ancient protosterol-producing bacteria and deep-branching stem-group eukaryotes. Modern eukaryotes started to appear in the Tonian period (1,000 to 720 million years ago), fuelled by the proliferation of red algae (rhodophytes) by around 800 million years ago. This 'Tonian transformation' emerges as one of the most profound ecological turning points in the Earth's history.

This brings us to the intervention of **destructive cycles**, both natural and astronomical, and human self-destruct cycles induced by the sheer instability of rapidly evolving technological civilisations and their tendency towards exploitation and internal conflict.

Firstly, we know both the lighter elements of life on Earth along with the heavier elements are produced in cataclysmic events, including supernovae and neutron star collisions, which are themselves potential threats to existing life on nearby planets through intense radiation and black-hole formation. We also know that astronomical collisions are part of the chaotic many-body gravitational dynamics of the universe, resulting in huge collisions such as that which resulted in the Earth-Moon system from a putative collision between Earth and another early planet and which inundated the Earth with asteroid and cometary strikes in the early Hadean era.

Secondly, we know e.g. from fig 19(4) that there have been five great mass extinctions of the diversity of existing life in Earth's geological history, confirming both astronomical impacts and massive atmosphere and ocean changing volcanism have all-but wiped life off the face of the planet.

Fig 30c: (1, 2) Dynamical instabilities between population growth, resource demand and global temperature lead to collapse of society unless resource change sufficiently addresses impacts far enough in advance (Frank et al. 2018, Billings 2018).
 (3) Civilisation leads to burnout unless such resource awakening occurs effectively enough to reorient energy demands before blowout. (4) Growing urban populations can suffer multiple singularity crises requiring homeostatic reorientation, resulting in a bi-modal distribution of failed planetary burnouts and some homeostatic cultures surviving crises (Wong & Bartlett 2022).



This brings us to the emergence of human culture and energy and habitat exploitation, resulting in rapid population growth in the wake of agriculture and animal husbandry, and ensuing human niche construction of urban cultures at the expense of both non-renewable energy resources and the planetary habitats sustaining the biosphere of Earth.

Homo sapiens can survive as a living species only in biospheric cooperation with the other species in the biosphere, particularly, but not restricted to, the species we rely on for food and medicine. We need the full robustness of the genetic and biological diversity of the biosphere to ensure the planet is in a resilient enough condition to last over evolutionary time scales. As can be seen from fig 19b the combined biomass of humanity and livestock is already 22.5 times that of all wild mammals an unsustainable ratio in evolutionary terms. From fig 19(1), although population growth rates have begun to ease, the world population will still rise to 2100 putting severe pressure on sub-Saharan Africa and unsustainable pressure on biodiversity worldwide.



Just as the current investment cycle depends on the futures triple witching hour, not our long-term welfare, not only is our predictable investment horizon less than six months, but we currently lack full confidence of human survival of even a month at a stretch, due to risks of nuclear confrontation and accidental

Fig 30d: Stanislav Petrov and the 1995 Norway rocket launch incident

(a) **Nuclear Holocaust:** We have a significant continuing

chance at any time of all-out nuclear war due to the sheer instability of massive first strike options and the hair trigger decision-making processes that would be set in motion in the event of a nuclear alert. As I write, the war continues in Ukraine, in which specific threats of the use of nuclear weapons have been made. We also know that, even in peace time, we have come very close to accidental hair-trigger mistaken launches. The logic of mutually-assured destruction does not protect us from nuclear war, but converts the situation into a form of global Russian roulette where any mistake could lead to complete Fermi annihilation:

On 26 September 1983, three weeks after the Soviet military had shot down Korean Air Lines Flight 007, Petrov was the duty officer at the command centre for the Oko nuclear early-warning system when the system reported that a missile had been launched from the United States, followed by up to five more. Petrov judged the reports to be a false alarm. His subsequent decision to disobey orders, against Soviet military protocol, is credited with having prevented an erroneous retaliatory nuclear attack on the United States and its NATO allies that could have resulted in a large-scale nuclear war which could have wiped out half of the population of the countries involved.

On January 25 1995, the Norwegian rocket incident occurred, when a team of scientists launched a four-stage sounding rocket to study the aurora borealis. The rocket eventually reached an altitude of 1,453 kilometres (903 mi), resembling a US Navy submarine-launched Trident missile. Fearing a high-altitude nuclear attack that could blind Russian radar, Russian nuclear forces went on high alert, and the "nuclear briefcase" was taken to Russian President Boris Yeltsin, who then had to decide whether to launch a retaliatory nuclear strike against the United States. Russian observers determined that there was no nuclear attack and no retaliation was ordered.

Fig 30: Greta Thunberg submerged by rising oceans. The older generation stealing the future of their offspring and all future generations.



(b) Climate Crisis: We are continuing to fail to meet the targets required to avoid Earth’s climate moving out of the temperature zone of the last million years and into an acutely accelerated warming that could take us back to the Eocene 50 million years ago (fig 19(2)), with a commensurate massive rise in ocean levels and unstoppable ecocrisis, in which major species can no longer survive in their existing habitats. Rather than making a rapid transition to renewable energy, we are supplementing oil and coal exploitation in a short-term economic vicious cycle, and instead we imagine utopian solutions, from massive scale carbon recapture, to geoengineering antarctic glaciers to impede the rising oceans and even mining the moon. These are all desperate technological Fermi extinction scenarios.



Fig 30f: Borneo deforestation

(c) Wild Habitat exploitation: Wherever humanity reaches, particularly by road, the biodiverse wilderness is ruthlessly exploited for beef farms, for agricultural land and for palm oil plantations, and later for urban development This leads to the

most pervasive form of biosphere destruction short of an astronomical impact, by systematic human conversion of the entire land surface area to human production and habitation. Again a Fermi extinction scenario.

Fig 30g: Giraffes die en mass during climate driven drought in Africa. An orangutan confronts a bulldozer deforesting land in Borneo for palm oil plantations. Over 100,000 have died as a result of this activity.



(d) **Biodiversity crisis and Mass Extinction:** Underlying the combined effects of climate crisis and habitat appropriation is the fact that the the Anthropocene, defining Earth's most recent geologic time period as being human-influenced, or anthropogenic, based on overwhelming global evidence that atmospheric, geologic, hydrologic, biospheric and other earth system processes are now altered by humans. This is occurring in a climate of opinion where there is little understanding that human survival depends on a robust evolving biosphere. Our economic targets are so short that we can't even comprehend of a sustainable future 5 years out, let alone a thousand years hence, or the tens of millions of years of stable climate and evolving diversity we need to envisage if we are talking about the survival of humanity as a living species. Biodiversity itself, while concerned words are expressed about the wonders of nature, is far out on the back burner of economic urgency, despite the increasing vulnerability of monoclonal food species to epidemic disease and genetic attrition. This is clearly on its own our most serious cause of long-term Fermi extinction.

(e) **AI takeover:** At the same time, our fixation with physical technologies and materialistic notions of cognition and intelligence, makes it harder and harder for human beings to distinguish themselves from biological machines, which can be superseded by generalised artificial intelligence, and robotic processes, leading to realistic concerns of humanity becoming dependent on AI and losing the autonomous agency to control our own fate as a species.

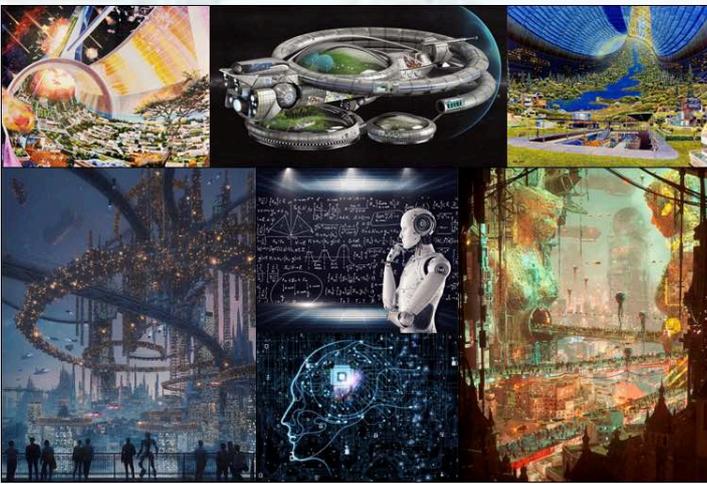


Fig 30h: Technological utopias involve concepts like interstellar travel in “generation ships” where species and genetic diversity is minimal, leaving the “late” planet Earth to an uncertain fate. Dystopias revolve around purely urban “civilisations” in which artificial intelligence dominates and there is no biosphere to support organismic life. None of these scenarios have stability over evolutionary time scales.

(f) **Sheer Cultural and Technological Instability**
Rather than existing in a living world of conscious agents, including other humans, animal predators and in our animistic origins in the gatherer hunter epoch, storms and floods as our existential survival threats, we have surrounded ourselves so completely by machines, and computational devices, that we have reduced the natural world

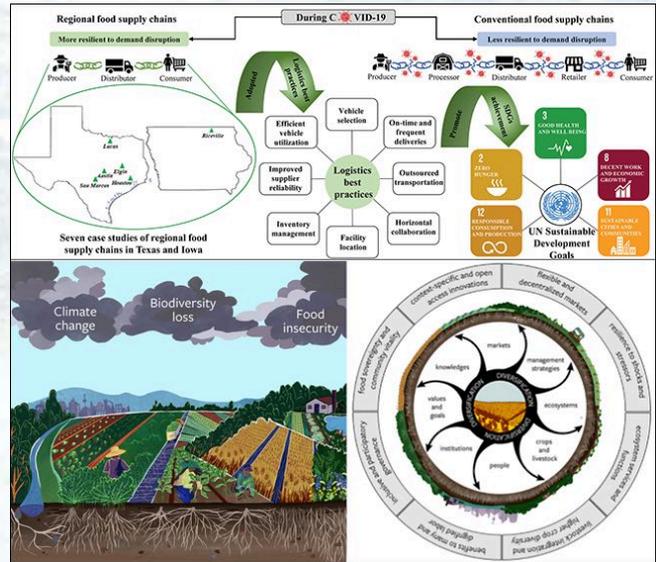
around us to a potentially dystopian mechanism, in which critical infrastructure, from energy supplies to the very food production and supply and transport lanes we depend on in urban societies to survive, are automated beyond our control. Even without a malicious AI takeover, we become a brittle, unstable techno-culture with so many avenues of short term instability, that survival prospects become no more viable than a casual breakdown on the technological highway, from which there is no escape and no return.

Humanity tends to envision future utopias which are purely technological and lack any form of stability over evolutionary time scales, when above all, we need to stop biosphere exploitation and engage sustainable enhancement of the diverse living species our food and medicinal supply and our climatic and biospheric survival depends on. We tend to treat other organisms as “dumb animals” driven by instincts, and see human intellectual achievements as superior and transformative towards a purely technological future, but this absolutely lacks any concept of the stability of life over evolutionary time scales. We see ourselves as moving beyond the evolutionary process, in forms of cultural, intellectual and technological innovation, but these remain tragically unstable on any cosmological time scale. The reality is that evolutionary diversification is the underlying creative process, from which new life forms emerge, and there is no guarantee that humanity will remain the dominant intellectual species, because of it's ill-fated evolutionary dominance. Thus species, from founding primates, to rodents, actually carry more future evolutionary potential than patriarchally dominant Homo sapiens, which is unstably prone to a self-destructive boom and bust “death wish”.

On the wider front, we remain politically and strategically stymied by tribal politics amid the endless exponential growth of GDP economics, which is transparently unsustainable, and a complete inability as a world culture to address the key existential threats to our own survival on Earth as a species as our top existential priorities. We all know this and across the planet, people feel a sense of uncertainty about the future and whether the world is going to be a

viable place in future for their children to survive, yet because of the global power structures and the way political decisions are made, we all feel too helpless to do anything decisive about it and bury our heads in the fog of delusion.

Fig 30i: (above) Food supply chain adaption during the covid 19 pandemic (Marusak et al. 2021) (below) Comparing Adaptive Capacity in Simplifying and Diversifying Farming Systems (Petersen-Rockney et al. (2021).



Humanity has evolved through Machiavellian intelligence to dominate and capitalistically, or militarily exploit one another. For males and male reproductive strategies to collectively dominate the entire female sex and control other living organisms as a dominant patriarchal species, turning to technology as a replacement for living systems is biospheric misadventure. To allow the males of a species, whose investment is principally in fertilisation, rather than the long-term female investment in sustainable child rearing, is committing evolutionary suicide because males risk death to compete for reproductive opportunities and their sole reproductive influence leads to boom and bust instability. We are politically and socially maladjusted to making constructive decisions for the welfare of humanity as a whole, let alone the other species with whom we co-exist and inter-depend. We are completely unaccustomed to living within our means and survive economically on the delusion that endless exponential growth is the solution to the world’s problems. Our global decision-making is driven by authoritarian leadership of a tribal nature, in which populism is rife and Western society is a WEIRD (Western, Educated, Industrialised, Rich and Democratic) minority aberration (Henrich 2020), to the global rule.

Closing the Circle: Doughnut Economies

A revolutionary female-inspired economic antidote to the paradigm of the GDP and exponentiating growth imperatives, comes from Kate Raworth (2012), in her discussion paper “A safe and just space for humanity”, forming an interactive template for regenerating a fair, sustainable social dynamics in the closing circle of the natural planetary ecosystem and environment, originally prepared under the auspices of Oxfam in the run-up to Rio+20. This is built on “A safe operating space for humanity” in which Johan Rockström et al. (2009) propose numerical boundaries for seven parameters: climate change, ozone depletion, ocean acidification, biodiversity, freshwater use, the global nitrogen and phosphorus cycles, and change in land use. The authors argue that we must stay within all of these boundaries in order to avoid catastrophic environmental change.

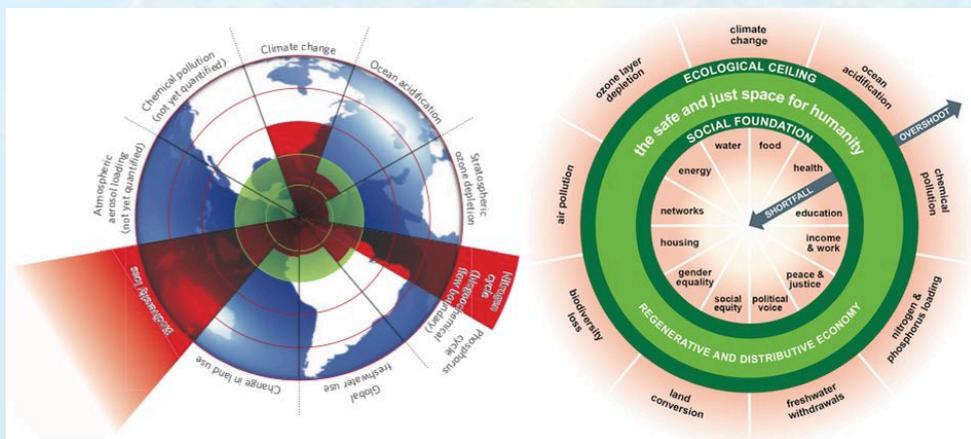


Fig 31: (Left) Beyond the boundary: The inner green shading represents the proposed safe operating space for nine planetary systems. The red wedges represent an estimate of the current position for each variable. The boundaries in three systems (rate of biodiversity loss, climate change and human interference with the nitrogen cycle), have already been exceeded. (Right) The Doughnut Economics model forming a closing circle

balancing the outer limits of the sustainable biosphere with the inner shortfalls of human society spanning health, education, energy, food gender equality and social equity.

In Kate Raworth's words ¹⁸: *The goal of the doughnut is to meet the needs of all people within the means of the planet. Sometimes when I present the idea of Doughnut Economics, people say. "Is this capitalism? Or is this communism? Or is it socialism?" And you think 'Really Are these the only choices we have?' The -isms of the last century? Can we not come up with some ideas of our own and create new names for them and see new patterns?*

Governments in every country are almost addicted to citing GDP figures as if this was proof of success and yet it's so clearly not. Because we have climate breakdown and Covid lockdown and financial meltdown, we have to pursue something far richer to move from this pursuit of endless growth, which we can now see is hitting us with crisis after crisis, moving too a goal of thriving. And the doughnut is possible to turn not into a single number, but into a dashboard. We can hold policy makers to account and say every year you need to talk about how you are making progress on these different dimensions of the Doughnut.

The outside of the doughnut is created by leading Earth system scientists just a decade ago. These are the nine life-supporting systems of planet Earth. To have a stable climate, healthy oceans, recharging fresh water. And they drew these and called them the planetary boundaries. But I thought if we go to the centre of the circle where we use hardly any of the Earth's resources, that's not thriving, that is actually death and destitution for billions of people. We need to convert Earth's lands for food, for water, for housing for energy. So I drew this inner circle and so just as there is an outer limit of humanity's pressure on the planet so too there must be an inner limit. In the hole in the middle is a place where people are left falling short on the essentials of life. It's where people don't have the food, water, energy, healthcare, housing, education, political voice that every person has a claim to meeting. We want to leave nobody in this hole. Get everybody into the green ring of the Doughnut itself.

And I think smart policy makers realised that they don't need a solution to financial crisis and a different one to climate crisis and a different one to health emergencies. They need a paradigm that no longer pushes for endless growth, but instead focuses on thriving, on resilience and on well-being within communities. We began with downscaling in rich cities, in high-income nations because they are the ones that have the greatest obligation to transform, to come back within the planetary boundaries. But I believe the framework that we've created can absolutely be adapted and used in low income countries and cities.

Since 2012, there have been initiatives to downscale the Doughnut Economy, so it can apply to individual countries and cities, starting with developed economies where there is an impending need to face these realities, with projects in Amsterdam and "Regenerate Costa Rica" and the spinoff DASH project where researchers have applied the Doughnut to the needs of 150 countries.

In short: (1) Give half the Earth back to re-wilding the wilderness, so there is enough species diversity for the biosphere to evolve. (2) Transition immediately to renewable energy. (3) Decentralise the food supply chains to protect humanity. (4) Ensure the genetic diversity of our food and medicinal species. (5) Eliminate nukes and consider how best to avoid a massive asteroid Earth strike and protection from a nearby supernova. (6) Teach people how to live in symbiotic urban culture. (7) Use technology for the benefit of life as a whole, not for humanity alone, or an artificial intelligence takeover (Werthner 2022). (8) Celebrate the perennial wonder of existence throughout our generations forever Amen.

"A human being is a part of the whole, called by us the 'Universe,' a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest — a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty" (Einstein)

Symbiotic Existential Cosmology is written to fully sacralise nature and the diversity of life as the supreme spiritual meaning of existence, in a universe whose climax is conscious life immortal unfolding in ever deepening illumination.

Karen Armstrong (2022) in "Sacred Nature" notes the urgency of this reflecting Kate Raworth's statement above:

Today that link between nature and humanity has become even more poignant, as we consider the damage we have inflicted on our environment. We cannot delight in nature any more without knowing that we face the urgent task of saving it from human destruction.

In the dynamic of concentric circles, of "The Great Learning" (Bloom 1999), the extension of each circle signifies a moment when we are compelled to transcend ourselves and our obsession with "me" and "mine." The Chinese rituals of family life were painstakingly contrived to make this expansion of sympathy habitual. But to that we should add a new circle, which transcends our focus on humanity. When finally we realise that our very existence depends upon nature, it will be time to surrender our anthropocentrism and include the entire cosmos in our ultimate concern. The Confucian scholar Tu Weiming (1998) argues that we must go beyond the

¹⁸ <https://www.bbc.co.uk/reel/video/p08hppxt/how-the-dutch-are-reshaping-their-post-pandemic-utopia>

secular humanism that formed the anthropocentric ethos of the Enlightenment. We should develop an anthropocosmic mentality that unites the individual with the community and preserves the harmony between the human species and the non-human world.

Psychedelics and Planetary Reflowering

The relation of psychedelics to Fermi extinction is the reason Symbiotic Existential Cosmology was written and why psychedelics have a key role in saving humanity from both an apocalyptic extinction, and a slow decline back to an oblivion of dark ages from which culture cannot recover.

The nascent reality connecting psychedelics and the Fermi paradox is that evolution climaxing to the emergence of a dominant cultural species like Homo, involves a narrowing of the experiential filters of conscious experience in the brain to promote species dominance, which then becomes a critical flaw, in a breakdown of coexistence into predatory exploitation, precipitating a mass extinction of the diversity of life through habitat destruction and the depletion of resources, in a non-renewable energy consumption and population burst, causing severe climatic change and disrupting planetary habitats on a global scale. This is the Fermi apocalypse catastrophe we are witnessing.

Fig 31b: Arbol de Ruben Huichol



The natural antidote to the destructive Fermi apocalypse is that the kind of climax, driven by a dominant cultural species also occurs at peak biodiversity, after a long period of fecund prosperity, in our case since the Tertiary-Cretaceous extinction, and this results in a 'salting' of the biosphere with biomolecules, which can modulate the neuronal activity of a dominant species in such a way as to carry its conscious neurodynamics closer to the climax edge of experiential chaos than its own evolutionary species selection became adapted for, thus opening the mind of humanity to the totality of existence that lies at the source of all spiritual experience of transcendence, but in a way that is fully entangled with the diversity of life, as a biospheric sacrament. This is then a way that the fullness of evolutionary climax comes to reestablish the symbiotic biosphere, because changing the consciousness of the dominant species liberates it from its evolutionary constraints. Because any dominant cultural species seeks to understand what the hell it is doing in the universe, this becomes a catalyst for its own self-discovery.



Fig 31c: (Top) DMT-bearing plants are widespread. *Phalaris arudinacia*, *Psychotria viridis* and *Acacia phlebophylla*. (Bottom) Mescaline-bearing cacti *Lophophora williamsii* and *Trichocereus pachanoi* have no close taxonomic relationship nor overlapping locale, suggesting a similar defence to insect predation.

This is not a magic process of divine psychedelic intervention. Of the three classic psychedelics, dimethyl-tryptamine (DMT) and its related compounds such as 5MeO-DMT are widespread across species. DMT is an endogenous compound found in both animals (Saavedra and Axelrod, 1972; Christian et al., 1977) and a wide variety of plants around the globe spanning both monocot grasses and dicot lowering plants. Major plant genera containing DMT include *Phalaris*, *Delosperma*, *Acacia*,

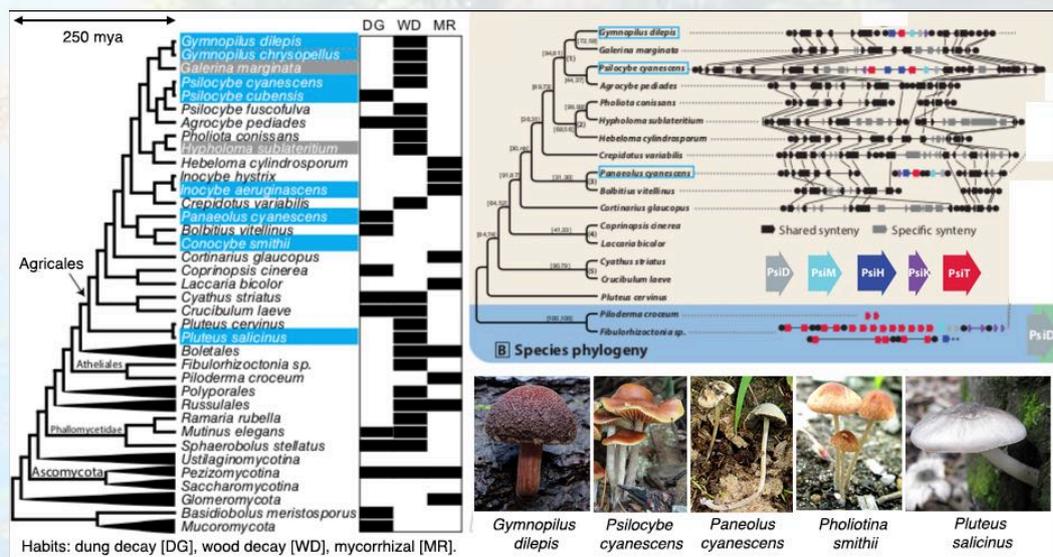
Desmodium, *Diplopterys*, *Mimosa*, *Virola*, and *Psychotria*. It has even been proposed that it plays an endogenous role neurologically in human beings (ibid). *Phalaris* grass species for example are known to contain the alkaloids DMT, 5-MeO-DMT, and 5-OH-DMT (bufotenin), which also occurs in toads, but also gramine (Pasos & Mironidou-Tzouveleki

2016), which is neuro-toxic in herbivores. DMT is traditionally consumed as ayahuasca, a mixture of *P. viridis* and *Banisteriopsis caapi* “the vine of he soul”, which contains the monamine-oxidase inhibitor harmine.

The occurrence of mescaline is less widespread, confined to two unrelated cactus genera, the peyote cactus *Lophophora williamsii* and several *Trichocereus* species, including *T. pachanoi*, the San Pedro cactus. This suggests that mescaline and the wider variety of bitter alkaloids in peyote have arisen through a response to insect predation.

The status of psilocin appears to be similar to mescaline and is even more intriguing. The incidence of psilocin activity is not taxonomic with the evolutionary tree, but is scattered across diverse genera of Agaricales. The active species share both dung and a rotting wood habits and do not have a mycorrhizal symbiotic relationship with plant roots, as related non-active species do, indicating their activity is an adaptive response to competition with insect varieties which also exploit these habitats. Reynolds et al. (2018) have established that a complex of five genes appears to have been horizontally transferred together from the wood-decomposing species to the dung species. The phylogenies of PS genes suggest they originally served roles in the wood-decay niche among fungi, and more recently emerged through both vertical and horizontal transfer in dung-decay fungi possibly in association with the rise of grasslands and megafauna in the Eocene at 50 mya. Horizontal transfer and retention of PS clusters are evidence of selection on the PS pathway in the recipient lineage. This suggests that the genes form a complex that can be transferred together by a transposable element which confers resistance to predation. The lead author Jason Slot notes: “The psilocybin probably doesn't just poison predators or taste bad. These mushrooms are altering the insects' 'mind' – if they have minds – to meet their own needs.” Serotonin shares psychodynamic survival function across all Bilateria, spanning arthropods and vertebrates, so it has been suggested that their role has been to deter insect consumption, possibly via a non-lethal psychoactive appetite suppressant based on the known olfactory role of 5HT2a receptors in fruit flies (Huser et al. (2017), although the spread of *P. cubensis* is also specifically associated with Brahman cattle.

Fig 31d: Analysis of horizontal transfer of psilocin synthesis genes between fungi.



But this explanation reveals the other good half of the Fermi paradox. A dominant species which discovers its psychic species and learns to use their paradoxically disturbing properties, and begins to protect

and even cherish its biosphere as sacred and integral to the evolving cosmic “design”, for the lack of a better word, and thus, instead of proudly announcing its dominant existence to all comers, or failing one of the many triple witching hours of its own cultural, political, economic and environmental instabilities, instead settles into discovering the abyss of its own conscious experience as a convergent symbiosis with the conscious universe as a whole.

This is what I term **cosmological symbiosis**, thereby settling into a much more cerebral perennially immortal existence, complemented by the use of renewable technology and adroit strategies to protect the biosphere from astronomical crises, such as massive impacts and nearby supernovae, by careful use of its solar system habitats to avoid putting all its eggs in one basket and to remain concealed in the universe at large, to avoid predatory exploitation from without. This is **Fermi paradise on the cosmic equator in space-time**.

Critical to addressing our existential threats to survival is the ability of subjective conscious volition to have efficacy over the physical universe. The history of neuroscience and consciousness research has been plagued by the notion of epiphenomenalism, in which the conscious mind is given the “ghost in the machine” status of an internal model of

reality constructed by the physical brain, while subjective conscious volition over the physical universe is disregarded entirely as an impossible option to accept, because of the devotion of physical science to purely mechanistic principles, particularly those expressed in physical behaviour. This is why Symbiotic Existential Cosmology has a core empirical principle that **subjective consciousness has efficacy of volition over the physical universe**, which we can each affirm at once through simple physical affirmation, as is central in the law on both criminal and corporate intent..

The failure to accept this foundation feeds into our entire existential dilemma, because we then accept the abandonment of personal responsibility for our fates in all the existential threats facing our species. We have drifted into accepting the notion of nuclear deterrence, as tacit acceptance of the necessity for ever refined and more automated forms of nuclear weapons, when this just perpetuates humanity's genocidal tendencies, as the Mayor of Hiroshima lamented after the G7 summit. We accept climate crisis as a fact of economic existence, whatever the ultimate costs to the diversity of life, and human welfare and futures. We are ruthlessly exploiting all the wild habitats of the planet, leaving no room for life as a whole to flourish. We are now in the process of reinventing ourselves as biological forms of artificial intelligence, reducing our intentionality and creative insights to mere computational processes, and homeostatic mechanisms. All this is leaning towards Fermi extinction by cultural instability. That is why I am acting to heal the apocalypse of life and doing it now.

Self-mechanisation constitutes a complete abandonment of our essential being, and our sense of personal responsibility for our fates, both because existential issues seem too huge and all-embracing to address, but also because we have abandoned our very notion of being intentional beings able to alter our destiny for the future of life as a whole, in the pursuit of a degenerate mechanistic identity. At the centre of the cyclone is not consciousness, but the ability of subjective consciousness to change the physical world around us, through conscious volition, as clearly expressed in our intentional physical behaviour, so that we and our offspring and all the sentient living creatures we are surrounded by, can continue our struggle for illumination and transcendence together. Pure materialism seeks to deny subjective conscious autonomy as a key way to prove the rule of mechanism, by deconstructing volition as brain based purely physical neural outputs, when consciousness itself is too elusive to attack. This is root misadventure.

Over the last few weeks Christine and I have spent a lot of time watching David Attenborough narrating the last few years of his documentary programs and what was utterly striking was the unrelenting conscious volitional will and sheer determination of seemingly dumb animals, and the plants and fungi, to struggle, not just for their own survival, but the flowering of life in each species, caring with utter resourcefulness for their offspring and for the evolving future of life, through the web of their interactions, as plant and fungal producers, herbivores, and carnivores, amid the tooth and claw of predators and prey, and parasites and hosts, to form the climax network of living diversity.

What is gobsmacking – outstanding in its sheer intensity, is that all these supposedly dumb organisms are intentionally creating and perpetuating life around us under extreme stresses of near starvation, food searches over hundreds of kilometres for their young, new born offspring having to depart without food, to fly or swim in one stretch, half-way across the planet to seasonal feeding grounds with mothers struggling to avoid all their offspring being consumed by predators along the way. All these species have the will to live and to perpetuate life as a sine qua non, except we ourselves, who can't even accept we have any ability to do so because our mechanistically computational physical brains made us do it! Hence it is key to **know** that subjective conscious volition has efficacy over the physical universe.

I summoned this “gnosis”, without fear or favour, when I made my millennial vigil to the Amazon and Jerusalem. I knew the odds and knew I was on the side of life against monotheistic doctrine, of dominion over nature and woman alike, as a catcher in the rye, passing right through the monotheistic throng, carrying the entheogenic sacramental holy grail of the Western religious tradition in my blood. I knew I was facing three major world religions with vested interests and violent tendencies. I didn't try to confront or argue fine points of law, and sought simply to find common ground with liberal rabbis of both sexes, and perform a quick passage, as Jesus did, after preaching in the synagogue at Nazareth and passing cleanly through the crowds seeking to throw him off the cliffs for blasphemy. So I held simple rites of passage – to **unfold the promised epoch of the Tree of Life**, throw open **the Gates of Compassion** and **celebrate the Hieros Gamos of woman and man**, in the **Song of Songs**, fulfilled in my subsequent pilgrimage to pay my respects to Kali in Varanasi, completing my academic sabbatical. These are the three core principles of natural redemption that heal the apocalyptic tradition in a true unveiling of the immortal abundance of life.

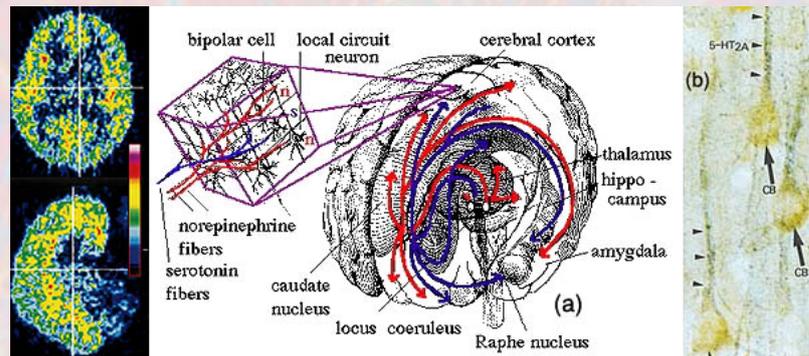
See also: (1) Resplendence, (2) Communique to the World To save the diversity of life from mass extinction, (3) Affirmations: How to Reflower the Diversity of Life for our own Survival.

Psychedelics in the Brain and Mind

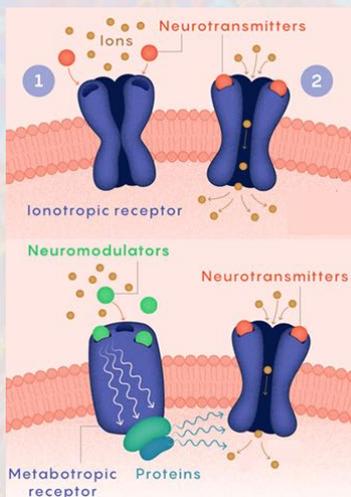
While the brain is an electrochemical organ, whose excitations are pulses and waves of electrical excitation, communication between neurons is predominantly biochemical, via synaptic bulbs which release neurotransmitter molecules that bind to receptor proteins in the membrane of the target neuron that are either ionotropic and open ion channels, causing an electrical voltage, or metabotropic, activating proteins which alter the target neuron response.

There is widespread agreement that all neurotransmitters, like dopamine, can act as neuromodulators under certain conditions. Which role a molecule is playing in given circumstances tends to be defined by its function and activity. In general, neurotransmitters are released from one neuron into the synaptic space that connects it to another neuron; within milliseconds, they cause the gates of ionotropic receptor proteins to open and allow ions and other charged molecules to flood into a neuron, changing its internal voltage. Once the voltage passes a threshold value, the neuron fires an electrical signal to other neurons.

Fig 32: Left: Serotonin 5HT_{2a} receptors are widely distributed across the cortex (Stein 2007). Centre: Ascending serotonin and nor-epinephrine pathways from basal brain centres fan out across layers of the cortex, modulating modes of sleep, wakefulness, mood, vigilance and drive. Right: 5HT_{2a} receptors line pyramidal cells traversing the cortical layers.



In contrast, neuromodulators are often released en masse at sites all over the cortex to seep through brain fluid and reach many more neurons. Binding to metabotropic receptors, whose protein cascades can affect both the nucleus and modulate neighbouring receptors, they act over seconds and minutes to make it more or less likely that the neuron will fire an electrical signal. They can alter the strength of connections between neurons, turn up the “volume” of certain neurons compared to others, and even affect which genes get turned on or off. These changes happen to individual neurons, but when a whole network is blanketed with neuromodulator molecules landing on the receptors of thousands or millions of neurons, due to major ascending pathways such as those of serotonin, nor-epinephrine, dopamine and acetyl-choline the molecules can “wash” into the intercellular fluid creating neurosystem-wide effects which influence every neural function, from sleep-wake cycles to attention and learning.



Eve Marder, recognised for her pioneering studies on neuromodulators notes: *By washing through the brain, neuromodulators allow you to govern the excitability of a large region of the brain more or less in the same way or at the same time. You're basically creating either a local brain wash or more extended brain wash that is changing the state of a lot of networks simultaneously.*

Fig 33: Metabotropic and ionotropic actions of neurotransmission and neuromodulation.

The primary excitatory neurotransmitter is the amino acid glutamate and the primary inhibitory one is gamma-amino-butyric acid or GABA, modulated by alcohol and sedatives. Their mutual interaction generates waves of excitation and inhibition identified with brain activity in the electroencephalogram.

Other neurotransmitter molecules including serotonin (5-hydroxy-tryptamine derived from the amino acid tryptophan), nor-epinephrine and dopamine (derived from tyrosine) have a modal modulating effect on brain activity mostly through slower-acting metabotropic receptors. Serotonin and nor-epinephrine pathways regulate modes of organismic behaviour, including sleep and mood in serotonin, vigilance in nor-epinephrine, and reward seeking in dopamine. The level of neurotransmitters in the synaptic junction is also regulated by transporter proteins which mop up unused neurotransmitters after the event, to avoid the brain being flooded with effects that are now over.

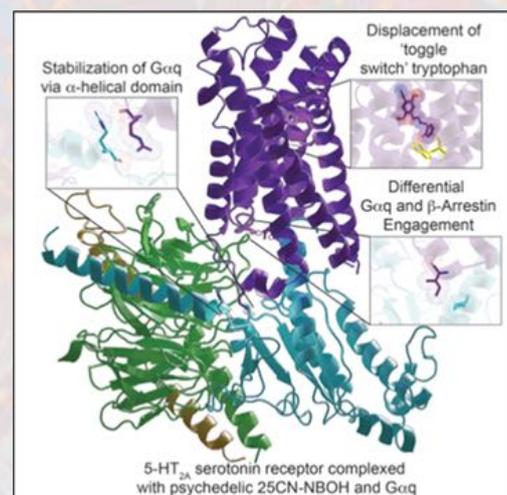
Each of the classical neurotransmitters have both ionotropic and metabotropic receptors as targets with the exception of mono-amines, where only the serotonin 5HT₃ receptor is ionotropic and differs structurally and functionally from all other metabotropic receptors which are hepta-helical G-protein-linked and all have a common evolutionary tree universal to life, fig 115. Postsynaptic 5-HT₃ receptors mediate fast excitatory synaptic transmission in neocortical interneurons, amygdala, and hippocampus. Nicotinic acetylcholine receptors are ionotropic. At the neuromuscular junction they are the primary receptor in muscle controlling muscular contraction. Muscarinic acetylcholine receptors are metabotropic and modulate alertness. Glutamate has both ionotropic NMDA and AMPA receptors and metabotropic mGlu receptors. GABA A receptors are ionotropic while B are metabotropic. The 5-HT₃, nicotinic and GABA A receptors all consist of five subunits arranged around a central ion conducting pore.

The term “psychedelic” has been eloquently (and compellingly) defined by Grinspoon and Bakalar (1979) to indicate “A drug which, without causing physical addiction, craving, major physiological disturbances, delirium, disorientation, or amnesia, more or less reliably produces thought, mood, and perceptual changes otherwise rarely experienced except in dreams, contemplative and religious exaltation, flashes of vivid involuntary memory, and acute psychosis.” The classic psychedelics, including psilocin, mescaline, dimethyl-tryptamine and LSD all have a common action on serotonin receptors in the brain. By interrupting psychedelic action with an inhibitor, Franz Vollenweider et al. (1998) established that the principal action of psychedelics was at the serotonin 2HT_{2a} receptor, widely distributed in the cortex, fig 34(a), and densely expressed in layer 5 pyramidal neurons. Their detailed interaction with the spectrum of brain receptors can be seen in fig 34(h) and the close relationship between psilocin (4-hydroxy-dimethyl-tryptamine) and serotonin (5-hydroxy tryptamine) in fig 34(i).

Serotonin has multiple modal behavioural roles in the brain as a regulator of sleep and mood. The class of anti-depressants called SSRIs, or selective serotonin reuptake inhibitors, increase the levels of serotonin by inhibiting its reuptake by transporter proteins. Entactogens such as MDMA, or ecstasy, go further and reverse the transporter, so as to dump an acute dose of serotonin, leading to the entactogenic high, accompanied by pleasurable and affectionate interpersonal contact. Both these agents can subsequently lead to serotonin depletion, the “Tuesday blues” or longer term withdrawal effects in antidepressants, but neither induce the psychedelic state. By contrast psychedelics have little physical dependence potential, because the acute effects rapidly wane if they are repeatedly dosed, until after a refractory period of days.

Outlines of an understanding of how psychedelics act have required protracted investigation and are still under exploration. Psychedelics are agonists that turn on serotonin receptors, rather than blocking their action, just as is serotonin itself, but the way psychedelics do this seems to involve a distinct protein cascade. As shown in fig 34(b), while all serotonin agonists activate the protein *c-fos*, psychedelics also activate the developmental protein early growth response 2 or *egr-2*. Fig 34(c) shows this is confirmed in vivo in mice. There has also been found from multiple researchers to be interactions between 5HT_{2a} and metabotropic glutamate MgluR2 receptors, fig 34(d) involving psychedelics, which may explain how psychedelics, in addition to causing a standard serotonergic effect, also have the bizarre sensory and existential effects they are renowned for, by modulating excitatory glutamate activity. Kim et al. (2020) have further explored the relation between psychedelics and the G α q subunit of the heterotrimeric G-protein responsible for psychedelic activation and its deactivation by β -arrestin.

Fig 33b: Full psychedelic agonist psychedelic 25CN-NBOH — 5HT_{2a} coupling involving differential G α q and β -arrestin engagement (Kim et al. 2020).



When we come to studying the effects on the brain in electrical and metabolic brain studies, the results are complex. There are two principal ways of studying brain activity, one is to place electrodes, or superconducting magnets on the scalp and record the electrical activity in electro- and magneto-encephalograms (EEG and MEG) and the other is to use metabolic measures using functional magnetic resonance imaging (fMRI), or positron emission tomography (PET) requiring a radio-active tracer. fMRI BOLD uses blood oxygen level dependent imaging and PET can sample for glucose.

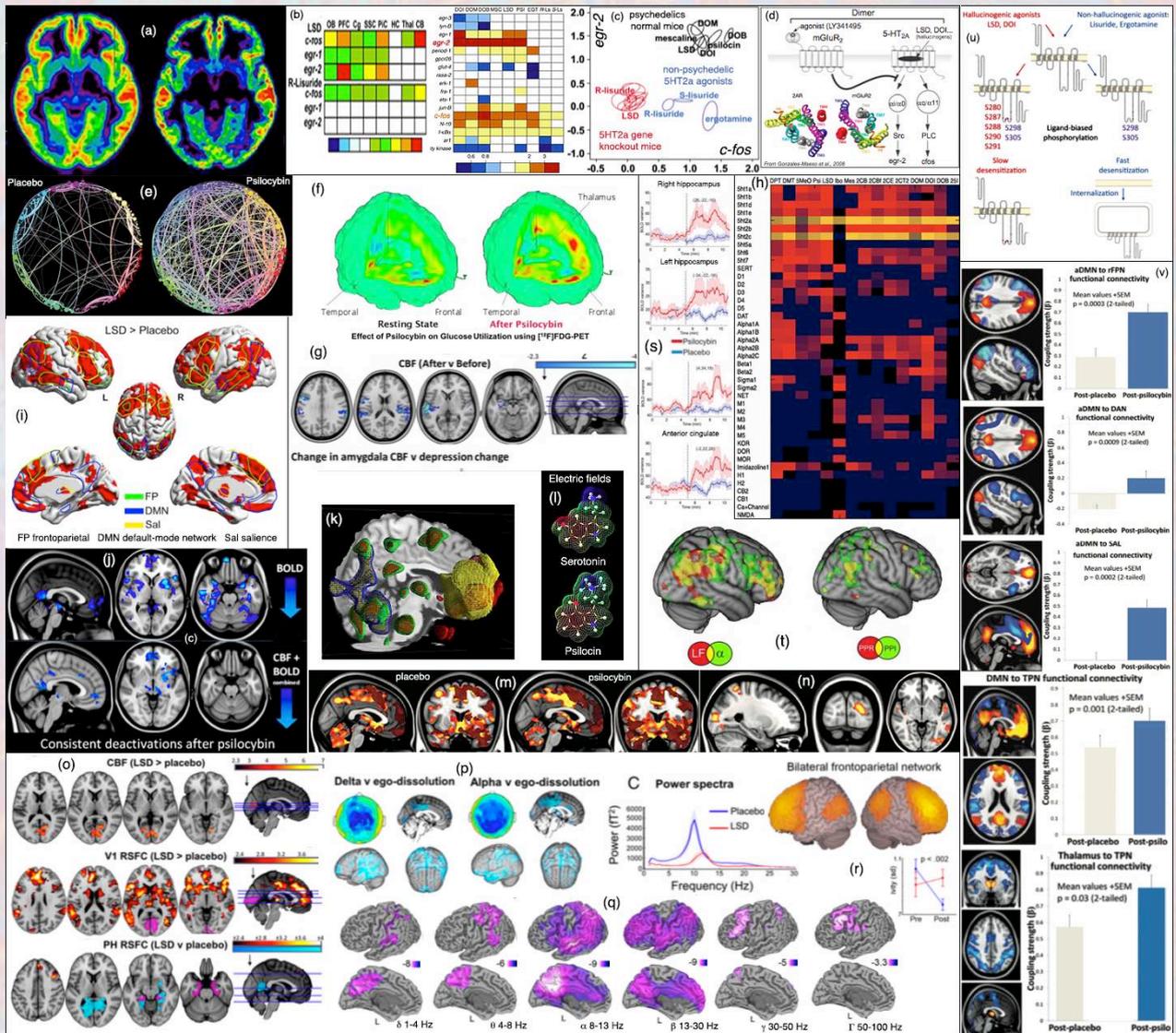


Fig 34: (a) Left healthy person's excitatory 5HT2a receptors are widespread across the cortex. Mentally "at-risk" patient right shows lower activation (Hurlemann et al 2008). (b) In vitro and (c) in vivo investigation of protein activations caused by 5HT2a has shown a consistent differential activation of *egr-2* (early growth response 2) transcription factor in psychedelics, as opposed to universal activation of *c-fos* (Nichols & Sanders-Bush 2002, González-Maeso & Sealfon 2003, González-Maeso et al 2007). (d) Serotonin agonism also appears to be linked to a pairing of 5HT2a with an adjacent glutamate mGluR2 metabotropic (G-protein-linked) receptor where *egr-2* is blocked by an mGluR2 agonist (Bockaert et al, Fribourg et al, Kondo & Sawa, Uslaner et al, Gewirtz & Marek, Delille et al). (e) Persistence homological scaffolds for placebo (left) and psilocybin (right) showing greater inter-connective persistence (Petri et al). (f) PET study of 15-20 mg psilocybin taken orally over a 48 minute period 90 minutes after consumption, which shows frontal activation by comparison with a resting state (Vollenweider et al 1997). (g) Reduction in amygdala activity in patients with treatment-resistant depression. Stabilisation of the DMN also occurred. Half of patients ceased to be depressed and experienced changes in their brain activity that lasted about five weeks (Carhart-Harris R et al. 2017). (h) Heat map of normalised receptor interactions (Ray 2010). Activity dark blue=0 to red=4 (orange for 2a and 2c, black no data). (i) LSD increases global functional connectivity of higher-level integrative cortical and sub-cortical regions (Tagliazucchi et al. 2016). (j) A recording during the 12 minutes after intravenous administration of psilocybin 2mg (~15 mg orally), which shows reduced activity in medial frontal cortex (mPFC), posterior cingulate cortex (PCC) and other areas (Carhart-Harris et al 2012a, Lee & Roth). (k) PET study of 5HT2a sites where psilocybin acts, with red and yellow having highest density (Hasler & Quednow). (l) Comparative electric fields of serotonin and psilocin. (m) Increases in activity associated with autobiographical memories on psilocybin. (n) Greater late phase activations during autobiographical recollection under psilocybin than placebo (Carhart-Harris et al. 2012b). (o) Changes in fMRI whole cerebral blood flow (CBF) on LSD, resting state functional connectivity (RSFC) increased between V1 and a large number of cortical and subcortical brain regions, but decreased between the parahippocampal (PH) and the retrosplenial cortex (RSC) and PCC, although increased between the PH and dorsal mPFC and right dorsolateral prefrontal cortex (Carhart-Harris et al 2016a). (p) Reductions in alpha (8-15 Hz) and delta (1-4 Hz) MEG power with ego-dissolution on LSD attributed to cortical desynchronisation (Ibid). (q) Corresponding decreases in MEG for psilocybin (Muthukumaraswamy et al. 2013). (r) Source localisation of one of several networks with reduced power, again associated with desynchronisation (Ibid). (s) fMRI BOLD Variance time courses into the four regions of peak statistical significance for psilocybin and placebo. (t) Statistical significance for decreased low frequency power (LFP) and power spectrum scaling exponent α after psilocybin infusion. Statistical significance of increased power point rate (PPR) and decreased point process interval (PPI) after psilocybin infusion (Tagliazucchi et al. 2014). (u) Distinct receptor phosphorylation barcodes in psychedelics. (Vandermoere & Marin 2014). (v) Increased functional connectivity after psilocybin between the DMN and (i) r-fronto-parietal, (ii) DAN dorsal attention network, (iii) SAL salience network, (iv) TPN task positive network, (v) thalamus to TPN (Carhart-Harris et al. 2013), consistent with the "unconstrained mind" (Lifshitz et al. 2018).

While one might expect that something causing visions, or even hallucinations, might result in enhanced brain excitation, some aspects of the psychedelic state, such as ego loss might also arise from a reduction in activity. Early scans of subjects on psilocybin, fig 34(f) indeed showed increases, as has a later study on LSD when the visual areas are examined, fig 34(o), but the scientific community was surprised when a team led by Robin Carhart-Harris and David Nutt, fig 34(j), found that there was a significant and unexpected reduction in activity. At the time, Franz Vollenweider commented: *“We have completed a number of similar studies and we always saw an activation of these same areas. We gave the drug orally and waited an hour, but they administered it intravenously just before the scans, so one explanation is that the effects were not that strong.”* Carhart-Harris et al. injected psilocybin and waited only a short period before the scans began. Psilocybin is a pro-drug, which is converted to psilocin, the active ingredient. The former is converted to the latter both by stomach acids and in the liver by alkaline phosphatase (Dinis-Oliveira 2017).

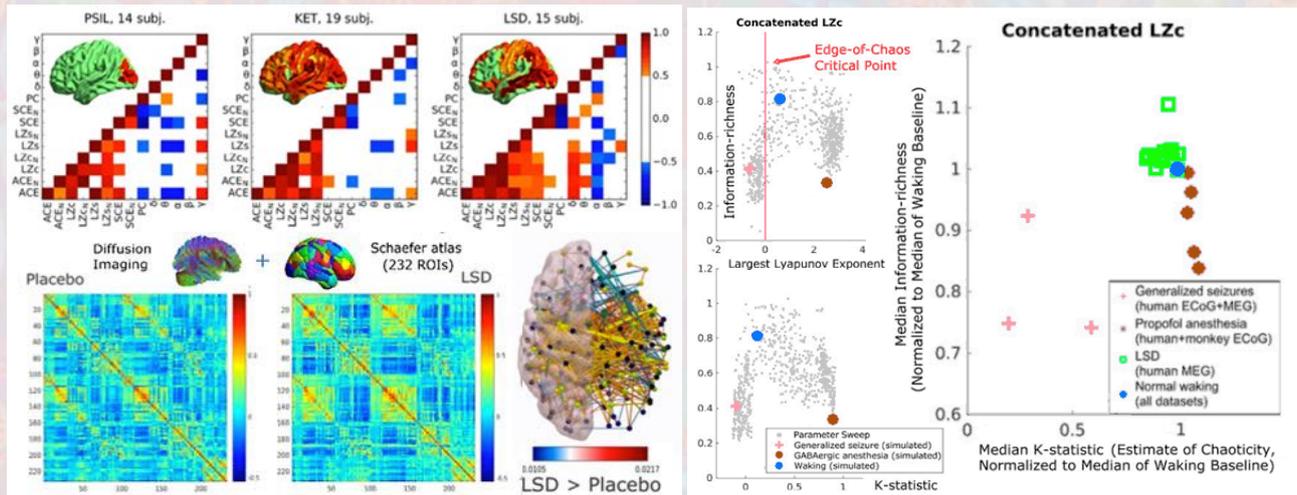


Fig 35: LEFT (Above) MEG complexity measures are greater for waking consciousness than sedative-induced anaesthesia, but greater still for psychedelics. Increased complexity and correlations of measures. For all three there is reliably higher spontaneous signal diversity, than placebo even when controlling for spectral changes (Schartner et al. 2017). Below left: Structural-functional similarity calculated as the Spearman correlation between vectorised structural and functional connectivity matrices. Below right: Brain networks of significant functional connectivity differences (r values) between placebo and LSD. LSD makes globally segregated brain sub-states more complex and more decoupled from structural constraints, as well as reducing functional connectivity of the anterior medial PFC, which is thought to subservise processes of reality monitoring (Luppi et al. 2021). RIGHT: Upper Left: Simulation of Lempel-Ziv complexity against Lyapunov exponent measured for a deterministic system. Lower left: The same measure in terms of the experimental K-statistic. Right: LSD, propofol anaesthesia and seizures normalised to the conscious state show that LSD enhances complexity, and brings the conscious brain state closer to edge-of-chaos criticality (Toker et al. 2022).

However Robin Carhart-Harris subsequently associated these results with a reduction in the activity of the default mode network (DMN). This was discovered a few years earlier from a pattern of apparent reductions in activity in certain areas during specific tasks that showed up as increased activity when resting (Raichle et al. 2001, Raichle & Snyder 2007). The DMN is thought to have a critical survival role in formulating responses to actual or incipient crises, making active use of the brain during down times from activity to be better prepared. In fact there are many resting state networks and the fundamental idea is that the brain has two complementary modes of activity which can occur together, a passive role responding to incoming environmental or sensory priorities and an active role generating activity beneficial to the organism's survival, with both of these processes superimposing during activities, so one or the other appears more prominent. Areas noted in these studies as having reductions were the medial frontal cortex (mPFC), posterior cingulate cortex (PCC), parahippocampal (PH) and the retrosplenial cortex (RSC). The PCC in particular is characterised in measuring how much you are “caught up” in your feelings and responses, as opposed to just having them. Carhart-Harris et al. (2013) also investigated (v) the connection between the DMN and other networks such as the saliency (SAL) and dorsal attention (DAN) networks and found psilocybin increased functional connectivity between several areas which normally have orthogonal non-interactive relationships confirming the increased functional connectivity of diverse regions under psychedelics.

Carhart-Harris cites the results as evidence of a reduction in default mode network activity consistent with silencing the internal dialogue and ego loss (Pollen 2018). A second researcher Justin Brewer has also found a similar reduction in people meditating (Brewer et al. 2011). This has led to the idea that stopping the internal dialogue of the default mode can result in ego dissolution, because the distinctions between self and other become blurred and the role of the ego as the strategic basis of the default mode network means that silencing it could induce a state of union, in

which self and universe become one. Functional imaging has linked the precuneus, an integral component of the default mode network to the processes involved in self-consciousness, such as reflective self-awareness, that involve rating one's own personality traits compared to those judged of other people (Cavanna & Trimble 2006). This thesis supports the notion that both psychedelics and meditation can induce states of ego loss, but the effects of psychedelics are very profound and striking and experientially different from a meditative state of controlled repose, so quietening the resting state networks is a necessary gateway to both, but is not sufficient to explain the vast experiential territory of the psychedelic conscious state.

Carhart-Harris, Fortier, & Millière (2017) note the collapse of duality: *The DMN is usually associated with mind-wandering, self-reflection and introspection while the Task Positive Network (TPN) is associated with the orientation of the mind towards the external world. Elaborating on this distinction, you notice that these two networks are anti-correlated in order to guarantee the functionally important distinction between the internal world and the external one. Now, with your colleagues, you have shown that the DMN/TPN anti-correlation is significantly decreased after psilocybin intake. You have proposed that the diminution of the orthogonality between the DMN and the TPN was a very plausible explanation as to why psychedelic experiences are characterized by a "collapse of dualities" and by the "disturbance in one's sense of self, and particularly one's sense of existing apart from one's environment"* (Carhart-Harris et al., 2014, 16).

Millière R et al. (2018) express psychedelic ego dissolution this way: *"even forms of putative "total" self-loss involving the radical disruption of both narrative and multisensory aspects of self-consciousness are best thought of as a family of states which can differ from a phenomenological perspective with respect to variables that are not directly related to self-consciousness. Indeed, strong forms of drug-induced ego dissolution may involve a very vivid and rich sensory phenomenology, perhaps as a result of decreased sensory gating, while available evidence on some "selfless" states induced by meditation suggests that their phenomenal content is very sparse (e.g., in states of so-called "pure consciousness" achieved in Samadhi practice)."*

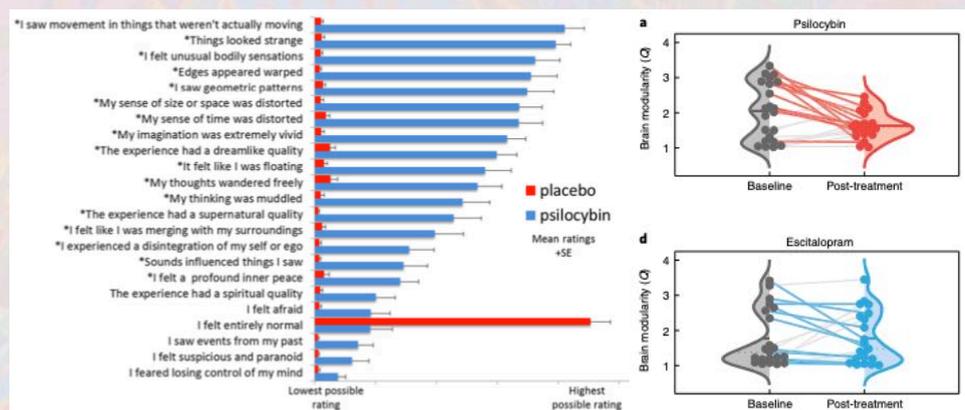
Carhart-Harris also compared the degree of reduction with subjects' personal reports of the experience during the session and found that the reduction was greater in subjects who reported evidence of ego or subject-world dissolution such as *"I existed only as an idea, or concept"*, or *"I didn't know where I ended and my surroundings began"*, suggesting the effect is genuine. The result is also consistent with heightened activity in other brain areas, particularly those involved in the subjective effects of visions and synesthesia ¹⁹, which would tend to affect sensory areas rather than associative or frontal areas.

Subsequent studies, both on psilocybin and LSD using MEG fig 34(p, q), give further insights into this situation. The psilocybin study was again by injection but the listed subjective responses showed marked effect differences between subject and placebo, indicative of the psychedelic state. In both studies there was found to be a reduction in oscillatory power, which in the LSD study was strongly associated with ego loss.

Fig 36: Left: Subjective responses within 15 mins of exiting the scanner (Muthukumaraswamy et al. 2013). Right: Increased global integration in the brain after psilocybin therapy for depression, but not for escitalopram (Daws 2022).

This reduction in overall power is consistent with increased desynchronisation in the signals, as in wave

superposition of decoherent signals, which rise and fall at different instants are more likely to cancel one another, resulting in lower net oscillatory power. This is consistent with diverse interacting signals arising from the stimulatory effects of the psychedelic on usually less associated areas, resulting in more information arising to the conscious level which would normally be filtered out, disrupting the usual flow of attention identifying and streamlining the ordered thought process. The psilocybin study also attempted to identify the source localisation of the resting state networks using independent component analysis (ICA) which determined up to 7, rather than just 1, as illustrated in fig 34(r).



¹⁹ *Synesthesia*: a perceptual phenomenon in which stimulation in one sensory or cognitive mode leads to experiences in a second mode.

Evidence corroborating this interpretation came from a further ingenious experiment from another team led by Carhart-Harris, to analyse “homological scaffolds” of brain activity under psychedelics. Fig 34(e) shows the result, in which there is a far richer network of homological scaffolds in play under psilocybin (right) with the “doors of perception” thrown open than in the normal mental state (left). This technique takes filtered correlations between the time series of the fMRI voxels, forms linkage graphs between each correlated series and then applies algebraic topology using the cliques of three or more to determine and weight the connections. Their evolution over time is also used to show that, while most of the population of psychedelic scaffolds have shorter duration than the fewer number in the placebo state, some psychedelic ones last significantly longer. This is also supported fig 34(s, t), by increased fMRI variance in the hippocampus and anterior cingulate and changes in power spectrum and other measures (Tagliazucchi et al. 2014). A further study (Lord et al. 2019) has explored recurrent BOLD phase-locking patterns (PL states). A similar result 5(i) shows LSD increases global functional connectivity of higher-level integrative cortical and sub-cortical regions (Tagliazucchi et al. 2016).

McNamara (2022) notes how psychedelics may alter the balance between intra and interconnectivity to induce mystical experiences:

Tagliazucchi et al. (2016) utilized fMRI to investigate global and local brain connectivity changes from the resting state following intravenous injection of LSD versus placebo to fifteen healthy volunteers. They found that the DMN, salience and FPN or fronto-parietal executive function network and the thalamus showed increased global connectivity under the drug but decreased within-network integrity. The increase in global connectivity observed under LSD correlated with subjective reports of ego dissolution. The authors suggested that increased cross talk between DMN, salience and FPN, when these individual networks are not functioning normally, could blur boundaries between self and world in such a way as to lead to ego dissolution and mystical experiences.

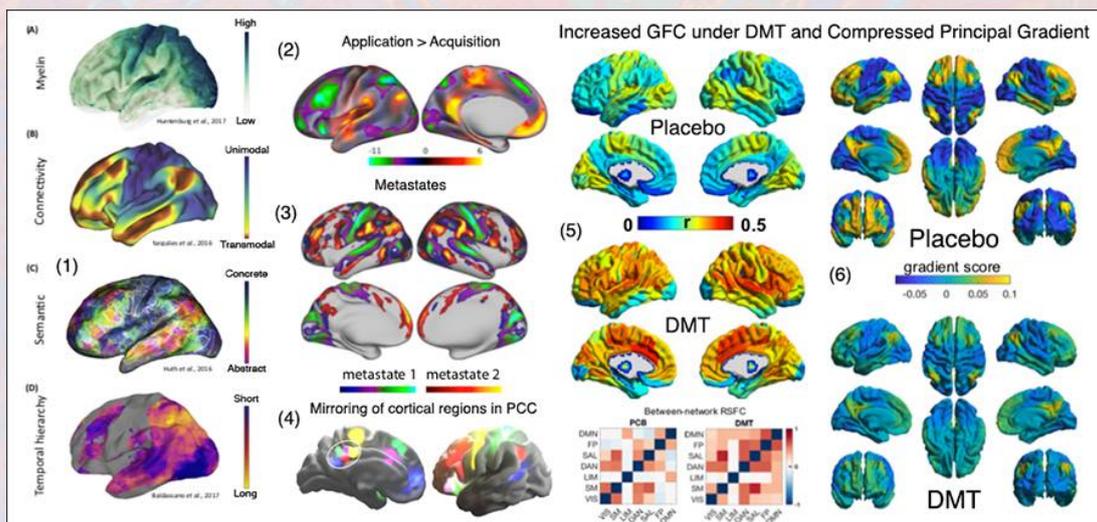


Fig 36b: (1) The principal cortical gradient of the transmodal association cortex pole (or “TOP”) of the human brain, expressed in a variety of measures, forming a hierarchical gradient down to primary sensory areas (Huntenburg et al. 2018). (2) Vatansever et al. (2017) used task-based fMRI to illustrate how the default mode network (DMN) and the fronto-parietal network (FPN), work collectively in cognition to guide complex behaviour. These demonstrate that the FPN is active after a rule change — the “acquisition phase”—suggesting its involvement in encoding the contingencies upon which the decision is based. Later, the “application phase” — when the individual understands the rule, activity within the FPN is reduced, and activity within the DMN increases (Margulies & Smallwood 2017). (3) Vidaurre et al. (2017) show that ongoing states are hierarchically organised, forming temporal groupings referred to as “metastates.” These reflect a dissociation between states anchored by regions of the cortex concerned with constrained neural processing (such as the sensorimotor systems), from those anchored by transmodal regions of the cortex. Spending time in states anchored in transmodal cortex, including those dominated by the DMN, predict better executive control and higher intelligence. (4) Subregions of the posterior cingulate cortex (PCC) within the white ellipse) and how each is functionally connected with (“echoes”) different whole brain intrinsic connectivity networks (shown by colour) (Braga & Leech 2015). The motor cortex has similar subdivisions sampling sensory and cognitive data (Gordon et al. 2023). (5) Timmermann et al. (2023) show increased global functional connectivity (GFC) under DMT, with corresponding decreased resting state between-network segregation in FPN, DMN, salience (SAL) and limbic (LIM). (6) Timmermann et al. (2023), (as well as Girn et al. 2022), show a compressed principal gradient under DMT (as well as LSD and psilocin), consistent with dysregulation of the separation between abstract associative areas and sensory processing.

In a 2023 study to explore the changes induced by the psychedelic DMT on fundamental neurodynamic networks, including the default mode (DMN) and fronto-parietal (FPN), a team led by Robin Carhart-Harris has performed the first experiment combining concurrent fMRI and EEG investigations.

At dosages consistent with the study, they note:

DMT, induces a deeply immersive and radically altered state of consciousness. DMT is thus a useful research tool for probing the neural correlates of conscious experience. Here, fMRI results revealed robust increases in global functional connectivity (GFC), network disintegration and desegregation, and a compression of the principal cortical gradient under DMT. The present findings advance on previous work by confirming a predominant action of DMT – and likely other 5-HT2AR agonist psychedelics – on the brain’s transmodal association pole, i.e., the neurodevelopmentally and evolutionarily recent cortex that is associated with species-specific psychological advancements, and high expression of 5-HT2A receptors.

The transmodal association cortex pole (or “TOP”) of the human brain sits at the upper end of a hierarchical gradient of cortical organisation, while unimodal sensory areas sit at the lower end. The TOP is linked to abstract semantic representations, longer temporal windows of information processing, and is relatively more detached from sensory input, while also appearing later in primate cortical expansion and development. These findings suggest that the subjective effects of psychedelics depend on the dysregulation of the association cortices. Evidence from neuroimaging studies also suggests that this cortical dysregulation may result in the disinhibition of “lower”, evolutionarily and developmentally “earlier” systems such as the limbic system. This also throws light on aspects of the role of the DMN, not just in the resting state, or phenomena of ego loss, but in active situations, in which the FPN plays a role in cogitative planning of solutions, while the DMN takes over once these strategies are established and have become familiar. It is also consistent with the phenomena of a sensory flood, as lower level sensory and perceptual networks become more globally interactive with higher abstract networks involving our entire conception of reality.

Deco et al. (2018) have in a similar vein, combined multimodal imaging (dMRI, fMRI, and PET) in a causal whole- brain model to explain the functional effects of 5-HT2a receptors with LSD in healthy humans. The model identifies the mechanisms for non-linear interactions between the neuronal and neurotransmitter systems. The model identified the causative mechanisms for the non-linear interactions between the neuronal and neurotransmitter system, which are uniquely linked to (1) the underlying anatomical connectivity, (2) the modulation by the specific brain-wide distribution of neurotransmitter receptor density, and (3) the non-linear interactions between the two.

Barrett et al. (2020) found that psilocybin significantly decreased both the amplitude of low frequency fluctuations as well as the variance of BOLD signal in the left and right claustrum. Psilocybin also significantly decreased functional connectivity of the right claustrum with auditory and default mode networks (DMN), increased right claustrum connectivity with the fronto-parietal task control network (FPTC), and decreased left claustrum connectivity with the FPTC. DMN integrity was associated with right-claustrum connectivity with the DMN, while FPTC integrity and modularity were associated with right claustrum and left claustrum connectivity with the FPTC, respectively. This suggests a major role for altered claustrum signalling in psilocybin’s effects as a model for psychedelic action.

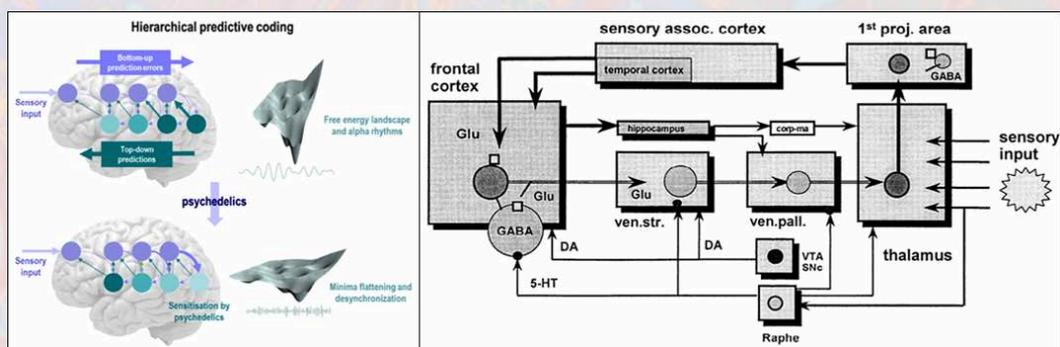


Fig 37: Left: REBUS model of lowered potential energy landscapes causing increased upwelling on psychedelics. Right: CTSC model of thalamic filtering. The filter function of the thalamus, under the control of the CSTC feedback loops, is postulated to protect the cortex from exteroceptive sensory information overload, as well as from internal over-arousal. The model predicts that sensory overload of the cortex may result from thalamic gating deficits, which may be caused by ketamine e.g. by blockade of NMDA-mediated glutamatergic (Glu) cortico-striatal neurotransmission, or excessive stimulation of 5-HT2 receptors—e.g., by psilocybin. James et al. (2022) have also applied Keppler’s (2018) zero point field model of consciousness to ayahuasca and DMT.

A theoretical idea advanced to explain salient features of the brain dynamics in psychedelic experiences is the notion of increased entropy. Carhart-Harris et al. (2014) note that “*There is an emerging view in cognitive neuroscience that the brain self-organizes under normal conditions into transiently stable spatiotemporal configurations that this instability is maximal at a point where the global system is critically poised in a transition zone between order and*

chaos". The paper then goes on to identify "metastability" of a brain network in terms of the variance in the network's intrinsic synchrony over time and to claim the psychedelic state has higher entropy than the normal waking mental state. While the dynamical details of this have been criticised (Papo 2016), they do serve to have conceptual explanatory power. Papo's critique incorrectly pivots on metastability and the argument is squarely refuted by Toker et al. (2022). Edge-of-chaos dynamics and transitions from chaos to order in critically poised sensitive states are essential to a dynamical model of the brain to avoid the dynamics becoming locked into sub-optimal ordered states, by using the butterfly effect and its "ergodic" ability to fully permeate the space of possibilities.

A second model, extending the entropy idea is that psychedelics may act to "flatten the potential energy landscape" between attracting brain states (Carhart-Harris & Friston 2019), which has received some tentative support in an LSD study (Singleton et al. 2021). The 2019 paper notes "*We call this formulation 'relaxed beliefs under psychedelics' (REBUS) and the anarchic brain, founded on the principle that — via their entropic effect on spontaneous cortical activity— psychedelics work to relax the precision of high-level priors or beliefs, thereby liberating bottom-up information flow, particularly via intrinsic sources such as the limbic system.*" SEBUS and ALBUS (strengthened and altered beliefs under psychedelics) are also cited as complementary processes (Saffron 2020).

A distinction is then made between two modes of cognition, **primary consciousness** "*a mode of thinking the mind regresses to under certain conditions, e.g., in response to severe stress, psychedelic drugs and in REM sleep*", including magical thinking, "*a style of cognition in which supernatural interpretations of phenomena are made*" and **secondary consciousness** "*the consciousness of mature adult humans*". The article then takes the view that "*the mind has evolved (via secondary consciousness upheld by the ego) to process the environment as precisely as possible by finessing its representations of the world, so that surprise and uncertainty (i.e., entropy) are minimized.*" It then argues "*that secondary consciousness actually depends on the human brain having developed/evolved a degree of sub-criticality in its functionality, i.e., an extended ability to suppress entropy and thus organize and constrain cognition. It is argued that this entropy-suppressing function of the human brain serves to promote realism, foresight, careful reflection and an ability to recognize and overcome wishful and paranoid fantasies. Equally however, it could be seen as exerting a limiting or narrowing influence on consciousness*". This leads to the conclusion that "*that the underlying neurodynamics of primary states are more "entropic" than secondary states i.e., primary states exhibit more pronounced characteristics of criticality and perhaps supercriticality than normal waking consciousness — implying that the latter is slightly sub-critical, if not perfectly critical.*"

This leads to a discussion of the role the default mode network is claimed to have maintaining the ego through the internal dialogue, leading to forms of mental illness involving the oppression of over-weaning order, such as depression, where repetitious rounds of internal dialogue occur, reinforcing a pessimistic existential outlook. It is also an ongoing feature of the fear of inevitable death that plagues human society.

As noted, there are some major issues with simply using entropy as a measure of criticality (Papo 2016). Highly entropic systems can be products either of chaotic criticality, or noisy randomness and entropy is itself not a measure of either complexity or criticality. That said, the general theme of balancing novelty with uncertainty is characteristic of brain dynamics, much of which has characteristics of pink, or $1/f$ noise displayed by edge-of-chaos dynamics, and human creations such as musical compositions, which ideally balance history and novelty.

A third notion is the cortico–striato–thalamo–cortical (CSTC) model which involves circuits between the cortex and the thalamus that mediate control of sensory information flow to the cortex and awareness and attention (Vollenweider and Geyer, 2001). This model highlights 5-HT_{2a} receptor activation on circuits between the thalamus and cortex to explain the subjective effects of psychedelics (Geyer and Vollenweider, 2008). In this view, psychedelics impede sensory gating functions of the thalamus, allowing increased sensory and interoceptive information flow from thalamus to cortical regions. This reduction in sensory gating is proposed to lead to sensory overload of the cortex that results in both the observed perceptual effects and cognitive changes.

McNamara (2022) in discussion each of these three models notes that none provided a full explanation for the intricate all-revealing nature of psychedelic experiences:

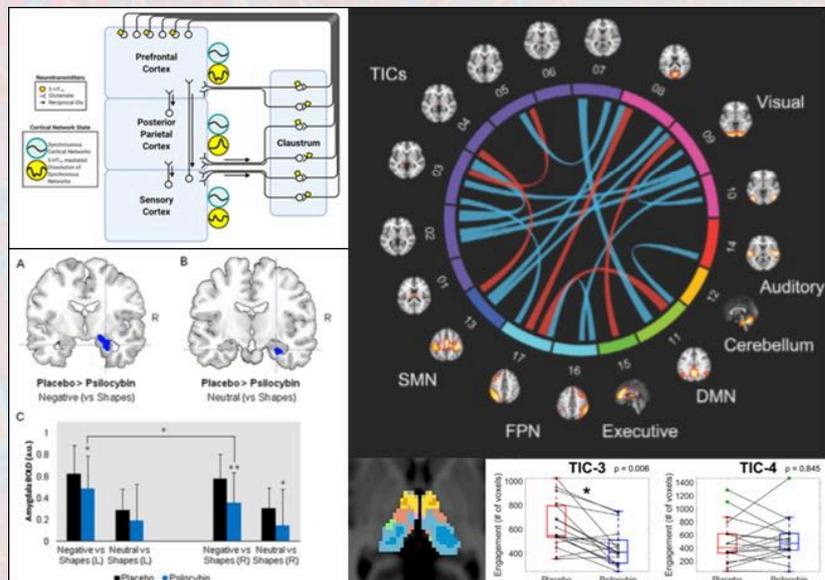
The REBUS model (Carhart-Harris & Friston, 2019) largely relies on the Free Energy Principle (Friston, 2010), which claims that brains seek to reduce uncertainty and do this largely via simulation of expected states or processes. As discussed in previous chapters of this book these simulations of expected events occur at all levels of the neural hierarchy with the topmost node in the hierarchy, the PFC, presumably playing a crucial role in enabling these predictive simulations and processing error messages when simulations do not match up with what actually occurs. The REBUS theory proposes psychedelics disrupt these predictive simulations and error processing essentially by down regulating prefrontal and anterior cingulate cortex "top-down" control of the DMN and by disrupting intrinsic DMN circuits themselves. The precision weighting of prior beliefs is disrupted thus allowing prior expectancies and beliefs to undergo reevaluation. The relaxation of top-down priors allows bottom-up information to exert more influence on brain function,

and this is what underlies the experiences induced by psychedelics. But can a simple increase in impulses or information coming from the bottom (e.g., distal sensory receptors), or even a reduction in filtering information coming from the distal sensory receptors result in the kinds of experiences people undergo on psychedelics? Would not the information simply be a barrage and blur of inchoate sensory experiences unless some kind of higher cortical cognitive processing was intact at the top of the hierarchy during a psychedelic experience? Instead, people report highly structured sensory experiences and indeed full-blown cognitive apperceptions of intricately structured worlds.

The CSTC model is similar in some respects to the REBUS model in that it implicitly adopts the idea that psychedelic experiences basically involve a removal of top-down inhibitory effects or a removal of the filtering functions of executive control networks in the cortex. This model (Vollenweider & Komater, 2010) proposes that psychedelics disrupt the gating functions of the thalamus, so all kinds of information gets into the system, flooding the brain/mind and causing ego dissolution and other psychedelic effects. The loss of gating functions of the thalamus allow increased sensory and interoceptive information to flow from thalamus to cortical regions. While LSD, as noted earlier, does appear to increase thalamus to cortex connectivity, we can ask again whether this information overload is enough to account for the structured experiences we see?

The claustrum-cortical circuit model argues that the claustrum is key to psychedelic drug effects (Nichols, 2016). The claustrum exhibits a large number of 5HT_{2A} receptors and is intensively interconnected with a large number of cortical regions. Therefore, when you perturb the claustrum you demodulate a very large number of cortical networks. Psilocybin alters connectivity between the claustrum and both the default mode and fronto-parietal attention networks in the human brain, but it is not clear exactly how alteration of claustrum activity then alters other brain networks in such a way as to account for the structured experiences we see in psychedelic states.

Fig 37b: (Top-left) claustrum model of psychedelic effects (Doss et al. 2022). (Lower left) reduction in amygdala activity under enhanced positive mood on psilocybin (Kraehenmann et al. 2015). (Right) increases in cortical and thalamic activation over placebo induced by psilocybin (red) and decreases (blue) (Gaddis et al. 2022).



A key characteristic of some neural nets using an energy landscape to reach and optimum is to run the simulation at a higher temperature of random fluctuations at first to avoid the system getting stuck in an “alpine lake”, gradually lowering the temperature to reach a quasi-optimal minimum, in a process called annealing. This is a similar process to using a transition

from chaos to order to enter a quasi-optimal strange attractor. The idea is that the higher energy landscape is a way the brain filters the doors of perception, by impeding upwelling stimuli using top-down control and that when the landscape is flattened using psychedelics, new information can flood into conscious awareness. A core basis of this argument is valid – that the brain has evolved to streamline conscious existence for survival, by filtering out uncertainty to enable rapid and decisive decision-making, ensuring organismic survival, consonant with Aldous Huxley’s (1954) notion in “The Doors of Perception” that everyday reality imposes a filter and that psychedelics, by reducing the filter can enable individual consciousness to perceive the “mind at large”.

Summarising the research to date Drew (2022) has the following overview:

Studies of functional connectivity have shown that the brain contains various discrete networks. Most scientists think there are about seven or eight discrete networks, including an attention or salience network, with others related to vision, hearing, sensorimotor processing and executive control. When a person is at ease, activity is seen across a collection of areas called the default mode network (DMN).

In many studies, the researchers have tried to identify specific connectional changes that correlated well with the self-reported intensity of the trip, or with some particular aspect of it, such as a sense of ego dissolution. These indicate that psychedelics lead to “more connections between networks, and less connectivity within networks.” Brain areas that usually have strong functional connections — and operate in a network that has a fairly circumscribed function — become less connected, suggesting that the drugs disrupt those networks’ normal outputs. And brain areas whose activity is normally only weakly correlated become more

connected. Most findings are consistent with the brain's sensory areas having more influence on overall brain activity after psychedelics were taken.

Another idea that Carhart-Harris et al.'s [2014] paper on the entropic brain considered was that psychedelics dissolve a person's sense of self by weakening connections within the DMN — an idea that gained traction far beyond the research community. Both hypotheses have been influential, but they have their critics.

"We don't know how large the contribution of the default mode network is, because there are ten other brain networks that are also altered," Katrin Preller says. Similarly, several researchers consider entropy to be too nonspecific.

In 2019, Carhart-Harris proposed the REBUS model and the anarchic brain (where REBUS stands for 'relaxed beliefs under psychedelics'), building on Karl Friston's idea of the brain as a prediction machine that constantly forms models of what it expects to perceive in the world, then tests whether incoming sensory data confirm these models. REBUS proposes that psychedelics weaken the constraints that a person's preexisting beliefs place on their perception of the world and of themselves. Under the influence of psychedelics, sensory inputs and recalled memories are freer to influence the brain and conscious experience.

Girn et al. (2022) found that LSD and psilocybin compress the usual hierarchy of connectivity between sensory and association networks. "These sensory areas — and their bare, concrete processing of the external world — become less separate from the processes conceivably related to our abstract thinking and beliefs," Girn says. "It doesn't fully validate the REBUS model, but it's consistent."

From research began in the 1990s in humans and animal models, Vollenweider proposed the CSTC or thalamic gating model. The thalamus is a brain area that processes and filters sensory information en route to the cortex, regulated by the cortex through axons that express the 5HT_{2A} receptor. Psychedelics seem to interfere with the thalamus's filtering operation, resulting in more sensory signals reaching the cortex. This is proposed to be central to the psychological effects of psychedelics.

In addition to these theories, Doss et al. (2022) claim that fMRI findings suggest a central role for the claustrum, a small subcortical region rich in 5HT_{2A} receptors. Like the thalamus, the claustrum exists in a loop with the cortex.

At its core, the entropic brain hypothesis proposes that the quality of any conscious state depends on the system's entropy measured via key parameters of brain function.

Cieri et al. (2021) note: According to the free energy principle (FEP; Friston et al., 2006) the brain is an open, adaptive, complex system far from equilibrium and as with any adaptive self-organizing biological system in nonequilibrium steady-state with the environment, it must reduce its free energy to resist a natural tendency to disorder (Ashby, 1947; Friston, 2010). They further explain that the neural complexity and brain entropy (BEN) of spontaneous neural activity decreases during states of reduced consciousness. This evidence has been showed in primary consciousness states, such as psychedelic states, under the name of "the entropic brain hypothesis", by contrast with physiological and pathological ageing, where BEN is reduced.

However the free energy principle is inadequate because consciousness existence is not just homeostatic, in terms of autopoiesis. Conscious volition is creative and isn't just homeostatic. But the theory is consistent with Huxley's view of the doors of perception being opened to the "mind at large" through psychedelics, so it does have explanatory value.

What feels like enlightenment from the inside looks like disorder from without. The idea here is that the brain processes impose a filter on the cosmic mind so that it can only behave in a way that serves the immediate survival interests of the organism, which makes it virtually impossible for a human to reach moksha. Then psychedelics paradoxically opening the filters causes ultimate reality at large to flood in. But this doesn't mean that the psychedelic experience is just a load of entropic junk — a kind of false vision. It's not this because the combination of sensory overload and self-annihilation allows the brain dynamic to run free of organismic constraints and respond to the underlying dynamic, closer to a disengaged cosmic phenomenon. From the outside, when we don't know the significance, yes this does look like forms of entropy relative to the organismic constraints.

The emerging picture is that, despite using wide varieties of techniques which are often not directly comparable, there is some support for all of these models, which illustrates how pervasive the psychedelic state is on the generation of conscious experience and serves to underline what a comprehensive transformation of our world view the psychedelic state actually entails, based on the wide distribution of 5HT_{2A} receptors.

As novel studies continue, further findings continue to emerge. Kraehenmann et al. (2015) demonstrate reduction of amygdala activity during enhanced positive mood on psilocybin emphasising the positive aspects of the experience.

Gaddis et al. (2022) showing significant psilocybin-induced alterations in spatial organisation of intra-thalamic components. Increased auditory-sensorimotor-thalamic connectivity is also shared between LSD, MDMA and stimulants (Avram et al. 2022). Barnett et al. (2020) have noted decreased directed functional connectivity in the psychedelic state, while Jobst et al. (2021) noted increased sensitivity to strong perturbations in a whole-brain model of LSD and Olsen et al. (2022 noted) time-varying functional connectivity, associated with plasma psilocin and subjective effects.

Mediano et al. (2024) note that the strongest increases in brain entropy which measures (understood as neural signal diversity), and this effect has been associated with both acute and long-term psychological outcomes, such as personality changes accentuated in the closed eye condition of sensory withdrawal. Furthermore, brain entropy changes measured by LZ complexity, fig 38a, are consistently associated with higher subjective ratings of the psychedelic experience, but this relationship is disrupted when participants are viewing a video—potentially due to a “competition” between external stimuli and endogenous LSD-induced imagery.

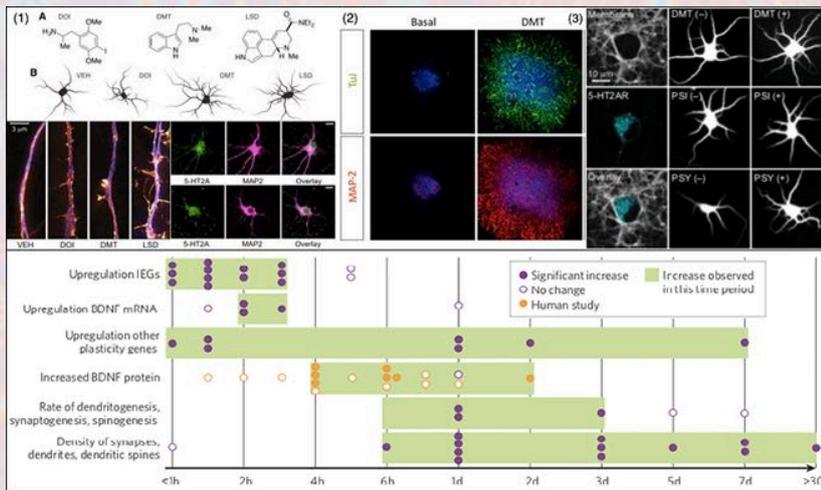


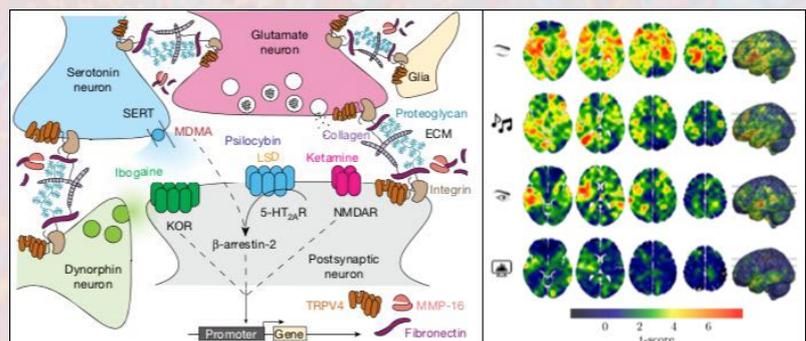
Fig 38: Upper: (1) Changes in neuronal structure, spinogenesis and the involvement of the 5-HT2a receptor in neural plasticity. (2) The involvement of DMT in neurogenesis. Neurospheres were cultured for 7 days in the presence of DMT. (3) Live-cell images of rat embryonic cortical neurons (DIV6) expressing Myc-5-HT2AR-CFP, b2AR-ECFP, or ECFP. Signals from the fluorescent protein and fluorescent plasma membrane marker in cyan and white (Vargas et al. 2023). Widefield images of rat embryonic cortical neurons (DIV6) that were administered compounds DMT, psilocin and psilocybin with (+) and without (-) electroporation, which creates temporary openings in the plasma membrane, which enables highly charged molecules to pass through and access the

intracellular space. The membrane-permeable 5HT2a agonists DMT and psilocin were able to promote dendritogenesis regardless. (Lower) Timeline showing the earliest and latest observations of various changes in neuroplasticity following treatment with a single dose of the serotonergic psychedelics LSD, psilocybin/psilocin, DMT, or DOI. One dot represents one study and time point. Human studies are shown in yellow; animal and in vitro studies are shown in purple. BDNF = brain-derived neurotrophic factor, IEGs = immediate early genes. Based on data for synaptic density, it is assumed that rates of dendritogenesis and synaptogenesis also increase at 6 h post-treatment (Calder & Hasler 2023).

Moliner et al. (2023) show that LSD and psilocin directly bind to TrkB the BDNF receptor promoting neural plasticity, with affinities 1,000-fold higher than those for other antidepressants. -Nardou et al. (2023) have also found that in young mice, psychedelics reopen the social reward learning critical period leading to long-term pro-social behaviour noting that reorganization of the extracellular matrix is a common downstream mechanism underlying psychedelic drug-mediated critical period reopening. There are also hints that psychedelics, such as DMT, which it is also believed occurs naturally to some extent in the brain has neurogenerative effects. Ly et al. (2018) report that, like ketamine, serotonergic psychedelics are capable of robustly increasing neurogenesis and/or spinogenesis both in vitro and in vivo. Calder & Hasler (2023) reinforce this with details of dendritogenesis and neural plasticity.

Fig 38a: (Left) Psychedelics act on a diverse array of principal binding targets and downstream signalling mechanisms that are not limited to the serotonin 2A receptor or β -arr2. Instead, mechanistic convergence occurs at the level of DNA transcription (Nardou et al. 2023). (Right) signal entropy represented by Lempel-Ziv Complexity eyes closed, with music, eyes open and watching TV.

These changes are accompanied by increased synapse number and



function. DMT treatment has also been found to activate the subgranular neurogenic niche regulating the proliferation of neural stem cells, the migration of neuroblasts, and promoting the generation of new neurons in the hippocampus, therefore enhancing adult neurogenesis and improving spatial learning and memory tasks (Morales-Garcia et al. 2020). Increased hippocampal neurogenesis also occurred in mice treated with 0.1 mg/Kg, who also extinguished cued fear conditioning significantly more rapidly (Catlow et al. 2013). Similar plasticity changes have been attributed to all classic psychedelics (Ly et al. 2018, 2021, Sotille et al. 2022. Vargas et al. (2023) further show fig 38(3) that this is common to classic psychedelics and involves intra-neuronal 5HT2a receptors also consistent with the metabotropic findings of fig 34 (b, c, d and u).

6 Therapy and Quantum Change: The Results from Scientific Studies

The theme of ego-dissolution and the DMN is also discussed with Robin Carhart-Harris at length in Michael Pollen's (2018) work. It provides a general perspective in which to understand the basis of some of the outstanding claims about the mental states psychedelics induce. As noted, psychedelics have been found to share characteristics both with meditative states and religious contemplation, in which experimenters have found a reduction in the activity of the DMN. Silencing of the internal dialogue in ego dissolution also involves extensive sensory-existential changes in which the boundary between self and other/world becomes blurred. It is important to understand that dissolving of the DMN in the acute psilocybin phase is naturally followed by a reintegration to an active and more functional DMN than in depressive illness. Carhart-Harris extends this blurring to explaining the magical thinking that frequently leads people experiencing deep insights under psychedelics to describe them as veridically true – revealed truths rather than just a personal opinion. He suggests that one explanation of this is that relative judgment that something is just a personal opinion requires separation of subjectivity to carry weight, but in the state of union no such distinction exists.

This raises a fundamental question. Are the insights real or illusory? This is the same question that plagues the status volitional will. Reductionistic materialists attempt to finesse this position by claiming we are simply the product of our circumstances and the causality of brain processes and that the notion of "free-will" is just an illusion resulting from evolution requiring us to invest in the notion as a rationale to proceed on the basis of an organismic personal autonomy that doesn't actually exist. Subjective consciousness then becomes an epiphenomenon, having no causal effect on the material world. However, most people and the law act on the conviction that we are intentional beings who have consequences on the world around us and that we are accountable for our actions. Premeditation is in criminal law the defining foundation of conscious intent that determines the severity of a crime. We thus need to assess deep psychedelic experiences by the same token. Reports from very astute and trustworthy individuals consistently declare that a genuine veridical experience has taken place, having the nature of truth of the same status as both swearing legal evidence and a replicable observation of the physical world.



Fig 38b: Huxley's reducing valve (Swanson 2018).

Aldous Huxley²⁰ wrote in *The Doors of Perception*: "Each person is at each moment capable of remembering all that has ever happened to him and of perceiving everything that is happening everywhere in the universe. The function of the brain and nervous system is to protect us from being overwhelmed and confused by this mass of largely useless and irrelevant knowledge, by shutting out most of what we should otherwise perceive or remember at any moment, and leaving only that very small and special selection which is likely to be practically useful. According to such a theory, each one of us is potentially *Mind at Large*" ... "In the final stage of egolessness there is an 'obscure knowledge' that All is in all — that All is actually each. This is as near, I take it, as a finite mind can ever come to 'perceiving everything that is happening everywhere in the universe.'"

The word psychedelic means "psyche revealing", where psyche means the human mind, soul, or spirit and *dēlos* means 'clear, manifest'. Thus, Osmond's (1957) proposed name-change— psychedelic—was intended to capture the spirit of filtration theory, by inhibiting certain brain processes which normally maintain their own inhibitory constraints on our perceptions, emotions, thoughts, and sense of self.

Huxley is highly critical of the limiting nature of the doors of perception's usual filter: "To make biological survival possible, *Mind at Large* has to be funnelled 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. To formulate and express the contents of this reduced awareness, man has invented and endlessly elaborated those symbol-systems and implicit philosophies which we call languages. Every individual is at once the beneficiary and the victim of the linguistic tradition into which he or she has been born — the beneficiary inasmuch as language gives access to he accumulated records of other people's

²⁰ This follows in line with the filter theories of Henri Bergson *Matière et Mémoire* (1896) and William James *Human Immortality*. (1898)

experience, the victim in so far as it confirms him in the belief that reduced awareness is the only awareness and as it be-devils his sense of reality, so that he is all too apt to take his concepts for data, his words for actual things.”

This criticism has become even more urgent and critical in a time of planetary climate and ecocrisis, when this reduced tribal awareness driven by ego-consciousness is causing dire risk of a mass extinction of the diversity of life and potentially the extinction of the human species. To a reader not familiar with these states, it is hard to give credibility to the notion that a person under the influence of an agent originally labelled as an “hallucinogen” that is known to have both transcendent and potentially diabolically dysphoric dimensions as Huxley emphasised in “Heaven and Hell” (1956) can also have experiences with the long-lasting therapeutic relief or mystical insight, let alone be literally and veridically true.

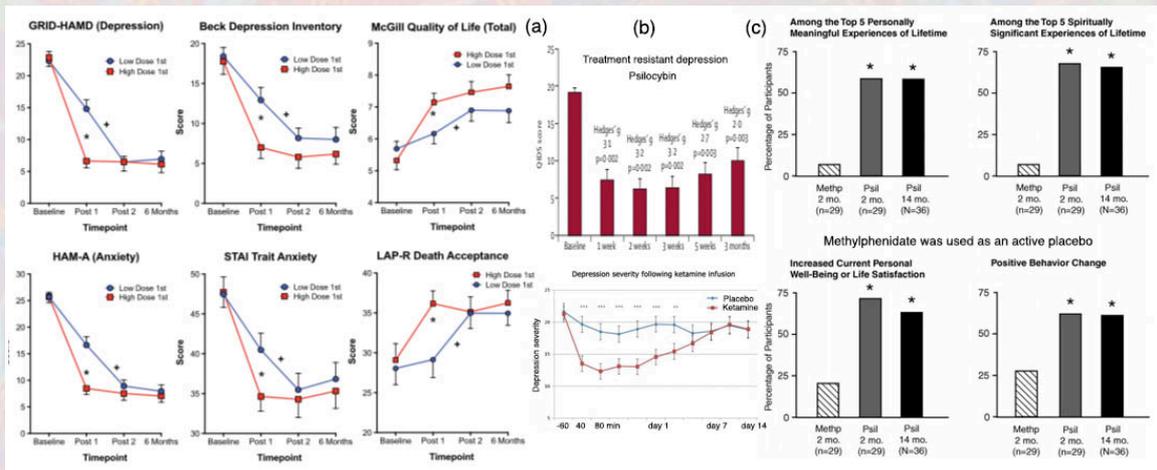


Fig 39: (a) Assessments of improvement in depression, anxiety and quality of life up to 6 months after psilocybin study in subjects facing life-threatening cancer (Griffiths et al. 2016) (b) Improvements in subjects with treatment-resistant depression after psilocybin study (Carhart-Harris et al. 2016b), compared with Ketamine (Zarate et al. 2012). (c) Assessments 2 & 14 months after the psilocybin study Griffiths et al. (2006, 2008). The largest study of its kind (Goodwin et al. 2022) has confirmed these findings for a one-dose treatment for a treatment-resistant episode of major depression.

However this is precisely what a number of studies, where precisely these “revelations” under psychedelics have been repeatedly shown to have long lasting insights and benefits, both in severe depression and in people suffering a terminal condition and in normal people experiencing mystical states (Carhart-Harris et al. 2016b, Griffiths et al. 2006, 2008, 2011, 2016, **2021**, Acero et al. 2023). Studies are also exploring psilocybin use in bipolar disorder (Aaronson et al 2023, Gard et al. 2021, Monaco K 2023, Morton et al. 2023, Yaden et al. 2023). The titles of these research papers indelibly attest to the genuine long-term effects that these experiences induced:

“Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance”, “Mystical-type experiences occasioned by psilocybin mediate the attribution of personal meaning and spiritual significance 14 months later”, and “Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer”.

The most striking finding from this 14-month follow-up evaluation of the effects of psilocybin ... administered to hallucinogen-naïve volunteers is that a large proportion of volunteers rate their “psilocybin experience” as among the most personally meaningful and spiritually significant of their lives. Fifty-eight percent and 67% of volunteers, respectively, rated the experience as being among the five most personally meaningful experiences of their lives, and the five most spiritually significant experiences of their lives; 11% and 17%, respectively, indicated that it was the single most meaningful experience, and the single most spiritually significant experience. Furthermore, 64% of the volunteers also indicated that the psilocybin experience increased their sense of well-being or life satisfaction moderately or very much, and no volunteer rated the experience as having decreased well-being or life satisfaction.

McNamara (2022) who has become prominent as a researcher into the neurological basis of religious experience strongly confirms the significance of these findings for mystical and religious experience:

It is now very well established that psychedelics reliably produce mystical-like experiences. The first well-documented experimental study to investigate the effects of a serotonergic psychedelic on mystical experience was the so-called Good Friday experiment conducted by Walter Pahnke at Boston University’s Marsh Chapel in 1962. The study involved administration of either 30 mg psilocybin ($n = 10$) or 200 mg nicotinic acid ($n = 10$) to seminary students during the Good Friday religious service (Pahnke, 1967). After the experience, and at a six-month follow-up, participants were assessed for mystical experiences based on the model of mystical experience developed by Stace (1960). The Stace dimensions of mystical experience include sense of unity, sacredness, positive mood, transcendence of time and space, noetic quality, ineffability, paradoxicality, transiency and persisting positive

changes in attitudes and behaviors. Four of the participants in the psilocybin conditions reported most or all of these dimensions while none in the control group did. Doblin (1991) tracked down sixteen of the original twenty participants twenty-five years later and confirmed that many of the positive benefits linked to the psychedelic experience remained!

In a now landmark psychedelic study (Griffiths et al., 2006) using the MEQ, the mean percentage of endorsed items was 78 percent immediately after psilocybin and 33 percent after the control substance methylphenidate. Follow-up some fourteen months later did not substantially change these numbers. In addition, the appearance and intensity of mystical experiences appears to be dose dependent (Barrett et al., 2015; Griffiths et al., 2011): volunteers received 5, 10, 20 and 30 mg/70 kg of psilocybin in separate sessions with at least one month between each session and a placebo session randomly placed within the sequence. The mean percentage of maximum total possible score on the MEQ30 on session days was 23 percent, 47 percent, 52 percent, 70 percent and 77 percent after placebo and 5, 10, 20 and 30 mg/70 kg psilocybin. This score for 30 mg/70 kg at fourteen months was 81 percent. Hierarchical regression analysis demonstrated that MEQ30 scores significantly predicted various clinical, health and spiritual well-being outcomes.

When the people who have them (1) describe the experiences as mystical, religious and spiritual, (2) when these experiences are associated with benign to excellent clinical outcomes, (3) when the phenomenology of the experiences are substantially similar and (4) when the mystical experiences are dose-dependent, I think we can conclude that these experiences are psychedelically induced and genuine religious mystical experiences.

Ketamine has similarly shown promise in treatment-resistant depression, though effects do not last as long as those observed with psilocybin. A possible mechanism has been found in the disassembly of perineuronal nets restraining new synapse formation in established learned memories (Venturino et al. 2021). Other evidence suggests a potentially shared mechanism wherein both ketamine and SPs may engender rapid neuroplastic effects in a glutamatergic activity-dependent manner (Kadriu et al. 2021). The notion due to Craddock, that ketamine and psychedelics share an interaction with microtubules affecting consciousness does not at this point have evidential support.

A later study (Griffiths et al. 2018) combined the use of psilocybin with meditation and other spiritual practices, echoing the way in which movements such as the Native American Church and the Union Vegetale provide a spiritually conducive context to engender positive outcomes, designed to tap into **quantum change experiences** – sudden, distinctive, benevolent, and often profoundly meaningful experiences that are said to result in personal transformations that affect a broad range of personal emotions, cognitions and behaviours (Miller, 2004; Miller and C’de Baca, 2001), also reminiscent of **peak experiences** (Maslow 1964).

The discussion notes: “The study showed robust interactive positive effects of psilocybin dose and added support for spiritual practices on a wide range of longitudinal measures at 6 months including interpersonal closeness, gratitude, life meaning/purpose, forgiveness, death transcendence, daily spiritual experiences, religious faith and coping, and rating of participants by community observers. Analyses suggest that the determinants of these effects were the intensity of the psilocybin occasioned mystical experience and the rates of engagement with meditation and other spiritual practices. Most broadly, as a model system for studying so-called quantum change experiences, which have been described for centuries but which have eluded rigorous prospective experimental analysis, further investigation of psilocybin-occasioned experiences may have broad implications for the development of drug and non-drug interventions in both therapeutic and nontherapeutic applications in order to engender enduring positive trait-level changes in attitudes and behavior and in healthy psychological functioning”.

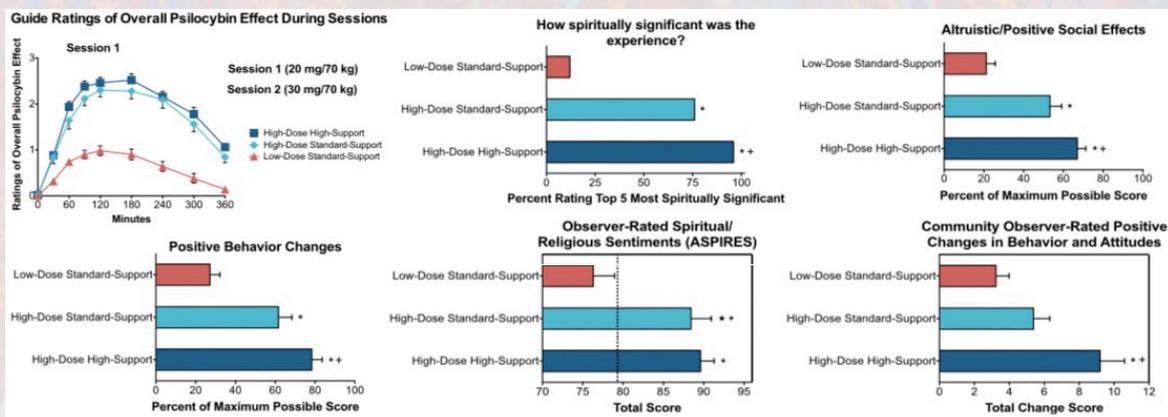


Fig 40: Selected results from Griffiths et al. (2018). All at 6-months after, except for the top-left rating of psilocybin effect.

A further study (Griffiths et al. 2019) compared “God-encounter experiences” under classic psychedelics and naturally. While “the Non-Drug Group was most likely to choose “God” as the best descriptor of that which was encountered while the psychedelic groups were most likely to choose “Ultimate Reality.” Most participants reported vivid memories of the encounter

experience, which frequently involved communication with something having the attributes of being conscious, benevolent, intelligent, sacred, eternal, and all-knowing. ... These experiences were rated as among the most personally meaningful and spiritually significant lifetime experiences, with moderate to strong persisting positive changes in life satisfaction, purpose, and meaning attributed to these experiences". A long-term increase in mindfulness is also noted (Madsen et al. 2020).

Having these mystical experiences, the patient is able to overcome their depression or reframe that depression and return to a more baseline mental being. It really seems to restore ... the wellness and balance in the life of the patient. It's quite magical. We don't know yet, but I strongly suspect that you cannot separate the two [effects therapeutic and psychedelic]. Hallucinating is an essential part of the way these drugs work. Chris Koch chief scientist of the [Allen Institute's MindScope Program](#).

Miller (2004) notes: "The person typically experiences mystical quantum change passively, not a product of personal will or control, and has a difficult time expressing the experience in words. They usually are intensely positive, joyful experiences, and often the person senses the presence of an awe-inspiring transcendent Other. Often there is a noetic element of revelation, a sudden knowing of a new truth. An experience of unity is common; for example, an ineffable oneness with all of humankind, with nature, or the universe. In these respects, the mystical type of quantum change is similar to common reports of near-death experiences (Lorimer 1990). At the most mystical level, quantum changers seemed to become more alike, as if they had in some way glimpsed the same truth. They often voiced the experience of being interconnected with and part of all of humanity and creation. Those who had experienced themselves in the presence of a transcendent Other gave strikingly similar descriptions. They felt awe but rarely fear, for in its presence they had experienced unspeakable love and acceptance. The insightful type of quantum change lacks most of the mystical components save one: the noetic element of sudden realization or knowing with great and sudden force, and in the moment of seeing, the person recognizes them for authentic truth (or Truth). Their effect tends to be a reorganization of one's perceptions of self and reality and a cathartic, ecstatic, sense of relief and release. They knew instantly they had passed through a one-way door through which there was no return. They were changed, freed right then, and knew it immediately. Often, characteristics that had been valued least became most important [spirituality and generosity], and those that had ranked as highest priorities [such as status and possessions] fell to the bottom".

Bill Richards²¹ notes that mystical experience isn't something vague, but a specific form of human consciousness. 'When it's expressed through questionnaires you can find evidence of six categories, which [are]: unity; transcendence of time and space; intuitive knowledge (what William James called the noetic quality); a sense of sacredness or awesomeness; deeply felt positive mood, such as joy, peace, love, purity; and claims of ineffability and what we call paradoxicality — that it's very hard to put these experiences into words and when people try to express it they keep contradicting themselves, that's the paradoxicality: 'I died but I've never been so alive, the ultimate reality was one but it was many, it was beyond time but it included time' — ultimately the Buddhist claim of the nothingness that contains all reality. And it seems contradictory, but mystics would say the problem isn't in the experience; it's in our ability to express the experience within language, at this point in the development of language. And that the answer, the truth is always "both and" rather than "either or"'.

As a warning to unsupported experiences in a bad setting, a survey by Griffiths' group of extreme, challenging experiences (Barrett et al. 2016, Carbonaro et al. 2016), 1993 individuals (mean age 30 yrs; 78% male) completed an online survey about their single most psychologically difficult, or challenging experience (worst "bad trip") after consuming psilocybin mushrooms. 39% rated it among the top five most challenging experiences of his/her lifetime. 11% put self or others at risk of physical harm; factors increasing the likelihood of risk included estimated dose, duration and difficulty of the experience, and absence of physical comfort and social support. 2.6% behaved in a physically aggressive or violent manner and 2.7% received medical help. Of those whose experience occurred >1 year before, 7.6% sought treatment for enduring psychological symptoms. Three cases appeared associated with onset of enduring psychotic symptoms and three cases with attempted suicide. Intriguingly, the degree of difficulty was positively associated with enduring increases in well-being. Despite difficulties, 84% endorsed benefiting from the experience and the researchers noted that the incidence of risky behaviour or enduring psychological distress is extremely low when psilocybin is given in laboratory studies to screened, prepared, and supported participants.

It is extremely significant that facing the fear of immanent death, possibly in pain and debilitation, which is the most real and terrifying crisis any conscious mortal being can face, can be redeemed on an ongoing, not just a transient basis, by a psychedelic experience. This attests to these experiences not being illusory but evidential to the conscious mind as the antidote to the mortal dilemma. This is precisely what "moksha", the primary goal of all Eastern spirituality, seeks to attain through a lifetime of renunciation and devoted meditation. It also stands as highly evidential that in their signature work "The Psychedelic Experience", Leary, Alpert and Metzner (1964) presented a guide for readers to navigate the psychedelic state, framed as a modern representation of the Bardo Thodol or Tibetan Book of the Dead — "The Great Liberation upon Hearing in the Intermediate State" — (Lāma Kazi Dawa-Samdub Eng trans 1927), the Tibetan Buddhist manual for successfully negotiating death and rebirth.

²¹ Bob Jesse and Bill Richards are co-authors of Roland Griffiths' 2006, 2008 mystical experiences studies.

Michael Pollen notes a conversation with Roland Griffiths, in which, despite being a world renowned academic researcher leading the field, he has to pick his words very carefully: "*The first time I raised [Bob] Jesse's idea of the betterment of well people with Roland Griffiths, he seemed to squirm a bit in his chair and then chose his words with care 'Culturally right now that is a dangerous idea to promote' "*. However Roland later commented "*We're all dealing with death – this is far too valuable to limit to sick people*", afterwards carefully amending it to "*This will be far too valuable to limit to sick people*".



"A Psychedelics Pioneer Takes the Ultimate Trip" Marchese (2023) NYT.

As the founding director of the Johns Hopkins Center for Psychedelic and Consciousness Research, Dr. Roland Griffiths has been a pioneer in investigating the ways in which psychedelics can help treat depression, addiction and, in patients with a life-threatening cancer diagnosis, psychological distress. He has also looked at how the use of psychedelics can produce transformative and long-lasting feelings of human interconnectedness and unity. Griffiths, who is 76, has been diagnosed with Stage 4 metastatic colon cancer, in all likelihood terminal, that has brought forth transcendently positive feelings about existence that he calls the great mystery of consciousness. "We all know that we're terminal," says Griffiths, "So I believe that in principle we shouldn't need this cancer diagnosis to awaken. I'm excited to communicate, to shake the bars and tell people, 'Come on, let's wake up!' "

In spite of the diagnosis, life has been more beautiful, more wonderful than ever. When I first got that diagnosis, because I work out regularly, I watch my diet, I sleep well, this came out of left field. There was this period in which it felt like I was going to wake up and say, "Boy, that was a bummer, a bad dream." But soon I started to contemplate the different psychological states that would be naturally forthcoming: depression, anxiety, denial, anger, or adopting some belief system of religious outcomes, which as a scientist I was not cut out to do. I went through those, exploring what life would be like if I inhabited those reactions, and I quickly concluded that that was not a wise way to live. I have a long-term Vipassana meditation practice and the focus there is on the nature of mind, of consciousness, and one comes to see that thoughts, emotions, are transient. That practice — and some experience with psychedelics — was incredibly useful because what I recognized is that the best way to be with this diagnosis was to practice gratitude for the preciousness of our lives. Grasping for the cure wasn't useful.

After getting the diagnosis, I had no immediate interest in psychedelics. I felt in many respects that I was having a very psychedelic-like experience. There was this awakening, this aliveness, and I hesitated to take a psychedelic because I wondered whether it was going to disrupt that. Then a question arose: Is there something I'm avoiding by not taking a psychedelic? Am I defending against some dark, fearful thing I'm in denial about? Am I papering it over with this story of how great I'm doing and actually I'm scared to death? I thought, Well, this would be an interesting stress test. So I did a session with LSD. First, asking myself, "Is there something I am not dealing with?" The answer came back: "No, the joy you're experiencing is great. This is how it should be." Then I asked a question directly of the cancer: "What are you doing here? I got nothing back. Then I wanted to humanize it, and I said: "I really respect you. I talk about you as a blessing. I have had this astonishing sense of well-being and gratitude, despite everything that's happening, and so I want to thank you. This process, is it going to kill me?" The answer was, "Yes, you will die, but everything is absolutely perfect; there's meaning and purpose to this that goes beyond your understanding, but how you're managing that is exactly how you should manage it." So then I said: "OK, there's purpose and meaning. I'm not ungrateful for the opportunity, but how about giving me more time?" [Laughs.] I got no response to that. But that's OK.

Our first study was in cancer patients. Ironically enough, these were cancer patients who were depressed and anxious because of a life-threatening diagnosis. The findings of that study were profound: A single treatment of psilocybin produced large and enduring decreases in depression and anxiety. I've had some limited experience with psychedelics since then. We've now treated hundreds of participants with psychedelics and before sessions, one of the key things that we teach them is that upon taking a psychedelic, there's going to be an explosion of interior experiences. What we ask them to do is be with those experiences — be interested and curious. You don't have to figure anything out. You're going to have guides, and we're going to create this safety container around you. But here's the trick: These are not necessarily feel-good experiences. People can have experiences in which they feel like they come to this beautiful understanding of who they are and what the world is, but people can also have frightening experiences. The preparation we give for these experiences is to stay with them, be curious and recognize the ephemeral nature of them. If you do that, you're going to find that they change. The metaphor we use is, imagine that you're confronted with the most frightening demon you can imagine. It's made by you, for you, to scare you. I'll say: "There's nothing in consciousness that can hurt you. So what you want to do is be deeply curious and, if anything, approach it." If your natural tendency is to run, it can chase you for the entire session. But if you can see it as an appearance of mind, then you go, "Oh, that's scary, but yeah, I'm going to investigate that."



Fig 40c: Griffiths in one of the psilocybin treatment rooms.

The approach that you're describing is pretty far from the typical mind-set of many doctors, who are working within a framework of curing, fixing, prevention. So if the ultimate goal is to help more otherwise healthy people get safe access to the potential benefits of using psychedelics, which of course would need to be used in a safe setting and supervised by trained experts, wouldn't that require a radical rethinking by medical practitioners about what helping people even means?

Yes, it will. One of the inspirations for the endowment is that it's not aimed at patient populations. Right now, there's money pouring into this area, but that's all going to be patient-related — there's a pathway to medical approval. I do have concerns that we don't replicate the mistakes that occurred in the 1960s, which over-promoted psychedelics' use culturewide. They're so powerful that if misaligned with cultural institutions, they can result in cultural kickback. In the 1960s they became aligned with the antiwar movement and radicalized-youth movement that was terrifying to existing political structures and institutions, and as a consequence, legislation was put up against them, funding dried up. We need to proceed cautiously. It's going to be critically important not to threaten existing cultural institutions. So I've been a proponent of medicalization, because with medicalization, we already have regulatory structures in place. It goes through F.D.A. approval; they're going to set standards to maximize safety by specifying who should be eligible to receive, who is authorized to prescribe, and under what conditions treatment should occur. So I'm cautious, but that's why I'll have the endowment in perpetuity. If we look at the long range, this could be critical to the survival of our species.

It is Griffiths's belief that humanity has developed — and is developing — technologies that could threaten its ongoing survival. He also believes that psychedelic experiences can provide the basis for moral and ethical principles that would lessen the likelihood that humanity will drive itself off a cliff. Because there's something about the nature of these experiences under these certain conditions that produce remarkable experiences of interconnectedness of all things. At the deepest level, if we recognize we're all in this together, then we have the kernel of what I suspect is most religious traditions and impulses and that is realizing that the Golden Rule makes a lot of sense. After we spoke, Griffiths mailed me a medallion embossed with an image of mushrooms and inscribed with the phrase "May you remain aware of awareness."

I've noticed that often when you discuss human consciousness and our awareness of the preciousness of life, you talk about those things as an awe-inspiring "mystery." What do you get out of putting it in those terms? Because consciousness may be a mystery now, but I've read theories that are convincing, to a layperson like me, that thoughts come from emotions and our emotions are one of the body's mechanisms of maintaining homeostasis. Or as far as the awareness that life is precious, I could easily imagine that biophilia has evolutionary advantages. So I don't see why these states of being have to be understood as mysteries. Does it diminish them to see them as explainable?

I can easily inhabit an evolutionary account that explains how we have come to be who we are — with the exception of the question of interiority! Why would evolution waste its precious energy on our having interior experiences at all? I don't get that. To me, it's a very precious mystery, and that mystery, if you want to put it in religious terms, is God. It's the unknowable. It's unfathomable. I don't believe in God as conceptualized within different religious traditions, but the mystery thing is something that strikes me as undeniable. I want everyone to appreciate the joy and wonder of every single moment of their lives. We should be astonished that we are here when we look around at the exquisite wonder and beauty of everything. I think everyone has a sense of that already. It's leaning into that more fully. There is a reason every day to celebrate that we're alive, that we have another day to explore whatever this gift is of being conscious, of being aware, of being aware that we are aware. That's the deep mystery that I keep talking about. That's to be celebrated!

On the question of authenticity, of the psychedelic experience, opinions vary. David Nichols (2011), the Perdue pharmacologist who founded the Hefter Institute to support psychedelic research and synthesised the psilocybin for Griffith's experiments (Nichols, Roseman & Timmermann 2018) said "If it gives them peace, if it helps people to die peacefully with their friends and their family at their side, I don't care if it's real or illusion". But Roland Griffiths acknowledges "authenticity is a scientific question not yet answered — all we have to go by is the phenomenology" — i.e. the quality of personal reports. In response to Michael's "staunchly materialist" world view Roland replied "Okay then, but what about the miracle that we are conscious? Just think about that for a second, that we are aware and that we are aware that we are aware! How unlikely is that?"

Primary consciousness associated with reduction of the internal dialogue and ego-dissolution is not just a question of flawed magical thinking that the mind regresses to, but is shared by psychedelics, meditation and deep religious contemplation, all of which in varying ways seek to calm the internal dialogue, attributed to inhibition of the DMN. Michael Pollen cites a number of themes relating to this, including the undifferentiated inclusive mentality of the child mind advanced by Alison Gopnik who co-hosted a talk with Robin Carhart-Harris (2016), echoing sayings of Yeshua

and Don Jose Matsuwa. Gopnik refers to a wider nuanced “lantern awareness” which becomes a starker “spotlight awareness” of the Cartesian theatre in adulthood, which as we age, becomes more and more locked into habitual routines that have been found successful in the past. It also applies to releasing the inability of the ordered mind to think outside the box and to be creative, as opposed to conservative and analytic consciousness, which is strongly history-based, rather than novelty-based.

McNamara (2022) notes the significance of “entity” experiences under psychedelics, particularly DMT which involve the perceived relationship with other visionary agents, which may take diverse forms from fairies, through monsters, thieranthropes (human-animal sprits), aliens, angels, deities and demons and serpents and their parallel with other forms of religious and mystical visionary experience, several of which are illustrated in figs: 168, 195, 203, 246 & 247:

Supernatural agent (SA) encounters are often a part of religious experiences. Existing reviews (Davis et al., 2020, Griffiths et al., 2019) report that on average greater than 80 percent of people who have taken a psychedelic at moderate to high dosage report encounters with nonnatural or supernatural entities. Survey results from the Davis et al. and Griffiths et al. studies revealed that people who had taken an agent with DMT described the SA encounters they experienced as being just as real as encounters with people when off psychedelics. The most commonly endorsed labels for the SAs they encountered when on DMT were “being” (60 percent), “guide” (43 percent), “spirit” (39 percent), “alien” (39 percent) and “helper” (34 percent). Virtually all respondents reported having had an emotional response to the experience including joy (65 percent), trust (63 percent), surprise (61 percent), love (59 percent), kindness (56 percent), friendship (48 percent) and fear (41 percent). The SA was considered to be a conscious being (96 percent), intelligent (96 percent), benevolent (78 percent), sacred (70 percent) and had agency in the world (54 percent). Most respondents believed that the SA was absolutely real, not hallucinated, with 72 percent believing that the entity continued to exist after their encounter.

These experiences can vary from ecstatic to stressful encounters such as with the “angel of death” but the encounter can result in beneficial experience:

In the Davis et al. (2020) survey study more than two-thirds of respondents (69 percent) endorsed receiving a message, task, mission, purpose or insight into personal issues from the entity encounter. All this speaks to the potential therapeutic benefits of such insights. The individual is receiving highly meaningful information from an awe inspiring source, so the information is taken to heart in a way that could impact therapeutic potential.

These can take the form of a near-death like experience as in my encounter with “Brahman” both as ultimate reality and as an ever-compassionate “entity” in the experience which precipitated this cosmology.

Shannon (2002 p13) notes the multi-modal nature of psychedelic experience extending beyond the superficial senses:

Ayahuasca induces powerful visions as well as hallucinations in all other perceptual modalities. Pronounced non-perceptual cognitive effects are also manifest. These include personal insights, intellectual ideations, affective reactions, and profound spiritual and mystical experiences. Moreover, Ayahuasca introduces those who partake of it to what are experienced as other realities. Those who consume the brew may feel that they are gaining access to new sources of knowledge and that the mysteries and ultimate truths of the universe are being revealed to them. All this is often coupled with what drinkers describe as an encounter with the Divine.

But there are also outstanding differences between psychedelic experiences and meditative and contemplative ones, which are essential to understand and are pivotal to the central enigma of existential cosmology. Meditation seeks to achieve enlightenment by careful top down control, mediated by equanimity, rejection of grasping desires, one-pointed concentration and compassionate emotion. Religious contemplation seeks repose in prayer and devotion. Thus the person involved finds a degree subjective fulfilment, amid acceptance of a spiritual or religious doctrine they are already committed to. Although these experiences of ego dissolution may induce positive outcomes for the individual, they also tend to confirm established beliefs, rather than open the floodgates to new ideas challenging one’s preconceived assumptions. By contrast, psychedelics are liable to induce insights of a novel and existentially challenging nature, such as the somewhat baffling notion of “the mind at large” as a spontaneous discovery.

Psychedelics provide a complex cyclonic perturbation of existential and sentient consciousness, not a simple “enlightenment pill”. Bill Richards notes: *‘The relation of the drug to the experience is not like taking an aspirin to get rid of your headache. What the psychedelic substance ... they all seem to be skeleton keys that open up the mind, that give you an opportunity to explore, but where you go and what happens depends on who you are, kind of who you are, your maturity, your life history, your capacity to be able to choose to trust unconditionally, your feeling of safety, your courage. So much more is involved than just taking the drug.’*

What we are dealing with in psychedelics is a whole constellation of mental states, depending on the circumstances and mind set of the person involved. They can take on visionary aspects of traditional notions such as soul theft and sorcery and invoke complex detailed visions from which the word 'trip' arises, including specific socio-cultural motifs such as snakes and animistic visionary deities. Some of these can be hilarious, others frightening. Some can be profound, others frivolous or meaningless. Some can lead to messianic delusions and others to creative art, musical composition and scientific discoveries. Albert Hoffman has stated that Kary Mullis, who invented the polymerase chain reaction that is now identified to be the core of molecular biology techniques and essential for Covid-19 testing, told him he credited its discovery to his use of LSD in his student days where he synthesised LSD. It was reported that he was actually coming down from a trip when the idea struck him. We are dealing with an agent invoking as many diverse features as existence can provide. The critical issue underlying this retinal carnival of experiences is how it can reveal underlying experiential knowledge difficult or impossible to gain through any other route.

Their political liberalism and nature-relatedness dimensions have been confirmed (Nour et al. 2017, Lyons & Carhart-Harris 2018). Nearly nine hundred participants provided information about their naturalistic psychedelic, cocaine, and alcohol use, and answered questions relating to personality traits of openness and conscientiousness, nature relatedness, – “*I am not separate from nature but part of nature*” – and political attitudes. Participants also rated the degree of ego dissolution experienced during their “most intense” recalled psychedelic experience. Analysis revealed that lifetime psychedelic use (but not lifetime cocaine use or weekly alcohol consumption) positively predicted liberal political views, openness and nature relatedness, and negatively predicted authoritarian political views, after accounting for potential confounding variables. Ego dissolution correlated significantly with these effects.

Psychedelics clearly have political and revolutionary implications that can lay siege to traditional cultural values. It is admitted that the initial wave of repression of psychedelics was political in nature in response to a social movement rejecting the core tenets of a consumer society polarised between materialistic exploitation and religious and sexual conservatism. Fifty three years later, we find ourselves only moderately emerging from a period of repression lasting half a century, still tightly regulated, so as to be applicable only to scientific studies, largely on pathological conditions of depression and terminal illness, or direct scientific inquiry but not for the betterment of sane and healthy people. There is a deep parallel between the Catholic repression of gnostic elements in the Inquisition that arose ultimately from cross fertilisation of ideas during the Crusades, and of the witch hunts against older spiritual beliefs centred around the ancient European Goddess whose practices Christianity replaced and the reaction to the social values emerging from psychedelics in the 1960s.

The same repressive end result as the middle ages Christian repressions of dissent occurred when LSD became popularised and suddenly, because it had not yet become illegal, huge quantities of very pure acid flooded into rock culture, by devoted underground chemists not seeking financial rewards but for the “common good”, celebrated by the Beatles’ “Tomorrow Never Knows” citing Leary’s Bardo Thodol, and “Lucy in the Sky with Diamonds”, while on the East Coast of the US, Timothy Leary was pronouncing “turn on, tune in and drop out” and on the West Coast, the Grateful Dead, playing “Dark Star” on acid, the Electric Kool-aid Acid tests and the Merry Pranksters, were blowing young peoples minds, while the infectious ethic of free love was shredding conventional sexual morality. This blew the cover on just how seriously the political and revolutionary implications of psychedelics were laying siege to traditional cultural and particularly commercialistic political and religious values.

In a commentary confluent with Symbiotic Existential Cosmology’s gradations of primal subjectivity, Leary said:

*There are as many levels of consciousness as there are anatomical structures in your body for receiving and decoding energy.
The five most important levels of consciousness are sleep, symbol, sense, cellular awareness, and molecular consciousness
(Timothy Leary 1966 Turn on, Tune in and Drop Out)*

Despite the fact that many of these events passed safely without incident, that LSD didn’t split peoples chromosomes, that groups of people hadn’t stared at the sun until they went blind, by the mid-1960s the backlash against the use of LSD and its perceived corrosive effects on the values of the Western middle class resulted in governmental action to restrict the availability of psychedelics by making any use of them illegal. Both LSD and psilocybin were declared “Schedule One” substances. The governors of Nevada and California signed bills into law on May 30, 1966 and the rest of the world followed shortly after, fulfilling the dark ending of Huxley’s (1962) allegory in “Island”, in which the people of Pala consume yellow mushrooms which they call “moksha” to induce visionary states, but are in the end subjected to a military takeover by a neighbouring conservative religious culture. The picture hardened with the case of Charles

Manson. The prosecution contended that, while Manson never directly ordered the murders, his ideology constituted an overt act of conspiracy.

However schedule 1 didn't stop consumption of psychedelics, which have remained an underground transformative staple at music festivals, forming the entheogenic²² counterpoint to MDMA's entactogenic love-in rave party experience. Entheogen (see Ott 1993) is a term that, by its own meaning infers that deity emerges from the sacrament rather than vice versa, confirming the overwhelming impression from this class of agents that they have transcendent dimensions. Stanislav Groff coined the term "holotropic"²³, to cover wholeness seeking in all its forms from experiencing the totality as in the mind at large to peri-natal experiences of a physical rebirth struggle.

But repressive legislation of the war on drugs has still had a mind-numbingly counter-productive effect. People are incarcerated for long periods for simple possession of psychedelics. For four decades they were effectively eliminated from scientific knowledge, or assessment. Society as a whole has had almost no opportunity to figure out what role these profoundly transformative agents have in world culture, despite the fact that the natural entheogens have been used for millennia for spiritual and therapeutic purposes in every culture that has consumed them. This means that the role of entheogens has until subtly in the 21st century, been suppressed entirely by the very world societies that have claimed to be the pillar of scientific enlightenment. At the same time, while psychedelics continue to be used devotedly by an underground network of devoted psychonauts, they tend to be trivialised as mere entertainment. Their potential impact on society's, and the planet's future, remains occluded as an illegal recreational playground of no confirmed value, or significance.

Currently natural psychedelics are used scientifically in research, and particularly into therapy for pathological conditions of depression and terminal illness. They also continue to be used in some settings for religious and spiritual purposes such as Santo Daime, the Union Vegetale and the Native American Church, much as they have for centuries. Finally they are used recreationally as an illegal but sometimes tolerated fringe activity, partly because they are easy to cultivate and almost impossible to eradicate. All of these uses create a gloss on the phenomenon which clouds its full potential. Recreational use tends to trivialise it and reduce it to the pursuit of pleasure. Spiritual and religious use tends to reinforce existing attitudes, from Christian doctrine to tribal sorcery and witchcraft.

Demonstrating just how complex the discourse on sacred mushrooms are, Andy Letcher in "*Mad Thoughts on Mushrooms*" (2007) cites three dominant discourses in a Foucauldian sense: (1) **Psychotic** where hallucinogens are perceived to induce psychosis, (2) **Therapeutic**, where they are seen to have therapeutic value when confined to the clinic, and (3) **Prohibitory** when they escape the clinic and should be suppressed by the full force of the law. In this view the pendulum swung firstly from (1) → (2) → (3) and is now swinging back towards (2) while still remaining a discourse of containment and marginalisation on the part of academics, out of realistic fear of a regulatory backlash.

Running counter to these three dominant discourses are four resistive discourses: (4) **Recreational**, in which breaking the bounds is advocated both for the pleasure these experiences brain and for the pleasure of transgression against the imposed restrictive order; (5) **Psychedelic**, for their ability to reveal or make manifest the hidden dimensions of the self; (6) **Entheogenic**, stemming ultimately from Gordon Wasson's religious experiences on mushrooms in a group conference in which Carl Ruck coined the term, meaning "generating God within," or "becoming God within", and finally; (7) **Panpsychic / Animistic**, that is, they evoke, not theophany but animaphany. Here, mushrooms are not regarded as altering, consciousness but as adjusting what it is possible to perceive, and therefore the spirits and beings occasioned by mushrooms are neither hallucinations nor some aspect of the self, but beneficent discarnate entities with whom the practitioner attempts to forge relationships. They thus tend to evoke states of consciousness in which the consciousness of animals and plants, to other, e.g. spirit entities, or the mind at large, are experienced.

David Luke (2020) also lists a diverse collection of anomalous experiences spanning the transpersonal and psychedelic including (a) synesthesia, (b) extra-dimensional percepts, (c) out-of-body experiences, (d) near death experiences, (e) entity encounters including (mythological beings, chimeras, extraterrestrials, angels and celestial beings, semi-divine beings such as Jesus or Buddha, demons, monsters and beings of death), (f) interspecies communication, (g)

²² *entheogen* – "god (theos) within", is a psychoactive substance that induces alterations in perception, mood, consciousness, cognition, or behaviour for the purposes of engendering spiritual development or otherwise in sacred contexts. (Wikipedia)

²³ *holotropic* "wholeness seeking" – states which aim towards wholeness and the totality of existence – e.g. Brahman-atman.

possession, and (h) telepathy, precognition, clairvoyance and psychokinesis. DMT is particularly prone to spirit images, as illustrated in “Ayahuasca Visions” (Luna & Amaringo 1991). Shaun Smith (2015) notes the contrasting neurotheological view of theistic phenomena being explained through neurobiology with the theoneurological view of Robert Strassman (2001,2014) in which God or deity is able to alter neurobiology through “the spirit molecule” DMT. Not all of the examples cited by Luke are psychedelic induced and several of the psychedelic examples echo in greater intensity and embellishment those in dreaming and hypnagogic imagery, in which the subject finds themselves immersed in perceived situations and encounters with entities that evaporate with arousal. These can be considered as visions at the periphery of the nierika portal.

At an extreme, we have Terrence McKenna's far-fetched statement identifying mushroom spores, rather than the cosmological consciousness and visions they evoke, as galactic entities of enlightenment spread across the universe:

“I am old, older than thought in your species, which is itself fifty times older than your history. Though I have been on earth for ages, I am from the stars. My home is no one planet, for many worlds scattered through the shining disc of the galaxy have conditions which allow my spores an opportunity for life.” (McKenna 1993 210).

There is a fine line between this kind of statement, which most people will find unbelievable fantasy, and a much more widely held, meaningful and validating discourse that the mushroom experience can evoke a universal consciousness that may inform in meaningful, or even urgent ways, the ensuing direction a person's life needs to take.

Yaden et al. (2021) call for epistemic humility²⁴ regarding psychedelics and the hard problem: *“We conclude by calling for epistemic humility regarding the potential for psychedelic research to aid in explaining the hard problem of consciousness while pointing to ways in which psychedelics may advance the study of many specific aspects of consciousness.”* Epistemic humility is applying a rule that we can't assess reality in itself – the very core of the psychedelic experience of “ultimate reality” unless we do so with the filters of the doors of perception slammed shut! How they can say this, while holding the purse strings of the dominant therapeutic discourse, is extremely troubling.

Their reasoning is not really about psychedelics but about the confounding nature of the hard problem: *“The hard problem of consciousness is currently not scientifically answered, and it is not clear that a scientific answer is even possible, which is why it is called “a hard problem.”* They then note that the hard problem is often described in terms of the “explanatory gap” (Levine, 1983), noting: *“This phrase may be an understatement – there is far more than a gap, but rather a yawning chasm between our current scientific understanding and the prospect of explaining the hard problem of consciousness.”* This is the chasm of the psychedelic experience in which materialistic science fails the test because it can't explain conscious volitional will either. To use the term scientific in this way is a contradiction to the meaning of science as a word which embraces knowledge more generally than physical investigation.

Although psychedelics may not of themselves automatically solve the hard problem, the psychedelic experience cited in this article has led to the cosmological description in this article, which does provide a concise solution to the hard problem. The problem is not with psychedelics, but the assumptions of materialism and physicalism of the current dominant fashion in scientific exploration of brain states. This is confirmed by their statement that: *“it is not clear that a scientific answer is even possible”*. This highlights what the author sees as a dangerous development in psychedelic research, where the agent most startlingly evoking subjective changes to experience is being filtered through a materialistic filter by the very academics acting as the mediators of therapeutic use and research into these agents. This looks to be an example of the dominant discourse in therapeutic use being applied by the mediators of the research to undermine both the psychedelic and the unrestrained entheogenic resistive discourses and the validity of psychedelics outside the laboratory as agents of cosmological investigation.

At the opposite extreme, Bernardo Kastrup (2013), proposes analytical idealism as an alternative, the notion that reality is essentially mental and inseparable from mind:

The scientific method allows us to study and model the observable patterns and regularities of nature ... But our ability to model the patterns and regularities of reality tells us little about the underlying nature of things. Mind is the medium of everything that you have ever known, seen, or felt; everything that has ever meant anything to you. Whatever has never fallen within the embrace of your mind, might as well have never existed as far as you are concerned. Your entire life and universe – your parents and the people you love, your first day at school, your first kiss, every time you were sick, the obnoxious boss at work, your dreams and aspirations,

²⁴ **epistemic humility** – a posture of scientific observation rooted in the recognition that (a) knowledge of the world is always interpreted, structured, and filtered by the observer, and (b) scientific pronouncements must be built on the recognition of observation's inability to grasp the world in itself.

your successes, your disappointments, your worldview, etc. – are and have always been phenomena of your mind, existing within its boundaries.

Kastrup (2016, Kastrup & Kelley 2018), has taken the position that psychedelics are precisely what the term indicates – mind manifesting, and sought to contend that psychedelics manifest the idealist principle and that the commentary on the emerging psychedelic research, even by the papers' authors is biased to justify a materialist interpretation of the results. Kastrup cites the research of Carhart-Harris and others showing reductions in activity to be evidence for the basis of "mind-expansion" not being physical in origin, particularly when accompanied by mystical peak experiences and that accompanying research such as the homological scaffolds indicating are of marginal value added to ensure a physicalist interpretation of psychedelic brain states, when the reality of reduced activity indicates they are mind states per se. David Nutt (2023) argues that we don't need to adopt an untestable metaphysical worldview to explain the subjective richness of psychedelic experiences.

The position of Symbiotic Existential Cosmology agrees that conscious experience is primary, but acknowledges that psychedelics are chemical neurotransmitter analogues means that the brain is critically involved in the psychedelic state and that the universe is necessary for the psychedelic state to occur and for our biological survival as well, and that a reduction in default mode activity is consistent with peak experiences, and increasing decoherence of activity correlates both with a reduction in coherent power and with increasing inter-connectivity between brain regions.

Symbiotic Existential Cosmology thus does not conform to the philosophical classification in Yaden et al. (2021) into 3 broad categories: materialist, dualistic, and monistic. Symbiotic Existential Cosmology is a form of interactive complementary aspect monism with is implicitly panpsychic so it is not materialist, but neither is it simple dualism or monism. It is a description based on complementarity, extending the wave-particle complementarity of quantum physics to a cosmological subject-object complementarity in which the two complements cannot be separated in a dualism, just as wave and particle aspects are alternate manifestations of a single quantum identity which cannot be separated, yet it is not monistic because it is a complementarity, not simply a monistic theory of a cosmic mind alone.

Yaden et al. (2021) attempt to justify their conclusion by citing four authors, (Blackmore, 2013; Letheby, 2015; Bayne and Carter, 2018; Johnson, 2020). A viewing of Susan Blackmore's 2020 Tucson talk however makes clear that she considers the debate whether psychedelics reveal new discoveries or merely cause distortions of the psyche will only be revealed by the new wave of psychedelic research which I support. Bayne and Carter do not treat the hard problem as such, but critique the idea of layers of consciousness and the simplistic notion that psychedelics per se invoke a "higher" form of consciousness, or even that what psychedelics do reveal can be classified in terms of one-dimensional layers, with which this article again agrees. In fact the notion of the nierika advanced in this article is more like a cyclonic vortex having a multitude of divergent experiential features, some illusory and some informative, with the centre of the cyclone providing a portal to deeper forms of experience which may have abstract or cosmological value. This is not a linear indexed description and the subjective process of entering such states requires going "deeper into the abyss" of unconstrained consciousness rather than any simplistic view of "higher" conscious states.

Link Swanson (2018) provides a comprehensive review of theories of the psychedelic state, from the first discovery of mescaline, through the psychotomimetic era of researchers experiencing its effects, but using their experiences to treat the experience as a form of reduced control shared by psychopathic states, to filter theories of Huxley and others and then on to more recent theories as outlined above, as well as ones we shall explore in the brain consciousness section such as integrated information theory and Friston's free energy principle:

He notes that Friston's theory can also be interpreted in terms of psychedelics:

In one model of global brain function based on the free-energy principle (Friston, 2010), activity in deep-layer projection neurons encodes top-down inferences about the world. Speculatively, if deep-layer pyramidal cells were to become hyperexcitable during the psychedelic state, information processing would be biased in the direction of inference—such that implicit models of the world become spontaneously manifest—intruding into consciousness without prior invitation from sensory data. This could explain many of the subjective effects of psychedelics (Muthukumaraswamy et al., 2013).

Summing up he sees common threads in these perspectives, in a view that's sees psychedelic research as an "acid test" of grand unified theories of brain function:

The four key features identified in filtration and psychoanalytic accounts from the late 19th and early 20th century continue to operate in 21st-century cognitive neuroscience: (1) psychedelic drugs produce their characteristic diversity of effects because they

perturb adaptive mechanisms which normally constrain perception, emotion, cognition, and self-reference, (2) these adaptive mechanisms can develop pathologies rooted in either too much or too little constraint (3) psychedelic effects appear to share elements with psychotic symptoms because both involve weakened constraints (4) psychedelic drugs are therapeutically useful precisely because they offer a way to temporarily inhibit these adaptive constraints. ... Psychedelic drugs offer a unique way to iteratively develop and test such big-picture explanatory frameworks: these molecules can be used to probe the links between neurochemistry and neural computation across multiple layers of neuroanatomy and phenomenology. Meeting the challenge of predicting and explaining psychedelic drug effects is the ultimate acid test for any unified theory of brain function.

Letheby invokes three descriptions of psychedelic experience: (1) **Yes** – by inducing mystical states of consciousness, psychedelics afford direct knowledge of supernatural, transcendent dimensions of reality (the entheogenic resistive discourse). (2) **No** – since materialism or physicalism is true, there are no transcendent realities, and psychedelics just cause compelling hallucinations or delusions (the dominant hallucinogenic and psychotomimetic discourse). (3) **Neither** – a third view that psychedelics can afford genuine epistemic benefits, even if materialism is true and there is no transcendent reality. Rather than helping us learn new factual information, psychedelics then allow us to understand or appreciate already-known (or otherwise knowable) facts in deep, vivid, affectively and motivationally significant ways. This is again taking a position with implicit dependence on a materialistic viewpoint, while conceding psychedelics may reveal epistemic benefits, so it is confining its own conclusion by its founding assumption of materialism. The symbiotic cosmology is again neither simply an old view, nor is it materialistic. It has resemblances to Upanishadic thought dating back to 700 BC, but it is not a monist theory and is based extensively on detailed investigation of quantum reality, chaotic systems, evolutionary origins of membrane excitability and neuroscience in a novel cosmological description induced by a mushroom experience.

Matt Johnson (2020) , who is both a cited reference and also a co-author of Yaden et al., takes issue with the very concept of consciousness itself as “sloppy”, noting that “*one might question whether the different concepts associated with consciousness should even be identified under a singular construct.*” This has some validity, for example the subjectivity of consciousness is distinct from its features of coherent attentiveness and from the distinct nature of specific qualia and with notions of self-consciousness and the cognitive mind of thoughts and verbal processes. But consciousness is all these things in a coherent concept, integral to our existential condition, so “sloppy” is derogatory and unscientific. Consciousness is our most enduring and all-encompassing arena of experience. It is not sloppy! It is fundamental and essential!

In dealing with the hard problem, he says “*Explaining the existence of experience itself, which is the “hard problem” of consciousness, is at present something that appears outside of the realm of empirical science. Some philosophers and scientists have disputed the existence of this hard problem, but I do not think the problem should be dismissed.*” But empiric²⁵ means “experience”, as does experiment, and there is abundant evidence coming also out of the Johns Hopkins team attesting to experiments confirming experiential observations of quantum change involving “ultimate reality” (Griffiths et al. 2018, 2019). These represent statistical evidence, just as the moksha epiphany does. The claims about consciousness and the experiments on mystical states are thus presenting mutually-contradictory academic reasoning. A critique is made of psychedelic states as having no evidential value based on a preamble assessment that the hard problem is empirically unscientific. This contradicts the definition of empirical, whose root lies in subjective accounts, by invalidating veridical reporting. The legal system depends centrally on veridical evidence. It is integral to interrogating the subjective condition sine qua non. So the materialist assumption is empirically counterproductive.

In summing up Johnson states: “*I suggest that psychedelic science has, to date, not provided substantial advancement in our understanding of any of these concepts [easy or hard] purported to relate to consciousness.*” This is a very pessimistic and confounding view for research in psychedelic science that is showing real promise of cultural benefit. Given a priori assumption of the hard problem’s quasi-unscientific status, it is hard to see how substantial advancement could ever occur on either the role of psychedelics as an informant of the nature of reality, or the status of the hard problem itself. This again underlines the fallacy of academic reasoning that is subservient to the materialistic hypothesis to the extent that no other type of cosmology can be entertained and no empirical result can be gained except by objective means. But biogenic/panpsychic cosmology is biologically precise and seamlessly consistent with multiple steps of the evolutionary pathway so it is a meticulous natural description, consistent with quantum and dynamical physics and with neuroscience. Therefore such reasoning is integral to the scientific discourse.

²⁵ **empirical** based on, concerned with, or verifiable by observation or experience rather than theory or pure logic.

Etym. **empiric** via Latin from Greek empeirikos, from empeiria ‘experience’, from empeiros ‘skilled’ (based on peira ‘trial, experiment’).

experimental late 15th century ‘having personal experience’, also ‘experienced, observed’: from Latin experimentum practical experience

This critique of empiricism applies critically to symbiotic cosmology because the principal evidence for it has to come veridically from first person reports. We can't directly see the consciousness of others, so it is impossible to see the consciousness in simpler life forms or physical processes directly. One can rightly conclude that this is the only class of cosmology in which conscious volitional intent is real, so by the veridical test of validity Occam's razor cuts for panpsychism as a necessity. This is because volitional will implies the conscious mind affect the physical brain and hence the physics of the universe. Therefore mind is a complementary aspect of the physical universe. To a materialist this appears to be adding something that is unnecessary but from the veridical perspective it is essential, because materialist cosmology does not admit conscious volitional will. The inescapable solution is quantum panpsychism.

The problem for mechanists is that intervening states of consciousness are largely inaccessible. But organismic consciousness is evident in humans and mammals generally and is accessible also in other forms in deeply unbounded mental states of meditation or psychedelic transcendence, in which organismic consciousness is asymptotically convergent to an unbounded abstract state identifiable to the subject with the mind at large. Thus the two accessible avenues for scientific discovery are the organismic state and the mind at large. This is why the role of psychedelics becomes sine qua non optimal. If you take them out of the equation, you really have only sparse states of meditative vigil and the dreaming state. Thus to discount the importance of psychedelics is futile and counterproductive.

Yaden et al. nevertheless do concede the potentiality of psychedelics to address the hard problem: *"The scientific study of psychedelics and consciousness, in all of its meanings, is still nascent. While we cannot, at present, see any clear scientific traction resulting from the intersection of psychedelics and the hard problem of consciousness, we are open to the possibility of being proven wrong."* This article now of full book length monograph articulates a strategic response.

Moreover several researchers state that the subjective experience of psychedelics, not just their physiological or neurochemical attributes are potentially pivotal in their beneficial effects. Yaden and Griffiths (2020) conclude that:

Based on the results from experimental studies of moderate to high dose psychedelics we believe that the case for subjective effects playing a major role in enduring beneficial effects is compelling. Across a number of studies, when the intensity of the subjective psychedelic effect is controlled, certain subjective effects predict desirable outcomes. Underlying neurobiological mechanisms are likely necessary but not sufficient to confer full and enduring beneficial effects.

Johnson (2022) in reviewing Chris Letheby's "Philosophy of Psychedelics" (2021) concurs with both this viewpoint and the central role of a "naturalism" that leads to a more supernatural worldview that is not just a comforting delusion:

Letheby argues based on the evidence that subjective experience does play a causal role in long-term benefit. This is supported by studies showing that the mystical-type nature of the experience can predict how therapeutic or otherwise positive the sessions will be in the long term, providing information in some cases that is above and beyond the predictive value of the dose itself or the participants' ratings of drug intensity. Letheby posits that the subjective experience causes lasting therapeutic benefit independent of whether the session involved or left patients with supernatural ideation. He argues, successfully in my opinion, that the core mechanism of psychedelic therapy benefit is not the provision of a comforting delusion, for example, one in which people shift to a more supernatural worldview. He argues instead that "naturalism" is the lens through which the key mechanisms of psychedelic therapy can be understood by combining empirical evidence across multiple disciplines through scientific reasoning. ... Letheby believes that changes in self-representation are the missing link connecting mystical experiences to therapeutic outcomes.

Safron & Johnson (2022) examining both present trends and future possibilities, note the relationship between psychedelics and natural dreaming states: *While we agree that some psychedelic experiences may be understood as a transient form of psychosis, we would add that the same thing can be said about dreaming. ... Intriguingly, while the mechanisms of action for both classic and non-classic psychedelics vary, there appear to be multiple pathways for inducing states in involving greater tendencies for imagining novel scenarios under states of more vivid and intense conscious experience, potentially contributing to the phenomenology of a "waking dream." While a detailed exploration is beyond the scope of the present discussion, partially overlapping effects from classic psychedelics, anticholinergic drugs (e.g. tropanes), kappa- receptor agonists (e.g. Salvia divinorum), and NMDA-receptor antagonists (e.g. dextromethorphan, or ketamine) suggest that anything that disrupts global integration processes while maintaining (potentially elevated) consciousness has the potential to induce profoundly altered states, and potentially altered traits.*

They conclude the following about the future of psychedelics as a discovery process in the context of formative quantum change experiences:

While we must continue to seek the most powerful and encompassing models we can find, we must also avoid the temptation of assuming that a single account will be adequate for explaining the diverse range of effects associated with different psychedelics under different sets and settings. Some may suggest that the mystic nature of psychedelic experiences reveal the truth of a perennial religion, and perhaps even the veracity of metaphysical principles that some would consider to be supernatural (Timmermann et al.,

2021). Others might conclude that egoless experiences reveal that selves were illusions all along (Millière et al., 2018; Milliere and Metzinger, 2020), so pointing to the veracity of some schools of Buddhist thought.

In particular Timmermann et al. (2021) cite a move away from physical materialism: *Results revealed significant shifts away from 'physicalist' or 'materialist' views, and towards panpsychism and fatalism, post use. With the exception of fatalism, these changes endured for at least 6 months, and were positively correlated with the extent of past psychedelic-use and improved mental-health outcomes. Path modelling suggested that the belief-shifts were moderated by impressionability at baseline and mediated by perceived emotional synchrony with others during the psychedelic experience.*

On the other hand, Millière et al. (2018) cite a diversity of selfless states in both psychedelic and meditative experiences: *We suggest that there are important phenomenological differences even between conscious states described as experiences of self-loss. As a result, we propose that self-consciousness may be best construed as a multidimensional construct, and that "self-loss," far from being an unequivocal phenomenon, can take several forms. Indeed, various aspects of self-consciousness, including narrative aspects linked to autobiographical memory, self-related thoughts and mental time travel, and embodied aspects rooted in multisensory processes, may be differently affected by psychedelics and meditation practices.*

Milliere and Metzinger, (2020) go further and address the foundational question of the link between subjective consciousness and self-awareness in states of ego-dissolution:

*Let us call the general claim that some basic form of self-consciousness or sense of self is ubiquitous to all conscious experiences, **the Ubiquity Thesis**. For example, the subjective effects of certain psychoactive drugs, and particularly those of classic psychedelic drugs such as LSD, psilocybin, or 5-MeO-DMT, present a special interest for the assessment of the Ubiquity Claim. Indeed, these drugs are known to have dramatic effects on self-consciousness, and some reports even suggest that they might temporarily suppress any form of self-consciousness – a phenomenon known as 'drug-induced ego dissolution' in the scientific literature (Nour & Carhart-Harris, 2017).*

In his article "Being for no-one: psychedelic experience and minimal subjectivity", Chris Letheby (2020) asks whether reports of drug-induced ego dissolution provide us with solid evidence against so-called "subjectivity theories of consciousness", according to which phenomenal consciousness constitutively involves a minimal form of self-awareness or "subjectivity". Letheby argues that the alternative notion that putatively selfless states of consciousness associated with depersonalization might not in fact be phenomenally conscious at all, does not work well for reports of selfless states of consciousness induced by classic psychedelic drugs, particularly potent and fast-acting psychedelics such as DMT and 5-MeO-DMT, because there is little doubt that the relevant states are phenomenally conscious.

Miguel Sebastián (2020) argues that given a proper understanding of a minimal form of self-awareness that he labels "Perspectival First-Person Awareness" (or PFP-awareness), it becomes apparent that even putatively selfless states of consciousness do not entirely lack self-awareness. PFP-awareness is anchored in a non-conceptual, identification-free self-attribution that defines the ultimate origin of the first-person perspective of conscious experience. ... He concentrates on the phenomenology of states induced by psychedelic drugs, meditation and dreams, as they have been claimed to present the biggest threat to the Ubiquity Thesis. First, he argues that although there are good reasons to think that some forms of self-awareness that typically accompany our ordinary experience can be compromised in altered states of consciousness, this does not mean PFP-awareness is absent in these states.

Fig 40b: The PEMM Tristinction (Sjöstedt-Hughes 2023).



Sjöstedt-Hughes (2023) sees psychedelic states as trisecting with both metaphysics and mystical states, noting that psychedelic-induced metaphysical experiences should be integrated and evaluated with recourse to metaphysics in which one sees the potential bridge between reason-based philosophy and practical therapy — with psychedelic-assisted psychotherapy there is the potential and mutually beneficial fusion of philosophy with practical science. Thus we see overall that paradoxically, the psychedelic experience, although being regarded as a highly exotic mental state, also has foundational insights about the universality of both subjective consciousness and self-consciousness.

The thesis in this monograph takes a form of a scientific investigation that sets up a verifiable framework to present a cosmology, consisting of interlocking biogenic, panpsychic and symbiotic aspects, scientifically accounting for the flowering of conscious life in the universe, that has components of discourse (2) that they are therapeutic, (5) that they reveal the self, (6) that they induce moksha and (7) in that this is not a theistic description of reality, but one in which consciousness as we know it is widespread in all eucaryote organisms, and in the mind at large through them, so that the animistic actually has a valid cosmological basis.

The Indigenous Psychedelic Dimension

Kerowen Cornelius (2023) reviewing the ethical implications of the scientific explosion of interest in psychedelics as therapeutic tools, for indigenous communities, who have a long history of sacred and medicinal use, cites Yulia Celidwen's (2023) efforts to form a consortium to address these concerns:

Over thousands of years, Indigenous communities have cultivated relationships with and accumulated knowledge on psychedelics such as psilocybin mushrooms, the Amazonian botanical brew ayahuasca, and the West African shrub iboga. More recently, psychedelics have exploded onto the stage of Western science. Clinical trials of these substances in the past 15 years have produced remarkable results in the treatment of depression, addiction, post-traumatic stress disorder, and end-of-life anxiety. Media buzz has generated a rush to legalize their therapeutic use, catapulting the global psychedelic drugs market from \$3.8 billion in 2020 to an estimated \$11.82 billion by 2029. But both Native and non-Native critics say the industry is ignoring the emotional, cultural, and ecological harms it is causing the Indigenous peoples who originated psychedelic medicine.

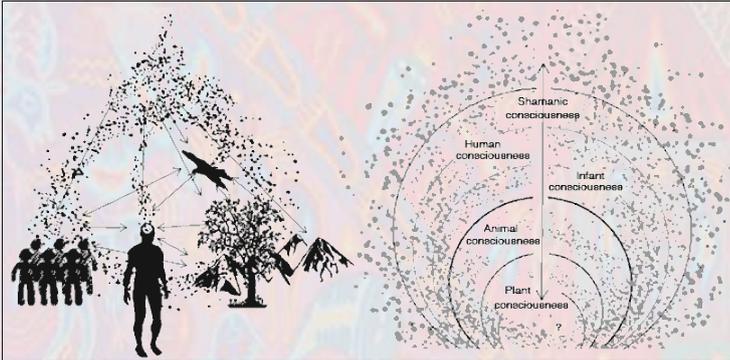


Fig 40c: Indigenous models of consciousness exemplified by animistic individual consciousness as the embodiment of global consciousness and its nested types (Lorencova & Trnka 2023).

Many Indigenous Nations are concerned they are being excluded from psychedelic spaces that extract their knowledge, threaten what they see as their intellectual property, and detach their medicines from their spiritual contexts, the paper finds. In addition, international demand is driving people to unsustainably harvest iboga, the plants used to make ayahuasca, and the hallucinogenic cactus peyote. Meanwhile, burgeoning retreat

*centers that offer psychedelic therapy often charge thousands of dollars for experiences that culturally appropriate Indigenous traditions yet share few benefits with these often impoverished communities. ...The resurgence of Western psychedelic research and practice has led to increasing concerns from many Indigenous Nations regarding cultural appropriation, lack of recognition of the sacred cultural positioning of these medicines, exclusionary practices in research and praxis, and patenting of traditional medicines. Indigenous voices and leadership have been notably absent from the Western psychedelic field currently widely represented by Westerners. An Indigenous-led globally represented group of practitioners, activists, scholars, lawyers, and human rights defenders came together with the purpose of formulating a set of ethical guidelines concerning traditional Indigenous medicines current use in Western psychedelic research and practice. A global Indigenous consensus process of knowledge-gathering was engaged which identified eight interconnected ethical principles, including: **Reverence, Respect, Responsibility, Relevance, Regulation, Reparation, Restoration, and Reconciliation**. A summary of the work is presented here with suggested ethical actions for moving forward within Western psychedelic research and practice spaces.*

The first and foremost of these is reverence for nature and the diversity of life.

Reverence for Mother Nature *Traditional Indigenous medicine is an ethical, ecosystem-protective, and holistic system of medicine that interconnects humans and the environment. A sense of reverence for the planet guides all relationships, as well as a commitment to preserve all life. Traditional Indigenous medicine from a systems and relational perspective prompts insight for compassionate living and awareness of collective care to sustain the well-being of the medicines themselves as well as all future generations.*

Concrete problem *Western psychedelic research and practice has its roots within traditional Indigenous medicines systems yet have turned 'kincentric' approaches (treating all relationships, including medicines, as kin) to anthropocentric approaches (human-centric). This anthropocentric approach fails to adequately reference or acknowledge Indigenous paradigms in Western procedures, thus expropriating Indigenous knowledges while separating the medicines from the context of their original environments.*

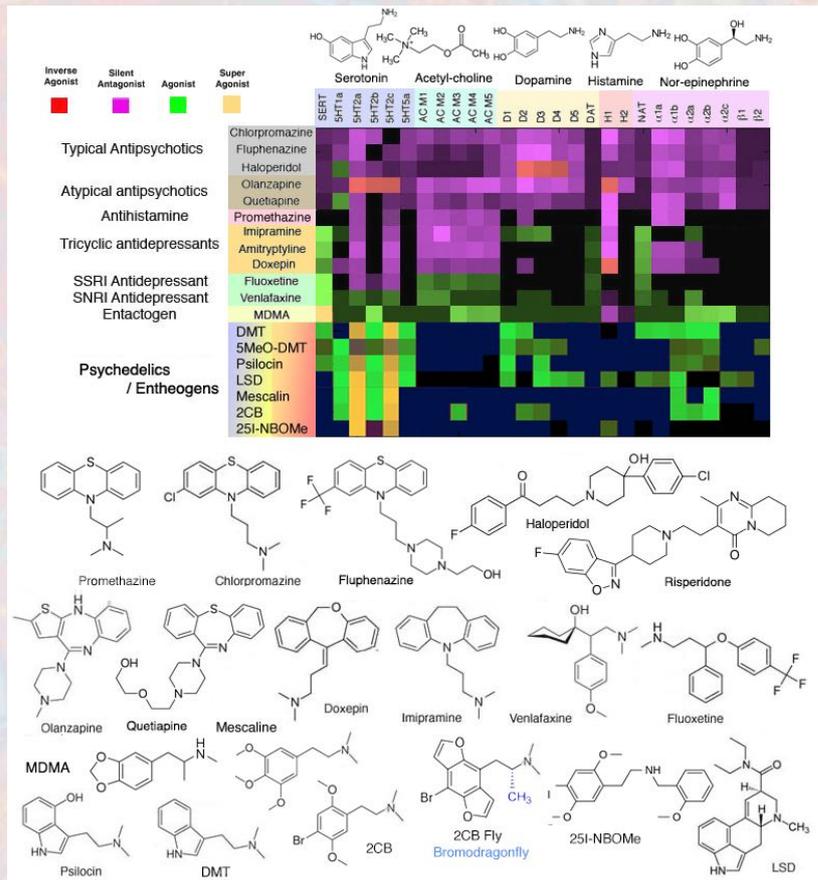
Reverence-governed actions *The explicit acknowledgement of Indigenous Peoples and their traditional medicines and practice as the root of Western psychedelic research and practice; Western psychedelic research and practice references Indigenous concepts of reverence as guided by local Indigenous scholars and communities; the Western psychedelic research and practice community takes action to support Indigenous Nations protection of the at-risk land and natural environments where these traditional Indigenous medicines originate; support Indigenous Peoples in their fulfilment of the right to life and of the right to live in peace on ancestral lands.*

Four later sections in this work – [Psychedelic Agents in Indigenous American Cultures](#), [Shipibo: Split Creations and World Trees](#), [Meso-American Animism and the Huichol](#) and [Redemption of Soma and Sangre in the Sap and the Dew](#), deal in detail with indigenous use as a pivotal heritage of psychedelic knowledge.

The Devil's Keyboard: Sanity, Hallucinations and Visions in the Sappy, Conscious Human Brain

The mammalian brain is not just a seething storm of electrical excitations reverberating through neural networks, but is driven at all stages through the intervening sappy connections that neurotransmitters, neuromodulators and receptors provide between one neuron and the next in the passage of such excitations as they develop strange attractors and other dynamic phenomena of cerebral processing. Neuromodulators do not just affect our moods but are key players in major life decisions. We can better understand these by examining the way psychoactive agents act on many receptors at once, like chords, sequential melodies, or extreme dissonances, enhancing some receptors and depressing the activity of many of others, leading to unpredictable and sometimes uncontrolled consequences and the ways human society, for better or worse, chooses to use these substances to ensure “sanity” or achieve insight.

Fig 41: **The Devil's Keyboard** Plot of receptor binding in pKi of major classes of psychoactive drugs, from antipsychotics through antidepressants and antihistamines to entactogens and entheogens, generated using the PDSP database (<http://pdsp.med.unc.edu/dataMining/pdspConfigGraph.php> and PLoS ONE 5/2 e9019 1-17). Five key classes of modulatory neurotransmitters, serotonin, acetyl-choline, dopamine, histamine and nor-epinephrine, cross indexed against key classes of psychoactive agents – typical and atypical antipsychotics, antihistamines, tricyclic and SSRI, SNRI antidepressants, entactogens, and psychedelics / entheogens. An inverse agonist binds to the same receptor-binding site as an agonist and not only antagonises the effects of an agonist but, moreover, exerts the opposite effect by suppressing spontaneous receptor signalling (when present). If we look across receptors and the various molecules used to alter the flow of these pathways, we begin to gain an understanding of how psychoactive molecules in the sappy biochemical brain activate positively and negatively the “Devil's keyboard” of receptors bound to by these molecules, many of which act on several receptors at once.



Two key primary agents are the amino acid glutamate and the closely related gamma-amino-butyric acid (GABA) which form the excitatory and inhibitory components driving the oscillations of the central pathways for information processing. Both these two are primal amino acids found in the Murchison chondrite and scattered in cosmic gas clouds, so they are not just a quirk of biology. These have both ionopore receptors, which can excite or inhibit electrical oscillations and slower longer-acting metabotropic receptors which modulate overall activity on a contextual basis by signalling to protein pathways interacting with the nucleus and adjacent receptors.

Along with these two, there are several additional simple molecules, many amines, such as dopamine, nor-epinephrine, serotonin (5OH-tryptamine) and complementing them, acetyl choline that, like glutamate and GABA, have an ancient origin as social signalling molecules in single-celled eucaryotes and which also have both ionotropic and metabotropic receptor versions. The amine and choline pathways also form the complementary components of the bodily adrenergic and cholinergic autonomic nervous system. Other receptors have more complex substrates such as the polypeptide endorphins of the opioid receptor.

Antipsychotics – Agents of Darkness

At the negative extreme a dark, diabolical side of psychotherapeutic agents, is presented in the form of antipsychotics. Although an affront to human autonomy, these are admittedly less damaging than a long line of previous diabolical and devastating treatments for key psychotic conditions, from schizophrenia to mania and depression.

The treatment of mental illness has a long tortured history. Lobotomy was one of a series of radical invasive physical therapies that signalled a break with a psychiatric culture of therapeutic nihilism that had prevailed since the late nineteenth-century. The new "heroic" physical therapies devised during this experimental era, including malarial therapy for general paresis of the insane, deep sleep therapy, in which the patients were put into long deep coma, insulin shock therapy, in which patients were repeatedly injected with large doses of insulin in order to produce daily comas over several weeks, cardiazol shock therapy and electroconvulsive therapy, both of which induced seizures, and finally prefrontal lobotomy helped to imbue the then therapeutically moribund and demoralised psychiatric profession with a renewed sense of optimism in the curability of insanity and the potency of their craft at the cost of a complete loss of autonomy and identity by the vulnerable afflicted.

Patients of lobotomy were, immediately following surgery, often stuporous, confused, and incontinent. Some developed an enormous appetite and gained considerable weight. Seizures were another common complication. Emphasis was put on the training of patients. Following the operation, spontaneity, responsiveness, self-awareness, and self-control were reduced. The activity was replaced by inertia, and people were mostly left emotionally blunted and restricted in their intellectual range. Walter Freeman ²⁶described one 29-year-old woman he had operated on as being, following lobotomy, a "smiling, lazy and satisfactory patient with the personality of an oyster" who could not remember her name and endlessly poured coffee from an empty pot. The originator of the procedure, Portuguese neurologist António Moniz, shared the Nobel Prize for Physiology or Medicine of 1949 for the "discovery of the therapeutic value of leucotomy in certain psychoses", which has been the subject of continuing controversy. Lobotomy has become a disparaged procedure, a byword for medical barbarism and an exemplary instance of the medical trampling of patients' rights.

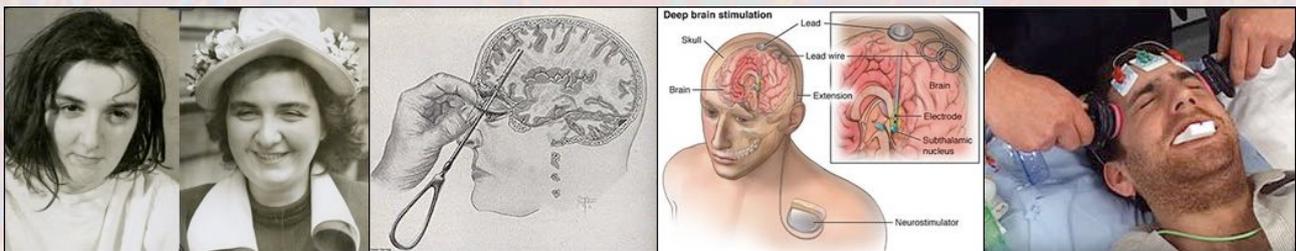


Fig 42: (Left) Freeman stated that this woman was schizophrenic and all that could be done was **to turn her into a 'veritable household pet'**. (Centre) Lobotomy procedure and deep brain stimulation. (Right) Electroconvulsive therapy.

Katie Serena (2022) notes: *Rosemary Kennedy JFK's sister suffered oxygen deprivation during birth. As a child, she was unable to keep up with her siblings. Her lack of inclusion often caused her to experience "fits," which were later discovered to have been seizures or episodes relating to her mental illness. She was also reportedly causing trouble for the nuns in the American convent. According to them, Rosemary was caught sneaking out at night to go to bars, where she met strange men and went home with them. Joe Kennedy was grooming his two oldest boys for careers in politics. Because of this, Rose and Joe worried that Rosemary's behavior could create a bad reputation not just for herself but for the whole family in the future, and eagerly searched for something that would help her. Despite the ominous stories about the lobotomy, Joe needed no convincing to sign Rosemary up for the procedure, as it seemed like this was the Kennedy family's last hope for her to be "cured." Years later, Rose would claim that she had no knowledge of the procedure until it had already happened. No one thought to ask if Rosemary had any thoughts of her own. In 1941, when she was 23 years old, Rosemary Kennedy received a lobotomy. During the procedure, two holes were drilled in her skull, through which small metal spatulas were inserted. The spatulas were used to sever the link between the pre-frontal cortex and the rest of the brain. Though it is not known whether he did so on Rosemary, Dr. Freeman would often insert an icepick through the patient's eye to sever the link, as well as the spatula. Throughout the entire operation, Rosemary was awake, actively speaking with her doctors and even reciting poems to her nurses. The medical staff all knew that the procedure was over when she stopped speaking to them. Immediately after the procedure, the Kennedys realized that something was wrong with their daughter. Not only had the operation failed to cure her intellectual challenges, but it had also left her extremely disabled. Rosemary Kennedy could no longer speak or walk properly. She was moved to an institution and spent months in physical therapy before she regained normal movement, and even then it was only partially in one arm. Her family did not visit her for 20 years while she was shuttered away in the institution. It wasn't until after Joe suffered a massive stroke that Rose went to go see her daughter again. In a panicked rage, Rosemary attacked her mother during their reunion, unable to express herself any other way.*

After 2,500 operations, Freeman performed his final ice-pick lobotomy on a housewife named Helen Mortenson in February 1967. She died of a brain haemorrhage, and Freeman's career was finally over. Freeman sold his home and spent the rest of his days traveling the country in a camper, visiting old patients, trying desperately to prove that his procedure had transformed thousands of lives for the better. Freeman died of cancer in 1972.

²⁶ The father of the Walter Freeman who proposed strange attractors in brain states fig 78.

Deep brain stimulation is an invasive process to surgically insert a stimulating electrode into deep brain regions such as the striatum, nucleus accumbens, subcallosal cingulate and thalamus (Delaloye & Holtzheimer 2014), using an implanted device to marginally help patients with intractable depression, where no other treatment works: A patient notes: *“Things got a little bit easier”*. Participating neurologist Helen Mayberg (Byrne 2023) notes: *“In this process, we are using crude devices, we’re sticking a wire into the brain. I hope I live long enough to see that people won’t require a hole in their brain and a device implanted in this way. I often have a nightmare with my tombstone that kind of reads like, what did she think she was doing?”* 150,000 people in the US have such implants for intractable Parkinsonism. Metzger et al. (2023) and Willett et al. (2023) have developed a brain-computer interface (BCI) enabling a paralysed person to “speak” using an electrode grid over motor areas. Elon Musk (2019) has gained FDA approval for human studies of a BCI, implanted on the cortex (Paul & Singh 2023), which could detect motor signals and could also be used for patterned neuronal stimulation, but recreational use carries surgical risks of brain tissue damage, infection, and scarring and raises acute ethical risks, with cyborg implications²⁷ about the technologisation of human consciousness, as his design for \$2000 entirely robotic brain surgery shows.

By contrast with removing key and essential parts of the brain, or damaging deep implants, electroconvulsive therapy is an electrically disruptive psychiatric treatment where a generalised seizure is electrically induced to manage refractory mental disorders. Typically, 70 to 120 volts are applied externally to the patient's head. ECT is used, where possible with informed consent, as an intervention for resistant major depressive disorder, schizophrenia, treatment-resistant catatonia, prolonged or severe mania. A course involves multiple administrations, two or three times a week until the patient no longer has symptoms. Although it is claimed to be an effective treatment for depression, significant cognitive impairment occurs after ECT. The American Psychiatric Association acknowledges: *“In some patients the recovery from retrograde amnesia will be incomplete, and evidence has shown that ECT can result in persistent or permanent memory loss”*, although it is disputed whether it causes permanent brain damage.

Antipsychotics are a class of psychotropic medication primarily used to manage psychosis (including delusions, hallucinations, paranoia or disordered thought), principally in schizophrenia but also in a range of other psychotic disorders, including bipolar disorder, encompassing mania and depression. First-generation (typical) antipsychotics were introduced in the 1950s following on from the discovery of promethazine in the 1940s, which also has antipsychotic properties but is used as a first generation sedative antihistamine. Chlorpromazine, derived from promethazine originally as a sedative, was found to have neuroleptic properties in the early 1950s, and was the first typical antipsychotic. Second-generation (atypical) antipsychotics, were sought in the 1970s to address some of the side effects including mortality risk.

Research has shown that use of any antipsychotic is associated with smaller brain tissue volumes, including white matter reduction and that this brain shrinkage is dose dependent and time dependent. They may result in many unwanted side effects such as involuntary movement disorders, such as tardive dyskinesia, gynecomastia, impotence, weight gain and metabolic syndrome increasing the risk of heart disease, stroke and type 2 diabetes.

To understand how antipsychotics affect receptors in the brain, it is highly informative to examine in detail their receptor binding properties to the major classes of psychoactive receptors. A key core of antipsychotics involves antagonism at dopamine receptors, believed to be driving psychosis. As shown in detail in fig 41, the prototypical antipsychotic chlorpromazine is an antagonist at all five dopamine receptors D1-5. However, it also antagonises multiple serotonin receptors, all muscarinic acetyl-choline receptors M1-5, histamine H1, and all the α -adrenergic receptors for nor-epinephrine. This is an effect like an elephant sitting on the devil’s keyboard, flattening (a) mood (serotonin) (b) alertness (acetyl choline) (c) motivation (dopamine) (d) wakefulness (histamine) and (e) vigilance (nor-epinephrine). Its introduction has been ironically labeled as one of the great advances in the history of psychiatry.

²⁷ Musk has claimed Neuralink’s device could be used for a range of therapeutic uses, to treat conditions like blindness, paralysis, depression. But he has also said that the eventual aim is to create a “general population device” that could connect a user’s mind directly to supercomputers and help humans keep up with artificial intelligence. He has also suggested that the device could eventually extract and store thoughts, as “a backup drive for your non-physical being, your **digital soul**.” A video released in 2021 shows a monkey using the device to play the video game Pong with his mind and another from 2022 appeared to **show** a monkey typing on a computer “telepathically”. In a current statement, a spokesperson for the FDA would only confirm that Neuralink was approved for an investigational device exemption (IDE) – the FDA process that allows a device to be used for clinical studies. The company would need to assemble an institutional review board to approve and monitor the research. The FDA’s approval last week comes after the regulator initially rejected Neuralink’s previous bid for clinical trials in 2022, **citing** “dozens of deficiencies” the company had to address before human testing, according to a report from Reuters. The company has killed more than 1,500 animals since it began experimenting on them in 2018. Employees told the news service the mortality rate has been higher than necessary due to Musk’s gruelling development timeline.

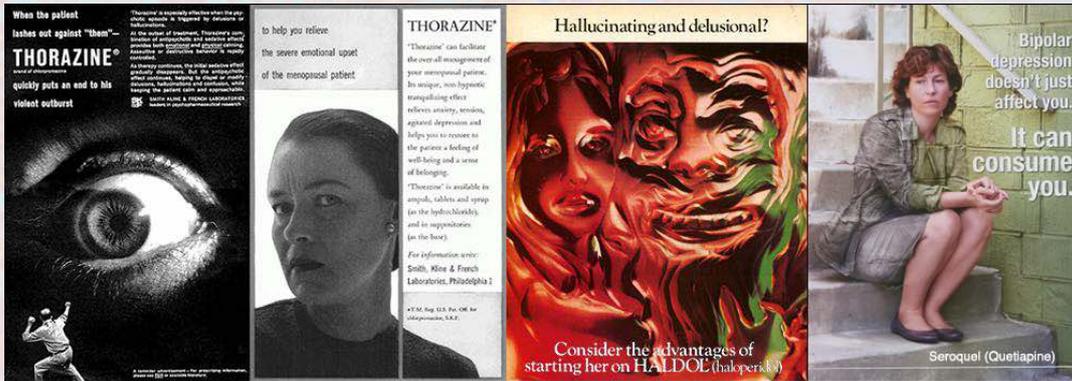


Fig 43: Thorazine (chlorpromazine) advertised both for aggressive mania (in men) “When the patient lashes out against ‘them’—Thorazine quickly puts an end to his violent outburst” and menopausal depression (in women). “To help you relieve the severe emotional upset of the menopausal patient – Thorazine”. Centre Right: “Hallucinating and delusional? – Consider starting her on Haloperidol”. Right: [Quetiapine advert 2009](#). “Bipolar depression doesn’t just affect you – IT CAN CONSUME YOU”. Marketed as both an atypical antipsychotic and as an adjunct treatment for bipolar, or just persistent, depression, complete with five pages of legal disclaimers, including: High blood sugar and diabetes, Weight gain, potentially fatal" neuroleptic malignant syndrome (fever, rigid muscles, confusion), "tardive dyskinesia (TD) uncontrollable movement of the face, tongue, or other parts of the body" which can become permanent, Cataracts, Suicidal thoughts, increased risk of death, "Priapism" [2011 Seroquel TV Advert](#).

Other typical antipsychotics are tuned to enhance the focus on antagonising dopamine receptors. Fluphenazine does this strongly with less anticholinergic effects. It is less prone to causing sedation, or low blood pressure but is associated with a higher frequency of movement disorders. Haloperidol does it even more aggressively, by being an inverse agonist, particularly at D2 as well as D3, D4 (orange squares in fig 41). However this extreme dopamine suppression causes Haloperidol to be the most prone to the rare neuroleptic malignant syndrome, a life-threatening reaction that can occur in response to antipsychotic medication, due to a sudden drop in dopamine levels, paradoxically causing glutamate over-stimulation. *Neuroleptic*, originating from Greek: νεῦρον (*neuron*) and λαμβάνω (*take hold of*)—thus meaning “*which takes the nerve*”—refers to both common neurological effects and side effects. Symptoms include high fever, confusion, rigid muscles, variable blood pressure, sweating, and fast heart rate. Complications include rhabdomyolysis, when damaged muscle tissue releases its proteins into the bloodstream, leading to heart and kidney damage or failure. All antipsychotics cause a significant increase in death rates when used for elderly dementia. In comparison with atypical risperidone, haloperidol was associated with a mortality ratio of 2.14 in one study and in another both typical and atypical (risperidone, olanzapine, quetiapine, and aripiprazole) had ratios of 1.6 against placebo, implying a death rate for haloperidol against placebo of over 3 times higher.

The atypical antipsychotics, perhaps with the exception of risperidone, fare little better, although they were intended to reduce negative side-effects, and display the same warnings about the same spectrum of outcomes. Quetiapine suppresses the same receptors as chlorpromazine and olanzapine is in addition an aggressive inverse agonist for serotonin receptors 5HT_{2a}, b, & c blanking out emotional mood.

Antidepressants – Brave New World

The history of antidepressants is equally chequered. Monoamine oxidase inhibitors (MAOIs) were the first type of antidepressant developed. Monoamine oxidase is a generalised enzyme which clears the brain of any superfluous monoamine transmitters. Use of MAOIs typically requires diet restrictions and avoiding certain other medications because MAOIs can cause dangerously high blood pressure when taken with certain foods or medications, as noted in serotonin syndrome. MAOIs also affect other neurotransmitters in the brain and digestive system, causing additional side effects.

The next generation of anti-depressants were tricyclics. Imipramine, originally investigated as an antipsychotic, was discovered in the early 1950s, and was the first tricyclic antidepressant, along with amitriptyline. As shown in fig 41, they inhibit serotonin uptake, although antagonising 5HT_{2a} and c, and although not suppressing dopamine, are still strongly anticholinergic, sedative antihistamines that suppress α -adrenergic receptors. Common side effects include sleepiness, sudden weight gain, dry mouth, constipation, nausea, and blurry vision, increased risk of suicide in those under the age of 25, mania, urinary retention and a withdrawal syndrome may occur if the dose is rapidly decreased. Tricyclic antipsychotics, antidepressants and antihistamines all have anticholinergic action which has been associated with increases in dementia and mortality (Gray et al. 2015, McMichael et al. 2020) with high use contributing to an approximately 50% increase in both.



Fig 44: Targeting women: (Left) Mother's little helper": Before the current fashion in SSRI antidepressants, benzodiazepines such as valium (diazepam) and serax (oxazepam) were massively marketed to vulnerable women trapped in domestic incarceration until their recreational popularity and withdrawal symptoms became apparent. (Right) Doxepin "Sinequan [sine qua non] helped her save her family life". The Prozac Promise – Confidence, Convenience, Compliance. Zoloft used for the same purpose as serax. Effexor "I got my playfulness back". In another "I got my mummy back"! Petition: Effexor withdrawal Can bring you to your knees!

Subsequent drug development has focussed closely on the serotonin transporter SERT as a way of enhancing mood in a modulated manner. The current round of SSRI and SNRI antidepressants are head and shoulders above the previous ones, although their efficacy and the basis of their action is still debated (Moncrieff et al. 2022, Erritzoe et al. 2022). Serotonin reuptake inhibition of the serotonin transporter SERT is believed to be responsible for their anti-depressant activity, although longer term neurogenesis has also been reported. The SSRI fluoxetine (prozac) and the SNRI venlafaxine (effexor) thus increase serotonin by reducing the reuptake of serotonin by the serotonin SERT transporter. Common side effects are agitation, nausea, digestive upset, loss of appetite and weight loss dizziness, blurred vision, dry mouth, excessive sweating, insomnia or drowsiness, loss of libido (Cox 2024), anorgasmia, erectile dysfunction, dependence and withdrawal symptoms. Severe side effects include increased risk of suicide, mania, and serotonin syndrome. Antidepressant withdrawal syndrome may occur if stopped. Fluoxetine has a less problematic tendency to antidepressant withdrawal syndrome than venlafaxine and can be used as a stepping stone out.

The effectiveness of antidepressants is still only marginal against placebo, or effective psychological support and they come with problems of long-term dependence potentially as serious as with previous use of benzodiazepines such as "mother's little helper" valium was. By comparison psychedelic therapy holds great promise because it doesn't require daily dosing on an indeterminate basis and the transformative nature of the experience can enable the person to reevaluate their life and meaning in the psychedelic context, giving them a new more wholesome accepting perspective on existence, even for people facing terminal conditions. In 2020 around 4000 death in the US were associated with antidepressants.

Reversing the effect of SERT is also believed to be responsible for the serotonin flooding causing the prosocial entactogenic effect of the amphetamine analogue ecstasy, or MDMA (3,4-Methylenedioxy-methamphetamine). The insights of MDMA experiences have proved effective in dealing with intractable conditions such as post-traumatic stress syndrome (PTSD) through a refreshed world view again without having to have daily medication. However MDMA can cause neurological oxidative damage and medium term depletion of SERT transporters, and deaths have been recorded. In Australia 62% of deaths were attributed to drug toxicity (48% multiple drug toxicity and 14% MDMA toxicity alone), and 38% to other causes (predominantly motor vehicle accidents) with MDMA recorded as a contributory factor (Roxburgh & Lappin 2020). The more serious adverse effects include hypertension, hyperthermia, serotonin syndrome, seizures, stroke, hyponatremia and cardiac arrest, involving multiple factors such as dancing in high temperatures in crowded spaces.

Serotonin Super-Agonists – Agents of Illumination and Annihilation

The most positive tolerable therapeutic agents are in the serotonin receptor class, the 5HT_{2a} receptor [fig 43](#), is widely distributed across the cortex, receiving inputs from 5HT_{1a} neurons sending ascending pathways from the basal Raphe nucleus widely across cortical areas, where they couple e.g. to 5HT_{2a} receptors on vertically-aligned pyramidal neurons and affect mood. Serotonin receptors are diverse with types 1 - 7, both excitatory and inhibitory, with 5HT₁ having five subtypes, 5HT₂ three and 5HT₃ being ionotropic.

The super-agonist effect of psychedelics differs from that of both antidepressants and MDMA because it leads instead to the psychedelic state, putatively via exciting a second subcellular G-protein linked pathway modulating the adjacent metabotropic glutamate receptor mGluR2 as illustrated in fig 34(d). It acts primarily as a super-agonist of 5HT2a and 5HT2c but is also a partial agonist of dopamine and nor-epinephrine receptors (green squares) adding motivational drive and vigilance to the experience. LSD has an even broader distribution of activations, giving it the rich quality of experience appreciatively noted by the research chemist Dave Nicholls.



Fig 45: Timothy Leary ([getonthebus](http://getonthebus.com)), Alexander and Anne Shulgin (Alex Gray) and Albert Hofmann (Robert Venosa).

Note however there is also a dark side – overdosing on SSRIs or SNRIs (serotonin norepinephrine reuptake inhibitors), or combining two agents, including a variety of drug combinations from pethidine which is also serotogenic with SSRIs and some psychedelics (mescaline) and monoamine oxidase inhibitors, can cause the potentially fatal condition, serotonin syndrome, involving high body temperature and blood-pressure, agitation, seizures and muscle breakdown.

The natural entheogens, psilocin, DMT and mescaline, are safe and can be highly illuminating, when used in a safe context, as is LSD although extremely potent. Deaths from overdose are unknown and the few deaths to which natural entheogens are attributed are due to accidental misadventure. Maria Sabina, the mushroom benefactress lived to 93 and last time I took peyote with the road man Tellus Goodmorning he was also 93. Mescaline was first isolated and identified in 1897 by Arthur Heffter and first synthesised in 1919 by Ernst Späth. LSD was first synthesised Nov 16, 1938, by Albert Hofmann, but it wasn't until 1963 that Hofmann and Troxler reported the synthesis of psilocybin. Starting from mescaline, which although not a serotonin analogue binds to the 5HT2a receptor in the same way as psilocin and DMT, a series of more potent mescaline analogs has been created (Shulgin 1991), such as 2CB, 2CB-Fly and the super-potent 25I-NBOMe. Psilocin also has several psychedelic analogues (Shulgin 1997).

But there are plain bad psychedelics too. Bromo-DRAGONFLY (BrDF), fig 41, is a very potent hallucinogen, having around one third the potency of LSD and it has an extremely long duration of action, up to several days and is relatively toxic. It can easily be confused with related less potent agents e.g. 2CB-FLY, which is 20x less potent, 2CB or 2CE which is 100 times less potent. Two young adults died after overdosing on BrDF, which they thought was 2C-E, and several others were hospitalised during the same incident. Because they took a dosage appropriate for 2C-E, those who took the drug received, in some cases, 100x the normal dose. Both deaths followed seizures, vomiting blood, and terrifying hallucinations. A 35-year-old male required amputation of the front part of his feet and several fingers on one hand after taking a massive overdose. The compound acted as a long-acting vasoconstrictor, leading to necrosis and gangrene which became apparent several weeks after the overdose occurred. A 22-year-old male from Copenhagen died after ingesting BrDF. His friend described the trip saying, "It was like being dragged to hell and back again. Many times. It is the most evil [thing] I've ever tried. It lasted an eternity."

The lesson for me is to trust natural entheogens. Sacred mushroom species such as *Psilocybe cubensis* have evolved to provide a genetically pure psychedelic experience with no dangerous contaminants. Magic mushrooms are some of the safest recreational drugs around. Out of a survey of more than 12,000 people who did shrooms in 2016, just 0.2 percent said they needed emergency medical care—a rate that was five to six times lower than LSD, cocaine, MDMA, and alcohol, and three times lower than weed. However some wood-loving species *Psilocybe azurescens*, *cyanescens*, and *subaeruginosa* can cause temporary muscle weakness or paralysis.

Cannabinoids

Cannabis plants have a great variety of psychoactive molecules. In particular cannabidiol moderates the effects of the principal psychoactive agent Δ 9-THC to give a more health promoting effect. 11-hydroxy-THC can be formed after consumption of THC from inhalation and oral use, although levels of 11-hydroxy-THC are typically higher when eaten compared to inhalation. The pharmacokinetic equivalency ratio comparing Delta-9-THC with 11-Hydroxy- Δ 9-THC means that one milligram of THC in edible form, is equivalent to 5.71 milligrams of THC in smokable form.

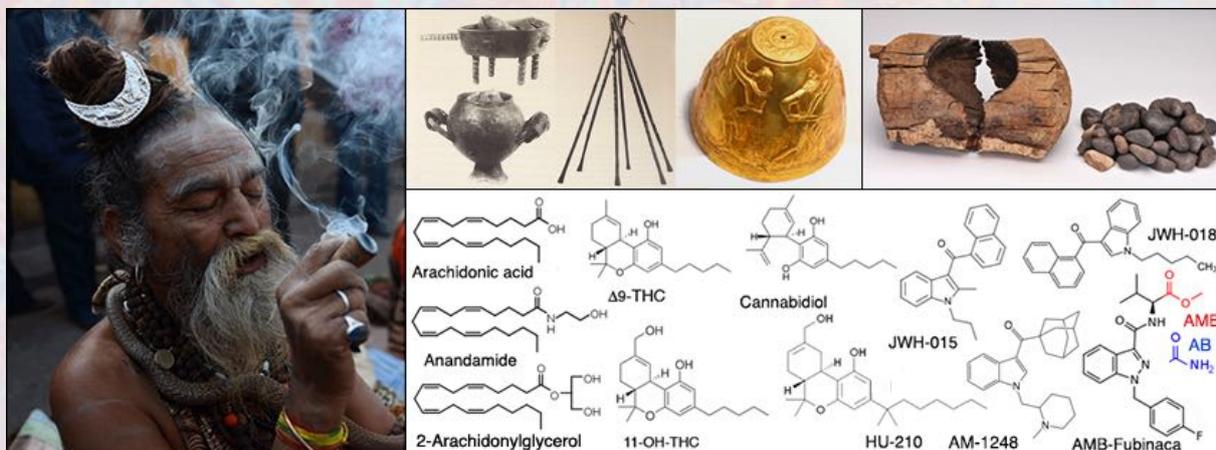
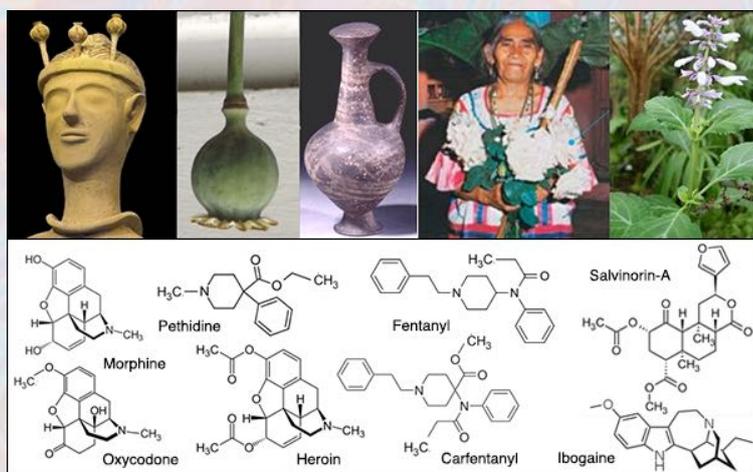


Fig 46:(Left) Sadhu attending the Maha Shivaratri festival Nepal marking a remembrance of "overcoming darkness and ignorance" in life and the world on the night before the new moon. (Lower) Some key natural and synthetic cannabinoids. (Upper-left) Scythians used cannabis ritually by heating whole plants in braziers in an enclosed space (Rudgley 1993). The black residue inside the gold vessels dating from the fourth century BC contained opium and cannabis (Curry 2015). (Upper-right). Vessels for heating cannabis resin of the Sogdians, a people of western China and Tajikistan who were Zoroastrians (Ren 2019). A 700-900 BC Israelite temple with active cannabis is shown in fig 196.



Cannabinoid metabotropic receptors have a variety of functions. CB1 occurs widely in the brain and CB2 is expressed on cells of the immune system where it has an immunomodulatory effect, reducing inflammatory response where it plays a role in processes including implantation of the fertilised embryo. CB1 receptors are thought to be one of the most widely expressed G protein-coupled receptors in the brain. This is due to endocannabinoid-mediated depolarization-induced suppression of inhibition, a very common form of short-term plasticity in which the depolarization of a single neuron induces a reduction in GABA-mediated neurotransmission.

Interference with working memory, displayed by cannabinoids is believed to result from secondary action of glial astrocytes, which have CB1 receptors, on hippocampal pyramidal, cells. The actions of Δ 9-THC result from partial agonist activity at the cannabinoid receptor CB1 ($K_i = 40.7$ nM), located mainly in the central nervous system, and the CB2 receptor ($K_i = 36$ nM), mainly expressed in cells of the immune system, meaning it binds similarly to both.

Anandamide, the principal endocannabinoid, along with 2-arachidonyl-glycerol, both derived from the prominent fatty acid arachidonic acid which occupies 20% of the fatty component of the brain, was first described (and named) in 1992 by Raphael Mechoulam and co-workers. The group went on to devise far more potent synthetic cannabinoids. HU-210, HU for Hebrew University, synthesised by Mechoulam has 100-800 times the potency of THC which itself is active in quantities of around 1-5 mg.

While natural cannabis is a safe herbal product used for up to five thousand years as a psychoactive substance, and the only deaths attributed to natural cannabis use are associated with other factors such as injuries from vehicle accidents

where cannabis is detected, synthetic cannabinoids have exploded on the recreational market, some with serious damaging side effects and deaths.

A series of potent naphthoylindole cannabinoids, the JWH family named after John W. Huffman, of Clemson University introduced a wide array of new cannabinoids with new structural arrangements and some with disquieting side effects. JWH-018 is a full agonist of both the CB1 and CB2 cannabinoid receptors and has been associated with unpleasant effects, including seizures, possibly associated with GABA inhibition and dissociative and anxiety episodes. JWH-073 acts as a partial agonist at both the CB1 and CB2 cannabinoid receptors. It is five times more selective for the CB2 subtype. JWH-015 has an affinity for CB2 receptors of 13.8 nM, while its affinity for CB1 is 383 nM, meaning that it binds almost 28 times more strongly to CB2 than to CB1. JWH-081 by contrast is ten times more selective for CB1. Two fluorinated compounds XLR-11 and AM-2201 have recently been associated with acute kidney damage (Murphy et al).

AB-Fubinaca was originally developed by Pfizer in 2009 as an analgesic medication but was never pursued for human use. In 2012, it was discovered as an ingredient in synthetic cannabinoid blends in Japan. In 2016, a "mass casualty event" in Brooklyn, New York, where 33 people ranging in age from 25 to 59 years old were adversely affected by the drug. 18 were hospitalised. All of the victims were described by bystanders as "zombielike" and the cause was attributed to closely-related AMB-Fubinaca with a methoxy group instead of an amine. A sudden spate of around 60 deaths in New Zealand, which had never experienced deaths from natural cannabis, accompanied by zombie incidents, were also attributed to the drug, with tested products containing between 32 mg/g and 400 mg/g of the active ingredient, between 2x to 25x stronger than the product involved in the mass casualty event in New York a year earlier.

Deleriants – Devil's Breath and Witches Brew

There is a long diverse history of use of solanaceous plants from belladonna (deadly nightshade), henbane and mandrake to *Datura* and *Brugmansia* species to induce states of delirious hallucination in which the subject is unable to differentiate their sometimes mundane hallucinations from reality, becoming unable to look after their own affairs, often slumping into unconsciousness and awakening with little memory of what has happened. This is the basis of the witches' flight on a broom stick, reputedly after rubbing the ointment on their skin and vaginal membranes. It is caused by toxic quantities of scopolamine, which is an indiscriminating muscarinic acetyl-choline antagonist, although also an essential medicine.



Fig 47: *Datura stramonium*, or devil's trumpet, renowned for the Jimson weed incident named after Jamestown, Virginia, where English soldiers consumed it for food while attempting to suppress Bacon's Rebellion. They spent 11 days in altered mental states of hallucinatory delirium incarcerated for their own protection. Guambioano drawing of a woman under a borachero tree of the evil eagle of toxic flight *Brugmansia volcanicola*, or angel's trumpet tree Colombian Andes. The Dance of the Sabbath (Gustav Doré). A young Basque witch applying her flying ointment José de la Pena. *Atropa belladonna* and Henbane *Hyoscyamus niger*. Ceremonial scopolamine use goes back to the beginning of the first millennium BC in the Mediterranean (Guerra-Doce et al. 2023).

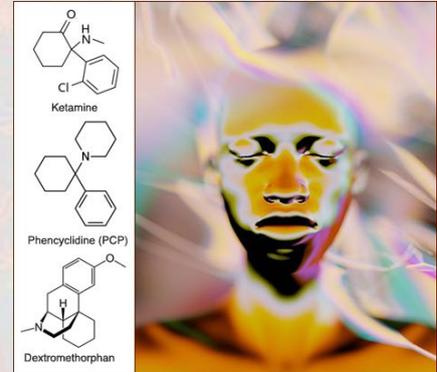
Its use in psychoactive quantities, like that of other anticholinergic agents leads, to accumulating brain atrophy. In smaller doses it is used for motion sickness and postoperative nausea and vomiting. Originally used as an anaesthetic and amnesiac in childbirth, it is frequently used to drug victims to induce docility, persuading the victim to release their bank accounts, after which they awaken not remembering what happened. In South America it is sometimes added to hallucinogenic ayahuasca potions containing DMT.

Then Rachel said to Leah, Give me, I pray thee, of thy son's mandrakes. And she said unto her, Is it a small matter that thou hast taken my husband? and wouldest thou take away my son's mandrakes also? And Rachel said, Therefore he shall lie with thee tonight for thy son's mandrakes (Gen 30:14).

NMDA Dissociatives

Ketamine is a dissociative anaesthetic which induces a trance-like state, providing pain relief, sedation, and amnesia. At sub-anaesthetic doses it is a recreational drug which induces a profound dissociative trance like experience entirely different from psychedelics and is a promising agent for pain and treatment-resistant depression. It is one of the safest anaesthetics, in contrast with opiates, ether, and propofol, it suppresses neither respiration nor heart rate.

Ketamine is an NMDA receptor antagonist which putatively acts by blocking the passage of ions in the ion channel. Related agents are PCP, N₂O, Xenon and dextromethorphan. The psychotropic effects of ketamine range from dissociation and depersonalization. Depending on the setting they can be pleasant or distressing and include a sensation of feeling light, body distortion, absence of time sense, novel experiences of cosmic oneness and out-of-body experiences. PCP has gained notoriety for uncontrolled behaviour, because it stimulates other receptors including D2, notably alleviated in an overdose by Haloperidol's D2 suppression. By contrast, overdosing Ketamine results in falling into the anaesthetic K-hole.



μ -Opioid Analgesics and κ -Opioid Dissociatives

Opioid receptors are a group of inhibitory G protein-coupled receptors with opioid polypeptides as ligands. The endogenous opioids are dynorphins, enkephalins, endorphins, endomorphins and nociceptin. Opioid receptors are distributed widely in the brain, in the spinal cord, on peripheral neurons, and digestive tract. The opioid receptor class consists of four types δ , κ , μ , ζ , and nociceptin – DOR, KOR, MOR, ZOR & NOR. Opiate drugs, such as morphine, act as MOR agonists setting off inhibitory effects, building up tolerance and causing withdrawal symptoms, possibly via NOR. NOP agonists have been shown to act as powerful, non-addictive painkillers in non-human primates. NOP and KOP do not react with MOP agonists such as α -endorphin, the 16 unit polypeptide Tyr-Gly-Gly-Phe-Met-Thr-Ser-Glu-Lys-Ser-Gln-Thr-Pro-Leu-Val-Thr, but dynorphins such as 13 unit dynorphin A – Tyr-Gly-Gly-Phe-Leu-Arg-Arg-Ile-Arg-Pro-Lys-Leu-Lys. The opioid receptors appear to maintain a dynamic equilibrium of pain perception, with opiates effect being due to MOP with NOP contributing to tolerance and withdrawal symptoms, with KOP having an alleviating role.

Fig 48: Top row: Poppy Goddess with slit pods (1400–1100 BC Gazi, Crete), Juglet with traces of papaverine unique to the opium poppy *Papaver somniferum* (Daley 2018), The sacred mushroom benefactress Maria Sabina holding *Salvia divinorum*.

Opium has been revered as a sacred potion since the dawn of urban culture, with sacred use manifest in the slit poppy pods on the crown of the Minoan Goddess and the presence of opium along with cannabis in the Scythian rituals. Opiates remain core essential medicines playing a key role in the management of pain, but they are also prime targets of dependence, addiction and mortality because of their seductive ability to escape the pain of the mortal coil. This leads to opiates and the ensuing synthetic opioids being primary agents of drug-induced mortality.

As can be seen in the figure above, opioids have been developed in two ways, firstly by modification of morphine to heroin (diamorphine), oxycodone and others, and secondly after the discovery of pethidine to arrive at fentanyl and carfentanyl, having exponentiating potencies and risks. The strength of sample opioids relative to morphine is: Codeine 1/10, Pethidine 1/3, Morphine 1, Oxycodone 3/2, Methadone 3, Heroin 3, Fentanyl 100, Carfentanyl 10,000. Correspondingly the overdose death rates in the US for opioids in 2020 are very high and skewed towards the most potent: Heroin 13000, Prescription opioids 16000, Fentanyl 57000. A significant share of these deaths can be directly attributed to the criminal mass marketing of opioids by the US drug industry.

Similarly to μ -opioid receptor agonists, such as morphine, κ -opioid agonists are potently analgesic, and have been employed clinically in the treatment of pain, however they also produce side effects such as dysphoria, hallucinations, and dissociation, which has limited their clinical usefulness. κ -opioid receptors are extremely widely distributed in the brain, spinal cord, and in peripheral tissues, including high levels in the prefrontal cortex, raphe nuclei (dorsal), ventral tegmental area, substantia nigra, dorsal striatum (putamen, caudate), ventral striatum, amygdala, claustrum,

hippocampus, hypothalamus, midline thalamic nuclei, locus coeruleus, spinal trigeminal nucleus, parabrachial nucleus, and solitary nucleus.

They may provide a natural addiction control mechanism, and therefore, drugs that target this receptor may have therapeutic potential in the treatment of addiction. Ibogaine a natural hallucinogen from Africa has seen a wave of popularity as a means to escape addiction and alcohol dependence. There is evidence that distribution and/or function of κ -opioid receptors may differ between sexes. The effects of the κ -opioid agonist salvinorin-A include baffling dysphoric visual spatial experiences quite different from psychedelics, and loss, or inversion of one's body image to become an external part of the environment, like the walls of the room, or crushed between giant wheels in a huge aircraft hangar. As can be seen in fig 34(h), ibogaine's unique receptor binding profile involves super-agonism of 5HT_{2a} providing a psychedelic effect, agonism of κ -opioid receptors providing both alleviation of dependence and a salvinorin-like dissociative effect and antagonism of NMDA receptors, akin to Ketamine's dissociative effect.

Uppers and Downers

Two central drugs of key medical use and recreational and addictive misuse second only to opioids are stimulants, providing euphoriant stimulus and emotional drive, and sedatives, providing obliterating relaxation and somnolence.

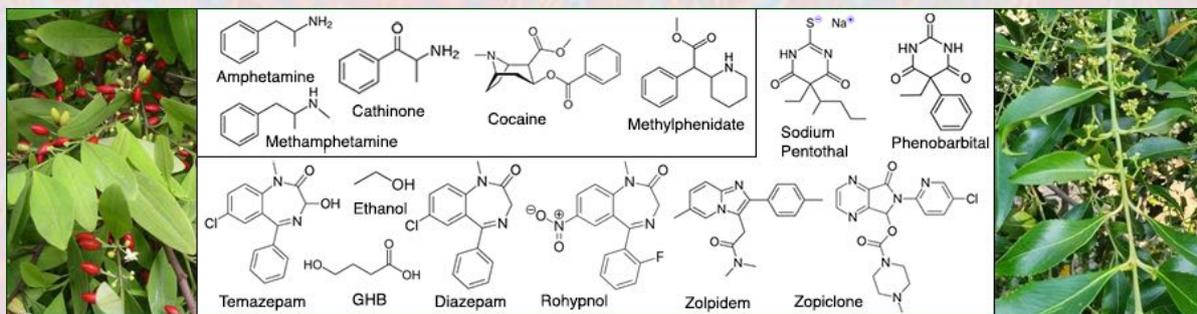


Fig 49: Left: *Erythroxylum coca* providing cocaine. Right: *Catha edulis* (Khat) providing the stimulant cathinone.

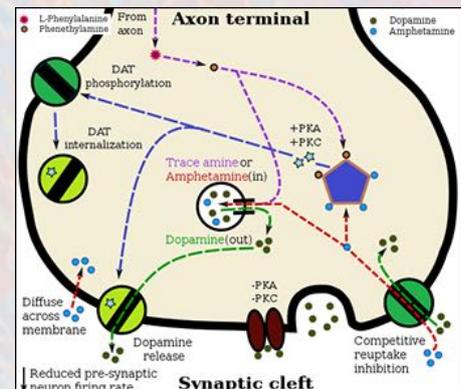
Stimulants

Caffeine, fig 65, present in tea and coffee and multiple plants, is regarded as the world's most commonly used stimulant. It acts uniquely by being an antagonist for receptors for adenosine, which accumulates in the brain through the day in the use of ATP energy, signalling the onset of fatigue.

Other stimulants act to enhance dopamine levels in various ways. Amphetamine is a strong central nervous system (CNS) stimulant that is a potent full agonist of trace amine-associated receptor 1 (TAAR1) residing inside the dopamine secreting synaptic bulb, which plays a key role, in promoting release of dopamine, as part of a complex feedback process, shown in fig 50. Methamphetamine is a variant now used primarily as a recreational drug as a euphoriant that at high doses, can induce psychosis, breakdown of skeletal muscle, seizures and bleeding in the brain. Cathinone is a natural amphetamine analogue consumed widely in the middle East as the stimulant khat.

Fig 50: Amphetamine action inside the synapse to release dopamine.

Cocaine – coca from Quechua kúka, is a natural stimulant from *Erythroxylum* species that has been used for millennia and is ritually and customarily consumed without social harm, by chewing the leaves with lime to free-base it. Cocaine is a purified form of the acid salt that has more capacity for psychological and physical dependence. It binds tightly to the dopamine transporter DAT forming a complex that blocks the transporter's function so that additional dopamine accumulates in the synaptic cleft. Cocaine also blocks the serotonin transporter and norepinephrine transporter, inhibiting reuptake of serotonin and norepinephrine. Effects include intense happiness, sexual arousal, loss of contact with reality, or agitation. Physical effects may include a fast heart rate, sweating, and dilated pupils. Effects begin within seconds to minutes of use and last between five and ninety minutes. Methylphenidate (Ritalin) is also a dopamine and norepinephrine reuptake inhibitor in a 3:1 ratio, used widely for attention deficit syndrome without social harm. A group of cathinone/MDMA analogues, marketed as "bath



salts”, such as mephedrone and methyline are stimulant/entactogen designer drugs with effects similar to MDMA or cocaine, with a duration of 5–6 hours. Methylenedioxypropylvalerone (MDPV) acts as a norepinephrine–dopamine reuptake inhibitor, causing not only a severe anxiogenic effect but also increased aggressive behaviour, resulting in a peak in US emergency admissions in 2011.

Central to the drug wars and the whole criminal enterprise of drug cultivation, manufacture and distribution for illicit profit and second only to opioids as harbingers of mortality, are stimulants. In the US in 2020, overdose deaths from cocaine are estimated at 19,000, and methamphetamine at 24,000. The only viable solution to undercut the cartels is to treat all recreational and nonprescription drug use as a health issue in a decriminalised environment.

Sedatives

Sedatives act almost universally through modulation of ionotropic GABA-A receptors to increase inhibition of ensuing glutamate excitatory activity. GHB (gamma-hydroxybutyric acid) is a pro-drug of GABA that is therefore an indirect natural agonist of GABA_A that causes acute sedation and is sometimes used as a date rape drug. All the other examples cited in the figure are allosteric modulators that result in increased expression of the receptor and central nervous inhibition. Ethanol’s drunkenness and sedation is understood in terms of its activity as such a modulator (Davies 2003).

The first GABA sedatives were the barbiturates that act as central nervous system depressants. They are effective as anxiolytics, hypnotics, and anticonvulsants, but have physical and psychological addiction potential as well as overdose potential and have largely been replaced by benzodiazepines and Z-drugs. Sodium pentothal is a rapid-onset short-acting barbiturate general anaesthetic. It is routinely used for euthanasia and was previously used for most lethal injections in the United States, but the US manufacturer Hospira stopped manufacturing the drug in 2011 and the European Union banned the export of the drug for this purpose. It is still used in some countries as a truth serum to weaken the resolve of a subject and make the individual more compliant to pressure, by decreasing both higher cortical brain function and inhibition. Phenobarbital is used as an anti-seizure medication in epilepsy and occasionally to treat trouble sleeping, anxiety, and drug withdrawal and help with surgery.

The next generation of GABA agents were benzodiazepines, which appeared to present fewer problems of toxicity, dependency and withdrawal. Their effects vary from sedation (temazepam) to tranquillisers aggressively marketed to treat anxiety (diazepam or valium) until recreational use led to a realisation of their dependence and withdrawal risks including rebound insomnia and seizures. Some have a long half life so used for sleep can leave the subject under the influence next day. Non-medical temazepam use reached epidemic proportions in some parts of the world with massive increases in fraudulent prescription, resulting in the banning of its use. Anecdotal evidence suggests that temazepam may be the most psychologically habit-forming (addictive) benzodiazepine.

Flunitrazepam (rohypnol) among other names is used to treat severe insomnia and assist with anaesthesia, to be prescribed only for short-term use or by those with chronic insomnia on an occasional basis. Adverse effects of flunitrazepam include dependency, both physical and psychological; reduced sleep quality resulting in somnolence; and overdose, resulting in excessive sedation, impairment of balance and speech, respiratory depression or coma, and possibly death. Because of the latter, flunitrazepam is commonly used in suicide. It is known to induce anterograde amnesia in sufficient doses; individuals are unable to remember certain events that they experienced while under its influence, particularly dangerous if it is used to aid in the commission of sexual assault. However, in a 2001 study, the benzodiazepines midazolam and temazepam were the two most common benzodiazepines utilised for date rape. In 2020 in the US, benzodiazepines accounted for 12000 deaths by overdose or suicide.

The non-benzodiazepine Z-drugs are also positive allosteric modulators of the GABA-A receptor. Like the benzodiazepines, they exert their effects by binding to and activating the benzodiazepine site of the receptor complex. Many of these compounds are subtype selective, providing novel anxiolytics with little to no hypnotic and amnesiac effects and novel hypnotics with little or no anxiolytic effects. Z-drugs have demonstrated efficacy in treating sleep disorders. There is some limited evidence that suggests that tolerance to Z-drugs is milder and slower to develop than with benzodiazepines. Zolpidem with a short half life of 2-3 hours is reported to result in occasional sleepwalking. Zopiclone has a half-life of 5-7 hours, suitable for inducing and maintaining sleep but without the hangover of temazepam, with a half life of 8-20 hours.

Fractal Biocosmology, Cosmological Panpsychism and Symbiotic Cosmology

Fractal Biocosmology

Fractal biocosmology (King 2020a) is an indisputable empirical feature of the universe, with only one partially unresolved link, in the biogenesis pathway from organic molecules found in galactic gas and dust clouds to the first evidence for life on Earth in rock formations some 3.6 billion years ago, shortly after the oceans formed. Recent research has however filled in many of the gaps in this account, so that there is a high degree of confidence that this stage is also cosmological in nature.

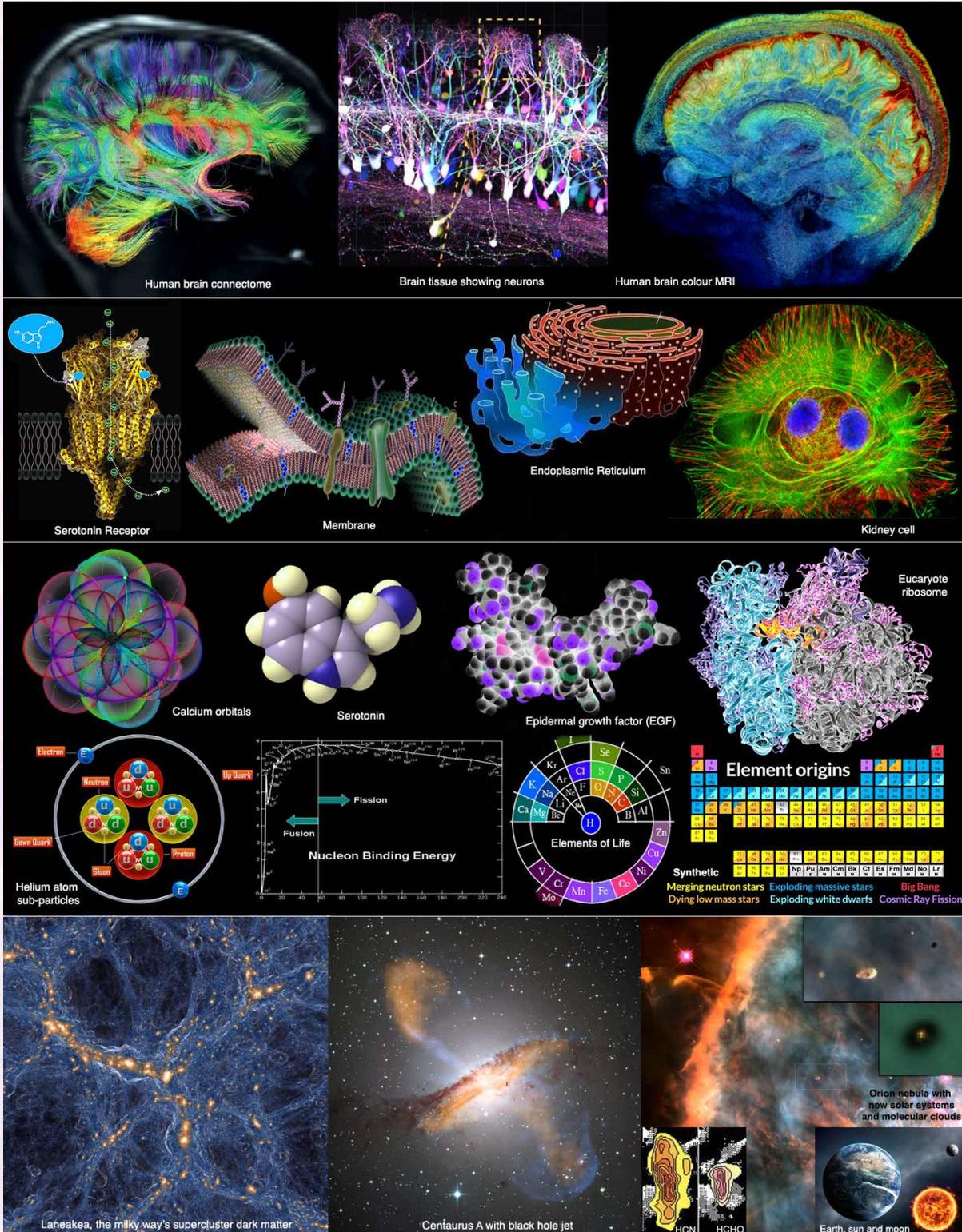


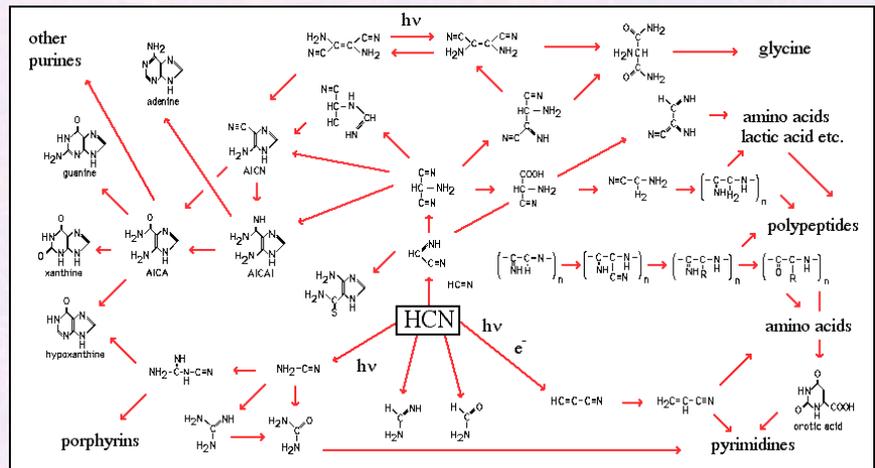
Fig 51 : Fractal biocosmology synopsis (See text below for discussion).

The physical universe and its laws hinge on investigations at two extremes, unified field theories of the fundamental forces at the quantum level and the evolution of the universe as a whole at the cosmological scale. At the quantum level, matter ends up being composed of multi-layered quantum structures, in which the strongest forces form interactive bonds first, and the rest follow in sequence of relative strength. The most complex of these quantum structures are atoms and molecules on the planetary surface, where all the forces come into structural interaction.

On the cosmic scale, following primal symmetry breaking, the universe forms a fractal structure of clusters of galaxies shaped by dark matter gravitational mass, called the cosmic web, illustrated above for the local Laneakea supercluster. Galaxies form, containing billions of stars, generally with massive black holes at their cores, as illustrated by Centaurus A above. Supernovae and colliding neutron stars end up generating the 100 or so atomic nuclei, seeding later smaller long-lived stars with the mineral elements. Among these galaxies are nebulae, consisting of gas clouds, in which star and planetary formation are taking place, such as the Orion Nebula above. These also contain gas clouds containing molecular precursors of life, from HCN and HCHO above to amino acids, seeding the biogenesis of evolutionary life. Radio-telescope data as early as 1974 (Buhl) demonstrated clouds of multiple-bonded $\text{HC}\equiv\text{N}$ and $\text{H}_2\text{C}=\text{O}$ spanning the region in the Orion nebula where several new stars are forming, fig 51. More recently, surveys from Hershel have produced high resolution maps of the distributions of HCN, and ionised H_2CO and NH_3 in both the Perseus and Serpens molecular clouds (Storm et al. 2014). These molecules form a core of primitive prebiotic syntheses in the laboratory, because multiple $-\text{C}\equiv\text{C}-$, $-\text{C}\equiv\text{N}$ and $>\text{C}=\text{O}$ bonds are some of the strongest covalent couplings in the universe, but are unstable to their higher energy π orbitals opening to make heterocyclic molecules, resulting in key prebiotic polymerisations. The nucleotide base adenine for example is $(\text{HCN})_5$ and is produced this way on industrial scales.

Fig 52: Polymeric pathways from HCN lead to both amino acids and nucleotide bases such as adenine (top left).

The four core forces of nature in the standard model plus conventional gravity, are symmetry-broken. The colour force, couples in triplets while the weak-electromagnetic couples in pairs of opposite charge. Their charge interactions display inverse quadratic non-linearities that make atomic and molecular matter have similar characteristics to Julia and Mandelbrot set fractals in terms of their quantum dynamics.



Gravity and electromagnetism both display inverse quadratic non-linearities, leading to chaotic dynamic regimes, both on solar system scales and in molecular interaction. Biological tissue is the ultimate expression of this quantum fractality in the universe as shown in fig 51. The abiogenesis of replicative life is a fractal molecular phase transition from a more diverse chaotic far-from-equilibrium milieu to the more ordered system of biomolecules in living systems, such as nucleic acids and polypeptides, which have evolved through subsequent functional refinement, a classic example of a transition toward the edge of chaos in living evolution from a more chaotic dissipative regime.

As shown in fig 51, the colour force gluons bind quarks in triplets of three colours and two base weak force flavours, forming protons and neutrons. These in turn become bound together by the strong nuclear force, a secondary effect of the colour force like the van der Waal's force in chemistry. Electromagnetism and the weak force have broken symmetry with one another. The equivalent of the electromagnetic photon, the X^\pm , and Z particles are both charged and inherit a large mass from coupling to the Higgs particle, discovered by the LHC. This means the weak force is very short range and operates primarily in the nucleus, exchanging the identities of neutrons and protons to minimise the energy in atomic nuclei and mediate the electromagnetic repulsion between positively charged protons. This in turn generates the diverse table of the atomic nuclei, the chemical elements and interactive molecular structures. A planetary surface, with a free energy source of incident solar radiation, held together by gravitation, sets the context for the negentropic quantum structural explosion we call replicative life. A hint of how symmetry breaking can interactively give rise to life as an entropy-defying unstable system can be seen from the simple [tippee top](#).

Life is present so far as we know only on planetary surfaces at much lower energies than the nuclear reactions of stars, where there is an incoming source of free energy in solar radiation, complemented by chemical gradients in the chaotic planetary environment, so it would appear that life can have little consequential affect on the evolution and fate of the universe as a whole. Traditional cosmology thus treats life as a phenomenon superfluous to the universe at large because the energies and forces of, not just of the big bang, or giant black holes at galactic centres, but even a small star like the Sun, are on a scale which would fry life to a crisp. However this picture, based on relative energy strengths, fails to appreciate the full scope of the interactive process set off by the cosmological symmetry-breaking of the forces of nature.

The chemical elements form a complex sequence of quantum structures, with orbital electrons captured by the positive charge of the nucleus, having non-linear energetics driven by the inverse quadratic electromagnetic force. The table of the elements is periodic in terms of the chain of s , p , d and f orbitals of successively higher spin and energy, according to linear Schrödinger equations and their ensuing σ , π molecular orbitals through electron sharing, but it is non-linear in terms of charge effects between negatively charged electrons and the positively charged nucleus. This means that the periodic table is not just periodic but a non-linear spiral of properties in which, for example O and S, N and P, and C and Si, each have quite distinct properties, although having the same outer orbital occupancy.

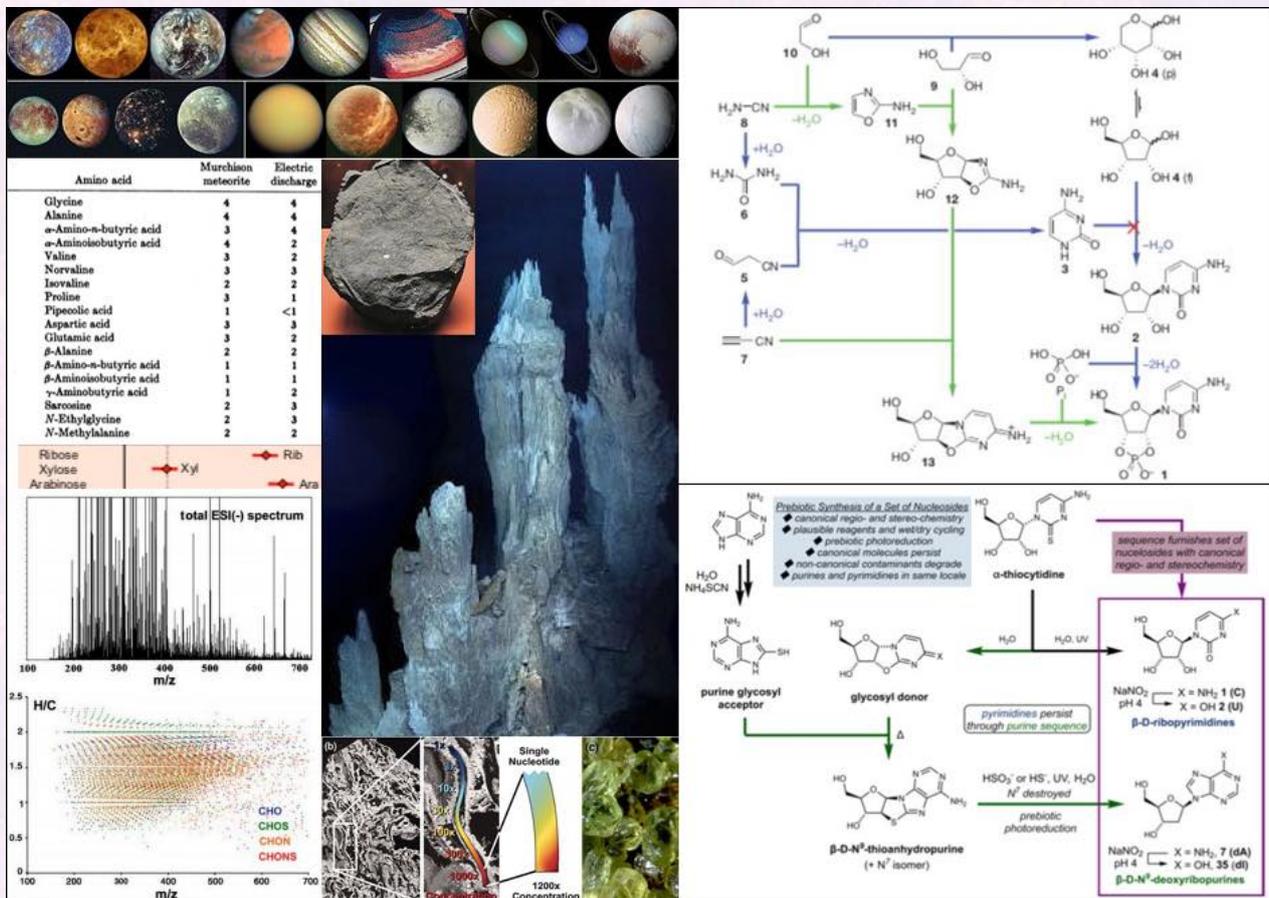


Fig 53: (King 2020a) Components of the link from organics in the universe to the origin of life on Earth. Top left: Solar system planets and moons of Jupiter and Saturn show divergent molecular compositions and chaotic surface phenomena, forming an open set of primordial conditions. Left: Murchison carbonaceous chondrite (inset), major amino acids and sugar components, and the sheer diversity of organic products. Centre left: Lost city vents formed by a chemical garden reaction between basic olivine (lower) and acidic sea water with dissolved CO_2 . Resulting H_2 and CO can drive the formation of organics including C1-4 hydrocarbons. These can be concentrated to biological levels (lower). Upper right: One pot synthesis of pyrimidine nucleotides (green), compared with the unsuccessful conceptual synthesis from ribose and pyrimidine subunits (blue) (Powner et al. 2009). Lower right: One pot synthesis of pyrimidine ribonucleotides and purine deoxyribonucleotides (Xu et al. 2020). Both weak force interactions and shoreline magnetism due to magnetite have been cited experimentally as ongoing sources of chiral catalysis (Ozturk et al. 2023). Papastavrou, Horning & Joyce (2024) have achieved RNA-catalyzed evolution of catalytic RNA.

The bioelements thus form a san-graal, or more correctly sang réal, "royal blood" relationship with the chemical elements as a whole as a core re-entrant interactive manifestation of cosmic symmetry-breaking, in which the strongest covalent elements – first row CNO – coupled with H form the core. The circular table of elements of life in fig

51 shows that these form a symmetry-broken quantum interference arrangement, centred on optimally covalent H-CNO as backbone-building elements complemented by ionic pairs K^+/Na^+ , Ca^{++}/Mg^{++} and Cl^- ; second row P, S adding additional pathways through polyphosphates and $-S-S-$ bonds, then extended by transition elements such as Zn, Cu, Co, Fe, Mn through to Mo as electronic catalysts. This gives a central cosmological status to life as the final interactive product of cosmic symmetry-breaking of the colour, weak and electromagnetic forces in the standard model of physics.

The orbital electrons are able to enter into a graduated series of chemical bonding structures, from strong covalent and ionic bonds, to weaker so-called hydrogen bonds and van der Waal's forces. Due to the non-linear energetics of cooperative weak bonding, interactively in a negentropic environment, these become able to generate fractal quantum structures extending up to the macroscopic scale of organisms, as illustrated by serotonin, the protein EGF and the ribosome complex fig 53, 54 – the factory to make proteins instructed by DNA, composed of RNAs and a number of ancillary proteins. On a larger fractal scale again, these form sub-cellular organelles, such as the membrane, as shown above and the endoplasmic reticulum. We then reach the scale of the single cell, illustrated in fig 54 for a kidney cell of a green monkey. Finally, we reach tissues in multi-celled organisms such as the olfactory bulb of the mouse above (Sakaguchi et al. 2018), then organs, illustrated above by the conscious human brain, the whole organism and the planetary biosphere.

Along with 15 amino-acids, all the nucleotide bases A, U, G, and C have been detected in carbonaceous chondrites, such as the Murchison and Tagish Lake meteorites (Glavin et al. 2012), carbonaceous chondrites containing primitive material from the Solar System's origin chemically altered by water during time on asteroidal bodies, before falling to Earth (Callahan et al. 2011, Oba et al. 2022). These also contain amphophilic membrane forming products. Alanine has been found to have a chiral excess of the L-enantiomer and L-excesses were also found in isovaline, suggesting an extraterrestrial source for molecular asymmetry in the Solar System. Ribose has been found in carbonaceous chondrites. The ribose in the Murchison has C13 levels 43% higher than terrestrial, confirming an extraterrestrial origin (Furukawa et al. 2020). Measured purine and pyrimidine compounds, including guanine, cytosine, adenine, thymine and uracil and others such as xanthine are indigenous components of the Murchison meteorite. The Murchison also contains phyllosilicates and olivine. Silicon carbide crystals in it date from as far back as 7500 billion years ago, nearly twice the age of the sun and solar system (Heck et al. 2020). Comets have likewise been shown to have primordial solar system organics, explaining how life appeared rapidly on the early earth after a period of heavy cometary and meteorite bombardment. The amino acids found have also been synthesised in laboratory experiments by the action of electric discharge on a mixture of methane, nitrogen, and water with traces of ammonia (Kvenvolden et al. 1972). A complex mixture of alkanes was isolated as well, similar to the Miller-Urey experiment.

A vast array of prebiotic molecules have been detected by mass spectrometry in the Murchison chondrite, of higher diversity than the present biosphere (Schmitt-Kopplin et al. 2009):

Here we demonstrate that a nontargeted ultra-high-resolution molecular analysis of the solvent-accessible organic fraction of Murchison extracted under mild conditions allows one to extend its indigenous chemical diversity to tens of thousands of different molecular compositions and likely millions of diverse structures. This molecular complexity, which provides hints on heteroatoms chronological assembly, suggests that the extraterrestrial chemodiversity is high compared to terrestrial relevant biological- and biogeochemical-driven chemical space.

This amounts to a clear manifestation of molecular pan-fecundity, a chaotic diversity of oligomeric fractal molecules with close to the ergodic maximum variety possible. These form an optimally fecund mix for subsequent edge-of-chaos dynamics on the planetary surface, balancing solar energy input against radiative degradation. This creates a far from equilibrium dynamic tending to minimum entropy production (Prigogine 1984, Klein & Meijer 1954), in which each type of molecule has a potentially catalytic influence through its orbital attractions, at the same time participating in creation annihilation events when bonds are formed and broken. But this isn't any kind of genetic panspermia, it is pan-fecundity of chaotic molecular diversity characteristic of the CNO-H + S component of the light elements on a rocky 'goldilocks planet' transitioning down to the temperature range of liquid H_2O . The process approaches chaotic fecundity because this optimally covalent molecular sector of the table of the elements, starts out with diversity and has no strong dynamic attractor to form predominant species, given the founding diversity and the opposing influences of anabolism and catabolism, so we end up with a quantum energy landscape with few strong attractors and ergodic diversity. Biogenesis then becomes a transition from deep molecular chaos towards the edge of chaos in which auto-catalytic populations emerge, and as we come closer to the edge, universal computation as in cellular automata ensues, eventually arriving at nucleotide replication and translation as a transition, leading to the reduced set of molecular varieties we find in metabolic biochemistry, RNA, DNA, proteins and lipids. This process is akin to an

ergodic version of adiabatic quantum computation, and the autocatalytic features constitute a selective process, affecting future survival of the species involved, whose catalytic potential is its “genetic” signature, forming a primitive evolutionary process in the collective auto-catalytic system as a prebiotic progenote.

Carl Woese (1998) coined this term for the kind of pseudo-organism that hypothetically existed prior to the universal common ancestor of all life LUCA. He described a process of genetic annealing, similar to neural net annealing on a potential energy landscape, at the point RNA replication and protein translation had both become established:

First consider the analogy: a physical annealing system starts at a high enough temperature that structures cannot form and then proceeds to slowly cool. In this quasi-stable condition, various combinations of the system’s elements form, dissociate, and reform in new ways, with only the most stable and structured of these combinations initially persisting, i.e., ‘crystallizing.’ As the temperature continues to drop, less stable structures begin to form, to crystallize, and many of the preexisting ones add new features, becoming more elaborate. In the evolutionary counterpart of physical annealing, the elements of the system are primitive cells, mobile genetic elements, and so on, and physical temperature becomes ‘evolutionary temperature,’ the evolutionary tempo. The evolutionary analog of ‘crystallization’ is emergence of new structures, new cellular subsystems that are refractory to major evolutionary change.

These considerations apply equally to the prebiotic transition before genetic replication and translation, when the catalysts were even weaker than early genetic systems only able to translate small proteins inaccurately and replicating erratically at lower fidelity. Therefore the entire autocatalytic population is required to maintain survival and evolution.

Lost city vents are formed by a chemical garden reaction between basic olivine and acidic sea water with dissolved CO₂. Olivine is cosmologically abundant on asteroids, Earth and the Moon and was far more abundant on the early Earth. Resulting H₂ and CO can drive the formation of organics including C1-4 hydrocarbons. Lost-city vents have been found to form carbonate columns with pores which have been demonstrated to be able to concentrate organics and in particular nucleotide molecules by a factor of over 1000 (Baaske et al. 2007), bringing them up to molar concentrations where a reactive metabolism and informational replication could be sustained. This provides a prospective nursery environment for life to emerge as a far from equilibrium complex dissipative systems becoming a cooperative progenote of replicating nucleotide and polypeptide molecules, with cell membranes and the genetic code arising later as an evolutionary product (fig 59).

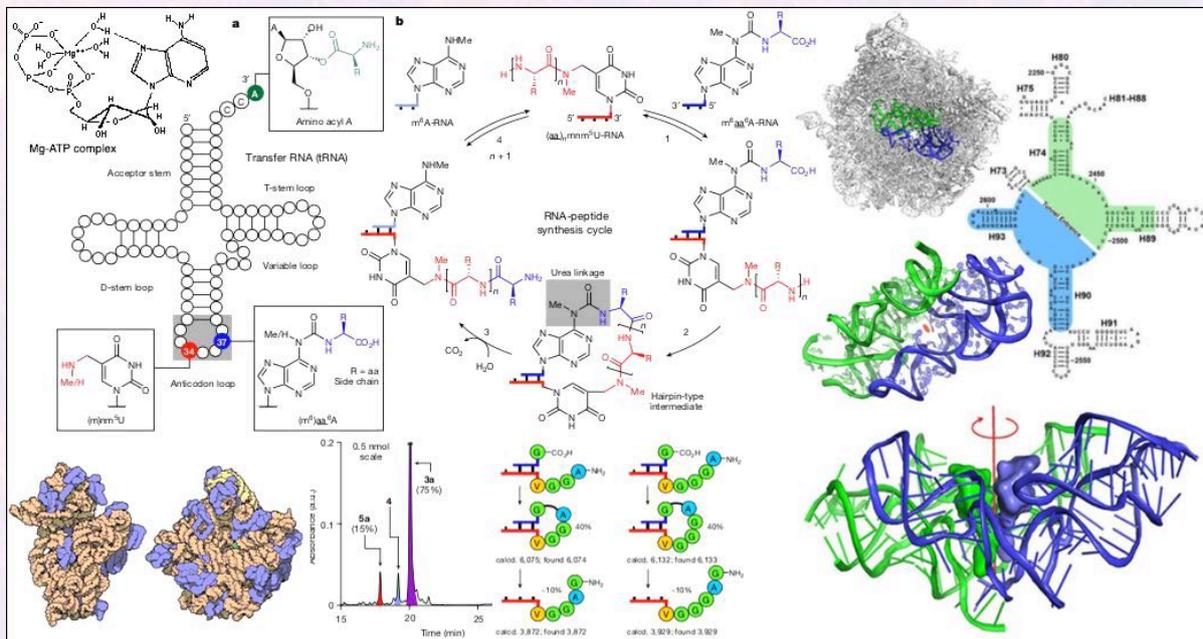


Fig 54: The ribosome (lower left) involving both two large rRNAs, (pink) with chaperone proteins (purple) the left one holding the mRNA and the right one building the nascent protein, along with small t-RNAs (upper left) specific for each amino acid which have to be coupled to their amino-acids by protein synthetases (Carter & Wills 2018). (Centre) A primitive precursor (Müller et al. 2022) to the dependence of RNA-based protein on the ribosome. Modified bases, still found on transfer RNAs (top centre) have been found to be able to induce formation of oligomeric chains of peptides (lower centre) by a cyclic process involving base pair binding between small RNAs carrying these modified bases (top right), confirmed by the chromatography rests (lower centre). (Right) Protoribosome, consisting of RNA molecules comprising only of some 120 nucleotides, about 60 for each of its two semi-symmetrical components, which accounts for less than 5 percent of the modern ribosome’s dimensions: some 4,500 nucleotides in bacteria and nearly 6,000 in humans. This forms a pocket able to join amino acids together. “Peptide bond formation is the most vital activity in any cell, and we’ve shown that it can take place within a protoribosome,” (Bose et al. 2022).

The “hard problem” of the critical step to replication has all but been solved in laboratory one pot reactions, fig 53, both capable of generating nucleotides from primitive precursors (Powner et al. 2009, Patel et al. 2015, Stairs et al. 2017) and a pyrimidine ribonucleotide and purine deoxy-ribonucleotide alphabet in the same pot (Xu et al. 2020). The key to understanding this is that all living systems are thermodynamically unstable dissipative systems depending on external sources of energy to maintain their polymeric stability, or the processes would immediately run to equilibrium in a terminal polymer. This is exemplified by the ATP-MG complex in fig 54, which is a single adenine nucleotide monomer with triple phosphates forming the principal energy currency of all metabolism demonstrating the exothermic nature of the polyphosphate bond that is also the linking bond in oligonucleotides.

This means that there is no stable polymerisation route to the first oligonucleotides, so that laboratory simulations for example of spontaneous RNA polymerisation cannot be performed without the complex substrate of prebiotic molecules that enabled this process, which necessarily take long lifetimes to explore the “topologically open” set of initial conditions that make this possible, although on evolutionary time scales they were short, as there is now evidence for life 3.45 bya ago, only around 500 mya after the oceans condensed (Schopf et al. 2002, 2018, Dodd et al. 2017). In every case where the route has proved difficult, from synthesising polynucleotides (fig 53) to RNA driven protein synthesis (fig 54), alternative pathways are subsequently discovered, that demonstrate the preconceived difficulties are due to failing to think outside the box, for example by assuming the sugars and bases have to be formed and then joined as whole units as fig 55 shows is fallacious.

Müller et al. (2022) fig 54, provide a third counter-intuitive ground-breaking discovery, showing that the modified RNA bases still present in transfer RNAs, when two RNAs hydrogen bond together can promote the polymerisation of amino-acids, providing a precursor route to the translation apparatus that later emerged in the ribosome. These modified bases, attached to short RNAs like tRNAs can co-synthesise peptide chains, forming diverse hybrid RNA-peptides with all kinds of catalytic functions no one had thought of. Here we have a demonstration of a completely new insight which has already been experimentally confirmed in the liquid chromatography assays in the figure and is thus feasible with the modified bases still existing in tRNAs, which is surprising in itself. Originally there would have been more. Confining RNAs to be pristine and proteins to be pristine is a misconception that has arisen because genetically coded translation later refined it to be like that. The underlying process is highly fecund as we should have expected, because amino acids are cosmologically abundant more so than nucleotide bases and have much more diverse catalytic diversity, so hybrid RNA-polypeptide molecules have more catalytic and complexity capacity to bootstrap abiogenesis. Bose et al. (2022), fig 54 have taken this a step further, discovering a semi-symmetrical proto-ribosome capable of forming peptides with only 5% of the ribosomal rRNA. These discoveries in one fell swoop demolish any irreducible complexity argument for the ribosome, transforming the paradigm of abiogenesis.

The climax of the cosmological interactive sequence emerging from the symmetry-breaking of the fundamental forces is conscious life. The brains of higher mammals and birds are the most complex coherent quantum structures we know of in the universe and thus, in terms of the cosmological interaction sequence, form their ultimate consummation. This structurally inverts the Copernican principle that humanity does not have a privileged view of the universe. Not only does it have a privileged view because we are conscious, both of ourselves and of the universe as a whole, but because we are its ultimate structural and dynamic expression, arising from the cosmic origin. A major concern is that of the Fermi paradox – the lack of astronomical evidence for extraterrestrial life. One critical hypothesis is not that intelligent life is unlikely, but that its probability for self-destruction destabilises the evolutionary paradigm through cultural misadventure, as we are seeing with human-induced climate and biodiversity crisis – the Medea hypothesis (Ward 2009).

Darwinian Cosmological Panpsychism

Darwinian panpsychic cosmology provides a description in which the subjective aspect is an integral complement to the objective physical universe, encapsulated in a series of evolutionary forms in: (a) individual quanta, (b) Gaia processes: Critically unstable multi-quantum dynamical systems, (c) living cells, (d) full consciousness in sentient form in eucaryotes (e) in organismic form in multi-celled organisms (f) in the evolving biosphere and (g) collectively in the universe. This is basically an evolutionary classification with edge-of-chaos phenomena and quanta linked by the butterfly effect. It replicates the results of standard quantum mechanics and of molecular biology, except in so far as idiosyncratic outcomes of quantum uncertainty, associated with collapse of the wave function are concerned, where the subjective aspect has functionality without disrupting physical causality.

it's perfectly reasonable to say that “the weather has a mind of its own”; it just happens to be a mind whose details and “purposes” aren't aligned with our existing human experience (Stephen Wolfram 2021).



Fig 55: Darwinian panpsychic cosmology synopsis

The cosmology thus replaces irreducible randomness of the Copenhagen interpretation of quantum mechanics with pan-psychic collapse generated through space-time quantum entanglement as input expressed in individual quantum events as output. Because irreducible randomness leaves the individual quantum free to manifest at any location in its equi-probable space normalised by the wave function, as consistent with the pilot wave interpretation's replication of standard quantum mechanics, no other inconsistencies arise. Because quanta may be also able to act under certain circumstances as interactive panpsychic "observers", the universe is able to collapse its own ramifying wave functions with human observer collapse just being a special case acting on unstable brain states, the multiverse (Deutsch 1997) becomes a real universe, arising from a phase transition between entanglement and collapse, with an ongoing line of history, as we perceive it.

This picture is one in which new probability branches are being created in the wave function by superposition in a similar manner to fractal cosmic inflation (Linde 1986, Hawking & Hertog 2018) while others are being collapsed by conscious measurement, resulting in dynamic evolution of the cosmic wave function. Special relativity, the most

classical part of quantum reality, is implicitly retrocausal as well as causal, as in quantum transactions, so quantum reality is implicitly anticipatory, involving transactional collapse across relativistic space-time in which a network of potential transactions become one or a set of real emitter-absorber interactions.

Fig 56: Fractal Cosmic Inflation leaves behind symmetry-broken universes.

These systems all inherit the capacity to avoid approach to classical macroscopic, limit as they are processes which are not IID systems generated by independent and identically distributed measurements (Gallego & Dakić (2021). Similarly, in the approach of stochastic electrodynamics (SED) (de la Peña et al. 2020), in which the stochastic aspect corresponds to the effects of the collapse process towards the classical limit ²⁸, consciousness has been proposed to be is represented by the zero point field (ZPF) (Keppler 2018).

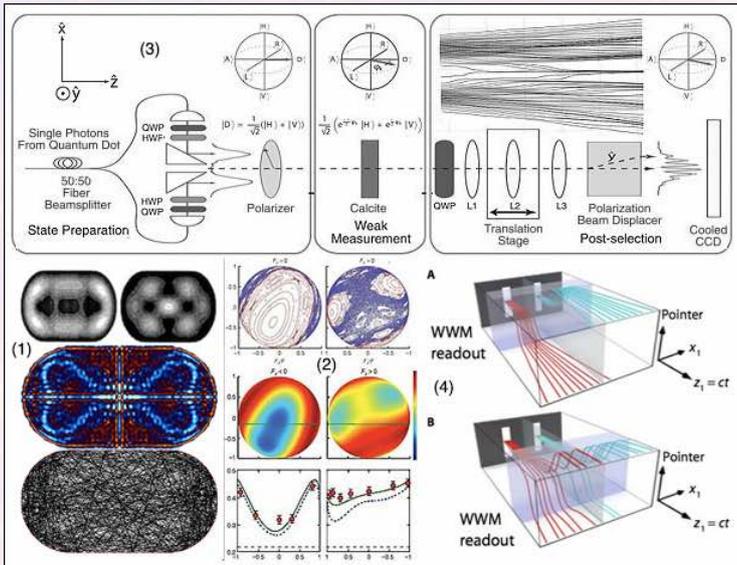
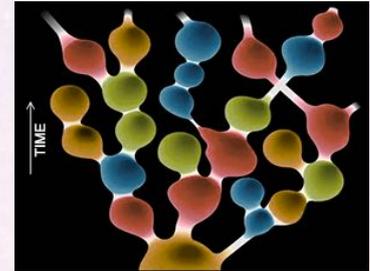


Fig 57:(1) The quantum stadium illustrates suppression of chaos in closed quantum systems. Top: Experimental realisation of scarring of the wave function around wave eigenfunctions, biasing the probabilities around unstable classical repelling orbits. Mid: Cellular automata simulation (King 2013). Bottom: Classical chaotic ergodic trajectory. (2) While the classical kicked top (above) shows similar regions of chaos to (1) in the Poincare map sections (top), the quantum kicked top (middle and bottom) shows chaos inducing entanglement with nuclear spin (Chaudhury et al. 2012). Entanglement between the electron and nuclear spins is quantified by the linear entropy, of the electron reduced density operator. (3) Weak quantum measurement demonstrating Bohmian trajectories (Kocsis et al. 2011). (4) Experiment confirming the existence of surreal Bohmian trajectories (Mahler et al. 2016). Conceptual diagram of the result of reading out the which way measurement (WWM) in a double-slit apparatus in the near field (A) and in the midfield (B). Color indicates the slit of origin of a Bohmian

trajectory, and vertical position indicates the result of the WWM. This surreal behaviour is the flip side of the demonstrated nonlocality. This nonlocality is due to the entanglement of the two photons, which, in Bohmian mechanics, makes their evolution inseparable even when the photons themselves are separated. Because entanglement is necessary for the delayed measurement scenario, this nonlocal behaviour is to be expected and is the reason for the surreal behaviour.

The Darwinian panpsychic description invokes seven broad evolutionary classes: (1) individual quanta (2) edge of chaos physical phenomena (3) excitable cells (4) eucaryote cells with informationally sentient membranes (5) organisms (6) evolving biospheres and (7) the universe as a whole. In this description, processes (1) – (3) consist of primitive subjectivity, while there is a discrete transition to sentient consciousness in (4) with the sequestering of respiration in the mitochondria with the eucaryote endosymbiosis, freeing the cell membrane for excitable sensitivity and social informational signalling via the molecules such as serotonin which evolved to become the principal neurotransmitters in the brain. This in philosophical terms, primitive subjectivity which philosophers call phenomenal consciousness is universally panpsychic and but the transitive structural details of subjective consciousness is emergent in a discrete transition with the eucaryotes, culminating in organismic consciousness through the constraints of neurodynamics. As noted, panpsychic quanta possess both consciousness through the space-time interactivity of the wave function and free will as a result if individual uncertainty, which Conway & Kochen (2009) show implies conscious free will.

Wong et al. (2023) also suggest that evolutionary principles may apply to natural phenomena extending beyond living systems by functional selection: “A star’s elemental abundances change over its lifetime; a hurricane incorporates many different parcels of air over its lifetime; organisms constantly exchange matter with their environment. We contend that Darwinian theory is just a very special, very important case within a far larger natural phenomenon. The notion that selection for function drives evolution applies equally to stars, atoms, minerals, and many other conceptually equivalent situations where many configurations are subjected to selective pressure (Robert Hazen).

²⁸ The approach of SED is guided by the hypothesis of the existence of the (random) zero-point radiation field, ZPF. This rather more elaborate approach goes through a statistical evolution equation in phase space, to arrive at a description in x-space, in which the dissipative and diffusive terms are seen to bring about a definitive departure from the classical Hamiltonian dynamics.

The eucaryote endo-symbiosis – a discrete topological transition of re-entry of the two founding life forms – archaea and bacteria – is the most outstanding evolutionary transition since the origin of life. It has resulted in edge-of-chaos excitability in the cell membrane, which becomes an arbitrarily sensitive sense organ due to the butterfly effect and also reaches to the quantum level invoking quantum uncertainty at unstable tipping points, thus freeing the dynamic to be causally open in a way which allows subjective conscious volition to intervene in the behavioural outcome. This is where attentive consciousness as we know it began and its principles have continued to be used by multi-celled organisms ever since in the diversity of conscious brains spanning the animal tree of life.

For this to have happened, not only the excitable brain, but its subjective conscious volition has to have retained an evolutionary advantage to the organisms possessing it in terms of anticipating immediate, or intermediate, threats to survival and opportunities to flourish. This suggests a form of anticipation which combines previous experience encoded by the brain with a form of conscious anticipation, which may utilise retrodictive aspects of quantum uncertainty.

Let's look at this evolutionary question more closely. The fact that the founding eucaryote membrane after endo-symbiosis became a chaotically sensitive complex dynamic doesn't mean it is just a physical dynamical system, or conscious volition never would have emerged and been elaborated in multicellular brains leading to our own conscious experience and volition. This process was a discrete topological transition freeing up the cell membrane for arbitrarily sensitive sentience and sensitive social communication via founding neurotransmitter molecules.

We are dealing with a choice between conscious attentive volition and automatic brain processing. These have to have physical differences in the organisms, so this is not the same as David Chalmers' zombies, which are conceived to be physically identical but are not conscious. It's not just a philosophical question, but an evolutionary one. If we define a "zombie" as an organism without conscious volition that is otherwise comparably similar to a conscious organism, there are two evolutionary arguments:

- (1) We know the eucaryote endo-symbiosis was a major evolutionary transition almost as significant as the origin of life itself and that all the ancestral archaea that gave rise to the eucaryotes have been swept off the face of the Earth by the very success of the founding eucaryotes. In this transition, procaryote "zombie" organisms possessing primitive subjectivity, but not sentient consciousness, evolved into and were replaced by conscious eucaryotes. This is however a phase transition in which both conscious sentience and a hugely improved energy and informational metabolism resulted, so it's hard to attribute a definable portion of the evolutionary advantage to conscious volition.
- (2) We can see in the evolution from single-celled eucaryotes to complex animal brains that these same intelligent cells have used the same dynamical basis to generate diverse brains providing a highly adapted environmental perceptual and behavioural dynamic using these same principles in their neurons. These first emerged in the loosely networked nervous systems of cnidaria such as hydra and then to mollusc, arthropod and vertebrate nervous systems all using the same founding edge-of-chaos neuronal dynamics and all of which appear to be conscious, as their tendencies to REM-like dreaming sleep attest.

This brings us to the second type of evolutionary advantage displayed by the universality of consciousness in animals. The ability of conscious organisms to out-survive mutational "zombies" that reduce or eliminate the role of conscious volition. The way consciousness in amoeba-flagellates appears to work is by the membrane having edge-of-chaos excitability with a butterfly effect which is causally open because it is quantum uncertain due to the butterfly effect. Now there is nothing stopping mutations in the organism tweaking this dynamical system to reduce or eliminate the source of this causal openness, which after all has a cost in terms of uncertainty of outcomes and a cost dynamically operating in this way. These zombies could arise by a variety of mutational avenues but there is no evidence for them. *Giardia lamblia* and related organisms have effectively lost their mitochondria, although there are relics present, and so present an example of retrogressive evolution, although this may not directly alter cell membrane dynamics.

This argument applies to all of evolution since, so it can apply to an organism like a fruit fly which could alter its developmental process so its neurons retreated from edge-of-chaos and differentially evolved to have entirely computational brains. Still they don't exist so far as we can experimentally determine, except perhaps for the roundworm *Cenorhabditis elegans* which comes close to computational organisation developmentally. Therefore the evolutionary argument holds.

Turning back to primitive subjectivity, many natural phenomena, take the form of edge-of-chaos processes, such as wind, waterfalls, thunder and lightning storms, from turbulent mountain summits to the ocean, which from the point of view of symbiotic panpsychism are strong candidates for primitive coherent subjectivity, consistent with animistic views. However it is not a physicalist form of panpsychism, as advocated by Galen Strawson (2006). SEC's form of panpsychism involves only root subjectivity, with brain dynamics as a boundary condition moulding how this is shaped into subjective qualia we experience, so it does not require the detailed analysis of how qualia are composed subjectively that arise in pan-protopsycho theories. Primitive subjectivity is consistent with the complementary subjective-objective picture of quantum reality of Vimal (2008, 2009), and in a more elaborate way by Boyer (2015).

This has a view of physical complexity which differs from integrated information theory (IIT), (Tononi and Koch 2015) in that it stresses the features of having unstable but coherent subjectivity as an unstable anticipatory property rather than system complexity as in the Markov complexity parameter of IIT, which is just an abstract mathematical formulation. Unlike Goff's notion of raw cosmic consciousness, possessing only elementary properties of agency and future awareness, the universe, like the biosphere possess forms of consciousness through the collective and individual subjective awareness of its participant biota.

While closed quantum systems such as nuclear energetics and the quantum stadium display suppression of chaos by energy separation of the eigenfunctions and by scarring of the wave function, as shown (1) in fig 57, chaotic systems where there is possible coupling to other interactions, such as the quantum kicked top (2) display additional quantum entanglement in the chaotic regime, exemplified by entanglement between electronic and nuclear spins in (2). This shows quantum chaos induces deeper levels of entanglement.

In weak quantum measurement (3), a photon released from a laser-excited quantum dot can demonstrate Bohmian trajectories by making a weak measurement which slightly disturbs the wave function without inducing collapse by absorbing the particle, which can then be used over multiple trials to map out individual trajectories over different time delays by detecting the particle's absorption. A significant aspect of this approach is that it involves a form of retrodiction, or backward causality we have seen in the Wheeler delayed choice experiment fig 74. Bohm's pilot wave theory involves a particle with a definite position shaped by a quantum potential derived from the wave function that carries all the other features such as spin.

Englert et al. (1992) noted that, in certain circumstances, the pilot wave theory could cause overlap of these real trajectories in such a way as to cause some trajectories in a two-slit interference experiment to behave as if they had come through the opposite slit to the one the Bohm interpretation implied, invoking a conflict with standard quantum mechanics. This caused a debate in the physics community, with opponents decrying the pilot wave interpretation. This was opposed by Basil Hiley, an original co-researcher with David Bohm. Hiley et al. (2000) stated : *"We also argue that contrary to their negative view, these trajectories can provide a deeper insight into quantum processes ²⁹."*

"This suggests that it may still be possible to retain the notion of a 'particle' even in the quantum domain. ... Alternatively we could give a more general meaning to these curves. For example, we could imagine a deeper, more complex process, which is not localised, but extends over a region of space where the wave function is non-zero. The curve could then be interpreted as the centre of this activity as this process evolves in space". ... "In spite of these limited successes, the nature of this deeper process is still very illusive and arises essentially from the non-commutative structure of the quantum algebra."

Mahler et al. (2016) demonstrated the actual existence of such trajectories, which are equivalent to streamlines of the probability currents in standard QM (Tastevin & Laloë F 2018), noting that their existence did not imply a conflict between the theories, but indicated instead a new level of quantum entanglement between the particles: *"This nonlocality is due to the entanglement of the two photons, which, in Bohmian mechanics, makes their evolution inseparable even when the photons themselves are separated. Because entanglement is necessary for the delayed measurement scenario of ESSW, this nonlocal behavior is to be expected and is the reason for the surreal behavior they identify. Indeed, our observation of the change in polarization of a free space photon, as a function of the time of measurement of a distant photon (along one reconstructed trajectory), is an exceptionally compelling visualization of the nonlocality inherent in any realistic interpretation of quantum mechanics"*.

Taking Hiley et al. and Mahler et al. at face value, we again have a situation where Bohmian trajectories are found to be consistent with quantum mechanics, confirming their validity in this context, but that the situation invoked by the experiment demonstrates deepening entanglement in these interacting systems.

²⁹ *"It is interesting to note that the surrealist movement in art claimed that there was more to reality than mere outward manifestations. There was a deeper reality (literally surreal means super reality) that lay behind outward appearances. When the word surreal is used with its intended meaning, then surreal trajectories is the correct term to describe them! Unfortunately [Englert et al.] use the term in a pejorative sense"* (Hiley et al.)

The validity of the pilot wave theory in these situations, when no issues of conflict arise with the Feynman path integral formulation, means it is also legitimate to propose that the deeper entanglement is playing a role in determining the position of the particle in the wave as any position in the probability space normalised by the probability amplitude is equally legitimate under the concept of irreducible randomness. Thus symbiotic cosmology is effectively consistent with both pilot wave and standard interpretations but suggests trajectories are derived from deep entanglement. When a theoretical explanation of any such quantum experiment is made, the quantum equations used to describe the outcome presume the only entanglements are the ones defined by the experimental apparatus used, but the quanta in the universe at large are all carrying a host of subtle entanglements from their past and future interactions and those of the other quanta they have interacted with. The equations are thus a first order ideal that masks the deep entanglement in both the experimental situation and the world at large..

Thus while panpsychic cosmology appears to introduce an ephemeral subjective complement to the universe, the effect is to give us back the real historical universe we experience, rather than the shadow multiverse of superimposed wave functions, because the subjective aspect of quanta participate in wave function collapse. The universe is thus not stranded from manifesting historically in the absence of conscious animate observers, but these animate observers through their consciousness are nevertheless able to also collapse wave functions in contexts like Schrödinger's cat for example those that are involved in brain function. Indeed this makes von Neumann's comment that collapse can happen anywhere up to the point of prescient conscious observation. In fact the traditional cat paradox experiment might collapse at the cat who is/was also conscious. But there are also diverse human strategic situations where tipping points occur and small acts of idiosyncrasy can have world-changing consequences.

Critically, it restores our subjective conscious ability to apply volitional will to affect the physical world around us. As noted in the introduction, all sane people have an implicit existential awareness that we make subjectively conscious intentional decisions and apply our volitional will to produce change in the physical world. We act and feel that we are intentional agents subjectively applying our will in our decisions and our actions and can do so through our intuitions. In this sense I am defining agency as the ability of subjective conscious experience to affect the physical world through the application of consciously experienced volition, resulting in physical effects, in our behaviour and actions. As noted in the introduction, affirming the efficacy of conscious volitional will leads directly to panpsychism, because some matter (brains) can manifest subjective consciousness affecting the physical universe, but because the brain is normal matter, obeying the four core quantum forces, even though these may involve exotic quanta such as quasi-particle excitations, subjectivity is a property complementing the physics of the universe. In this sense agency is subjective conscious volition intentionally affecting physical reality, unlike the purely objective notions of Moreno & Mossio (2015), where weak and adaptive agency are just objective dynamical structures.

The brain, in which continuous wave excitations and complementary discrete phased pyramidal action potentials are forming, is a process at face value homologous to quantum observation of edge of chaos dynamics at unstable tipping points. The role of consciousness as a quantum observer of the brain's own attention dynamics, noted in Graziano's (2016) AST model, would enable a quasi-causal role for volitional will to avoid lethal misadventure, by filling in the uncertainty gaps in edge of chaos computation and thus validate our veridical impression of possessing autonomous will as real rather than the delusion materialists claim. Human decision-making has a similar idiosyncratic nature to single quantum events I shall call a **quantum instance**, just as evolution is a sequence of adventitious quantum transformations, every one of which is a single unrepeated quantum instance, none of which individually converge to the classical expectation of the probability amplitude. In this way there is a deep correspondence between human decision making, evolutionary mutation and the cosmological idiosyncrasy³⁰ of a single quantum instance, which is completely uncertain. Hence the free-will of the quantum is its instance and our volitional will is also an instance.

See: [Primal Foundations of Subjectivity](#) for a further explanation of this process.

9 Cosmological Symbiosis

We next explore how the [fractal](#) and [panpsychic](#) cosmological pictures fit into a deeper [symbiotic](#) picture, in which biological life, the universe and consciousness all enter into a symbiotic relationship extending the manifest [biological symbiosis](#) that is the basis of the endosymbiotic eucaryote cell, eucaryote sexuality, cell-virus symbiosis and the natural and sexual selection (Darwin 1859, 1889), that is universal in the biosphere.

³⁰ *idiosyncrasy* a mode of behaviour or way of thought peculiar to an individual *idiosunkrasia*, from *idios* 'own, private' + *sun* 'with' + *kraasis* 'mixture'.

Fig 58: The Huichol nierika or portal to “ultimate reality” and the “spirit world”: Cosmological symbiosis realised through psychic symbiosis.

Cosmological Symbiosis

Cosmological Complementarity

1. The **physical universe has a veridical**³¹ complement – **cosmological consciousness**, or the “mind at large”, the subjective manifestation of the cosmos. Individual human consciousness is an encapsulated instance of the whole.
2. The mind at large **shapes physical history** in the quantum multiverse, through **volitional will** collapsing the superimposed, quantum-entangled wave functions. Full scale cosmology image

Biogenesis

3. **Cosmological fecundity**: The physical universe is the most complex quantum fractal conceivable in space-time, due to cosmic symmetry-breaking of the four quantum forces – gravity, the weak and colour forces and electromagnetism.
4. Consequently emergent molecular action is a complex fractal quantum process, culminating the symmetry-broken interaction of the four quantum forces of nature.
5. At the same time, planetary conditions permeate the degrees of freedom for biogenesis, due to chaotic dynamics of gravitation and the other forces.
6. Consequently, due to ergodicity³², replicative life will take root in an open subset of cosmological conditions.

Evolution

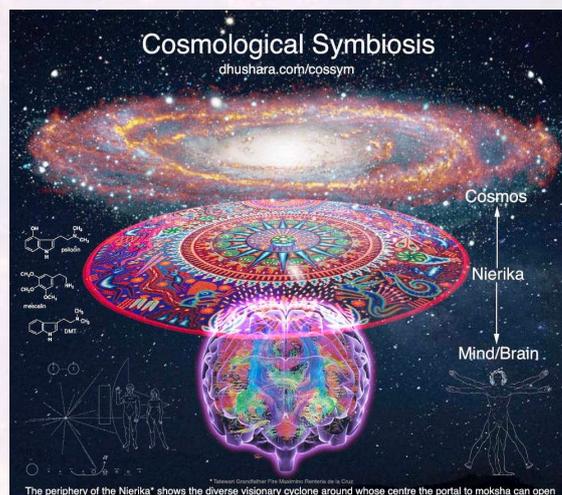
7. **Computational catastrophe**: With the advent of genetic evolution, molecular interaction becomes a complex massively-parallel quantum computer, accumulating adventitious information through mutation and natural selection.
8. **Cellular excitability**: Edge of chaos excitable cells gain a coherent encapsulated form of panpsychism, which is adaptive to survival and is thus selected for.
9. **Eucaryote symbiosis** between the two founding branches of life, archaea and bacteria, triggers a **complexity catastrophe**.
10. **Cellular consciousness**: Adaption to environmental modes of quantum perturbation of cell excitability in eucaryotes results in cellular sentience. This is the critical transition to existential consciousness. The transition to brains is a secondary extension.
11. **Signalling molecules**, such as serotonin, evolve to mediate modes of social interaction conducive to survival of the collective organism in single celled eucaryotes, also affecting epigenetics and, by selection over the result, genetics.

Organism

12. As organisms evolve to become multi-celled, cellular consciousness becomes **organismic consciousness** via neuronal coupling.
13. **Fractal culmination in the Biota**: Conscious organisms become the consummating fractal interactive expression of cosmological symmetry-breaking, running from quarks through nuclei, atoms and molecules, to molecular complexes such as the membrane and ribosome, to cell organelles, cells, tissues, organs such as the brain, societies of organisms and the symbiotic biosphere.
14. The brain’s organismic consciousness becomes **evolutionarily adapted** to aid the **survival of the organism** and the family.
15. In mammals, this involves **limbic emotions**, invoking a dynamic network for survival that we consciously identify with **the ego**.
16. At the same time, the brain, as a closely-coupled society of neuronal cells, interacting via the same signalling molecule types, remains **dependent on elementary amine-based neurotransmitters**, to modulate key survival strategies, because these arose from modalities directly ensuring the survival of the collective organism in single-celled species.
17. **Involution**: Again at the same time, given the variety of niches on an Earth-like planet, several species are likely to evolve to synthesise modified amino acid derivatives (e.g. psilocin, DMT, mescaline), capable of altering the dynamics of consciousness in such a way as to bring individual consciousness back into relationship with the mind at large using the same receptor pathways.

Biospheric, Psychic and Cosmological Symbiosis

18. All living species, including humans, survive through evolutionary niches in effective **biospheric symbiosis** with the whole.
19. Because *Homo sapiens*, the currently dominant species on Earth has evolved an **ego-based form of individual consciousness**, evidenced in our tribal emergence, our species is not adapted to, and thus **lacks the intrinsic ability to care for the planet** mindfully enough to avoid exploiting it to the extent that it becomes **critically compromised**, threatening human survival.
20. **Entheogenic species** bearing **psychedelic neurotransmitter analogues**, by tweaking a central brain survival mode at the receptor level, can precipitate **ego dissolution**, leading to **moksha** – reunion with the “mind at large”, thus evoking a psychic symbiosis with humanity complementary to our inter-dependence with food, medicinal, and biosphere-supporting species.
21. This psychic symbiosis enables humanity to find its role as the guardians of the living planet and the flowering of conscious existence in evolutionary and cosmic time scales, rather than becoming its tragic “*espèce fatale*”, thus resolving the existential and planetary crises, fulfilling the spiritual, eschatological and scientific quest for the meaning and purpose of intelligent life.
22. **Psychic symbiosis** is potentially as significant as the eucaryote symbiosis, because the future survival of the planet’s entire living diversity is at stake and it is thereby manifesting **cosmological symbiosis** of the physical universe and mind at large, thus providing a means to avoid a mass extinction of biodiversity invoking the self-destruct scenario of the Fermi paradox.



³¹ *veridical* – coinciding with reality (Oxford Languages). Mid 17th century: from Latin *veridicus* (from *verus* ‘true’ + *dicere* ‘say’) + *-al*.

³² *ergodic* – relating to, or denoting (e.g. chaotic) systems or processes with the property that, given sufficient time, they include or impinge on all points in a given space and can be represented statistically by a reasonably large selection of points.

Symbiosis and its Cosmological Significance

According to Thomas Hertog (2023), in a post-humous follow on from Stephen Hawking's "Brief History of Time (1988), the new perspective that he has achieved with Hawking reverses the hierarchy between laws and reality in physics and is "profoundly Darwinian" in spirit. "It leads to a new philosophy of physics that rejects the idea that the universe is a machine governed by unconditional laws with a prior existence, and replaces it with a view of the universe as a kind of self-organising entity in which all sorts of emergent patterns appear, the most general of which we call the laws of physics."

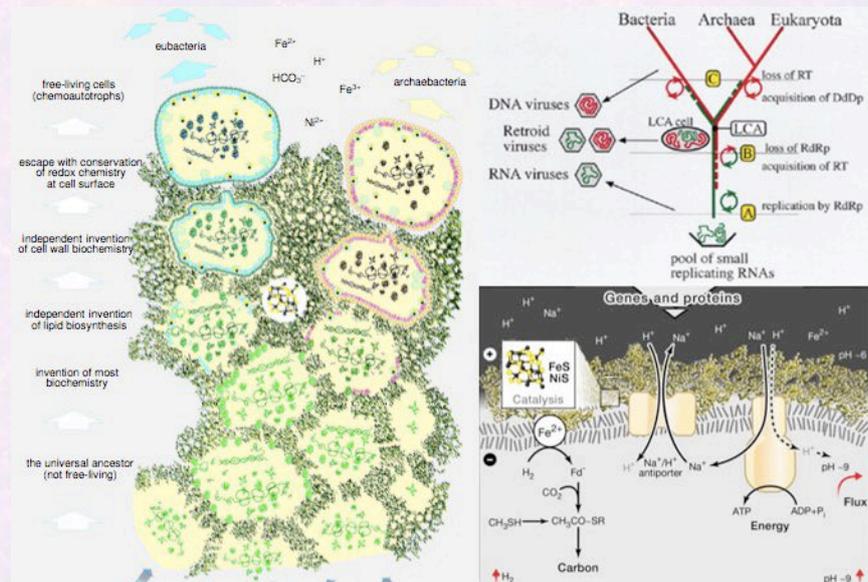
It is critically important in this discussion to understand how pivotal symbiosis is to the continuity of life in the universe. When we talk about survival of the fittest and the notion of the selfish gene seeking its own replication, these both occur in the context of natural selection, which is selection by symbiosis with the biosphere as a whole. Apart from a few extremophile archaea whose niches are predominantly geospheric, all evolutionary niches are biospheric, relative to the living diversity of all other species defining the niche, so natural selection is the key vector of biospheric symbiosis. Thus the capitalistic notion of survival of the fittest in the concrete jungle of human economic business as usual is a biospheric tragedy of the commons, (Hardin 1968) resulting only in planetary crisis, as a misaligned manifestation of human tribal origins. Species we see as predatory, or parasitic, also have symbiotic roles in ensuring the survival of their hosts and prey. For example, carnivore predation also avoids their herbivore prey populations going into boom and bust extinction by eating out all their vegetative food supplies.

All the interesting things in the universe happen at the edge of chaos (Teuscher 2022). Cosmological symmetry-breaking causes the structure of molecular matter to be potentially fractal so with bio-elements we get the fractal structure of tissues. The edge of chaos is an abstract principle we can find throughout nature and cosmology. It is manifest in complementary regimes of order and chaos in both continuous and discrete dynamics and in discrete cellular automata where edge of chaos system 110 is a universal computer (Chen et al. 2012, Cook 2004). It is a fundamental concept in key transitions in brain states in the Freeman model of neuronal dynamics and is a critical aspect of evolution's rise to climax diversity.

We have also noted that there is a beautiful Goldilocks scenario for the origin of life. Firstly the galactic nebulae are flush with the primordial molecules that readily polymerise to nucleic acid bases and amino acids. Secondly the acidic CO₂-filled ocean reacts with crustal alkaline olivine to form chemical gardens just like the one's I made as a kid. They were rife on the early Earth and still occur today in the Lost City vents. Experiments have shown they can also concentrate biomolecules 1200 times up to biological concentrations and feed them on the chemical reactions produced.

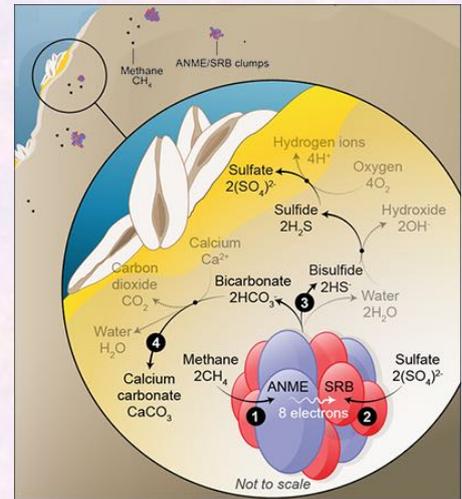
Fig 59: Left: Emergence of archaea and bacteria as complementary cellular life forms with differing membrane structures from the common progenote (Lane & Martin 2003). Top right: The divergence happened before the evolution of DNA polymerases (Leipe et al. 1999). Lower right" The electrochemiosmotic foundation of cellular life (Lane & Martin 2012).

The end result is the chemiosmotic origin of life where membrane electrochemistry set the whole process going. This gave rise to two fundamentally complementary life forms, archaea and bacteria as well as a lot of viruses emerging from a cooperative milieu called a progenote in which viruses and transposable genetic elements provided a sexual complementation to emerging cellular life forms. The archaea are geological organisms in salt pans, hot smokers, methane swamps, and volcanic hot pools. They don't cause diseases. Bacteria are fast metabolic organisms that decompose, photosynthesise and respire and can be pathogenic.



Archaea have different kinds of cell walls from bacteria, so it is likely that each emerged from the progenote and became cellular as they escaped gaining metabolic autonomy via the membrane energetics. The DNA polymerases of archaea and bacteria are also different, so it also looks as if they evolved and diverged before DNA-based life had stabilised, at a point where DNA and RNA were flipping cyclically using the reverse transcriptase that is still in retroviruses like HIV and in the endogenous retroviruses in our genomes and in telomerase!

Fig 59b: The anaerobic oxidation of methane would not be possible without a close coupling between anaerobic methanotrophs ANME and sulphate-reducing bacteria SRB. Methane is a high-energy but very stable molecule: it is not easy to crack it open to release electrons and power metabolism. Anaerobic methanotrophs can do the job, but they end up releasing an overabundance of electrons as a result, leading to a backlog that would normally cause their metabolism to grind to a halt. Sulphate-reducing bacteria use the surfeit of electrons to turn sulphate into sulphide and reap the energetic windfall that results. It is a classic symbiosis: the anaerobic methanotrophs enjoy a swift trash collection service, and the sulphate-reducing bacteria bask in an in-house power plant. In the progenote era many fundamental metabolic cycles may have evolved symbiotically in this way. But the co-evolution leads to mutual dependence, as genomes come to depend on the presence of molecules they cease to synthesise (Marlow & Braakman 2018).



Life thus started out with two complementary life forms, but then about 2 billion years ago an edge of chaos event happened, when a very slowly growing archaean, with long protruding filaments started to grow alongside alpha-proteo-bacteria like our gut bacteria *Escherichia coli*, using the relationship to live off their high value respiratory electron transport chain energy while also giving them value in return by exchanging metabolites. You can see close relatives of these two species top right in fig 60 below. There are still some archaea and bacteria that do this today, but basically what happened is that the symbiosis was so successful that it wiped all trace of itself off the face of the Earth in a rapid quantum leap of evolution to form the higher nucleated eucaryote cells that make amoeba-flagellates and complex organisms. Without this symbiotic quantum leap complex life could not exist!

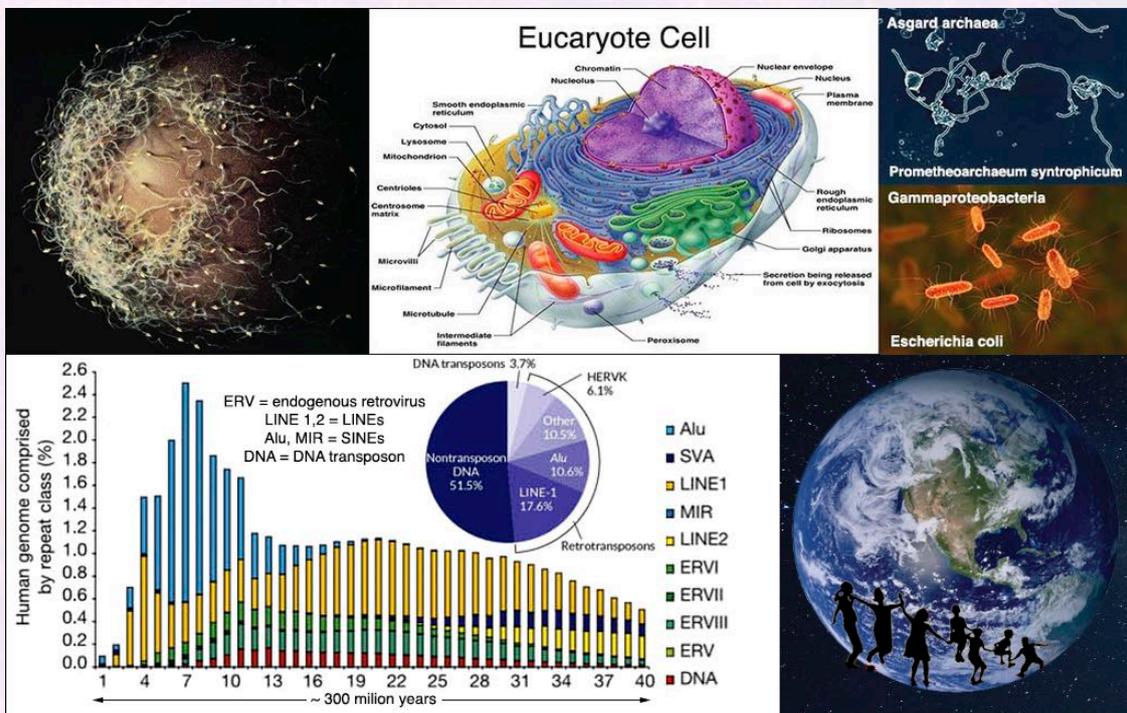


Fig 60: Symbiosis is ubiquitous and essential to human life. Top Left: Human fertilisation. Symmetry-broken sexuality is a form of intra-species symbiosis between the genetic sexes. Top right: The symbiosis between archaea and bacteria to form the eucaryotes, leading to all complex life. Lower left: Transposable elements occupy nearly half the human genome, have co-evolved with humans since the formation of multi-celled organisms and have inherited key symbiotic roles. See also [major evolutionary transitions](#) Lower Right: Homo sapiens can survive as a species only by symbiosis with the biosphere, within which our very existence interdepends. Human religious and commercial dominion over nature runs completely counter to biospheric survival over cosmological time scales and is frank evolutionary suicide.

Eucaryote endo-symbiosis

About half our genes, the metabolic ones, were derived from the bacterium and are now in the nucleus while the informational processing genes came from the archaean. Now the mitochondria have only a skeleton set of key genes constituting the maternally inherited mitochondrial DNA that showed us that the African Eve was a San woman.

Elucidating how this happened genetically from previous organisms didn't happen until a few years ago. In 2019 Lokiarchaea, the first of the Asgard archaeans to be discovered was finally successfully grown in culture. It had originally been identified as a unique archaeal organism from microbial mud, dredged near Loki's Castle, a sea-floor hydrothermal vent field off the coast of Greenland. In a 2015 study in metagenomics, Ettema and his colleagues sequenced genetic fragments from the microbial portion in the sediment and assembled them into fuller genomes of individual species. One genome stood out. It was clearly a member of the archaea. But dotted throughout this genome were eukaryotic-like genes, named Lokiarchaea, after Loki, the trickster of Norse mythology (Lambert 2019). However, unbeknown to the metagenomics researchers, Hiroyuki Imachi and colleagues (Imachi et al. 2019) had been working since 2007 to cultivate microbes from deep-sea sediments. They built a bioreactor that mimicked the conditions of a deep-sea methane vent. Over 5 years, they waited for the slow-growing microbes in the reactor to multiply and then took samples placed these, along with nutrients, in glass tubes, which sat for another year before showing any signs of life. Genetic analysis revealed a barely perceptible population of Lokiarchaea. The researchers patiently coaxed the Lokiarchaea -- which took 2-3 weeks to undergo cell division -- into higher abundance and purified the samples. Over 12 years, in a breakthrough work, the researchers produced a stable lab culture (*Prometheoarchaeum syntrophicum*)

containing only this new Lokiarchaeon and a different methane-producing archaeon in a symbiotic relationship. The researchers sequenced all the microbe's DNA, confirming that it does contain some genes that look like those found in eukaryotes. This has now enabled verification that the cultured genome contains the eucaryote-related genes from the metagenomics analyses and enables a much more detailed investigation of this critical group of organisms.

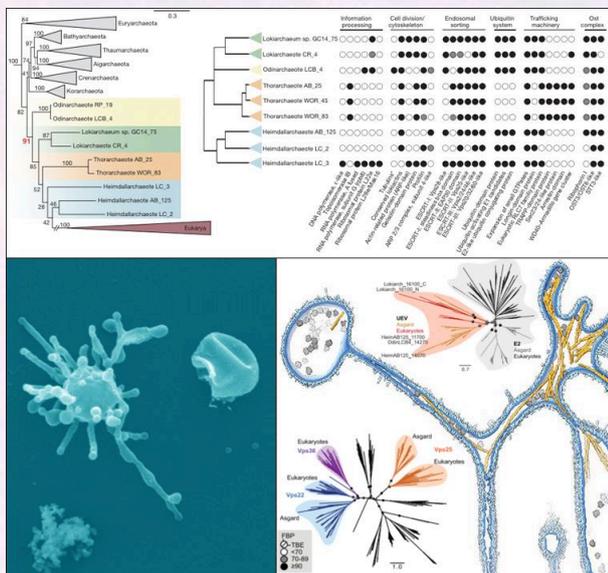
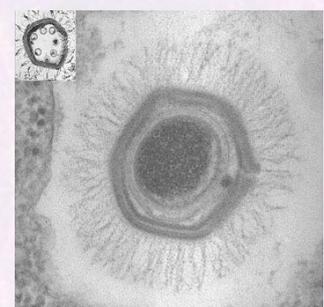


Fig 61: Top: Ettema's team (Zaremba-Niedzwiedzka et al. 2017, Eme et al. 2023) have found a superphyllum comprising archaea in diverse environments including marine sediments, aquifers and hot springs which have a phylogenetic relationship with eucaryotes and include genes for vesicle formation, membrane-trafficking components and cyto-skeletal functions including ESCRT and TRAPP domains. Bottom: *Candidatus Lokiarchaeum ossiferum* (Rodrigues-Oliveira et al. 2022). Insets: Evolutionary trees of ubitiquitin genes UEV, E2, Vps22 and Vps25 (Hatano et al. 2022).

By carefully decanting cell cultures Rodrigues-Oliveira et al. (2022) have isolated a new Asgard *Candidatus Lokiarchaeum ossiferum*, which has a significantly larger genome compared with the single previously cultivated Asgard strain (Imachi et al. 2019). Wu et al. (2022) isolated two other Asgard species—from rock collected from a hydrothermal vent in the Gulf of California to sequence their complete genomes. These harbored mobile pieces of DNA that contained bacterial genes involved in metabolism, suggesting these elements played a critical role in transferring genes among life's major branches. Hatano et al. (2022) have discovered four ubiquitin-ESCRT gene complexes eukaryotic cells use to bend, cut up, and stitch together their membranes to link internal compartments. On the other hand, Knopp et al. (2021) calculated that Asgard archaea contributed as little as 0.3% of the protein families believed to exist in the common ancestor of the eukaryotes, suggesting that the stresses on the host drove eucaryote complexification, such as the nucleus, Golgi apparatus, and the evolution of sex (Raval, Garg & Gould 2022).

Fig 62: *Mamavirus (mimiviridae)* with double membrane and capsid and parasitic phage.

Viral eucaryogenesis: There is also evidence from key genes involved in both viral and eucaryote replication and transcription, that both the cell nucleus and mitosis and sexual meiosis arose from a lysogenic DNA virus than can integrate quiescently with the host cell genome, with a double membrane envelope, that invaded the endo-symbiont, or its archaeal precursor, and rather than just altering its transcription to the virus's



advantage, went further and captured the archaean genetic organisation, to the extent that replication of the viral nucleus became coupled to replicating the entire archaean and viral genome, with transcription sequestered outside the nuclear envelope.

Telomerases appear to have viral origins (fig 63). Many classes of nucleocytoplasmic large DNA viruses (NCLDVs) such as mimiviruses have the apparatus to produce m7G capped mRNA, as in eucaryotes, and contain homologues of the eukaryotic cap binding protein eIF4E. (Bell 2001, 2006, 2009, 2020, Chaikerasak et al. 2017a, b, Claverie 2006, Trevors 2003, Takemura 2020, Villareal & Witzany 2009). Asgard viruses and TEs have recently been described, with genes in transition between archaean and eucaryote forms (Rambo et al. 2022, Wu et al. 2022). Indeed, viral eucaryogenesis could have been the founding event, leading to endosymbiosis.

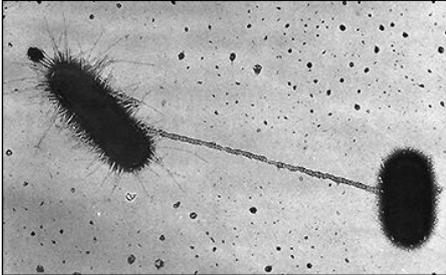
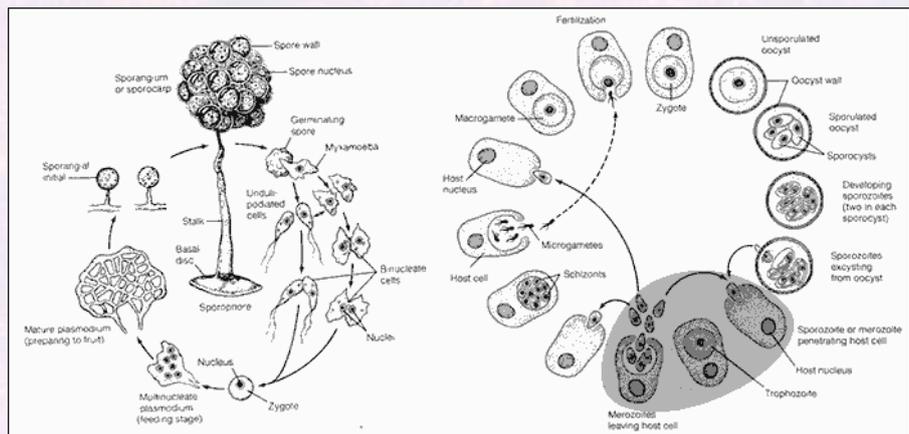


Fig 62a: Procaryote cell-virus symbiosis. TE-encoded sexual conjugation plasmid recombining genomes between two distinct species of bacteria.

Sexuality (King 2016) is a form of genetic symbiosis both between viruses and cells and between the two or more sexes of a species. Sexual recombination is essential to avoiding mutational degradation. Sexual exchange is universal in procaryotes (archaea and bacteria), through a symbiosis between the cellular and viral genomes, where plasmids and viruses also serve to exchange genetic material between hosts.

Concomitant with the establishment of the archaean-bacterial endosymbiosis, eucaryotes established both mitotic and sexual meiotic genetic replication, in which each parent contributes half their diploid genome to make haploid gametes, with indexed chromosomal crossing-over of gene alleles. Subsequently this became symmetry-broken to sperm-ovum dyadic sex, to avoid cytoplasmic genetic warfare between the maternal and paternal symbiotic mitochondria and chloroplasts, resulting in the two genetic sexes in each species (more in fungi), each becoming genetically interdependent with one another for survival and hence sexually-symbiotic, with the mitochondria being inherited down the maternal line. A founding reason why all complex life is sexual and why we thus have the dilemma of individual mortality, is that the diversity of sexual individuals in a species protects the species in the peacock's tail race against its sexual parasites. A key role of eucaryote sexuality is to enable this, where sexually inherited genomic differences act to prevent total extinction of a monoclonal parthenogenetic host species, so that with very few exceptions, at least cryptic (intermittent), sexuality is universal. But sperm-ovum sex is a prisoners' dilemma of highly asymmetric reproductive investments, leading to sexually antagonistic co-evolution, starkly displayed in humans in attempts by men to assert patriarchal dominion over female reproductive choice in an evolving culture of female gatherer reproductive cooperation, leading to male social repression and control of the female sex by veiling, female genital mutilation, chaperoning by male relatives, stoning for adultery, honour killings, lack of ability to work, or to have a full education and professional life.

Fig 62b: Sex becomes gender. The slime mold *myxomycota* has flagellated isogametes, while *apicomplexa* although a simple single celled protocist already has sperms and ova (Margulis and Schwartz 1982).



Cell-virus symbiosis is also rife in the human genome (King 1985, 1992, 2020c), where transposable elements (TEs) occupy 46% of the human genome, of which only around 2% is protein coding, making the TE content of our genome one of the highest among mammals, second only to the opossum genome with a reported content of 52%. LINE-1 elements which have co-evolved in the human germ line with a history running back to the Eukaryote origin, numbering 100,000-950,000 partially defective copies, around 100 of which remain fully active in humans, and their 300,000 dependent smaller fellow traveller Alu SINEs, together comprise 33% of the human genome. Long terminal repeat (LTR) retro-transposons 8% and DNA transposons 3%. Retroviruses related to HIV also exist in endogenous forms in the human germ-line, comprising up to 5 to 8%. Giving an evolutionary comparison, the slime mould *Dictyostellium* has both LTR- and retro-transposons

occupying 10% of a gene dense genome in which around 66% codes for proteins (King 1985, Malicki et al. 2017). The survival of such a high proportion of transposable elements in such a tightly packed genome is strong evidence for symbiosis. In terms of the selfish gene (Dawkins 1976), transposable elements notwithstanding, organism genomes are one huge genetic symbiosis, through organismic survival and selection.

Ivancevic et al. (2016) have traced the evolutionary tree of LINE-1 back to the founding eucaryotes as L1 elements occur in both plants and animal phyla spanning vertebrates, arthropods, and molluscs such as octopi where L1 transposition has specifically been associated with high-intelligence where transcription and translation measured for one of these elements resulted in specific signals in neurons belonging to areas associated with behavioural plasticity (Petrosino et al. 2022). L1, along with DNA transposons and LTR retroelements are ubiquitous across the arthropod kingdom (Petersen et al. 2019) and span the eucaryote tree. So cell-TE/virus symbiosis is foundational to eucaryotes.

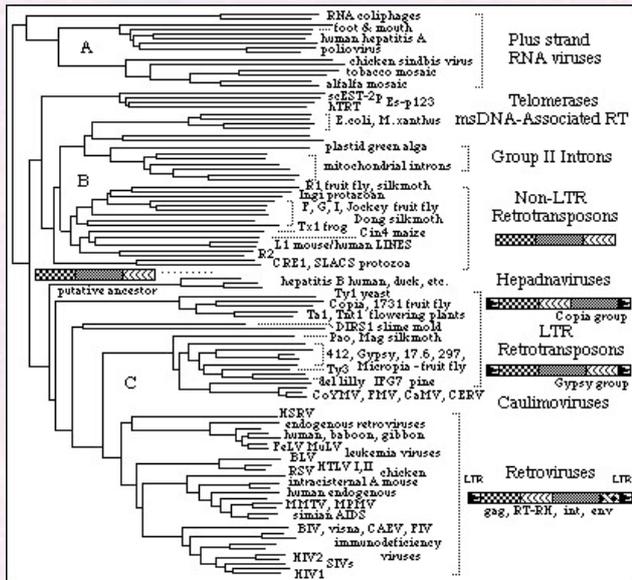


Fig 63: Eucaryote cell-virus symbiosis. Retrotransposons (Xiong & Eickbush 1990), which replicate by copy and paste transcription and reverse transcription of RNA to DNA and insertion into the genome, are present in all eukaryotic genomes, where they constitute the most abundant class of mobile DNA, in many cases, around 50% of the nuclear DNA, a situation that may have arisen in just a few Myr. They play a central role in the structure, evolution, and function of eukaryotic genomes. Retroviruses evolved during the early Palaeozoic Era, between 460 and 550 million years ago, providing the oldest inferred date estimate for any virus group (Hayward 2017). Although they are found only in vertebrates, the wider grouping C of metaviridae, which have evolved from LTR retrotransposons are ubiquitous across eucaryotes, populating diverse eukaryotic genomes, such as *oomycetes*, slime molds, fungi, plants and animals (Gorinsek et al. 2004).

Having integrated with our germ line, such elements both result in transpositions, which can cause mutations and genetic disease, but have also co-evolved to perform essential symbiotic tasks. Many of the historical transpositions have also caused adventitious mutations, giving the inserted elements key functions in coordinated gene expression. LINE-1 elements are key to forming the blastula, have key expression in neural progenitor cells and are essential in collapsing one of the two X-chromosomes which are poisonous to females except in their germ line. Endogenous retroviruses have provided membrane budding genes such as syncytin, which aid the formation of the syncytium, the super-cellular membrane that enables nutrient diffusion from the mother to the baby and immunity evasion, which avoids rejection of the embryo (Mi et al. 2000). Endogenous retroviral genes, such as suppressyn in humans, like in other mammals have been found to confer resistance against exogenous retroviral infection (Frank 2022). The recombination activating gene protein RAG1/RAG2, essential for the mutational variability of the vertebrate immune system, appears to have evolved from an ancient DNA transposon common to the metazoa (Agrawal et al 1998, Kapitinov & Jurga 2005).

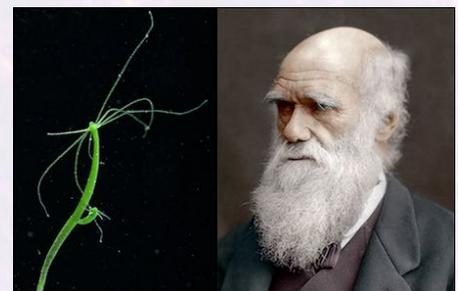
Organisms and Cellular Symbiosis.

One needs to understand at the outset, that an organism is a collective colony of cells living symbiotically together and that although each cell in an organism shares the same genetic heritage in its DNA, there is no overall imposed order, other than the cellular intercommunication that enables differentiation and embryonic development to occur.

Fig 63b: Cnidarian *hydra* is envisaged as a colony of cells. Here *H. viridissima* is both carnivorous and in symbiosis with *Chlorella* algae, as is common with coral polyps. By contrast, advanced metazoa such as *H. Sapiens* are regarded as developmentally regulated organisms, but both stem from autonomous processes of colonial cellular differentiation and embryonic interactive development which is also a crowning manifestation of cellular symbiosis.

Indeed Darwin commented:

“To see a puppy playing [one] cannot doubt that they have free-will” and if “all animals, then an oyster has and a polype.” (Darwin ex Smith 1978)



Lynn Margulis has been pivotal, both in establishing the correct view of eucaryote endosymbiosis, and in conveying the importance of symbiotic relationships in evolution generally, and finally in biospheric terms, in her cooperation with James Lovelock, in establishing the Gaia hypothesis, which is itself a form of symbiotic mutually stabilising relationship between the entire biosphere and the major planetary geochemical cycles.

Lynn Margulis opposed competition-oriented views of evolution, stressing the importance of symbiotic or cooperative relationships between species. She later formulated a theory that proposed symbiotic relationships between organisms of different phyla or kingdoms as the driving force of evolution, and explained genetic variation as occurring mainly through transfer of nuclear information between bacterial cells or viruses and eukaryotic cells. Her organelle genesis ideas are now widely accepted, but the proposal that symbiotic relationships explain most genetic variation is still something of a fringe idea (Mann 1992, Wikipedia).

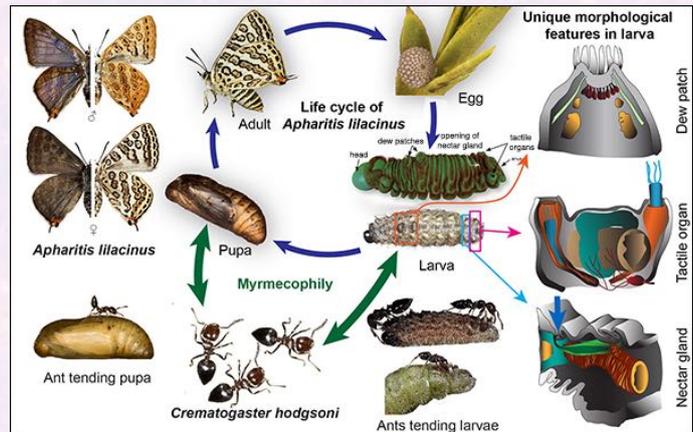
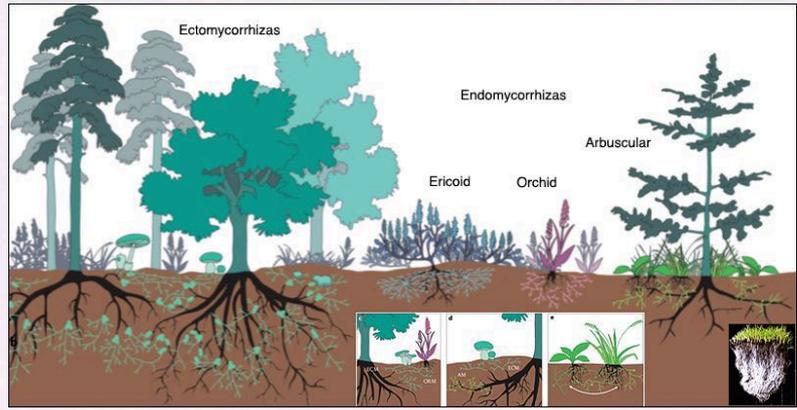


Fig 63c: **Symbiosis** is a prime manifestation of food web, and hence ecological, complexity. (Top left) cleaner fish gain food by cleaning the skins and mouths of larger carnivorous fish, which also keeps the fish free of parasites. Similar symbioses occur with cleaner shrimps and Moray eels, between crocodiles and birds, and with the oxpecker, which cleans parasites from the ox. The usual mutualistic relation between plants and their insect pollinators providing nectar and protein pollen to the pollinator, in return for spreading their pollen, has many dynamical variations, changing the rules. (Bottom left) Frank exploitation of the orchid *Ophrys eleonorae*, whose pollinator a type of bumble bee is purely exploited because it receives no nectar and instead, the orchid accomplishes its sexual deception by mimicking the appearance, scent, and even tactile experience of a female bee, complete with fake fur and what appear to be folded iridescent wings and amid the sexual jostling sticks its pollinia on to the bees' back. Bees have even been recorded ejaculating wasting their sperm (Gaskett et al. 2008). (Centre pair) A peacock's tail arms race often occurs between flowers and pollinators, in which a plant becomes choosy enough to select only one pollinator species, virtually guaranteeing its pollen will go to a plant of the same species. Here *Angraecum sesquipedale* has an exceptionally long nectary (getting on for 30 cm) and in a book on orchid pollination, Darwin suggested that this extreme feature may have evolved alongside a moth with an exceptionally long tongue to pollinate it. In 1907, more than 20 years after Darwin's death, a subspecies of the gigantic Congo moth from Madagascar was identified and named as *Xanthopan morgani praedicta* apparently fulfilling Darwin's prediction (the name indicating that it was predicted). The moth is large at around 16cm in wingspan, but the proboscis is truly colossal and can be more than 20cm in length forming a huge coil in front of the head when not in use. It wasn't until 1992, nearly a century later, that observations were made of the moth feeding on the flower and transferring pollen from plant to plant with both videos and stills being taken. This was observed in the wild and confirmed further with studies in captivity (Ardetti et al. 2012). Right: Oxpeckers in mutualism with Zebra. Carrion beetles symbiotic with mites which eat the eggs and freshly hatched maggots of flies that compete with beetle larvae for their food source. Aphids in symbiosis with ants provide sap nectar "stools" for the ants, while the ants attack and remove ladybug predators.

Margulis also held a negative view of certain interpretations of Neo-Darwinism that she felt were excessively focused on competition between organisms, as she believed that history will ultimately judge them as comprising "a minor twentieth-century religious sect within the sprawling religious persuasion of Anglo-Saxon Biology." She wrote that proponents of the standard theory "wallow in their zoological, capitalistic, competitive, cost-benefit interpretation of Darwin – having mistaken him for ... Neo-Darwinism, which insists on [the slow accrual of mutations by gene-level natural selection], is in a complete funk." (ibid)

Fig 63d: One of the world's greatest symbiotic relationships is the mycorrhizal relationship between fungi and the land plants (Genre et al. 2020). The plant makes organic molecules such as sugars by photosynthesis and supplies them to the fungus, while the fungus supplies the plant with water and mineral nutrients, such as phosphorus, taken from the soil. This can create a very extensive web throughout wilderness areas, in which the fungi serve to mediate competing needs of individual plant species. Fossil and genetic evidence indicate that mycorrhizae are ancient, potentially as old as the terrestrialisation of plants. There is fossil evidence that early land plants that lacked roots formed arbuscular mycorrhizal associations. Genetic evidence indicates that all land plants share a single common ancestor, which appears to have quickly adopted mycorrhizal symbiosis, and research suggests that proto-mycorrhizal fungi were a key factor enabling plant colonisation of the land, although the analogy of a "wood-wide web" is debated (Karst et al. 2023). Similar symbioses occur between legumes and nitrogen fixing bacteria in their root nodules.

Margulis met with Lovelock, who explained his Gaia hypothesis to her, and very soon they began an intense collaborative effort on the concept. One of the earliest significant publications on Gaia was a 1974 paper co-authored by Lovelock and Margulis, which succinctly defined the hypothesis as follows: "The notion of the biosphere as an active adaptive control system able to maintain the Earth in homeostasis we are calling the 'Gaia hypothesis.'" Like other early presentations of Lovelock's idea, the Lovelock-Margulis 1974 paper seemed to give living organisms complete agency in creating planetary self-regulation, whereas later, as the idea matured, this planetary-scale self-regulation was recognized as an emergent property of the Earth system, life and its physical environment taken together (Lovelock 1972, Lovelock & Margulis 1974).



Wolbachia, fig 68 are a genus of bacteria that parasitise arthropod species, including a high proportion of insects, and some nematodes. It is possibly the most common reproductive parasite in the biosphere. As many as 25 to 70% of all insect species are estimated to be potential hosts. Their interactions with their hosts are often complex, and in some cases have evolved to be mutualistic rather than parasitic (Zug & Hammerstein 2015). In the bedbug *Cimex lectularius*, *Wolbachia* provide essential B vitamins and are housed in specialised organs, the bacteriomes. The mosquito *Culex pipiens* is naturally infected with *Wolbachia* and the pathogen *Plasmodium relictum*. *Wolbachia* protects its host against *Plasmodium*-induced mortality. The parasitic wasp *Asobara tabida* depends on *Wolbachia* for oogenesis. *Wolbachia* can alter the hosts' sexual reproduction in multiple ways to enhance their own reproduction and survival, including: (1) induced **male mortality** during larval development, increasing reproduction of infected females, (2) **feminization** resulting in infected males that develop as females or infertile pseudofemales, (3) **parthenogenesis** – reproduction of infected females without males and (4) **cytoplasmic incompatibility** – the inability of *Wolbachia*-infected males to successfully reproduce with uninfected females or females infected with another *Wolbachia* strain.

True symbiosis is usually defined as an evolutionarily stable mutually supportive relationship between species in which each symbiont achieves a better outcome than it would if it defected and exploited its co-species instead. The biosphere contains many examples of such relationships, from the cleaner shrimps servicing moray eels (animal—animal), through lichens (algae/cyanobacterial—fungal) coral polyps (algae—animal) and ants with fungi (animal—fungal—bacterial). However, these relationships can become very complicated, with dynamic evolutionary processes affecting both mutualism and parasitism as illustrated in figures 63b, 63c, 63d 64 and 68.

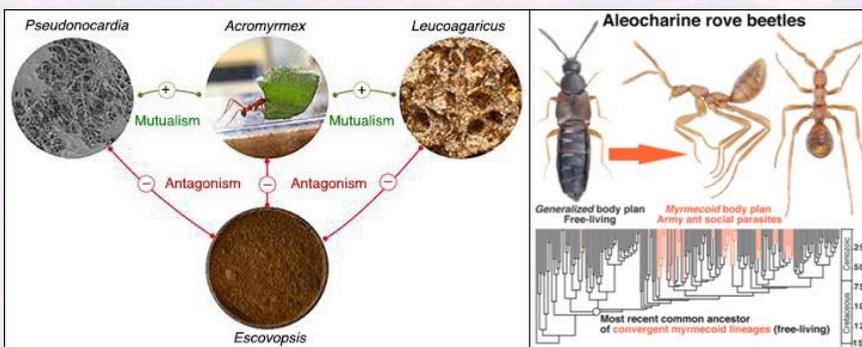


Fig 63e: Left: *Acromyrmex* leaf-cutter ants form a mutually beneficial symbiosis with the fungus *Leucoagaricus gongylophorus* and with *Pseudonocardia* bacteria. Both are vertically transmitted and actively maintained by the ants. The fungus garden is manured with freshly cut leaves and provides the sole food for the ant larvae. *Pseudonocardia* cultures are reared on the ant-cuticle and make anti-fungal metabolites to help protect the cultivar against disease. Parasitic

Escovopsis fungi can overrun the fungus garden and lead to colony collapse. *Escovopsis* upregulates the production of specialised metabolites. These inhibit *Pseudonocardia* and one also reduces worker behavioural defences and is ultimately lethal when it accumulates in ant tissues, resulting in an evolutionary arms race. Right: deep long-lasting symbioses between multiple species of Roe beetle symbionts and army ants whose evolutionary tree displays convergence to such habits going back to a common ancestor in the early Cretaceous 110 million years ago (Maruyama & Parker 2017).

Furthermore, a more general view of indirect or dynamic symbiosis is reinforced by the dynamical relationships between organisms, for example between plants and their herbivore animal parasites and predators and their herbivore prey, where the exploitative relationship belies the fact that the population dynamics of each, with insect

plant predation aiding plant diversity by attacking weedy monocultures and the carnivores avoiding the herbivores entering boom and bust by denuding the landscape of plants they depend on in the absence of predators.

One needs to understand that climax ecology involves increasingly deep and long-lasting symbiotic relations when species interact in ways which benefit both, as illustrated in figs 63c-f. Vertebrate-arthropod symbiosis for example occurred between nest dwelling beetle larvae feeding on feathers from a theropod host (avian or nonavian) 105 million years ago, found in feathered amber as skin/hide beetles (family Dermestidae), an ecologically important group of keratophagous species that commonly inhabit bird and mammal nests (Peñalver et al. 2023). Byrne & Lunn (2019) describe the complexity of elephants and trees mediated by Scarabaeidae – scarabs, or dung beetles, revered as symbols of regeneration in ancient Egypt, whose spoils rolled in a giant ball with great effort by the beetles and buried, improve soil structure and fertility and facilitate regeneration of the seeds of the plant and tree species elephants eat.

Fig 63f: Because major classes of organism adopt characteristic niche strategies they can provoke the evolutionary emergence of a reactive class of prey. Carnivorous ants have a major world-shaping influence on wild ecosystems, consuming insects in their path. In response, the *Lycaenidae*, the second-largest family of butterflies with over 6,000 species worldwide (about 30% of the known butterfly species) have developed a long-term symbiotic relationship with ants, in which they provide nutrient in return for not being attacked and being able to consume plants in the ants territory. The larvae are often flattened, with glands that may produce secretions that attract and subdue ants. Some are capable of producing vibrations that are transmitted through the substrates they inhabit and use these sounds to communicate with ants even causing them to think they are an alarmed queen. Several evolutionary adaptations enable these associations, including small glands on the skin of the caterpillars called "pore cupola organs". Many species have a gland on the seventh abdominal segment that produces honeydew, as do aphids which are "milked" by ants, and a cylindrical "tentacular organ" is present on the eighth abdominal segment and this is topped with a ring of spikes and emits chemical signals which are believed to help in communicating with ants. In some species, larvae are attended and protected by ants while feeding on the host plant, and the ants receive sugar-rich honeydew from them. In some species like the large blue *Phengaris arion*, the majority of the larval lifespan is spent as a predator within the ant nest. It becomes a parasite, feeding on ant regurgitations, or a predator on the ant larvae, turning the tables on the symbiosis, to exploit it having long ago evolved to seduce the ants.

There are of course outstanding examples of competitive survival of the fittest in evolution. Genetic systems as simple as transposable elements and simple molecular viroids, such as the potato spindle viroid fig 64, display competitive life cycles, giving rise to the notion of the "selfish gene" (Dawkins 1976). Competitive survival also resounds in male sexual combat, ensuring genetic fitness of the resulting offspring. Competition also occurs between predator species, as illustrated fig 64 right, in cheetahs stealing from a lion. Hence competition, predation and parasitism and symbiotic mutualism form complementary strategies, all of which are essential to climax diversity.

The lesson from this, in naively simplistic mathematical terms, is that predators appear to be destructive to the herbivores, but actually ensure their long-term survival, by avoiding genocidal famines. Out on the savannah, these seasonal oscillations may be less predominant, and wet and dry seasons and the vagaries of the climate will also cause fluctuations. The carnivores tend to opportunistically take out stragglers, and some of the young and old, so we rise to a climax of interacting species.

Many of the most outstanding features of tooth and claw that give us the image of the brutality of nature actually abet biospheric symbiosis. Robert May (1976) used the logistic iteration to model a rabbit population X_i eating the remaining grass $1 - X_i$ and we get $X_{i+1} = rX_i(1 - X_i)$. Depending on the reproduction rate r we get equilibrium, period doubling, and chaos, which eventually disrupts in a high chaos bust at $r = 4$, where the population hits unity, consuming all the grass and then zero in extinction. This shows that two component herbivore-plant ecosystems are intrinsically unstable to lethal oscillation of the herbivore. When we include herbivore predators, the Lotka–Volterra equations give us precipitous but sustainable oscillations, as growing carnivore populations assimilate the herbivores to low levels, leading to seasonal rebounds in each. Other population dynamics can become chaotic. Rogers et al. (2021) show that chaos is common >30% in natural ecosystems.

The same picture is occurring with plant evolution. The rise of plant climax diversity is symbiotically moderated by the wide spectrum of herbivorous parasites and predators. This idea of repulsion – formally known as conspecific negative density dependence, or CNDD – goes back to the 1970s when the ecologists Daniel Janzen (1970) and Joseph Connell (1971) independently suggested that insects, herbivores and pathogens that prey selectively on one species could make the area around an adult tree dangerous for its seeds. The reason weedy plants don't rule the Earth is because insects, animals and fungal, bacterial and viral diseases all selectively target massive distributions of genetically similar material. The grasslands are subject to plagues of locusts. Diseases likewise target predominant species. Thus plant

diversity, although also aided by environmental variance (Fung et al. 2016), is critically driven by insect predation, which explains why rainforests reach climax diversity rather than dominance of weedy species.

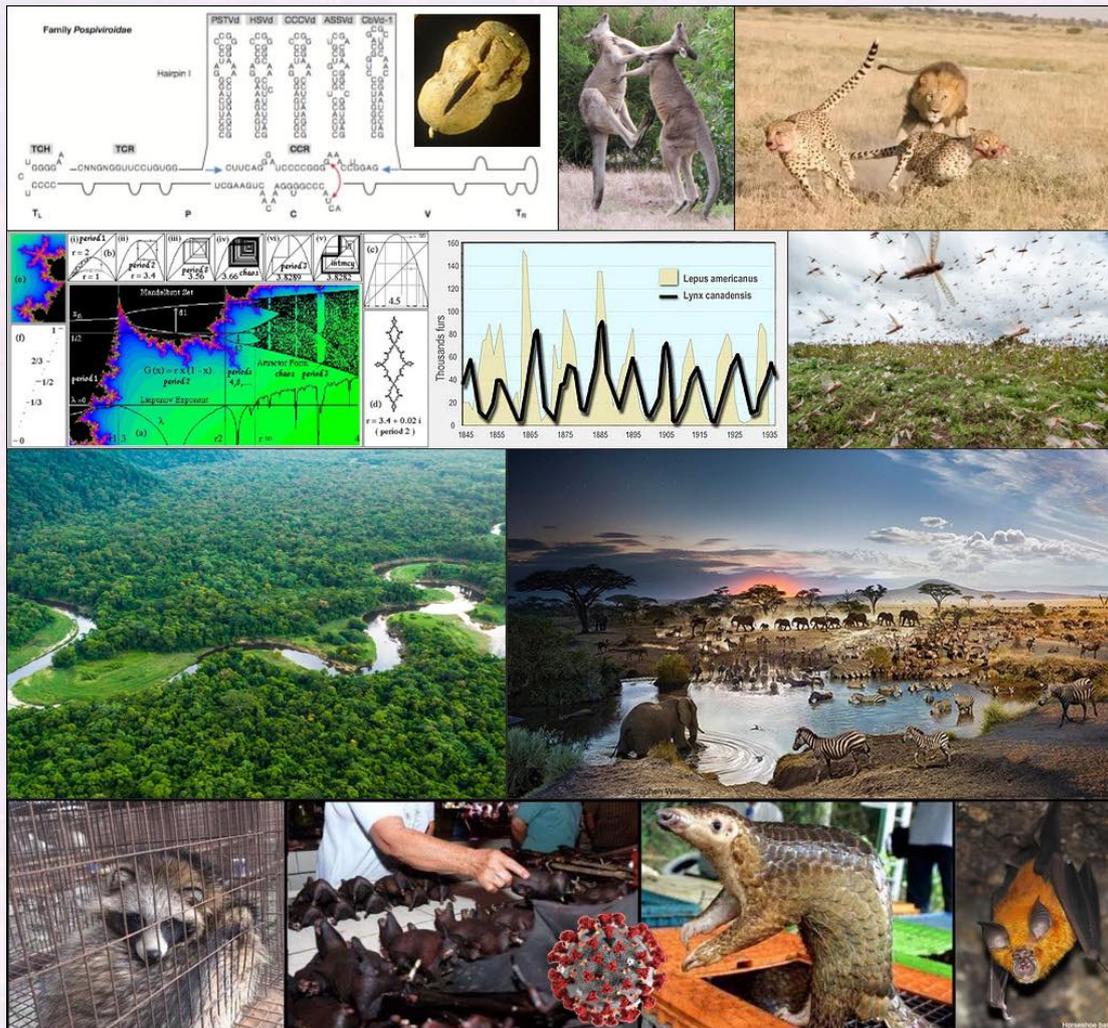


Fig 64: **Biospheric Symbiosis:** Top: Potato spindle viroid exemplifies competitive fitness in a single RNA molecule. Two male kangaroos in sexual combat. Cheetahs stealing meat from a lion. Second row: Logistic equation for rabbits in a finite pasture reaches chaotic instability leading to boom and species extinction bust. Lotka–Volterra equations between lynx and rabbits show coupled stable oscillations over 10-year seasons. A locust swarm consumes dominant vegetation. Third row: Climax plant diversity in the rain forest and large mammal diversity on the savannah. Bottom: The corona virus pandemic was caused by human misadventure, in a symbiotic bat virus becoming pathological by forcing wildlife together in unnatural conditions, leading to mutational species jumps.

Although plants also engage inter-individual and inter-species competition, Forrister et al. (2019) tested two mechanisms thought to underlie negative density dependence (NDD): plant competition for resources and attack by herbivores and confirm that it is the load of insect predation which results in the related species separation of climax diversity. After a long undisturbed period, wilderness habitats thus reach climax biodiversity because the overall interactive species-specific forms of natural and sexual selection promote maximal genetic symbiosis and optimal species diversity. Kalyuzhny et al. (2023) show that in comparison to a null model of stochastic birth, death, and limited dispersal, the adults of dozens of tropical forest tree species show strong spatial repulsion, which can occur only if CNDD considerably exceeds heterospecific negative density dependence – an even stronger condition required for coexistence – and that large-scale repulsion can indeed result from small-scale CNDD.

Biospheric symbiosis: Ultimately every species is able to survive only in relation to its viability in the biosphere in relation to the other existing organisms. Organismic symbiosis is then realised in biospheric symbiosis of each species within the biosphere as a whole, in which natural and sexual selection is a measure of survival of the most successfully symbiotic species within the biosphere, whether parasites, prey, predators or hosts through the long term dynamics of social survival within the enclosing planetary circle. As noted, predators, although epitomising homicidal aggression, function to stabilise the biosphere from unstable fluctuation, by taking out the herbivore stragglers, avoiding the herbivores eating out their food supplies and starving in a boom and bust. *Homo sapiens* is the first species to exist on

the planet and globally disrupt and exploit and violate the symbiotic climax of life evolving through habitat destruction, climate crisis and sheer overpopulation.

But the buck doesn't stop there. The Corona virus pandemic occurred because of human impact on animals harbouring Corona viruses, forcing wild animals into close contact with other species, which would not occur in the wild, that gave rise to a new disease, when bat corona viruses, which are in a symbiotic relationship with bats, were knocked out of their symbiosis and became a world plague, affecting not only humans, but massive numbers of mink in dense mink farms and even rhinos. Bats roost in vast "urban" cave communities, where multiple pathological diseases, from rabies to corona viruses, occur endemically. Bats have figured out how to dampen down the corona presence to an asymptomatic level using interferons. With the rise of the Omicron variant, involving recombination with other corona virus elements, the pendulum is potentially swinging back to endemic symbiosis. Thus again the plagues and pestilences we abhor as the worst aspects of nature in the raw are actual vectors of symbiotic climax.

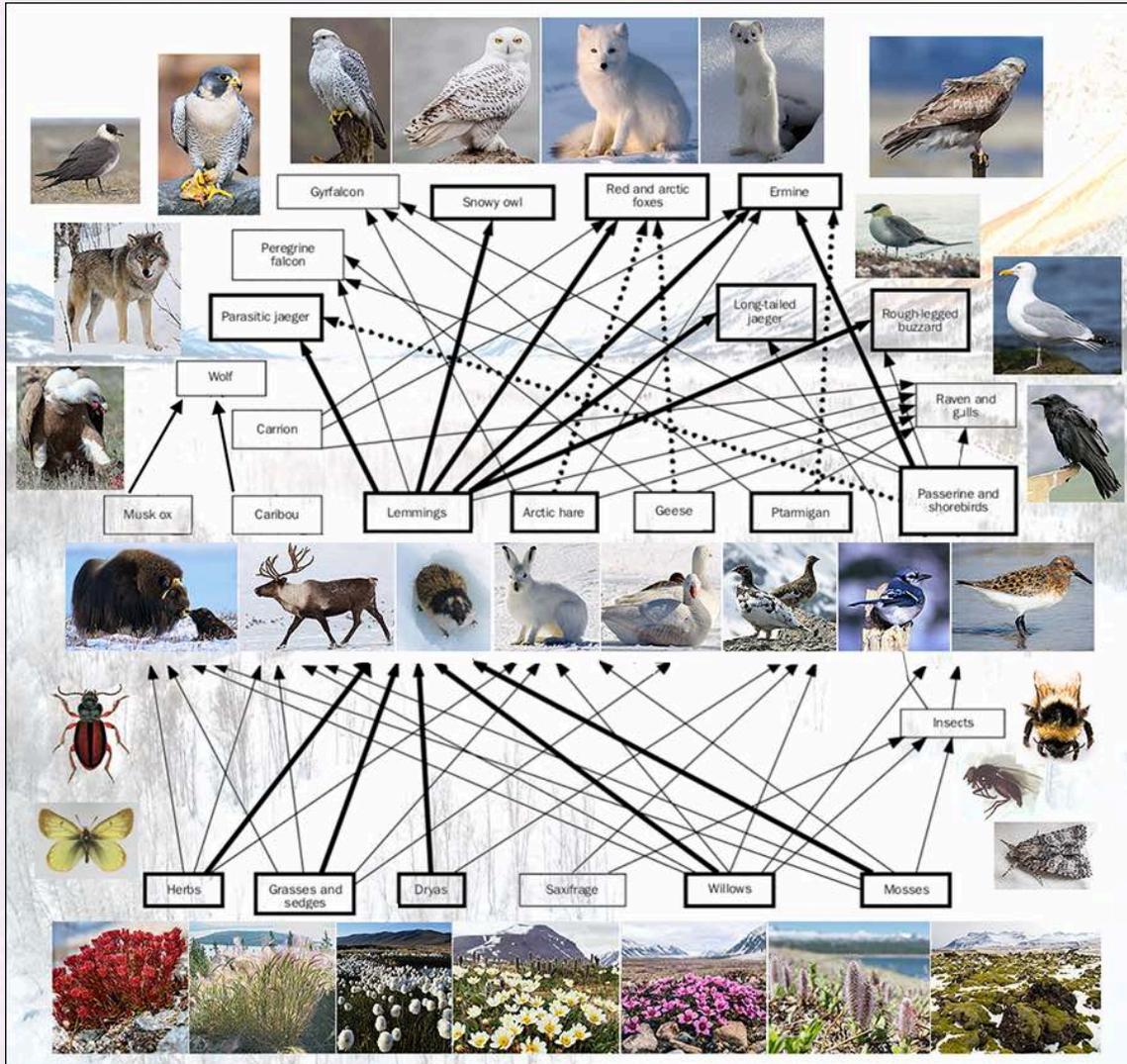
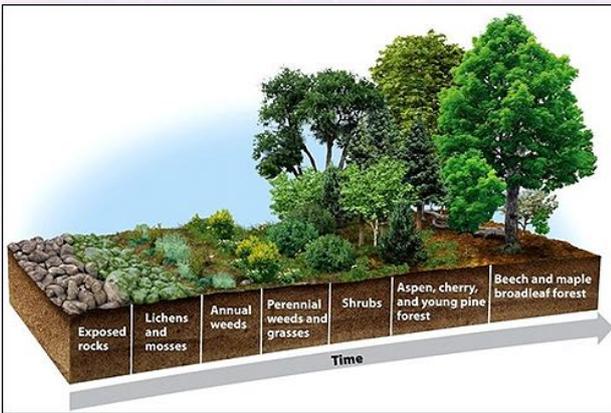


Fig 64b: Climax ecology food web of the Arctic tundra illustrates how interactive species relationships come to sustain a complex thriving ecology, in which plants, herbivores and carnivores all form an integral whole in biospheric symbiosis (Ims & Fuglei 2005). As we speak, the high tundra is losing its whiteness and turning green due to climate change, threatening all these fragile ecological relations and the very survival of these species (Rawlence 2022).

Ultimately, **society** and **culture** are also manifestations of symbiotic survival, however human emergence has been fraught with species-focused selection, leading to **egotistical consciousness**, tribal and civil warfare, as well as **sexual wars of dominance** between the male and female sexes, in which **patriarchy** has compromised the sexual prisoners' dilemma, inhibiting female reproductive choice essential for XY-based evolution and breaching human equilibrium with the biosphere, in exponentiating **devastation of the natural habitats** of the planet, **climate crisis** and **resource crisis**.

No matter what pretensions we have to technological, scientific, cultural, intellectual or even spiritual ascendancy and dominion over over nature, we are and remain biological mammals, who depend on other living species, to eat like



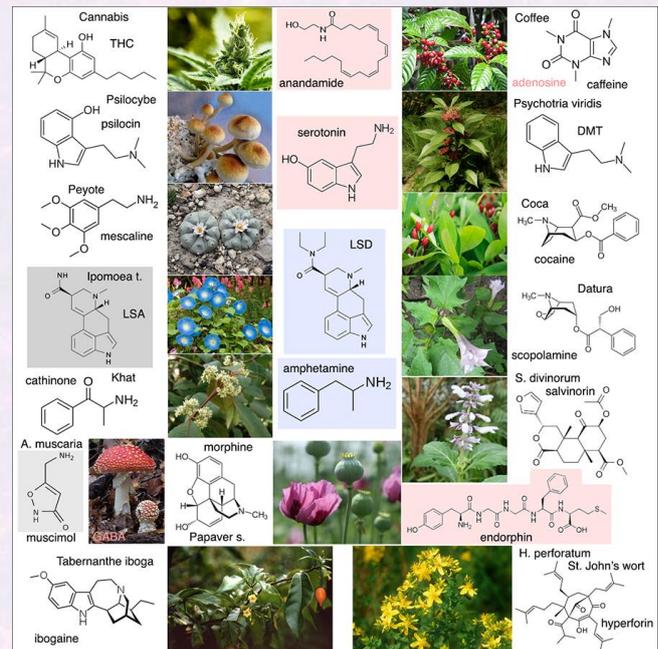
other mammals do to survive, for our medicines, and ultimately for the entire viable biospheric and climatic environment in which we exist and even the oxygenated air we breathe. We evolve as other species do, notwithstanding utopian notions of genetic engineering. Culture and intellect are extremely rapid and fundamentally unstable processes, which provide no conceivable survival tenure on evolutionary time scales. We thus survive as a species through our relationships with the biosphere and its living diversity on which we remain utterly dependent.

Fig 64c: The primary succession from weedy plants to large shade tolerant climax forest takes hundreds of years to establish.

(e) **Psychic symbiosis** with entheogenic species is a well-established reality. Although traditional use of mushrooms and peyote has tended to involve collection from the wild, since their rediscovery, sacred mushrooms have become symbiotically cultivated worldwide. *Cannabis indica*, *Papaver somniferum* and *Erythroxylon coca* have each had several millennia of cultural cultivation. *Salvia divinorum* originated in the Oaxaca region of Mexico, where it has been cultivated and used for centuries by the Mazatec people as a healing herbal remedy including Maria Sabina herself, and in religious ceremonies. The species has so adapted to being kept as hidden cultivars, that an event after the pollen tube reaches the ovary is aberrant and no fully developed nutlet has been collected from a Mexican plant.

Fig 65: A spectrum of natural psychoactive substances are all of optimal activity and not superseded by synthetics except for LSA in morning glory which is superseded by LSD and to a certain extent muscimol is eclipsed by GABA-ergic Z-drugs. This illustrates efficient but incomplete biospheric evolution of psychoactives. Pink: corresponding natural neurotransmitters. Blue: synthetic pharmaceuticals.

Fig 65 shows a variety of species bearing psychoactive substances. Certain synthetic molecules such as selective serotonin uptake inhibitor (SSRI) anti-depressants, which inhibit serotonin transporters and tricyclics are absent, but, apart from the lysergic acid amide (LSA) in *Ipomoea*, these substances are optimal, in the sense that no synthetic drug has effectively superseded them and many remain essential medicines. Many of these species have probably derived their phytochemicals as defences against insect predation, as we have seen with the gene complex for psilocin.



Most are receptor agonists, or antagonists, for example the psychedelics psilocin, dimethyl-tryptamine (DMT) and mescaline are serotonin 5HT_{2a} receptor super-agonists, but cocaine inhibits dopamine transporters increasing pleasure and alertness and cathinone has similar stimulant effects to amphetamine by activating the trace-amine receptor (TAAR1) responsible for regulating dopamine and nor-epinephrine levels via transporters. By and large those synthetics which transcend the activity of these natural substances, from methamphetamine to fentanyl and synthetic cannabinoids, have markedly more damaging social effects. Even cocaine in its natural context is a revered spiritual ally, for example the Kogi of the Andean cloud forest, who use coca as their principal spiritual ally, believe that natural coca civilises men. Nicotine in tobacco (not included in the figure) agonises nicotinic acetyl choline receptors, while scopolamine antagonises muscarinic ones. Morphine agonises μ - δ -opioid receptors while salvinorin-A agonises κ -opioid receptors. THC partially agonises CB₁, CB₂ anandamide receptors in neurons and neuroglia. Caffeine antagonises adenosine receptors, blocking effects of fatigue.

This is an expression of symbiotic edge of climax. This doesn't mean that entheogens are an exclusive route to the cosmic mind, but they are in my view sang raal – royal blood of the biosphere for our insight. Just as the fractal molecular structures of the H–CNO bio-elements are a sang raal of biogenesis, the entheogens are sang raal of biospheric union – a genuine spiritual experience evoked by union with and interdependence with other species.

The prosocial effects of psilocybe species have even been proposed to have played a role in the emergence of human culture (Rodríguez & Winkelmann 2021). The natural correction to this scenario comes from the complex sensitivity of conscious existence **not being the exclusive dominant possession of a single species *Homo sapiens***, but is achieved in **psychic symbiosis**.

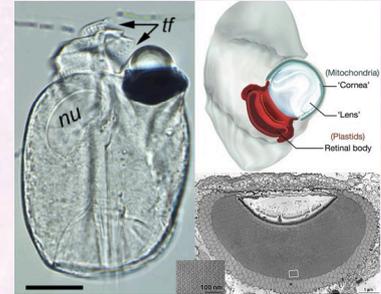


Fig 66: An extreme example of single-celled eucaryote adaption to a quantum mode. The dinoflagellate *Nematodinium* possesses an ocellum forming an eye, with a retina made from coopted chloroplast light sensors and a lens with inset wave plate made from mitochondrial membranes (Gavelis et al. 2015).

Of course this is not the exclusive or only route to moksha. We can also do deep transcendental meditation, but full blown moksha is rare and generally a more controlled experience of union, which tends to invoke mind-sky mysticism in which humanity remains the dominant pinnacle of divinity under deity. In some religions such as the Jains, all life is revered but it is linked to the idea of reincarnation and the life forms are simply sentient beings rather than genetic biological organisms. Reincarnation is really an opt out clause for the rarity of moksha based on the moral law of karma. And yes it is also a manifestation of the animistic inclusion of souls of all beings which is good. But entheogens are prima facie empirical psychic symbiosis because moksha is achieved in sacred interaction with another species, closing the biospheric symbiotic circle.



Fig 67: **Devoted parenting**: Upper: (1) Jumping spider guarding her young. (2) Squid guarding her egg pouch. Carrying an egg mass of 2,000 to 3,000 eggs and hatchlings for six to nine months can make swimming difficult for *Gonatus onyx* squid mothers. (3) The Golden Brown Stink Bug mothers guard not only the eggs, but also the 1st instars until they become 2nd instars. Lower: (4) Cichlid fishes have evolved into over 1500 species in the isolated lakes of the Great Rift Valley. Competition is fierce, and this mother shelters her offspring in her mouth at any sign of danger and takes them to a safe spot to release. They may also become invaded by cuckoo catfish (fig 68). (5) Hierarchical rank of female dominant hyenas is a key social feature of survival. At 12 weeks young hyenas need to learn to observe the rank of all 60 in the clan. Here an alpha female with two young offspring, teaches them to extract a head-bobbing concession from an older adolescent of lower rank (BBC).

Cosmological symbiosis. Psychic symbiosis provides a basis for cosmological symbiosis (see fig 58) recognising that symbiosis is a foundational principle of the interactive consummation of the physical universe, invoked as a key manifestation of complementarity, evident in the eucaryote symbiosis between archaea and bacteria, sexual complementarity, and the symbiotic relationship between all living species and the biosphere as a whole, on which we all co-depend. This then becomes extended in the following description as a cosmological principle, both in psychic

symbiosis with entheogenic species and the ensuing symbiosis between the organismic and cosmic mind and between the cosmic mind and the physical universe as a result of human symbiosis with the cosmos, leading to planetary reflowering and abundance over evolutionary and cosmic time scales.

A key element of this description is that it gives a succinct, biologically realisable account of how the subjective aspect of reality i.e the panpsychism in quanta becomes coherently evoked in living systems, revealing a coordinated functional relationship with the physical universe.

This is a three stage-process, **(1)** with the formation of **excitable cells** in both archaea and bacteria. **(2)** with the symbiosis between archaea and bacteria to form complex eucaryote cells we reach the emergence of **cellular consciousness**. With cell organelles and nuclei, the excitable eucaryote cell gains the full edge-of-chaos sentience associated with physical quantum modes, from light, molecular vibration and the perturbation of chemical orbitals on the excitable membrane, leading to sensory organelles, social signalling, epigenesis and genetic evolution modified by cellular sentience. This is where the major quantum leap of consciousness takes place. **(3)** We reach **organismic consciousness** through dynamic elaboration via neuronal coupling in multi-celled organisms, and genetic diversification of function with increasing organismic complexity, we arrive at the conscious brains of organisms, utilising coupled cellular sentience, as manifested in our subjective consciousness accompanying brain dynamics. This has in turn induced an explosive increase in complexity so that the human brain has around 10^{10} neurons with 10^{15} synapses, an intimately coupled society of amoeba-flagellates, forming a massively parallel quantum computer, making transitions at the edge of chaos (King 2014) involving quantum measurements of its own wave excitations, through discrete pyramidal action potentials timed to the progression of wave coherence (Qasim et al. 2021) as highlighted in fig 78. This complexity has in climax species from humans, through dolphins to elephants reached a cosmological level unknown elsewhere in the universe than in the biota.

Fig 68 **Parasitic coevolution** can be viciously predatory but also innovatively symbiotic. (1) Parasitic horsehair worms *Chordodes formosanus* that dwell in the guts of praying mantises compel their hosts to walk to water, by stealing chunks of their their hosts' genome in massive horizontal transfer (Mishina et al. 2023), producing a molecule that causes them to march toward light shimmering off water and drown themselves, where the worms can reproduce and enter new nymphs. (2) The cuckoo catfish lay their eggs alongside those of mouth-parenting cichlids of fig 67 eating as many cichlid eggs as possible as a gang, so the cichlid mother ends up with some intruders, and like cuckoo bird hatchlings eradicate competition, they eat the cichlid babies and take over while the



cichlid mother continues to nurture them. (3) The isopod crustacean *Cymothoa exigua* parasitises this clown fish's tongue. These organisms are protandric hermaphrodites that start their lives as males and switch sexes later in their life cycle. The isopod that attaches to the tongue is or becomes female, while a subsequent male attaches to the gill arches beneath and behind the female until they move forward to fertilise her when she is ovulating. Using its front claws, *C. exigua* severs the blood vessels in the fish's tongue, causing the tongue to necrose from lack of blood. The parasite then replaces the fish's tongue by attaching its own body to the muscles of the tongue stub. The fish then survives remaining relatively healthy if not doubly infested, but depends on the isopod to survive and eat while it lives off the fish's mucus or blood scraps. (4) An amber snail infected with the green-banded broodsac worm *Leucochloridium paradoxum* crawls into the eyestalks of snails, takes over its brain then pulsates to make the mollusk look like a dancing caterpillar to attract birds to eat them. A similar strategy to *Toxoplasma gondii* which affects rodent brains to make them fearless of cats. 30-60% of humans are infected, have longer reaction times and become less careful as drivers, having a 2.6 times higher risk of accidents (Flegel et al. 2002). (5) *Wolbachia* bacteria in *Drosophila* (orange) with DNA (green) are transmitted in the ova using the host microtubules (Ferree et al. 2005). *Wolbachia* are parasitic but can also evolve to be mutualistic (Zug & Hammerstein 2015) providing hosts with essential nutrients, disease resistance and reproductive options. (6) Ants of the species *Temnothorax nylanderii* show exceptionally high survival rates when infected with a tapeworm (inset). Such workers are favourably tended by the workers and have adolescent pheromones promoting nurturing, giving them a survival longevity similar to queens, which can live for up to 20 years, while female workers rarely reach the age of two. The ants serve as an intermediate host for the tapeworm *Anomotaenia brevis*, whereby a single ant can be infected by up to 70 parasitic larvae. The parasites survive in the hemolymph body fluid of the insects. Their complex life cycle is completed once they have been ingested by a woodpecker that feeds on the ants, to become an adult tapeworm.

"The fact is, I don't even know that you're conscious.

The only thing I know beyond any doubt—and this is one of the central insights of Western philosophy—is *Cogito ergo sum*.
What Descartes meant is the only thing I'm absolutely sure of is my own consciousness". (Chris Koch)

“My own view is that consciousness is intimately tied to our nature as living flesh-and-blood creatures. In this picture, being conscious is not the result of some complicated algorithm running on the wetware of the brain. It is an embodied phenomenon, rooted in the fundamental biological drive within living organisms to keep on living. If I’m right, the prospect of conscious AI remains reassuringly remote” (Anil Seth *Why Conscious AI Is a Bad, Bad Idea* 2023).

Just as we don’t directly perceive the subjective consciousness in others, but infer it in their lively, purposeful behaviour, in a combination of sentience and volitional will, which we sense we can subjectively identify as conscious, cellular subjective consciousness is universal but unrealised. We see subjective consciousness more easily in other mammals, such as our pets, but we also see it in the creatively extraordinary songs and mating dances of birds and spiders [fig 113](#) because here sexual selection hones the sheer creativity of evolution through mate choice. We also see it in parenting and cooperative social activity in animal societies. We can also experience subtle expressions of conscious purposiveness in the collective mating songs of crickets in the field, and in the synchronised flashing of fireflies.

“The agency of all sorts of creatures is the most fascinating, self-explanatory, self-manifesting thing and phenomenally and experientially the most indubitable fact in the world”
(Vetlesen “The Cosmology of the Anthropocene” 2019).

And evolution shows us that these patterns of purposive activity run all the way down the evolutionary tree to the first single-celled eucaryotes. Dictyostellium are single-celled free-living amoeba that show individual purposiveness in their feeding behaviour and have extensive behavioural and genetic homology to our neutrophil phagocytes [1](#), [2](#). [Dictyostellium slugs](#) also show coordinated purposeful behaviour in a highly active colony of a thousand aggregated myxamoeba. These are electrically excitable, pluripotent, motile stem-cells, engaging coordinated, motile actions and clear decision-making manoeuvres as a consensual organism. This is an organismic manifestation of cellular consciousness in action even though myxamoebae have only graded potentials. Individual amoeba likewise show purposeful activity very similar to human macrophages. This is the closest we can come to a scientific verification of the kind of consciousness we associate with higher animals in social single celled eucaryotes.

The problem facing verification is not that the complementary subjective aspect is fuzzy or vitalistic, or ill-defined, but that, by its very subjectivity it is not objectively evident just as we don’t see one another’s consciousness directly and it non-local and largely indivisible, as Buddhist philosophy suggests, forming encapsulated instances of a phenomenon complementary to the universe as a whole. Replication is thus achieved not through objective observation, but veridical verification by empirical experience. This is straightforward with other humans by mutual affirmation, but very difficult with single-celled species and even more so with individual quanta, which manifest subjectivity only through idiosyncratic individual particle trajectories which approach statistical average in the wave amplitude.

No matter how subtly we try to monitor brain states, and unravel their biology, chemistry and physics, including edge-of-chaos dynamics and quantum effects, subjectivity cannot be conjured up by an objective interaction of purely objective structures. No assembly of objective elements that has no subjective components can have subjective existence. We may find a dynamic structure of excitons, just as we do in subtle quantum experiments, such as weak quantum measurement and quantum entanglement, but none of these complex structures will have subjective nature if none of the elements do, as we learn from the failure of complex digital systems to demonstrate verifiable features of subjective existence. Therefore a purely objective description founded only on the brain is categorically intractable and incomplete. On the other hand, all physical experiences of the world around us are actually consensual forms of conscious experience, so it is clearly possible to construct a complete cosmology from consensual conscious experiences. A complementary description in which consciousness and the physical universe co-exist can thus solve the hard problem, while retaining all the empirical features in brain dynamics key to a biological realisation of the Cartesian theatre (Baars 1995, 1997). At the same time it resolves the quantum measurement problem through the subjective aspect collapsing the wave functions of the probability multiverse. Moreover the symbiotic cosmology depends only on the current status of the [core model](#) of physics, and the standard probability interpretation of the wave function, and does not need to invoke the anthropic cosmological principle (Barrow & Tipler 1988) although this is obviously consistent with it.

Both a purely physical cosmology in which human actions are ruled by [mindless physical circumstance](#) and religious cosmologies ordained by the [will of God](#) or cosmic consciousness itself, place fundamental impediments on our personal autonomy. The materialist physical world view regards consciousness as merely an internal model of physical reality constructed by the brain and volitional will as a delusion having no real effect on the physical world. The

religious view asserts that we do possess free will, but casts the entire universe as a moral test for God's will under pain of dire punishment. The only way out of this dilemma is that subjective consciousness has an effect upon the world at the level of fundamental physics. In the symbiotic cosmology volitional will has a real part in determining the course of history, thus verifying our veridical autonomy of decision-making, i.e. free will, validating and completing our experience of the world around us. Indeed only in such a cosmology can personal autonomy have any real meaning.

Since we know we no longer exist in a flat Earth universe with beaten-dome firmaments, deity or its alternatives have to be envisaged in more subtle ways, as something that stands outside and beyond the universe but shapes it in some manner outside physical cosmology. It is also extremely unlikely that a God who created the universe as we now know it, with symmetry-breaking forces, galaxies permeating the heavens, and on Earth, evolution leading to climax genetic diversity, including parasites and hosts, predators and prey, did so as a simple moral test of obedience. But we do know that the one and only tangible entity that stands outside and beyond the objective physical universe is subjective conscious existence itself. In fact all religious notions, such as Heaven and Hell are consciously envisioned realms, just as animist spirit realms are conscious visionary experiences and all personal religious experiences of deity, that are not simply religious doctrine taken on faith, including all mystical transformative encounters come as conscious and generally visionary experiences.

All realisable hope of a tangible "deity" existing thus now resides in the realms of consciousness. Panpsychism also explains how "God consciousness" could arise as a conscious interaction with the universe as a whole. This is the same concept as the atman becoming one with Brahman in Indian spiritual philosophy. We have to accept that if such interaction is unreal, then tangible interaction with any form of "deity" is unreal. However if the panpsychic postulate is true then the mind at large has reality as the fully manifest form of the subjective aspect existence on a cosmic basis and then our individual conscious existences are extant as functionally encapsulated instances of the mind at large.

There are fundamental evolutionary reasons why the entheogenic species are bound to occur and why they may be able to induce a form of "primary consciousness" evoking cosmic consciousness or the mind at large, as a result of evolution in a universe governed by fractal laws of nature.

The core neurotransmitters involved are modified elementary amino acid amines going back to the origin of life. Their pathways have been conserved since the foundation eucaryotes, as social signalling molecules, to provide feedback modes ensuring the survival of the collective organism. The brain is effectively a close-knit social organism of neurons and neuroglia communicating almost exclusively through neurotransmitters, with the core pathways, such as serotonin and dopamine continuing to have key conserved survival-related modes to ensure a purely electrochemical brain doesn't deviate from organismic survival. Evolution has honed this by natural selection, so that these modes, as expressed in the default mode network and others, focus on an emotional and cognitive dynamic that gives rise to what we consciously experience as ego. However, this has proven not to be hard wired, but like the senses, is adaptive. Moreover the highly-conserved evolutionary role of serotonin in development from social amoeba to the human brain noted above means that the ancient roles of serotonin in development may maintain evolutionary forces in humans also favouring serotonin and other target neuronal circuits to favour collective, rather than individual survival.

Because individual consciousness is actually an encapsulated form of cosmic consciousness, modified forms of these neurotransmitters produced by other species among them *psilocybe*, *lophophora* and *psychotria*, are able to tweak the serotonin 5HT2a receptor system in such a way as to impede "secondary consciousness", as in the DMN, allowing the conscious brain to revert to an ego-dissipated form of "primary consciousness". It appears that, simply by doing so, a form of long-term potentiation results, which has lasting beneficial effects, by allowing the individual to "no longer see through a glass darkly", in Paul's words, but now "face to face, knowing even also as we are known".

This makes the notion of unfolding from encapsulated individual consciousness into the universal cosmic consciousness of the mind at large, clearly and unambiguously identifiable with the traditional notion of moksha – escaping the round of birth and death of mortal existence in union of Brahman and atman and in Buddhist satori³³. The Upanishadic notion of atman or inner self, which can become united with Brahman the cosmic self, provides a central vision of this unification. However in the Buddhist perspective, the reality of the self is transcended by the unbroken wholeness and essential voidness of undivided consciousness central to the ability to experience moksha, which requires an approach where there is no dualistic distinction between subjective and objective aspects. Psychic

³³ satori – sudden enlightenment Oxford Lang. See also *subitism* derived from the French *illumination subite* (sudden awakening).

symbiosis is again a complete realisation of the Shakti-Shiva tantra. As noted in fig 259, the moksha epiphany "is not something you can experience from without, neither is it something just within in the heart's desire", but arises when you completely "let go and give your consciousness back to the universe".

The Chan/Zen notion of Buddha-nature, encompasses the idea that the awakened mind of a Buddha is already present in each sentient being. This Buddha-nature was initially equated with the nature of mind, and meditations introspecting on perceiving the mind as a mirror, but this was challenged by Hui-neng in the Zen doctrine of no mind:

*The body is the Bodhi-tree.
The mind is like a mirror bright;
Take heed to keep it always clean
And let not dust alight.
Shen-hsiu*

*There is no Bodhi-tree
Nor stand of mirror bright
Since all is void,
Where can the dust alight?
Hui-neng*

The idea of the immanent character of the Buddha-nature took shape in a characteristic emphasis on direct insight into, and expression of this Buddha-nature. It led to a reinterpretation of Indian meditation traditions, and an emphasis on the idea that the teachings and practices are comprehended and expressed "suddenly" – "in one glance", "uncovered all together" – "together, completely, simultaneously", as opposite to gradualism, the original approach which says that following the dharma can be achieved only step by step, through an arduous practice, possibly taking several lifetimes. This attests to the validity of entheogenic experiences giving sudden insight of lasting value, contradicting the mistaken notion that genuine enlightenment can be achieved only through a supreme effort of dispassionate top down control through mindfulness and suppression of ego in favour of compassionate equanimity.

Fanaa (Arabic: فناء fanā') "to die before one dies" in Sufism is the "passing away" or "annihilation" (of the self). Some Sufis define it as the annihilation of the human ego before God, whereby the self becomes an instrument of God's plan in the world (Baqa). Other Sufis interpret it as breaking down of the individual ego and a recognition of the fundamental unity of God, creation, and the individual self. Persons having entered this enlightened state are said to obtain awareness of an intrinsic unity (Tawhid) between Allah and all that exists, including the individual's mind – being united with the One or the Truth. This second interpretation is condemned as heretical by orthodox Islam. al-Hallaj was crucified when he cried: "ana al-Haqq - I am the truth" and preached overthrow of the Caliphate:

*I am He whom I love, and He whom I love is I: We are two spirits dwelling in one body.
If thou seest me thou seest Him, And if thou seest Him thou seest us both"
(al-Hallaj Armstrong 1993 263).*

Moksha also lies at the source of shamanism and visionaries who initiate and inspire major religions, as exemplified by Yeshua's statements in the Gospel of Thomas – "the kingdom is inside of you, and it is outside of you. When you come to know yourselves, then you will become known, and you will realize that it is you who are the sons of the living father" (3) – "It is I who am the light which is above them all. It is I who am the all. From me did the all come forth, and unto me did the all extend. Split a piece of wood, and I am there. Lift up the stone, and you will find me there" (77). The "ultimate reality" experienced in quantum change experiences also has parallels with the Christian Holy Spirit.

Because psychedelics play directly into the visionary state, in an intense, but consciously negotiable experience, with outstanding transcendent features, it is natural that they should be regarded as central tools, *sine qua non*, in the discovery process of the central enigma of existential cosmology – the role and function of consciousness in the universe, complementing projects such as the LHC seeking to elucidate the foundations of physical cosmology.

Erwin Schrödinger (1944) in dealing with the paradox of many minds in one world stated:

*"There is obviously only one alternative, namely the unification of minds or consciousnesses. Their multiplicity is only apparent, in truth there is only one mind." "Mind is by its very nature a *singulare tantum*³⁴. I should say: The overall number of minds is just one. I would say it is indestructible, since it has a very peculiar time table, namely mind is always now. There is really no before and after for mind. There is only a now that includes memories and expectations"*

Symbiotic cosmology was prefigured in George Greenstein's "Symbiotic Universe" (1988), echoing and extending the cosmological anthropic principle that the existence of the universe depends on its laws being compatible with living observers (Barrow & Tipler 1988):

³⁴ *singulare tantum* a noun which appears only in the singular form – objects which may in principle be counted but are referred to as one.

But the symbiosis to which I am referring here is different. It is of an entirely new sort. The first partner in this new interdependency is not an organism at all, but rather an inanimate structure. Furthermore, it is a structure not previously suspected as taking part in such relationships: the universe as a whole. The second partner in turn, to which to which the first is inextricably conjoined, is alive, but it is not any particular organism. It is not even an entire species. Rather, the second partner is all organisms — life itself. The proposal is that life and the universe are melded into an immense symbiotic unity, and that this is so for reasons that are ultimately metaphysical. Why did the cosmos bring forth life? It had to. It had to in order to exist.

The reality of the mind at large is consistent with the biological and physical reality of a human brain in a transformative state where the brain processes supporting consciousness are freed from their boundary constraints and become unbundled from subject-object polarisation. Since the only manifestations of subjective consciousness we know of in the universe are the biota, organismic consciousness, particularly in such mental states may be the key and perhaps only realisable way that cosmological consciousness of the universe at large can become fully manifest.

We know that the Cartesian theatre of the global workspace of consciousness (Baars 1997) is a complex affair. It is not just the external senses of sight, sound, touch and smell which mediate varying quantum modes – photons, phonons and molecular orbital perturbations. It includes emotions, bodily sensations, trains of conscious thought, involving semantic, symbolic and auditory dimensions. Thought is visual, verbal and abstract. We know we experience these subjective modes together, as a totality, in the midst of a dynamic encounter in the real world. But we also know we can experience intense situations in dreams that are perceived as real rather than merely imagining something. We also experience visionary states which may have complex scenes and encounters, but also other more exotic abstract or ecstatic states of consciousness, unbound from these same constraints also having veridical reality value and that these can approach a state of moksha. Some aspects of our sentience are also shaped by the varying types of receptors for each of the senses, and the way these are processed in wave excitations and action potentials in the nervous system.

This makes it obvious that major aspects of the form of our conscious life and of our brain processing shape the human nature of consciousness. What is critically at stake is the foundation subjective nature of experiential consciousness, complementing the physics, not the particular human evolutionary design of the encapsulation. It is obvious that, even for a person in a state of samadhi, their cosmic consciousness is appearing through a human viewpoint. For example we more easily identify with mammals as we share their limbic system emotions and find arthropods more alien.

On the other hand, we have seen that the key transition in the emergence of subjective consciousness is the founding eucaryote cell. This means that both the features of neuronal excitation and the roles of neurotransmitters are widely shared across all metazoan phyla, with some secondary variation. Thus the physics evoking subjective consciousness in an arthropod, or an octopus is fundamentally homologous to ours, despite major differences in neural circuit design. A key example is the role of serotonin, where we find it maintains the development of the fruiting body sporulation tip in *Dictyostellium*, and likewise plays in humans the role of a fundamental organiser of human brain structure, from the neural groove, to differentiating the layers of the prefrontal cortex. Thus, although humans are very very different from slime moulds, core aspects of their excitability and social signalling are strongly conserved and remarkably similar.

The fact that people have such similar experiences during quantum change attests to their universality and potentially cosmological status and hence to the validity of psychedelics as a key oracle for discovery of the foundations of consciousness in the mind at large. Realising the symbiotic mind at large solves the hard problem of consciousness and the central enigma of existential cosmology, the nature and purpose of conscious existence, thereby resolving the scientific, eschatological and theistic quests in one “fell swoop”, in a compact, coherent synthesis.

Symbiotic existential cosmology is thus empirically verified in three principal ways:

- (1) Existential cosmology, as an interaction between subjective consciousness and physical reality, is verified through affirmation by empirical experience between conscious human volitional agents, in the same manner that legal transactions, such as sworn evidence, fiduciary duties of care and terms of trust are veridically affirmed. This is necessary for applying Occam's razor to eliminate materialistic cosmologies failing the volitional efficacy test fundamental to human decision-making autonomy and personal responsibility for our actions upon the world.
- (2) The extent of subjective consciousness across the evolutionary tree can be verified through empirical observation of volitional purposiveness in eucaryotes.
- (3) Cosmological symbiosis is verified by statistical evaluation of quantum change experiences of “ultimate reality” in psychedelic and meditational states, as demonstrated in studies by the Johns Hopkins team and others.

Stanislav Groff (1980) notes:

"In one of my early books I suggested that the potential significance of LSD and other psychedelics for psychiatry and psychology was comparable to the value the microscope has for biology or the telescope has for astronomy. My later experience with psychedelics only confirmed this initial impression. These substances function as unspecific amplifiers that increase the cathexis (energetic charge) associated with the deep unconscious contents of the psyche and make them available for conscious processing. This unique property of psychedelics makes it possible to study psychological undercurrents that govern our experiences and behaviours to a depth that cannot be matched by any other method and tool available in modern mainstream psychiatry and psychology. In addition, it offers unique opportunities for healing of emotional and psychosomatic disorders, for positive personality transformation, and consciousness evolution".

I have now taken this to its cosmological conclusion, by taking a Galilean interpretation of Groff's position that also cosmologically inverts the Copernican principle³⁵. That is, I am asserting that subjective consciousness does make human observers, by possession of it, privileged observers of, and participants in the universe, and that a cosmic view of this privileged position is both achievable and facilitated through psychedelics and that this knowledge or "knowing" invokes upon us a primary responsibility to care for and ensure the survival and flowering of sentient life and consciousness within the universe throughout the generations of life.

All the evidence that we have at our disposal indicates that subjective consciousness is manifest in the biota and that only the biota possess it in the fully fledged form we witness it. Notwithstanding the cosmic web, which has fractal similarities to neural tissue (Vazza & Feletti 2020), and the hypothetical idea that some small stars might be conscious (Matloff 2016), the brain appears to be the most complex coherent system in the universe, as the cumulative manifestation of all the forces of nature interacting in consummation of their fractal interaction on all scales, from cosmological symmetry-breaking, running through quarks, protons and neutrons, atomic nuclei, atoms and molecules, to molecular complexes such as the ribosome and membrane, to cell organelles, cells, tissues, organs such as the brain, societies of organisms and the symbiotic biosphere. We know of no other process in the universe, from black holes to stars and the gas clouds of nebulae, or even dark matter, that cumulatively complete the interaction of the fundamental forces in this way.

The evidence also indicates that, while psychedelics create diverse forms of altered conscious states, spanning the entire spectrum, from the paradisiacal to the diabolical, requiring careful guidance, and having significance varying from the sublime to the ridiculous, they constitute humanity's most powerful research avenue to discover what the inner dimensions of conscious experience are, complementing experiences of dreaming and other states, with a central avenue which can be induced and explored, both scientifically and personally by the waking mind. And finally, underlying these diverse visionary phenomena is a deeper enlightenment at the centre of this cyclone, which has the potential to resolve what the existential status of conscious experience is cosmologically, in the experience of moksha, transcending the cycle of birth and death in mystical transformative experiences of long-lasting psychic benefit, whose common features imply they are accessing a common primary conscious condition.

Working to validate entheogenic experiences and conscious states generally requires a different type of verification from physical to establish a phenomenology of the subjective psychedelic state. Peoples experiences of daydreaming and dreaming sleep confirm that very real events can occur, particularly in dreaming. The nature of space and time in dreaming is also undetermined as some people report precognitive dreams (Dunne 1927). We don't usually assess the reality value of internal mental states as the same as everyday experience of the world, but they still often possess features which we recognise and identify as having veridical reality. Likewise some psychedelic states form a diverse population from frank delusions to common claims of profound experiences of a life-changing nature.

Ralph Metzner's (2017) radical empiricism approach gives the foundations of how to assemble such a phenomenology:

"Over 100 years ago the American philosopher William James said that radical empiricism would not dismiss any observations just because we don't have a theory or model to explain them in our current worldview. For that reason, James allowed drug experiences (with nitrous oxide), mystical visions, parapsychological or psi-phenomena and telepathic communications, into science for consideration and further observations. HH the Dalai Lama has formulated a similar epistemology, by his notion of "first person empiricism" – empirical observations made with our own senses. Repeated observations of similar situations by the same observer or similar observers gradually make the observations less "purely subjective" and step-by-step more objective. So the basic formula of radical empiricism is objective = subjective plus one or more. If only one person sees something, it remains purely subjective, like a

³⁵ In physical cosmology, the **Copernican principle** states that humans, on the Earth or in the Solar System, are not privileged observers of the universe. (Wikipedia)

fantasy or a dream. But if at least one other person sees it and can say “yes, I see it” it becomes a little bit more objective, and this can have profoundly healing implications. ... So when people speak about “entities” or “spirits” or “demons” or “visions” or “hallucinations” we want to first separate the observations from the speculations. Then we can gather further observations – which might have been recorded in various books or in works of art, and start the process of making systematic comparisons. ... Our intuitions and subtle inner perceptions can be mistaken just like any outer perceptions – and can and should always be subject to repetition and repeated verification”.



Fig 70: Entheogens are a/the key instrument providing the subjective conscious equivalent to the LHC's role in physical cosmology. Left: Curandero (Luke Brown). Right: Particle shower (Pb ion collision LHC). Just as there are many visions, surrounding one nierika portal to the 'spirit', world, so there have been a multitude of particle showers, for one Higgs particle discovery.

Future generations will come to realise they have been betrayed by Western culture, discovering that:

- (a) A scientific discovery which has features consistent with being the subjective equivalent of the LHC³⁶, a consciousness reactor that could give us access to the core cosmological secrets of the universe, had been suppressed for half a century by the very culture that claims to be the climax of scientific enlightenment.
- (b) That this had happened because this very discovery was perceived by political leaders to be threatening to a consumption-driven society based on venture capital exploitation of the planet's resources for financial gain, combined with adherence to a religious belief which requires the drinking of the saviour's blood and eating His flesh because “without the shedding of blood there is no remission of sin.”
- (c) That this repression, reminiscent of the dark ages, has intentionally acted in such a way as to seek to prevent us from attaining moksha or psychic union with the cosmos, the very ideal that lies at the heart of the spiritual and religious quest for enlightenment and transcendence, because it risks unraveling the status quo.
- (d) That Entheogens giving the respect due could also have critically helped alleviate the planetary crisis that has ensued from human evolutionary emergence as a tribal society, and unfold a symbiotic psychic relationship with reality, just as we are obligately symbiotic with the food and medicinal species on which we depend.
- (e) That instead of helping enable humanity to ensure its survival and the survival of the diversity of life on this planet on which humanity depends, this repression had caused a 50 year delay in addressing a climate and biodiversity crisis, significantly risking the economic welfare, health and survival of these future generations.

This appears to be the situation we are just beginning to emerge from, and yet are still facing today. For the planet to continue to survive over evolutionary and cosmological time scales, climax consciousness is, and has to be, fully sensitive as a complex system to the biosphere. This is necessary to be able manifest a cosmologically conscious response, consistent with perennial survival on evolutionary time scales. The fully evolved consciousness is thus, in its complete form symbiotically biospheric. Its fullest and complete manifestation is biospheric and cannot, in evolutionary terms, be the exclusive provenance of a single dominant species, *Homo sapiens*.

³⁶ Large Hadron Collider responsible for discovering the Higgs boson completing the standard model of physics, fig 71.

The Conscious Brain, and the Cosmological Universe³⁷
 Solving the Central Enigma of Existential Cosmology
 Chris King – 21-6-2021
 In memory of Maria Sabina and Gordon Wasson

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Abstract:

*This article resolves the **central enigma of existential cosmology** – the nature and role of subjective experience – thus providing a direct solution to the "hard problem of consciousness". This solves, in a single coherent cosmological description, the core existential questions surrounding the role of the biota in the universe, the underlying process supporting subjective consciousness and the meaning and purpose of conscious existence. This process has pivotal importance for avoiding humanity causing a mass extinction of biodiversity and possibly our own demise, instead becoming able to fulfil our responsibilities as guardians of the unfolding of sentient consciousness on evolutionary and cosmological time scales.*

The article overviews cultural traditions and current research into psychedelics³⁸ and formulates a panpsychic cosmology, in which the mind at large complements the physical universe, resolving the hard problem of consciousness extended to subjective conscious volition over the universe and the central enigmas of existential cosmology, and eschatology, in a symbiotic cosmological model. The symbiotic cosmology is driven by the fractal non-linearities of the symmetry-broken quantum forces of nature, subsequently turned into a massively parallel quantum computer by biological evolution (Darwin 1859, 1889). Like Darwin's insights, this triple cosmological description is qualitative rather than quantitative, but nevertheless accurate. Proceeding from fractal biocosmology and panpsychic cosmology, through edge of chaos dynamical instability, the excitable cell and then the eucaryote symbiosis create a two-stage process, in which the biota capture a coherent encapsulated form of panpsychism, which is selected for, because it aids survival. This becomes sentient in eucaryotes due to excitable membrane sensitivity to quantum modes and eucaryote adaptive complexity. Founding single-celled eucaryotes already possessed the genetic ingredients of excitable neurodynamics, including G-protein linked receptors and a diverse array of neurotransmitters, as social signalling molecules ensuring survival of the collective organism. The brain conserves these survival modes, so that it becomes an intimately-coupled society of neurons communicating synaptically via the same neurotransmitters, modulating key survival dynamics of the multicellular organism, and forming the most complex, coherent dynamical structures in the physical universe.

This results in consciousness as we know it, shaped by evolution for the genetic survival of the organism. In our brains, this becomes the existential dilemma of ego in a tribally-evolved human society, evoked in core resting state networks, such as the default mode network, also described in the research as "secondary consciousness", in turn precipitating the biodiversity and climate crises. However, because the key neurotransmitters are simple, modified amino acids, the biosphere will inevitably produce molecules modifying the conscious dynamics, exemplified in the biospheric entheogens, in such a way as to decouple the ego and enable existential return to the "primary consciousness" of the mind at large, placing the entheogens as conscious equivalents of the LHC in physics. Thus a biological symbiosis between Homo sapiens and the entheogenic species enables a cosmological symbiosis between the physical universe and the mind at large, resolving the climate and biodiversity crises long term in both a biological and a psychic symbiosis, ensuring planetary survival.

³⁷ This work was conceived out of a quantum change experience evoked by psilocybe mushrooms. Taken together the full dimensions of the work inform a scientific and sacramental paradigm shift towards perennial planetary survival.

³⁸ *psychedelic* "mind-manifesting" psychē (ψυχή, "soul"), dēloun (δηλοῦν, "to make visible, to reveal"), as opposed to *hallucinogenic* – inducing hallucinations and *psychotomimetic* (psycho- mind + mīmētikós, imitative) mimicking psychotic behaviour/personality.

The Decline of Ground-Breaking Disruptive Scientific Discoveries

The research of Park, Leahey & Funk (2022) confirms that papers and patents are becoming less disruptive over time. I want to draw the attention of readers to the fallacy that the past record of science and technology is a basis to believe pure physicalist science will show how the brain “makes” consciousness in any sense greater than the neural correlate of conscious experience. This research needs to be taken seriously and is damning evidence against the assumption that the past progress of mechanistic science will solve the hard problem of conscious volition.

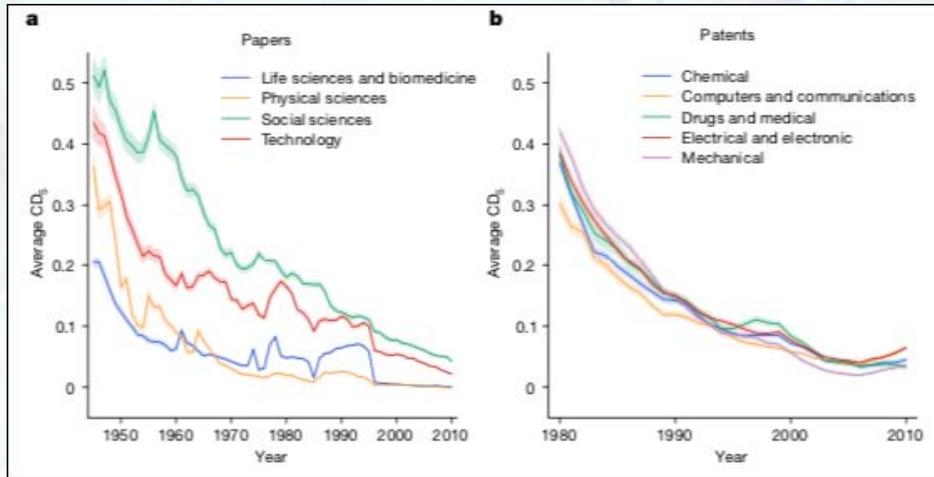


Fig 70b: Decline of disruptive science and technology

The figure shows how devastating the decline has become and indicates the extreme unlikelihood of mechanistic science solving the biggest problem of all. This belief is a product of severe ignorance of the diffuse complexity of the excitation from the prefrontals through to the motor cortex modified by the basal ganglia and the cerebellum, involving both diffuse network activity and deep cyclic connections, which appear to be both uncomputable and empirically undecidable in the quantum universe.

Research Citation Profile

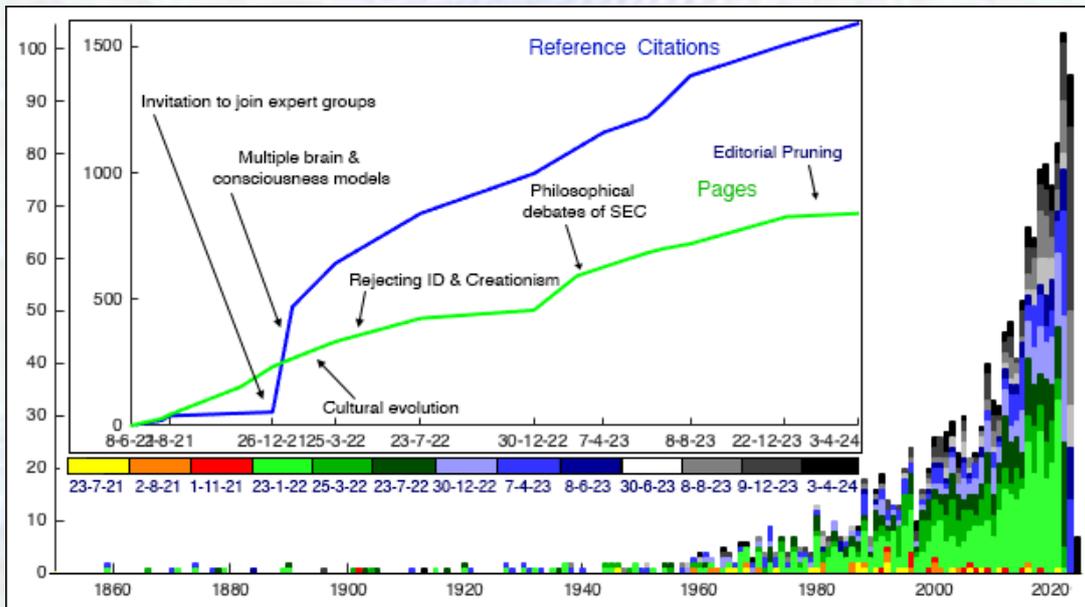


Fig 70c: The research citation profile of Symbolic Existential Cosmology

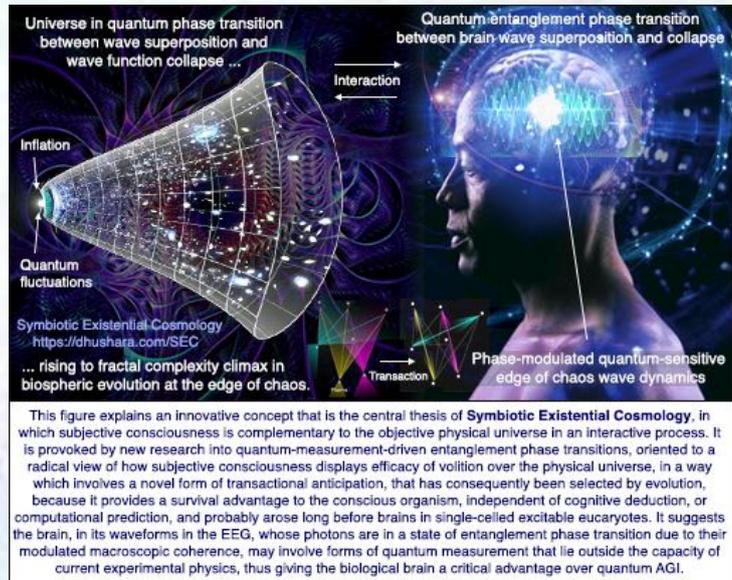
Growth of research and distribution of dates of citations two years since the mushroom trip that precipitated this work, it has accrued 844 pages, with 1593 source references, with a peak of 103 in 2022 and 95 in 2023. Of these 1172 are from 2000 on, 898 from 2010 on and 361 from 2020 on, illustrating the real-time up-to-date nature of the work, which is roughly in four categories, (1) cosmological physics, (2) consciousness and neuroscience, (3) evolutionary biology, (4) metaphysics, animism and religious studies. Fittingly, the oldest citation is Charles Darwin (1859) “On the Origin of the Species”.

The Central Thesis of Symbiotic Existential Cosmology © Chris King 25-10-2023 as part of SEC 1.1.416

The central thesis of Symbiotic Existential Cosmology is that subjective consciousness **interacts with** the physical brain, as a **sub-quantum anticipator** of environmental uncertainty, using space-time – entangled patterns of brain wave states, which are in a **quantum phase transition** between superimposed wave function evolution and measurement-derived wave function collapse, biologically coupled to a complementary **self-critically tuned neurodynamic phase transition**, in which **edge-of-chaos instabilities** in conscious brain dynamics, accompanied by **wave phase-modulation**, implicitly involve both **past and future special-relativistic states** in their entangled wave functions, thus facilitating **efficacy of subjective conscious volition** over the physical universe, by **anticipating existential threats** to organismic survival, a process which is thus **preserved by evolution**, in a universe that is also in a **phase transition** between full entanglement and wave collapse – a process which is itself in a state of **biospheric evolutionary climax at the edge of chaos**.

This resolves two complementary questions essential to a complete existential cosmology:

- The **neurobiological question** of the **hard problem** of the subjectivity of consciousness extended to volition, in which subjective conscious physical volition is manifested through space-time – entangled patterns of brain wave states in a **quantum phase transition**, coupled to self-organised **neurodynamic phase transitions** at the **edge-of-chaos**, complemented by tuned **modulation of wave phase**.
- The **cosmological question** of a universe, in an ongoing partially collapsed **phase transition**, of **quantumness**, between a fully quantum-entangled cosmic wave function and a measurement-reduced universe, substantially quantum-collapsed, due to a plethora of destructive measurement processes that tend to evoke “classical” outcomes, through the projection operator, as in the **cat paradox experiment**, in which planetary biospheres and conscious existence, co-arise in evolutionary climax, at the **edge of chaos**.



Empirical experience confirms that, while the existence of the universe is necessary to our biological survival, subjective conscious experience is primary. We informatively access the physical world, entirely and exclusively through our subjective conscious experiences of it, so subjective consciousness is clearly primary to our knowledge of the physical universe, whose physical quanta in bosons and fermions, we do not experience directly, but only inferentially, through our subjective biologically derived sensory perceptions, along with our inner less-confined subjective experiences in dreams and visionary states. Nevertheless, we understand that, as living organisms, the physical universe in the form of climax planetary biospheres, is necessary to our biological survival, as an inferred foundation of our common existence.

Recall that, in a classical deterministic Laplacian universe, every future state is fully determined by the dynamical laws of evolution and the initial conditions, while in the quantum universe, our knowledge of outcomes is restricted to evolution of the Schrödinger equation, punctuated by collapse of the wave function, resulting in discrete events having a probability determined by the wave function amplitude. This leads to so-called non-local hidden-variable theories, postulated below the quantum level, from pilot waves, through quantum transactions to super-determinism, which seek to explain and determine the specific individual outcomes we see, for example in the Schrödinger **cat paradox experiment**, where a cat subjected to a lethal dose of cyanide, via a radio-active decay is found to be alive or dead but not both, e.g. with a 50-50 probability. The quantum universe is thus in a state of probability-punctuated causality and is neither fully defined, nor causally closed. We attempt to understand this using two classical ideas, (1) the deterministic nature of billiard ball collisions and (2) the probabilities of a classical poker game, applying the first to the Schrödinger evolution and decoherence and the second to the probability interpretation of wave function collapse, but neither are adequate to deal with the non-locality implied by quantum entanglement. God does not play dice!

The central thesis of Symbiotic Existential Cosmology asserts that subjective consciousness is a key process resolving cosmological indeterminacy, by forming a neurodynamic **realisation of these hidden variable interactions** governing non-local entanglement, facilitating biological survival by **anticipating quantum-derived environmental uncertainty** in a manner complementing computational boundary conditions. Space-time anticipation constitutes whole conscious experiences containing a retro-causal echo of the future, both in intuitive conscious anticipation and in rarer more graphic experiences of prescience, precognition and déjà vu. This is not just a deductive process. It cannot be analysed, or predicted by causal computation, for the same reason entanglement prevents transmission of classical information under local Einsteinian causality, and the uncertainties are irreducible, because they involve both computationally intractable environmental uncertainties and indeterminacies due to other live conscious volitional agents.

The central thesis states that the conscious brain uses its continuous wave **tissue potentials** to evoke a unique form of quantum space-time anticipation through global-scale entangled excitations moving in and out of coherence, in a phase transition between full entanglement and wave function collapse, reflected biodynamically in both the phase transition between edge of chaos dynamics at tipping points between chaos and order, and **phase coupling** between continuous electromagnetic wave potentials in the tissues and individual neuronal action potentials in the neural net connectivity. It is thus not just a quantum super-computer, but a sub-quantum conscious anticipator. This results in subjective experience manifesting as a globally omnipresent “stream of consciousness” – **everything, everywhere, all at once** (Gillett 2023), forming an anticipatory “quantum of the present”, utilising memory and the environmental context, but also entangled with the future, in a manner similar to an integral transform, also supported by extensive predictive coding in the brain, acting as a contextual environmental filter, to enable intuitive conscious volitional choices, favouring the survival of the whole organism, by anticipating acute **existential threats**, crises and opportunities and in turn applying subjective conscious volition in our decision-making and behaviour to facilitate our biological survival over evolutionary time scales. By contrast, rational processes are tied more to established classical causal factors compatible with cerebral cognition. The subjective interaction can thus move seamlessly from uncertainty-dominant anticipative intuition, to a context-dominant predictively cognitive response. Because brain dynamics do not involve independent identically-distributed **IID measurements**, as their contexts are continually changing, there is no evidence that they converge to the classical. Nor can it be established that the quantum universe, or brain, is causally closed to subjectivity.

This overall picture coincides with our empirical subjective experience of conscious intuitive decision-making, resulting in veridical perception of our volitional action in intentional behaviour. For this purpose, SEC asserts that there are two scientific empirical avenues, (a) **verified objective observation** and (b) **affirmed subjective experience**, consistent with the etymology and current meaning of “empirical” as “based on, concerned with, or verifiable by observation, or experience, rather than theory or pure logic” (Oxford Languages). Given the fact that the overwhelming opinion of sane people is that we have conscious empirical intentional ability to affect our fates and this is the basis of criminal and corporate law on intent, this has a very high level of empirical validation, which even scientific physicalists, in all honesty, need to concede is the case. Indeed SEC is the only type of cosmology that respects our empirical experience without invoking some form of illusionism that our subjective experience of active agency is a fallacious deception.

Symbiotic Existential Cosmology asserts that subjective conscious intuition in decision-making and volition can influence the ongoing brain state, in situations where there is quantum-derived environmental uncertainty, as is critical for our survival, and that the brain state accompanying subjective conscious volition over the physical universe, occurs only when the physical brain dynamic is in a self-organised critical state of physical phase transition at the edge of chaos, between a more chaotic and a more ordered regime, which is itself at a quantum uncertain unstable tipping point. This avoids causal conflict between subjective volition and a determined ongoing physical brain state. It is achieved by minimising quantum measurement in favour of a higher degree of anticipatory phase entanglement than the surrounding universe, consistent with minimal collapse to the classical. The efficacy of conscious anticipation in survival in the wild is essential to explain why subjective conscious volition has an evolutionary advantage, over non-conscious computational processing and has thus been conserved by evolution, giving conscious biological brains a critical advantage over AI, using phase transitional entanglement that is not accessible to objective physical interrogation.

While SEC is agnostic to specific quantum interpretations, it finds the approach of **transactional** super-causality helpful as an explanation of quantum anticipation, through a trans-causal future-past handshaking phase transition, from a plasma-like interaction of contingent offer and confirmation waves, to a solid-like set of real interactions between emitters and absorbers, which, like subjective experience, stands outside physical space-time.

Furthermore, this is achieved because the brain also uses **phase modulation** of its waveforms, evidenced in electro- and magneto-encephalograms, through hand-shaking phase coupling of individual action potentials with the continuous tissue potentials. Because brain waves in the EEG share the features of macroscopic radio waves, they share features of entanglement of their fields that we witness in coherent laser light as well. The modulated phase coherence of global brain dynamics in dynamic feedback with more decentralised partially decoherent local processing, invokes the “spotlight” of coherent conscious attention, with a sub-conscious periphery, common to theories such as **global neuronal workspace** theory. Symbiotic Existential Cosmology asserts that these phase modulations are not just analogous to the foundation concept of quantum uncertainty through **wave beats**, but constitute a unique form of quantum measurement by the brain of its own internal dynamical states, distinct from using the Born probability interpretation by destructive measurement, as in standard experimental physics, such as the cat paradox experiment, while keeping destructive measurement minimal to facilitate quantum anticipation.

In turn, this enables the subjectively conscious brain to collapse the probability multiverse of future quantum uncertainties, to unfold the line of emerging world history that we invoke together, for better or worse, through our choices in the uncertain “karmic” quantum environment, as live autonomous intentional agents, inheriting personal conscious responsibility for our actions, particularly in relation to the biosphere and it’s and our survival as a species.

The Cosmological Axiom of Primal Subjectivity

To begin the physics and neuroscience section, I shall put the core axiom into precise formulation, taking into account that the existence of primary subjectivity is an **undecidable proposition**, from the **physical point of view**, in the sense of Gödel, but is **empirically certain** from the **experiential point of view**, we come to the following:

- (1) We start on home ground, i.e. with human conscious volition, where we can clearly confirm both aspects of reality – **subjectively experiential** and **objectively physical**.
- (2) We then affirm, as empirical experience, that we have **efficacy of subjective conscious volition over the physical universe**, manifest in every intentional act we make, as is necessary for our behavioural survival – as evidenced by my consciously typing this passage into physical form, and that this is in manifest conflict with pure physicalism asserting the contrary.
- (3) We now apply **Occam's razor**, not just on parsimony, but **categorical inability of pure materialism**, using only **physical processes**, which **can only be empirically observed**, to deal with **subjective consciousness**, because this **can only be empirically experienced** and is private to observation. Classical neuroscience accepts consciousness only as an **epiphenomenon** – an internal model of reality constructed by the brain, but **denies volition**, as a delusion perpetrated by evolution to evoke the spectre of intentional behaviour. This leads to intractability of the **hard problem of consciousness**, extended to the physicalist blanket denial of conscious physical volition, which we perceive veridically in our conscious perception of our enacted intent, this becomes the **extended hard problem**.
- (4) We then scrutinise the physical aspect and realise we **cannot empirically confirm classical causal closure the universe in brain dynamics** because: (a) the **dynamics is fractal to the quantum-molecular level**, (b) **non-IID** processes don't necessarily converge to the classical and (c) **experimental verification is impossible** because we would need essentially to trace the neurodynamics of every neuron, when the relevant dynamics is at the unstable edge of chaos and so is quantum sensitive. This remains experimentally and technologically unfeasible. Neither can we prove consciousness causes brain states leading to volition, because consciousness can only be experienced and not observed, so this is a genuine undecidable proposition physically.
- (5) This sets up the status of: **“Does subjective conscious volition have efficacy over the universe?”** to be an **empirically undecidable cosmological proposition** from the **physical perspective**, in the sense of Gödel. From the **experiential perspective** however, it is an **empirical certainty**.
- (6) We therefore add a single minimal **cosmological axiom**, to state the affirmative proposition – **“Subjective conscious volition has efficacy over the physical universe”**. We also need to bear in mind that a physicalist could make the counter proposition that it doesn't, and both could in principle be explored, like the continuum hypothesis in mathematics – that there is no infinite cardinality between those of the countable rationals and uncountable reals.
- (7) **Rescaling the primal axiom**: We now need to scale this axiom **all the way down to the quantum level**, because it is a **cosmological axiom** that means that **the universe has some form of primal subjective volition**, so we need to investigate its possible forms. The only way we can do this, as we do with one another about human consciousness, where we can't directly experience one another's consciousness, is to make deductions from the physical effects of volition – in humans, organisms, amoeba-flagellates, prokaryotes, biogenesis, butterfly effect systems and quanta.
- (8) **Quantum experience and volition**: We immediately realise that quantum reality has **two complementary processes, consciousness and volition**:
 - (a) **Quantum consciousness**: The wild wave function which contains both past and future implicit “information” under special relativity, corresponding to the **quantum-experiential interface of primal subjectivity**.
 - (b) **Quantum volition**: Collapse of the wave function, which violates causality and in which the normalised wave power space leaves the quantum total free will where to be measured, which is the **quantum-volitional interface of primal subjectivity**.
- (9) **Primal cosmological subjectivity**: This means that subjectivity is a primal complement to the quantum universe and that the cosmos as a whole in an interactive process between physical objectivity and experiential subjectivity, arising at the cosmic origin.
- (10) **Two potentially valid cosmologies arise from the physical perspective, but only one from the experiential perspective**:

As with any undecidable proposition, from the objective perspective, pure physicalists can, on the one hand, continue to contend that the quantum has no consciousness or free will and that uncertainty is “random” and cite lack of an obvious bias violating the Born interpretation, and develop that approach, thus claiming volition is a self-fulfilling delusion of our internal model of reality. But Symbiotic Existential Cosmology can validly argue that uncertainty could be due to a complex quasi-random process, e.g. a special relativistic transactional collapse process, which by default, the quantum, by virtue of its wave function context does have “conscious” free will over, allowing us and the diversity of life to also be subjectively conscious and affect the world around us, unlike the pure materialist model.
- (11) Symbiotic Existential Cosmology, thus shows that CA, in the form of subjective conscious volition, is **undecidable physically**, although it is **certain experientially** and **necessary for subjective conscious survival**.

1 The Cosmological Problem of Consciousness

The human **existential condition** consists of a complementary paradox. To survive in the world at large, we have to accept the external reality of the physical universe, but we gain our entire knowledge of the very existence of the physical universe through our **conscious** experiences, which are **entirely subjective** and are complemented by other experiences in dreams and visions which also sometimes have the genuine reality value we describe as **veridical**. The universe is thus in a fundamental sense a description of our consensual subjective experiences of it, experienced from birth to death, entirely and only through the relentless unfolding spectre of subjective consciousness.

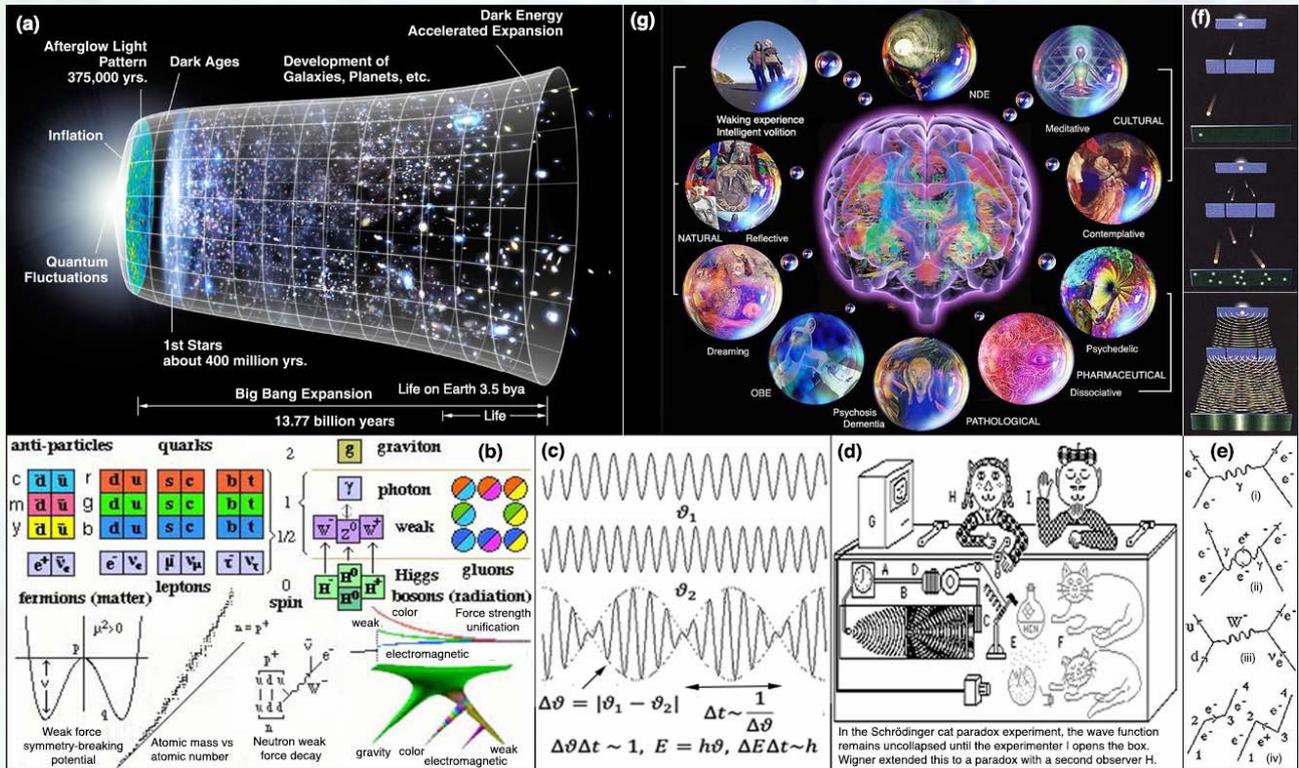


Fig 71: (a) Cosmic evolution of the universe (WMAP King 2020b). Life has existed on Earth for a third of the universe’s 13.7 b ya lifetime. (b) Symmetry-breaking of a unified superforce into the four wave-particle forces of nature, colour, weak, electromagnetic and gravity with the first three forming the standard model and with the weak-field limit of general relativity (Wilczek 2015) comprising the **core model**. (c) quantum uncertainty defined through wave coherence beats, (d) Schrödinger cat experiment. Schrödinger famously said “*The total number of minds in the universe is one*”, preconceiving Huxley’s notion of the mind at large used as this monograph’s basis for cosmological symbiosis. Quantum theory says the cat is in both live and dead states with probability 1/2 but the observer finds the cat alive or dead, suggesting the conscious observer collapses the superimposed wave function. (e) Feynman diagrams in special relativistic quantum field theories involve both retarded (usual) and advanced (time backwards) solutions because the Lorenz energy transformations ensuring the atom bomb works have positive and negative energy solutions $E = \pm \sqrt{p^2 + m^2}$. Thus electron scattering (iv) is the same as positron creation-annihilation³⁹. Each successive order

Feynman diagram has a contribution reduced by a factor $\alpha = \frac{e^2}{2\pi\epsilon_0\hbar c} \sim \frac{1}{137}$, the fine structure constant. (f) Double slit

interference shows a photon emitted as a particle passes through both slits as a wave before being absorbed on the photographic plate as a particle. The trajectory for an individual particle is quantum uncertain but the statistical distribution confirms the particles have passed through the slits as waves. (g) Cosmology of conscious mental states (King 2021a). Kitten’s Cradle a love song.

³⁹ Feynman notes in his Nobel address: “I received a telephone call one day at the graduate college at Princeton from Professor Wheeler, in which he said, ‘Feynman, I know why all electrons have the same charge and the same mass’ ‘Why?’ ‘Because, they are all the same electron!’” “suppose that the world lines which we were ordinarily considering before in time and space – instead of only going up in time were a tremendous knot, and then, when we cut through the knot, by the plane corresponding to a fixed time, we would see many, many world lines and that would represent many electrons, except for one thing. If in one section this is an ordinary electron world line, in the section in which it reversed itself and is coming back from the future we have the wrong sign to the proper time – to the proper four velocities – and that’s equivalent to changing the sign of the charge, and, therefore, that part of a path would act like a positron.” “But, Professor”, I said, “there aren’t as many positrons as electrons.” This became the basis of his representation of positrons as electron holes and for the entire Feynman diagram approach to quantum field theories.

The Physical Viewpoint

The religious anthropocentric view of the universe was overthrown, when Copernicus, in 1543 deduced that the Earth instead of being in the centre of the cosmos instead, along with the other solar system planets, rotated in orbits around the Sun. Galileo defended heliocentrism based on his astronomical observations of 1609. By 1615, Galileo's writings on heliocentrism had been submitted to the Roman Inquisition which concluded that heliocentrism was foolish, absurd, and heretical since it contradicted Holy Scripture. He was tried by the Inquisition, found "vehemently suspect of heresy", and forced to recant. He spent the rest of his life under house arrest.

The Copernican revolution in turn resulted in the rise of classical materialism defined by Isaac Newton's laws of motion (1642 – 1726), after watching the apple fall under gravity, despite Newton himself being a devout Arian Christian who used scripture to predict the apocalypse. The classically causal Newtonian world view, and Pierre Simon Laplace's (1749 – 1827) view of mathematical determinism "that if the current state of the world were known with precision, it could be computed for any time in the future or the past", came to define the universe as a classical mechanism in the ensuing waves of scientific discovery in classical physics, chemistry and molecular biology, climaxing with the decoding of the human genome, validating the much more ancient atomic theory of Democritus (c. 460 – c. 370 BC). The classically causal universe of Newton and Laplace has since been fundamentally compromised by the discovery of quantum uncertainty and its "spooky" features of quantum entanglement.

In counterposition to materialism, George Berkeley (1685 – 1753) is famous for his philosophical position of "immaterialism", which denies the existence of material substance and instead contends that familiar objects like tables and chairs are ideas perceived by our minds and, as a result, cannot exist without being perceived. Berkeley argued against Isaac Newton's doctrine of absolute space, time and motion in a precursor to the views of Mach and Einstein. Interest in Berkeley's work increased after 1945 because he had tackled many of the issues of paramount interest to 20th century philosophy, such as perception and language.

The core reason for the incredible technological success of science is not the assumption of macroscopic causality, but the fact that the quantum particles come in two kinds. The integral spin particles, called bosons, such as photons, can all cohere together, as in a laser and thus make forces and radiation, but the half-integer spin particles, called fermions, such as protons and electrons, which can only congregate in pairs of complementary spin, are incompressible and thus form matter, inducing a universal fractal complexity, via the non-linearity of the electromagnetic and other quantum forces. The fermionic quantum structures are small, discrete and divisible, so the material world can be analysed in great detail. Given the quantum universe and the fact that brain processes are highly uncertain, given changing contexts and unstable tipping points at the edge of chaos, objective science has no evidential basis to claim the brain is causally closed and thus falsely conclude that we therefore have no agency to apply our subjective and consciousness to affect the physical world around us. By agency here I mean full subjective conscious volition, not just objective causal functionality (Brizio & Tirassa 2016, Moreno & Mossio 2015), or even autopoiesis (Maturana & Varela 1972).

The nature of conscious experience remains the most challenging enigma in the scientific description of reality, to the extent that we not only do not have a credible theory of how this comes about but we don't even have an idea of what shape or form such a theory might take. While physical cosmology is an objective quest, leading to theories of grand unification, in which symmetry-breaking of a common super-force led to the four forces of nature in a big-bang origin of the universe, accompanied by an inflationary beginning, the nature of conscious experience is entirely subjective, so the foundations of objective replication do not apply. Yet for every person alive today, subjective conscious experiences constitute the totality of all our experience of reality, and physical reality of the world around us is established through subjective consciousness, as a consensual experience of conscious participants.

Erwin Schrödinger: *Consciousness cannot be accounted for in physical terms. For consciousness is absolutely fundamental.*

Arthur Eddington: *The stuff of the world is mind stuff.*

J. B. S. Haldane: *We do not find obvious evidence of life or mind in so-called inert matter...; but if the scientific point of view is correct, we shall ultimately find them, at least in rudimentary form, all through the universe.*

Julian Huxley: *Mind or something of the nature as mind must exist throughout the entire universe. This is, I believe, the truth.*

Freeman Dyson: *Mind is already inherent in every electron, and the processes of human consciousness differ only in degree and not in kind from the processes of choice between quantum states which we call "chance" when they are made by electrons.*

David Bohm: *It is implied that, in some sense, a rudimentary consciousness is present even at the level of particle physics.*

Max Planck: *"I regard consciousness as fundamental. I regard matter as derivative from consciousness. We cannot get behind consciousness."*

Werner Heisenberg: *Is it utterly absurd to seek behind the ordering structures of this world a "consciousness" whose "intentions" were these very structures?*

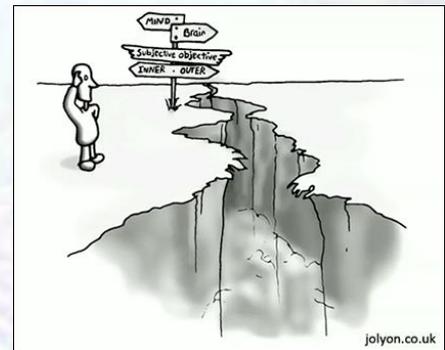
Andrei Linde: *Will it not turn out, with the further development of science, that the study of the universe and the study of consciousness will be inseparably linked, and that ultimate progress in the one will be impossible without progress in the other?*

The **hard problem** of consciousness (Chalmers 1995) is the problem of explaining why and how we have phenomenal first-person subjective experiences sometimes called "qualia" that feel "like something", and more than this, evoke the entire panoply of all our experiences of the world around us. Chalmers comments (201) *"Why should physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does."*

By comparison, we assume there are no such experiences for inanimate things such as a computer, or a sophisticated form of artificial intelligence. Two extensions of the hard problem are the **hard problem extended to volition** and the **hard manifestation problem** how is experience manifested in waking perception, dreams and entheogenic visions?

Fig 71b: The hard problem's explanatory gap – an uncrossable abyss.

Although there have been significant strides in both electrodynamic (EEG and MEG), chemodynamic (fMRI) and connectome imaging of active conscious brain states, we still have no idea of how such collective brain states evoke the subjective experience of consciousness to form the internal model of reality we call the conscious mind, or for that matter volitional will. In Jerry Fodor's words: *"Nobody has the slightest idea how anything material could be conscious. Nobody even knows what it would be like to have the slightest idea about how anything material could be conscious."*



Nevertheless, opinions about the hard problem and whether consciousness has any role in either perception or decision-making remain controversial and unresolved. The hard problem is contrasted with easy, functionally definable problems, such as explaining how the brain integrates information, categorises and discriminates environmental stimuli, or focuses attention. Subjective experience does not seem to fit this explanatory model. Reductionist materialists, who are common in the brain sciences, particularly in the light of the purely computational world views induced by artificial intelligence, see consciousness and the hard problem as issues to be eliminated by solving the easy problems. Daniel Dennett (2005) for example argues that, on reflection, consciousness is functionally definable and hence can be corralled into the objective description. Arguments against the reductionist position often cite that there is an explanatory gap (Levine 1983) between the physical and the phenomenal. This is also linked to the conceivability argument, whether one can conceive of a micro-physical "zombie" version of a human that is identical except that it lacks conscious experiences. This, according to most philosophers (Howell & Alter 2009), indicates that physicalism, which holds that consciousness is itself a physical phenomenon with solely physical properties, is false.

David Chalmers (1995), speaking in terms of the hard problem, comments: *"The only form of interactionist dualism that has seemed even remotely tenable in the contemporary picture is one that exploits certain properties of quantum mechanics."* He then goes on to cite (a) John Eccles' (1986) citing of consciousness providing the extra information required to deal with quantum uncertainty thus not interrupting causally deterministic processes, if they occur, in brain processing and (b) the possible involvement of consciousness in "collapse of the wave function" in quantum measurement. We next discuss both of these loopholes in the causal deterministic description.

Two threads in our cosmological description indicate how the complementary subjective and objective perspectives on reality might be unified. Firstly, the measurement problem in the quantum universe, appears to involve interaction with a conscious observer. While the quantum description involves an overlapping superposition of wave functions, the **Schrödinger cat paradox**, fig 71(d), shows that when we submit a cat in a box to a quantum measurement, leading to a 50% probability of a particle detection smashing a flask of cyanide, killing the cat, when the conscious observer opens the box, they do not find a superposition of live and dead cats, but one cat, either stone dead or very alive. This leads to the idea that subjective consciousness plays a critical role in collapsing the superimposed wave functions into

a single component, as noted by John von Neumann, who stated that collapse could occur at any point between the precipitating quantum event and the conscious observer, and others likewise (Greenstein 1988, Stapp 1995, 2007).

Wigner & Margenau (1967) used a variant of the cat paradox to argue for conscious involvement. In this version, we have a box containing a conscious friend who reports the result later, leading to a paradox about when the collapse occurs – i.e. when the friend observes it or when Wigner does. Wigner discounted the observer being in a superposition themselves as this would be preceded by being in a state of effective “suspended animation”. As this paradox does not occur if the friend is a non-conscious mechanistic computer, it suggests consciousness is pivotal. Henry Stapp (2009) in “Mind, Matter and Quantum Mechanics” has an overview of the more standard theories.

While systems as large as 2000 atoms (Fein et al. 2019) that of gramicidin A1, a linear antibiotic polypeptide composed of 15 amino acids (Shayeghi et al. 2020), and even a deep-frozen tardigrade (Lee et al. 2021) have been found in a superposition of states resulting in interference fringes, indicating that the human body or brain could be represented as a quantum superposition, it is unclear that subjective experience can. More recent experiments involving two interconnected Wigners’ friend laboratories also suggest the quantum description “cannot consistently describe the use of itself” (Frauchiger & Renner 2018). An experimental realisation (Bong et al. 2020) implies that there is no such thing as objective reality, as quantum mechanics allows two observers to experience different, conflicting realities. These paradoxes underly the veridical fact that conscious observers make and experience a single course of history, while the physical universe of quantum mechanics is a multiverse of probability worlds, as in Everett’s many worlds description, if collapse does not occur. This postulates split observers, each unaware of the existence of the other, but what kind of universe they are then looking at seems inexorably split into multiverses, which we do not experience.

In this context Barrett (1999) presents a variety of possible solutions involving many worlds and many minds, or one mind and in the words of Saunders (2001) in review has resonance with existential cosmology:

Barrett’s tentatively favoured solution [is] the one also developed by Squires (1990). It is a one-world dualistic theory, with the usual double-standard of all the mentalistic approaches: whilst the physics is precisely described in mathematical terms, although it concerns nothing that we ever actually observe, the mental – in the Squires-Barrett case a single collective mentality – is imprecisely described in non-mathematical terms, despite the fact that it contains everything under empirical control.

In **quantum entanglement**, two or more particles can be prepared within the same wave function. For example, in a laser, an existing wave function can capture more and more photons in phase with a standing wave between two mirrors by stimulated emission from the excited medium. In other experiments pairs of particles can be generated inside a single wave function. For example an excited Calcium atom with two outer electrons can emit a blue and a yellow photon with complementary polarisations in a spin-0 to spin-0 transition, as shown in fig 72(8). In this situation when we sample the polarisation of one photon, the other instantaneously has the complementary polarisation even when the two detections take place, without there being time for any information to pass between the detectors at the speed of light. John Bell (1964) proved that the results predicted by standard quantum mechanics when the two detectors were set at varying angles violated the constraints defined by local Einsteinian causality, implying quantum non-locality, decried by Einstein, Rosen and Podolsky (1935) as an incomplete view:

In a complete theory there is an element corresponding to each element of reality. A sufficient condition for the reality of a physical quantity is the possibility of predicting it with certainty, without disturbing the system. In quantum mechanics in the case of two physical quantities described by non-commuting operators, the knowledge of one precludes the knowledge of the other. Then either (1) that the description of reality as given by a wave function in quantum mechanics is not complete, or (2) these two quantities cannot have simultaneous reality. Consideration of the problem of making predictions concerning a system on the basis of measurements made on another system that had previously interacted with it leads to the result that if (1) is false then (2) is also false. One is thus led to conclude one precludes the knowledge of the other. Then either (1) that the description of reality as given by a wave function is not complete.

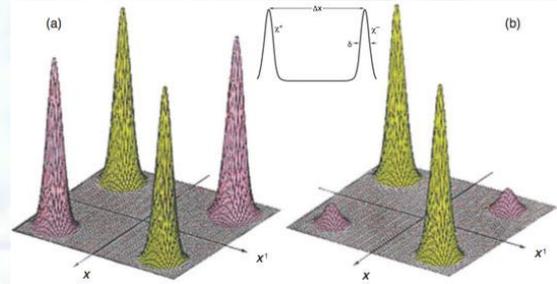
The experimental verification was confirmed by Alain Aspect and others (1982) over space-like intervals using rapidly time varying analysers (fig 72(8)), receiving a Nobel in 2022. There are other more complex forms of entanglement such as the W and GHZ states (Greenberger, Horne & Zeilinger 1989, Mermin 1990), used in quantum computing (Coecke et al. 2021), types of entangled state that involve at least three subsystems (particle states, or qubits). Extremely non-classical properties of the GWZ state have been observed.

Albert Einstein dubbed the phenomenon “spooky action at a distance” and proposed that the effect actually came about because the particles contained hidden variables, or instructions, which had already predetermined their

states. This doesn't mean that quantum mechanics is incomplete, superficial or wrong, but that a hidden variable theory we do not have direct access to within uncertainty may provide the complete description.

Other notions of collapse (see King [2020b](#) for details) involve interaction with third-party quanta and the world on classical scales. **Decoherence** is commonly attributed to entanglement with third party particles and all forms of quantum entanglement (Aspect et al. 1982), or its broader phase generalisation, **quantum discord** (Ollivier & Zurek 2002) involve decoherence (Zurek 1991, 2003) with respect to other particles, because the system of interest has become coupled to other wave-particles. But these can generate further entanglements, not wave function collapse. **Recoherence** (Bouchard et al. 2015) can reverse decoherence, consistent with quantum erasure, supporting the notion that all non-conscious physical structures can exist in superpositions. Another notion is **quantum darwinism** (Zurek 2009), in which some states survive because they are especially robust in the face of decoherence.

Fig 71c: Cancellation of off-diagonal entangled components in decoherence by damping, modelling extraneous collisions (Zurek 2003).



Penrose's objective-collapse theory, postulates the existence of an objective threshold governing the collapse of quantum-states, related to the difference of the spacetime curvature of these states in the universe's fine-scale structure. He suggested that at the Planck scale, curved spacetime is not continuous, but discrete and that each separated quantum superposition has its own piece of spacetime curvature, a blister in spacetime. Penrose suggests that gravity exerts a force on these spacetime blisters, which become unstable above the Planck scale and collapse to just one of the possible states. Atomic-level superpositions would require 10 million years to reach OR threshold, while an isolated 1 kilogram object would reach OR threshold in 10^{-37} s. Objects somewhere between these two scales could collapse on a timescale relevant to neural processing. An essential feature of Penrose's theory is that the choice of states when objective reduction occurs is selected neither randomly nor algorithmically. Rather, states are selected by a "non-computable" influence embedded in the Planck scale of spacetime geometry, which in "The Emperor's New Mind" (Penrose 1989) he associated with conscious human reasoning.

Spontaneous random collapse models GRW (Ghirardi, Rimini, & Weber 1986) include an extra factor complementing the Schrödinger equation forcing random collapse over a finite time. Both Penrose's gravitationally induced collapse and the variants of GRW theories such as continuous spontaneous localisation (CSL) involving gradual, continuous collapse rather than a sudden jump have recently been partially eliminated by experiments derived from neutrino research which have failed to detect the very faint x-ray signals the local jitter of physical collapse models imply.

Then we have **pilot waves**⁴⁰ (Bohm 1952), which identify particles as having real positions, thus not requiring wave function collapse, but have problems with handling creation of new particles. Images of such trajectories can be seen in weak quantum measurement and surreal Bohmian trajectories in [fig 57](#). However, the pilot wave theory has a fundamental problem with particle creation because stipulating a position for the particle doesn't work if a high energy photon then undergoes a creation event and then splits into an electron and a positron, where we have a potentially infinite number of possible trajectories of the ensuing particles. Attempts to solve this (Duerr et al. 2004, 2005, Nikolic, H 2010) involve two problems (1) the configuration space splits into a potentially infinite number of configurations and (2) A stochastic process is arbitrarily introduced for creation.

In the approach of SED (de la Peña et al. 2020), the stochastic aspect corresponds to the effects of the collapse process into the classical limit, but here consciousness has been represented by the zero point field (ZPF) (Keppler 2018).

David Albert (1992), in "Quantum Mechanics and Experience", cites objections to virtually all descriptions of collapse of the wave function. In terms of von Neumann's original definition, which allowed for collapse to take place any point

⁴⁰David Bohm's (1952) pilot wave theory posits a real position and momentum for a particle such as a photon guided by a particular non-local form of pilot wave. It illustrates a form of hidden variable theory which does not require collapse of the wave function, but the predictions hold only for a situation where no new particles are created with new degrees of freedom during the trajectory. Its interpretation is thus inconsistent with the Feynman approach, where the transition probability includes all paths and all possible virtual particles created and annihilated during the transition. To the extent that its predictions coincide with those of quantum mechanics, phenomena, from weak quantum measurement (Kocsis et al. 2011) to surreal Bohmian trajectories (Mahler et al. 2016) can also be interpreted correctly by entanglement using standard quantum mechanics.

from the initial event to the conscious observation of it, what he concluded was that there must be two fundamental laws about how the states of quantum-mechanical systems evolve:

Without measurements all physical systems invariably evolve in accordance with the dynamical equations of motion, but when there are measurements going on, the states of the measured systems evolve in accordance with the postulate of collapse. What these laws actually amount to will depend on the precise meaning of the word measurement. And it happens that the word measurement simply doesn't have any absolutely precise meaning in ordinary language; and it happens (moreover) that von Neumann didn't make any attempt to cook up a meaning for it, either.

However, if collapse always occurs at the last possible moment, as in Wigner's (1961) view, things get complicated:

All physical objects almost always evolve in strict accordance with the dynamical equations of motion. But every now and then, in the course of some such dynamical evolutions, the brain of a sentient being may enter a state wherein states connected with various different conscious experiences are superposed; and at such moments, the mind connected with that brain opens its inner eye, and gazes on that brain, and that causes the entire system (brain, measuring instrument, measured system, everything) to collapse, with the usual quantum-mechanical probabilities, onto one or another of those states; and then the eye closes, and everything proceeds again in accordance with the dynamical equations of motion.

We thus end up with either purely physical systems, which evolve in accordance with the dynamical equations of motion or conscious systems which do contain sentient observers. These systems evolve in accordance with the more complicated rules described above. ... So in order to know precisely how things physically behave, we need to know precisely what is conscious and what isn't. What this "theory" predicts will hinge on the precise meaning of the word conscious; and that word simply doesn't have any absolutely precise meaning in ordinary language; and Wigner didn't make any attempt to make up a meaning for it; and so all this doesn't end up amounting to a genuine physical theory either.

But he also discounts related theories relating to macroscopic processes:

All physical objects almost always evolve in strict accordance with the dynamical equations of motion. But every now and then, in the course of some such dynamical evolutions (in the course of measurements, for example), it comes to pass that two macroscopically different conditions of a certain system (two different orientations of a pointer, say) get superposed, and at that point, as a matter of fundamental physical law, the state of the entire system collapses, with the usual quantum-mechanical probabilities, onto one or another of those macroscopically different states. But then we again have two sorts of systems microscopic and macroscopic and again we don't precisely know what macroscopic is.

He even goes to the trouble of showing that no obvious empirical test can distinguish between such variations, including decoherence e.g. from air molecules, and with the GRW theory above, where other problems arise about the nature and consequences of collapse on future evolution.

Tipler (2012, 2014), using quantum operators, shows that, in the many worlds interpretation, quantum non-locality ceases to exist because the first measurement of an entangled pair, e.g. spin up or down, splits the multiverse into two deterministic branches, in each of which the state of the second particle is determined to be complementary in each multiverse branch, so no nonlocal "spooky action a distance" needs, or can take place.

This also leads to a fully-deterministic multiverse:

Like the electrons, and like the measuring apparatus, we are also split when we read the result of the measurement, and once again our own split follows the initial electron entanglement. Thus quantum nonlocality does not exist. It is only an illusion caused by a refusal to apply quantum mechanics to the macroworld, in particular to ourselves.

Many-Worlds quantum mechanics, like classical mechanics is completely deterministic. So the observers have only the illusion of being free to chose the direction of spin measurement. However, we know my experience that there are universes of the multiverse in which the spins are measured in the orthogonal directions, and indeed universes in which the pair of directions are at angles ϑ at many values between 0 and $\pi/2$ radians. To obtain the Bell Theorem quantum prediction in this more general case, where there will be a certain fraction with spin in one direction, and the remaining fraction in the other, requires using Everett's assumption that the square of the modulus of the wave function measures the density of universes in the multiverse.

There is a fundamental problem with Tipler's explanation. The observer is split into one that observes the cat alive and the other observes it dead. So everything is split. Nelson did and didn't win the battle of Copenhagen by turning his blind eye, so Nelson is also both a live and dead Schrödinger cat. The same for every idiosyncratic conscious decision we make, so history never gets made. Free will ceases to exist and quantum measurement does not collapse the wave function. So we have a multiverse of multiverses with no history at all. Hence no future either.

This simply isn't in any way how the real universe manifests. The cat IS alive or dead. The universe is superficially classical because so many wave functions have collapsed or are about to collapse that the quantum universe is in a dynamical state of creating superpositions and collapsing nearly all of them, as the course of history gets made. This edge of chaos dynamic between collapse and wave superposition allows free will to exist within the cubic centimetre of quantum uncertainty. We are alive. Subjective conscious experience is alive and history is being unfolded as I type.

Nevertheless the implications of the argument are quite profound in that both a fully quantum multiverse and a classical universe are causally deterministic systems, showing that the capacity of subjectively conscious free-will to throw a spanner in the works comes from the interface we experience between these two deterministic extremes.

Transactional Interpretations: Another key interpretation, which extends the Feynman description, to real particle exchanges, is the **transactional interpretation** TI (Cramer 1986, King 1989, Kastner 2012, Cramer & Mead 2020) where real quanta are also described as a hand-shaking between retarded (usual time direction) and advanced (retrocausal) waves from the absorber, called "offer" and "confirmation" waves. TI arose from the Wheeler-Feynman (WF) time-symmetric theory of classical electrodynamics (Wheeler and Feynman 1945, 1949, Feynman 1965), which proposed that radiation is a time-symmetric process, in which a charge emits a field in the form of half-retarded, half-advanced solutions to the wave equation, and the response of absorbers combines with that primary field to create a radiative process that transfers energy from an emitter to an absorber.

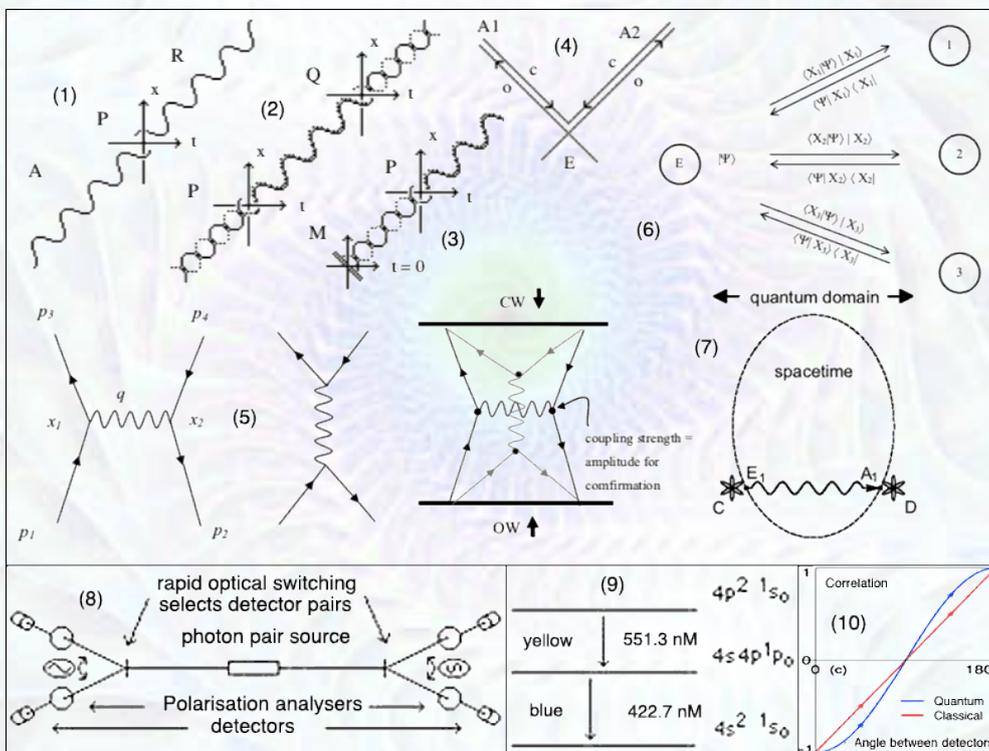


Fig 72: (1) In TI a transaction is established by crossed phase advanced and retarded waves. (2) The superposition of these between the emitter and absorber results in a real quantum exchanged between emitter P and future absorber Q. (3) The origin of the positive energy arrow of time envisaged as a phase reflecting boundary at the cosmic origin (Cramer 1983). (4) Pair splitting entanglement can be explained by transactional handshaking at the common emitter. (5) The treatment of the quantum field in PTI is explained by assigning a different status to the internal virtual particle transactions (Kastner 2012). (6) A real energy emission in which time has broken symmetry involves multiple transactions between the emitter and many potential absorbers with collapse modelled as a symmetry breaking, in which the physical weight functions as the probability of that particular process as it 'competes' with other possible processes (Kastner 2014). (7) Space time emerging from a transaction (Kastner 2021a). (8) Entanglement experiment with time varying analysers (Aspect et al. 1982). A calcium atom emits two entangled photons with complementary polarisation each of which travels to one of two detectors oscillating so rapidly there is no time to send information at the speed of light between the two detector pairs. (9) The blue and yellow photon transitions. (10) The quantum correlations blue exceed Bell's limits of communication between the two at the speed of light. The experiment is referred to as EPR after Einstein, Podolsky and Rosen who first suggested the problem of spooky action at a distance.

The only non-paradoxical way entanglement and its collapse can be realised physically, especially in the case of space-like separated detectors, as in fig 72(8) is this:

- (A) The closer detector, say No. 1 destructively collapses the entanglement at (1) sending a non-entangled advanced confirmation wave back in time to the source.
- (B) The arrival of the advanced wave at the source collapses the wave right at source, so that the retarded wave from the source is no longer entangled although it was prepared as entangled by the experimenter. This IS instantaneous but entirely local.
- (C) The retarded offer wave from the Bell experiment is no longer actually entangled and is sent at light speed to detector 2 where if it is detected it immediately has complementary polarisation to 1.
- (D) If detector 1 does not record a photon at the given angle no confirmation wave is sent back to the source, so no coincidence measurement can be made.
- (E) The emitted retarded wave will remain entangled unless photon 1 is or has been absorbed by another atom but then no coincidence counts will be made either.
- (F) The process is relativistically covariant. In an experimenter frame if relative motion results in detector 2 sampling first, the roles of 1 and 2 become exchanged and the same explanation follows.

Every detection at (2) either collapses the entangled wave, or the already partially collapsed single particle wave function as in (B): If no detection has happened at 1, or anywhere else, the retarded source wave is still entangled, and detector 2 may sample it and collapse the entanglement. If a detection of photon 1 has happened elsewhere or at detector 1 the retarded source wave is no longer entangled, as in B above and then detector 2, if it samples photon 2, also collapses this non-entangled single particle wave function.

So there is no light-speed violating information transfer directly from 1 to 2 resulting in paradox, but there is a deeper paradox about advanced and retarded waves in space time in the transactional principle. This as far as I can see gives the complete true real time account of how the universe actually deals with entanglement, not the fully collapsed statistical result the experimenter sees, and conveniently figures the case is already closed.

The standard account of the Bell theorem experiment, as in (8) cannot explain how the universe actually does it, only that the statistical correlation agrees with the sinusoidal angular dependence of quantum reality and violates the Bell inequality. The experimenter is in a privileged position to overview the total data and can conclude this with no understanding of how an entangled wave function they prepared can arrive at detector 2 unentangled when photon 1 has already been absorbed.

Richard Feynman's (1965) Nobel Lecture "The Development of the Space-Time View of Quantum Electrodynamics" opened the whole transactional idea of advanced and retarded waves twenty years before Cramer (1983) did. It enshrines the very principle before QED got completed as the most accurate theory ever.

The same applies to single particle wave functions, where collapse of the wave function on absorption has to paradoxically result in a sudden collapse of the wave function to zero even at space-like intervals from the emission and absorption loci, but the advanced and retarded confirmation and offer waves. Quantum mechanics also allows events to happen with no definite causal order (Goswami et al. 2018).

As just noted, the process of wave function collapse has generally been considered to violate Lorenz relativistic invariance (Barrett 1999 p44-45):

The standard collapse theory, at least, really is incompatible with the theory of relativity in a perfectly straightforward way: the collapse dynamics is not Lorentz-covariant. When one finds an electron, for example, its wave function instantaneously goes to zero everywhere except where one found it. If this did not happen, then there would be a nonzero probability of finding the electron in two places at the same time in the measurement frame. The problem is that we cannot describe this process of the wave function going to zero almost everywhere simultaneously in a way that is compatible with relativity. In relativity there is a different standard of simultaneity for each inertial frame, but if one chooses a particular inertial frame in order to describe the collapse of the wave function, then one violates the requirement that all physical processes must be described in a frame-independent way.

However Kastner (2021a,b) elucidates the relativistic transactional interpretation, which claims to resolve this through causal sets (Sorkin 2003) invoking a special-relativistic theory encompassing both real particle exchange and collapse:

In formal terms, a causal set C is a finite, partially ordered set whose elements are subject to a binary relation $<$ that can be understood as precedence; the element on the left precedes that on the right. It has the following properties:

- (i) transitivity: $(\forall x, y, z \in C)(x < y < z \Rightarrow x < z)$ (ii) irreflexivity: $(\forall x \in C)(x \not\sim x)$*
- (iii) local finiteness: $(\forall x, z \in C)$ (cardinality $\{y \in C \mid x < y < z\} < \infty$)*

Properties (i) and (ii) assure that the set is acyclic, while (iii) assures that the set is discrete. These properties yield a directed structure that corresponds well to temporal becoming, which Sorkin describes as follows:

In Sorkin's construct, one can then have a totally ordered subset of connected links (as defined above), constituting a chain. In the transactional process, we naturally get a parent/child relationship with every transaction, which defines a link. Each actualized transaction establishes three things: the emission event E, the absorption event A, and the invariant interval I(E,A) between them, which is defined by the transferred photon. Thus, the interval I(E,A) corresponds to a link. Since it is a photon that is transferred, every actualized transaction establishes a null interval, i.e., $ds^2 = c^2t^2 - r^2 = 0$. The emission event E is the parent of the absorption event A (and A is the child of E).

A major advantage of the causal set approach as proposed by Sorkin and collaborators ... is that it provides a fully covariant model of a growing spacetime. It is thus a counterexample to the usual claim (mentioned in the previous section) that a growing spacetime must violate Lorentz covariance. Specifically, Sorkin shows that if the events are added in a Poissonian manner, then no preferred frame emerges, and covariance is preserved (Sorkin 2003, p. 9). In RTI, events are naturally added in a Poissonian manner, because transactions are fundamentally governed by decay rates (Kastner and Cramer, 2018).

Ruth Kastner comments in private communication in relation to her development of the transactional interpretation:

The main problem with the standard formulation of QM is that consciousness is brought in as a kind of 'band-aid' that does not really work to resolve the Schrodinger's Cat and Wigner's Friend of paradoxes. The transactional picture, by way of its natural non-unitarity (collapse under well-quantified circumstances), resolves this problem and allows room for consciousness to play a role as the acausal/volitional influence that corresponds to efficacy (Kastner 2016). My version of TI, however, is ontologically different from Cramer's and it also is fully relativistic (Kastner 2021a,b). For specifics on why many recent antirealist claims about the world as alleged implications of Wigner's Friend are not sustainable, see Kastner (2021c). In particular, standard decoherence does not yield measurement outcomes, so one really needs real non-unitarity in order to have correspondence with experience. I have also shown that the standard QM formulation, lacking real non-unitarity, is subject to fatal inconsistencies (Kastner 2019, 2021d). These inconsistencies appear to infect Everettian approaches as well.

Kastner (2011) explains the arrow of time as a foundational quantum symmetry-breaking:

Since the direction of positive energy transfer dictates the direction of change (the emitter loses energy and the absorber gains energy), and time is precisely the domain of change (or at least the construct we use to record our experience of change), it is the broken symmetry with respect to energy propagation that establishes the directionality or anisotropy of time. The reason for the 'arrow of time' is that the symmetry of physical law must be broken: 'the actual breaks the symmetry of the potential.' It is often viewed as a mystery that there are irreversible physical processes and that radiation diverges toward the future. The view presented herein is that, on the contrary, it would be more surprising if physical processes were reversible, because along with that reversibility we would have time-symmetric (isotropic) processes, which would fail to transfer energy, preclude change, and therefore render the whole notion of time meaningless.

Kastner is a possibilist who argues that OWs and CWs are possibilities that are "real." She says that they are less real than actual empirically measurable events, but more real than an idea or concept in a person's mind. She suggests the alternate term "potentia," Aristotle's term that she found Heisenberg had cited. For Kastner, the possibilities are physically real as compared to merely conceptually possible ideas that are consistent with physical law. But she says the "possibilities" described by offer and confirmation waves are "sub-empirical" and pre-spatiotemporal (i.e., they have not shown up as actual in spacetime). She calls these "incipient transactions." She calls for a new metaphysical category to describe "not quite actual...possibilities."

Kastner (2012, 2014b) sets out the basis for extending the possibilist transactional interpretation or PTI, to the relativistic domain in relativistic transactional interpretation or RTI. This modified version proposes that offer and confirmation waves (OW and CW) exist in a sub-empirical, pre-spacetime realm (PST) of possibilities, and that it is actualised transactions which establish empirical spatiotemporal events. PTI proposes a growing universe picture, in which actualised transactions are the processes by which spacetime events are created from a substratum of quantum possibilities. The latter are taken as the entities described by quantum states (and their advanced confirmations); and, at a subtler relativistic level, the virtual quanta. PTI proposes a growing universe picture, in which actualised transactions are the processes by which spacetime events are created from a substratum of quantum possibilities.

The basic idea is that offers and confirmations are spontaneously elevated forms of virtual quanta, where the probability of elevation is given by the decay rate for the process in question. In the direct action picture of PTI, an excited atom decays because one of the virtual photon exchanges ongoing between the excited electron and an external absorber (e.g. electron in a ground state atom) is spontaneously transformed into a photon offer wave that generates a confirming response. The probability for this occurrence is the product of the QED coupling constant α and the associated transition probability. In quantum field theory terms, the offer wave corresponds to a 'free photon' or excited state of the field, instantiating a Fock space state (Kastner 2014b).

In contrast, with standard QFT where the amplitudes over all interactions are added and then squared under the Born rule, according to PTI, the absorption of the offer wave generates a confirmation (the 'response of the absorber'), an advanced field. This field can be consistently reinterpreted as a retarded field from the vantage point of an 'observer' composed of positive energy and

experiencing events in a forward temporal direction. The product of the offer (represented by the amplitude) and the confirmation (represented by the amplitude's complex conjugate) corresponds to the Born Rule.

Kastner (2014a, 2021c,d) deconstructs decoherence as well as quantum Darwinism, refuting claims that the emergence of classicality proceeds in an observer-independent manner in a unitary-only dynamics, noting that quantum Darwinism holds that the emergence of classicality is not dependent on any inputs from observers, but that it is the classical experiences of those observers that the decoherence program seeks to explain from first principles:

"in the Everettian picture, everything is always coherently entangled, so pure states must be viewed as a fiction -- but that means that it is also fiction that the putative 'environmental systems' are all randomly phased. In helping themselves to this phase randomness, Everettian decoherentists have effectively assumed what they are trying to prove: macroscopic classicality only 'emerges' in this picture because a classical, non-quantum-correlated environment was illegitimately put in by hand from the beginning. Without that unjustified presupposition, there would be no vanishing of the off-diagonal terms"

She extends this to an uncanny observation concerning the Everett view:

"That is, MWI does not explain why Schrodinger's Cat is to be viewed as 'alive' in one world and 'dead' in another, as opposed to 'alive + dead' in one world and 'alive – dead' in the other."

Kastner (2016a) notes that the symmetry-breaking of the advanced waves provides an alternative explanation to von Neumann's citing of the consciousness of the observer in quantum measurement:

Von Neumann noted that this Process 1 transformation is acausal, nonunitary, and irreversible, yet he was unable to explain it in physical terms. He himself spoke of this transition as dependent on an observing consciousness. However, one need not view the measurement process as observer-dependent. ... The process of collapse precipitated in this way by incipient transactions [competing probability projection operator weightings of the] absorber response(s) can be understood as a form of spontaneous symmetry breaking.

Kastner & Cramer (2018) confirm this picture:

And since not all competing possibilities can be actualized, symmetry must be broken at the spacetime level of actualized events. The latter is the physical correlate of non-unitary quantum state reduction.

However, in Kastner (2016b), she considers observer participation as integral, rejecting two specific critiques of libertarian, agent-causal free will: (i) that it must be anomalous or "antiscientific"; and (ii) that it must be causally detached from the choosing agent. She asserts that notwithstanding the Born rule, quantum theory may constitute precisely the sort of theory required for a nomic grounding of libertarian free will.

Kastner cites Freeman Dyson's comment rejecting epiphenomenalism:

I think our consciousness is not just a passive epiphenomenon carried along by the chemical events in our brains, but is an active agent forcing the molecular complexes to make choices between one quantum state and another. In other words, mind is already inherent in every electron, and the processes of human consciousness differ only in degree but not in kind from the processes of choice between quantum states which we call "chance" when they are made by electrons."

Kastner then proposes, not just a panpsychic quantum reality but a pan-volitional basis for it:

Considering the elementary constituents of matter as imbued with even the minutest propensity for volition would, at least in principle, allow the possibility of a natural emergence of increasingly efficacious agent volition as the organisms composed by them became more complex, culminating in a human being. And allowing for volitional causal agency to enter, in principle, at the quantum level would resolve a very puzzling aspect of the indeterminacy of the quantum laws—the seeming violation of Curie's Principle in which an outcome occurs for no reason at all. This suggests that, rather than bearing against free will, the quantum laws could be the ideal nomic setting for agent-causal free will.

Kastner, Kauffman & Epperson (2018) formalise the relationship between potentialities and actualities into a modification of Descartes *res cogitans* (purely mental substance) and *res extensa* (material substance) to *res potentiae* and *res extensa* comprising the potential and actual aspects of ontological reality. Unlike Cartesian dualism these are not separable or distinct but are manifest in all situations where the potential becomes actual, particularly in the process of quantum measurement in PTI, citing (McMullin 1984) on the limits of imagination of the *res potentiae*:

... imaginability must not be made the test for ontology. The realist claim is that the scientist is discovering the structures of the world; it is not required in addition that these structures be imaginable in the categories of the macroworld.

They justify this by noting that human evolutionary survival has depended on dealing with the actual, so the potential may not be imaginable in our conscious frame of reference, however one can note that the strong current of animism in human cultural history suggests a strong degree of focus on the potential, and its capacity to become actual in hidden unpredictable sources of accident or misfortune. In addition to just such unexpected real world examples, they note the applicability of this to a multiplicity of quantum phenomena:

Thus, we propose that quantum mechanics evinces a reality that entails both actualities (res extensa) and potentia (res potentia), wherein the latter are as ontologically significant as the former, and not merely an epistemic abstraction as in classical mechanics. On this proposal, quantum mechanics IS about what exists in the world; but what exists comprises both possibles and actuals. Thus, while John Bell's insistence on "beables" as opposed to just "observables" constituted a laudable return to realism about quantum theory in the face of growing instrumentalism, he too fell into the default actualism assumption; i.e., he assumed that to 'be' meant 'to be actual,' so that his 'beables' were assumed to be actual but unknown hidden variables.

What the EPR experiments reveal is that while there is, indeed, no measurable nonlocal, efficient causal influence between A and B, there is a measurable, nonlocal probability conditionalization between A and B that always takes the form of an asymmetrical internal relation. For example, given the outcome at A, the outcome at B is internally related to that outcome. This is manifest as a probability conditionalization of the potential outcomes at B by the actual outcome at A.

Nonlocal correlations such as those of the EPR entanglement experiment below can thus be understood as a natural, mutually constrained relationship between the kinds of spacetime actualities that can result from a given possibility – which itself is not a spacetime entity. She quotes Anton Zellinger (2016):

...it appears that on the level of measurements of properties of members of an entangled ensemble, quantum physics is oblivious to space and time .

Kastner (2021b), considers how the spacetime manifold emerges from a quantum substratum through the transactional process (fig 72(6)), in which spacetime events and their connections are established. The usual notion of a background spacetime is replaced by the quantum substratum, comprising quantum systems with non-vanishing rest mass, corresponding to internal periodicities that function as internal clocks defining proper times and in turn, inertial frames that are not themselves aspects of the spacetime manifold.

Three years after John Cramer published the transactional interpretation, I wrote a highly speculative paper, "Dual-time Supercausality (King 1989, Vannini 2006), based on John's description which says many of the same things emergent in Ruth Kastner's far more comprehensive development. Summing up the main conclusions we have:

- (1) **Symmetric-Time:** *This mode of action of time involves a mutual space-time relationship between emitter and absorber. Symmetric-time determines which, out of the ensemble of possibilities predicted by the probability interpretation of quantum mechanics is the actual one chosen. Such a description forms a type of hidden-variable theory explaining the selection of unique reduction events from the probability distribution. We will call this bi-directional causality transcausality.*
- (2) **Directed-time:** *Real quantum interaction is dominated by retarded-time, positive-energy particles. The selection of temporal direction is a consequence of symmetry-breaking, resulting from energy polarization, rather than time being an independent parameter. The causal effects of multi-particle ensembles result from this dominance of retarded radiation, as an aspect of symmetry-breaking.*

Dual-time is thus a theory of the interaction of two temporal modes, one time-symmetric which selects unique events from ensembles, and the other time-directed which governs the consistent retarded action of the ensembles. These are not contradictory. Each on their own form an incomplete description. Temporal causality is the macroscopic approximation of this dual theory under the correspondence principle. The probability interpretation governs the incompleteness of directed-causality to specify unique evolution in terms of initial conditions.

Quantum-consciousness has two complementary attributes, sentience and intent:

- (a) **Sentience** *represents the capacity to utilise the information in the advanced absorber waves and is implicitly transcausal in its basis. Because the advanced components of symmetric-time cannot be causally defined in terms of directed-time, sentience is complementary to physically-defined constraints.*
- (b) **Intent** *represents the capacity to determine a unique outcome from the collection of such absorber waves, and represents the selection of one of many potential histories. Intent addresses the two issues of free-will and the principle of choice in one answer – free-will necessarily involves the capacity to select one out of many contingent histories and the principle of choice manifests the essential nature of free-will at the physical level.*

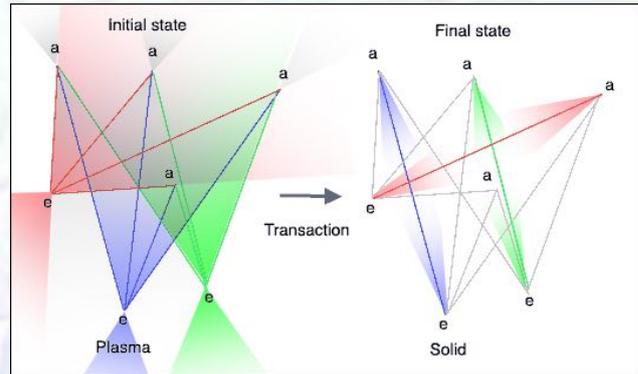
The transactional interpretation presents a unique view of cosmology, involving an implicit space-time anticipation in which a real exchange, e.g. a photon emitted by a light bulb and absorbed on a photographic plate or elsewhere, or a

Bell type entanglement experiment with two detectors, is split into an offer wave from the emitter and retro-causal confirmation waves from the prospective absorbers that, after the transaction is completed, interfere to form the real photon confined between the emission and absorption vertices. We also experience these retro-causal effects in weak quantum measurement, and delayed choice experiments.

To get a full picture of this process, we need to consider the electromagnetic field as a whole, in which these same absorbers are also receiving offer waves from other emitters, so we get a network of virtual emitter-absorber pairs.

There is a fundamental symmetry between creation and annihilation, but there is a sting in the measurement tail. When we do an interference experiment, with real positive energy photons, we know each photon came from the small region within the light source, but the locations of the potential absorbers affected by the wave function are spread across the world at large. The photon could be absorbed anywhere on the photographic plate, or before it, if it hits dust in the apparatus, or after if it goes right through the plate and out of the apparatus altogether, just as radioactive particles escape the exponential potential barrier of the nucleus. The problem concerning wave function collapse is which absorber?

Fig 73: A transaction modelled by a phase transition from a virtual plasma to a real interactive solid spanning space-time, in which the wave functions have now become like the harmonic phonons of solid state physics.



In all these cases once a potential absorber becomes real, all the other potential absorbers have zero probability of absorption, so the change occurs instantaneously across space-time to other prospective absorbers, relative to the successful one. This is the root problem of quantum measurement. Special relativistic quantum field theory is time symmetric, so solving wave function collapse is thus most closely realised in the transactional interpretation, where the real wave function is neither the emitter's spreading linear retarded wave, nor any of the prospective absorbers' linear advanced waves, but the results of a phase transition, in which all these hypothetical offer and confirmation waves resolve into one or more real wave functions linking creation and annihilation vertices. It is the nature of this phase transition and its non-linearity which holds the keys to life the universe and everything and potentially the nature of time itself.

The entire notion in Bell experiments, where communication between absorbers appears to be impossibly instantaneous, invoking super-luminal communication, is unnecessary because the retrocausal confirmation wave perfectly cancels the time elapse of the offer wave, so if detector 1 samples first, its confirmation goes back to the source photon-splitter arriving at the same time as the original emission and the offer wave collapses to a single photon emission to detector 2 which arrives there at exactly the time when 2 should have sampled the complementary polarisation, with this information as required. No superluminal interactions between absorbers occurs even if it looks like the process was instantaneous and would have to involve infinite velocity. This looks instantaneous without contradiction because of the time elapse cancellations, but if we follow it as a process, it is some kind of non-linear phase transition from a "plasma" state of offers and confirmations collapsing into a set of real photons with phonon like real excitations connecting them.

In Symbiotic Existential Cosmology this is envisaged as allowing a form of prescience because the collapse has implicit information about the future state of the universe in which the absorber exist. This may appear logically paradoxical but no classical information is transferred, so there is no inconsistency. Modelling the collapse appears to happen outside space-time, but actually it is instantaneous, so dual-time is just a core part of the heuristic to understand the non-linear process. This depends on transactional collapse being a non-random hidden-variable theory in which non-local correlations of the universal wave function manifest as a complex system during collapse in a way that looks deceptively like randomness because it is a complex chaotic ergodic process.

My perspective is that subjective conscious physical volition has to imbue an evolutionary advantage, or it would be evolutionarily unstable and ultimately be discarded by evolution, but this advantage has to involve real time anticipation of existential threats to survival. So I favour the transactional interpretation, in which a real particle e.g. a

photon is a superposition of a causal “offer wave” from an emitter complemented by potential retrocausal “confirmation waves” from absorbers. This is actually necessary, because the emission wave is a linear Schrödinger wave that spreads, but a real photon is an excitation between an emitter and an absorber, more like a simple harmonic phonon, non-linear in space with two foci as in fig 73.

I remain intrigued by the transactional principle because I am convinced that subjective consciousness is a successful form of quantum anticipation in space-time, (rather than classical prediction), that has enabled single-celled eucaryotes to conquer the biosphere before there were brains, which have evolved based on intimately-coupled societies of such cells (neurons and neuroglia) now forming the neural networks neuroscience tries to understand in classical causal terms. The eucaryote endo-symbiosis in this view marks a unique discrete topological transformation of the membrane to unfold attentive sentient consciousness invoking the second stage of cosmological becoming that ends up being us wondering what the hell is going on here? This is the foundation of emergence as quantum cosmology and it explains why we have the confounding existential dilemma we do have and why it all comes back to biospheric symbiosis being the centre of the cyclone of survival for us as a climax species.

The full picture of a transaction process is a population of real, or potential emitters in excited states and potential ground state absorbers, with their offer and confirmation wave functions extending throughout space time, as in the Feynman representation. As the transaction proceeds, this network undergoes a phase transition from a “virtual plasma” state to a “real solid”, in which the excited emitters are all paired with actual absorbers in the emitters’ future at later points in space-time. This phase transition occurs across space-time – i.e. **transcausally** – covering both space-like and time-like intervals. It has many properties of a phase transition from plasma to solid, with a difference – the strongest interactions don’t win, except with a probability determined by the relative power of the emitter’s wave amplitudes at the prospective absorption event. This guarantees the transaction conforms to the emitter’s probability distribution and the absorber’s one as well. If a prospective absorber has already interacted with another emitter, it will not appear in the transaction network at this space-time point, so ceases to be part of the collective transaction. Once this is the case, all other prospective absorbers of a given emitter scattered throughout space-time, both in the absorber’s past and future, immediately have zero probability of absorption from any of the emitters and no causal conflict, or time loop arises.

The transition is laterally across the whole of space-time, not along the arrow of time in either direction, so cannot exist within space-time and really needs a dual time parameter. This is why my 1989 paper was entitled “dual-time super-causality”. Now this doesn’t mean a transaction is just a random process. Rather, it is a kind of super-selection theory, in which the probability of absorption at an absorber conforms to the wave probability but the decision making process is spread between all the prospective absorbers distributed across space-time, not just an emitter-based random wave power normalised probability. The process is implicitly retro-causal in the same way weak quantum measurement and Wheeler’s delayed choice experiments are.

The fact that in the cat paradox experiment, we see only a live or dead cat and not a superposition doesn’t mean however, that conscious observers witness only a classical world view. There are plenty of real phenomena in which we do observe quantum superpositions, including quantum erasure and quantum recoherence, where entangled particles can be distinguished collapsing the entanglement, and then re-entangled. A laser consists of excited atoms above the ground state which can be triggered to coherently emit photons indistinguishably entangled in a superposition of in-phase states stimulated by a standing wave in the laser caught between pairs of reflecting mirrors, so we see the bright laser light and know it is a massive superimposed set of entangled photons.

In all forms of quantum entanglement experiment, when the state of one of the pair is detected, the informational outcome is “transmitted” instantaneously to the other detector so that the other particle’s state is definitively complementary, although the detectors can be separated by space-like as well as time-like intervals, and this transmission cannot be used to relay classical information. This again is explained by the transactional interpretation, because the confirmation wave of the first detector of the pair is transmitted retro-causally back to the source event where the splitting occurred and then causally out to the second detector where it now has obligately complementary spin or polarisation when detection occurs.

What the transactional interpretation does provide is a real collapse process in which the universe is neither stranded in an Everett probability multiverse, nor in a fully collapsed classical state, but can be anywhere in between, depending on which agents are doing the measuring in a given theory. Nor is collapse necessarily random and thus meaningless,

but is a space-time spanning non-linear phase transition, involving bidirectional hand-shaking between past and future. The absorbers are all in an emitter's future so there is a musical chairs dance happening in the future. And those candidates may also be absorbers of other emitters and so on, so one can't determine the ultimate boundary conditions of this problem. Somehow the "collapse", which we admit violates retarded causality, results in one future choice. This means that there is no prohibition on this being resolved by the future affecting the outcome because the actual choice has no relation to classical causality.

The only requirement is that repeated individual observations are asymptotic to the Born probability interpretation normalised by the wave function power $\phi \cdot \phi^*$, but this could arise from a variety of complex transcausal quasi- or pseudo-random processes, where multiple entanglements generate effective statistical noise, while having a basis in an explicit hidden variable theory. The reason for the Born asymptote could thus be simply that the non-linear phase transition of the transaction, like the cosmic wave function of the universe, potentially involves everything there is – the ultimate pseudo-random optimisation process concealing a predictive hidden variable theory. One should point out that that near universal assumption that the probability interpretation implies pure randomness normalised by the wave power has as much onus on scientific proof as does any hidden variable theory, such as transactional collapse.

It is also one in which subjective conscious volition and meaning can become manifest in cosmic evolution, in which the universe is in a state of dynamic ramification and collapse of quantum superpositions. The key point here is that subjective conscious volition needs to have an anticipatory property in its own right, independent of (although complementary to) brain based attention processes, or it will be discarded by natural selection, even if we do have free will, and would not have been selected for, all the way from founding eucaryotes to *Homo sapiens*. The transactional interpretation, by involving future absorbers in the collapse process, provides just such an anticipatory feature.

It is one thing to have free will and it's another to use free will for survival on the basis of (conscious) prediction, or anticipation. Our conscious brains are striving to be predictive to the extent that we are subject to flash-lag perceptual illusions where perceptual processes attempt, sometimes incorrectly, to predict the path of rapidly moving objects (Eagleman & Sejnowski 2000), so the question is pivotal. Anticipating future threats and opportunities is key to how we evolved as conscious organisms, and this is pivotal over short immediate time scales, like the snake's or tiger's strike which we survive. Anticipating reality in the present is precisely what subjective consciousness is here to do.

The **hardest problem of consciousness** is thus that, to be conserved by natural selection, subjective consciousness (a) has to be volitional i.e. affect the world physically to result in natural selection and (b) it has to be predictive as well. Free-will without predictivity is as neutral to evolution, as random behaviour, and it will not be selected for. If we are dealing with classical reality, we could claim this is merely a computational requirement, but why then do we have subjective experience at all? Why not just recursive predictive attention processes with no subjectivity?

Here is where the correspondence between sensitive dynamic instability at tipping points and quantum uncertainty comes into the picture. We know biology and particularly brain function is a dynamically unstable process, with sensitive instabilities that are fractal down to the quantum level of ion channels, enzyme molecules whose active sites are enhanced by quantum tunnelling and the quantum parallelism of molecular folding and interactive dynamics. We know that brain dynamics operating close to the edge of chaos is convergent to dynamic crisis during critical decision-making uncertainties that do not have an obvious computational, cognitive, or reasoned disposition. We also know at these points that the very processes of sensitivity on existing conditions and other processes, such as stochastic resonance, can allow effects at the micro level approaching quanta to affect the outcome of global brain states.

And those with any rational insight can see that, for both theoretical and experimental reasons, classical causal closure of the universe in brain dynamics is an unachievable quest. Notwithstanding Libet's attempt, there is no technological way to experimentally achieve verification that the brain is causally closed and it flies in the face of the fractal molecular nature of biological processes at the quantum level. Nevertheless we can understand that subjective conscious volition cannot enter into causal conflict with brain processes which have already established an effective computational outcome, as we do when we reach a prevailing reasoned conclusion, so free will is effectively restricted to situations where the environmental circumstances are uncertain, or not effectively computable, or perceived consciously to be anything but certain. This in turn means that the key role of free will is not applying it to rationally or emotionally foregone conclusions but to environmental and strategic uncertainties, especially involving other conscious agents whose outcomes become part of quantum uncertainty itself.

The natural conclusion is that conscious free will has been conserved by evolution because it provides an evolutionary advantage at anticipating root uncertainties in the quantum universe, including environmental and contextual uncertainties which are themselves products of quantum uncertainty amplified by unstable processes in the molecular universe such as quantum kinetic billiards. This seems almost repugnantly counter-intuitive, because we tend to associate quantum uncertainty and the vagaries of fate with randomness, but this is no more scientifically established than causal closure of the universe in brain function. All the major events of history that are not foregone conclusions, result from conscious free will applied to uncertainty, such as Nelson turning his blind eye to the telescope, in the eventually successful Battle of Copenhagen. So the question remains that when we turn to the role of subjective consciousness volition in quantum uncertainty, this comes down to not just opening the box of Schrödinger's cat, but to anticipating uncertain events more often than random chance would predict in real life.

That is where the transactional approach comes into its own, because, while the future at the time of casting the emission die is an indeterminate set of potential absorbers, the retro-causal information contained in the transaction is implicitly revealing which future absorbers are actually able to absorb the real emitted quantum and hence information about the real state of the future universe, not just its probabilities at emission. Therefore the transaction is carrying additional implicit "encoded" information about the actual future state of the universe and what its possibilities are that can be critical for survival in natural selection.

Although, like the "transmission" of a detection to the other detector in an entanglement experiment cannot be used to transfer classical information faster than the speed of light, the same will apply to quantum transactions, but this doesn't mean they are random or have no anticipatory value, just that they cannot be used for causal deduction.

Because the "holistic" nature of conscious awareness is an extension of the global unstable excitatory dynamics of individual eucaryote cells to brain dynamics, a key aspect of subjective consciousness may be that it becomes sensitive to the wave-particle properties of quantum transactions with the natural environment in the process of cellular quantum sentience, involving sensitivity to quantum modes, including photons, phonons and molecular orbital effects constituting cellular vision, audition and olfaction. Expanded into brain processes, this cellular quantum dynamics then becomes integral to the binding of consciousness into a coherent whole.

If we view neurodynamics as a fully quantum process, in the most exotic quantum material in the universe, in which the wave aspects consist of parallel excitation modes representing the competing possibilities of response to environmental uncertainties. If there is an open and shut case on logical, or tactical grounds, this mode will win out pretty much in the manner of Edelman's (1987) neural Darwinism or Dennett's (1991) multiple drafts. In terms of quantum evolution, the non-conscious processes form overlapping wave functions, proceeding according to deterministic Schrödinger solutions, (von Neumann type 2 processes), but in situations where subjective consciousness becomes critical to make an intuitive decision, the brain dynamic approaches an unstable tipping point, in which system uncertainty becomes pivotal (represented in instability of global states which are in turn sensitive to fractal scales of instability to the molecular level. Subjective consciousness then intervenes causing an intuitive decision through a (type 1 von Neumann) process of wave function collapse of the superimposed modes.

From the inside, this feels like and IS a choice of "free-will" aka subjective conscious volition over the physical universe. From the outside, this looks like collapse of an uncertain brain process to one of its eigenfunction states which then become apparent. There is a very deep mystery in this process because the physical process looks and remains uncertain and indeterminate, but from inside, in complete contradiction, it looks and feels like the exercise of intentional will determining future physical outcomes. So in a fundamental way it is like a Schrödinger cat experiment in which the cat survives more often than not, i.e. we survive. Now that is a really confounding issue at the very nub of what conscious existence is about and why SEC has the cosmological axiom of subjectivity to resolve it, because it is a fundamental cosmological paradox otherwise. So we end up with the ultimate paradox of consciousness how can we not only predict future outcomes that are quantum uncertain but capitalise on the ones that promote our survival, i.e. throw a live cat more often than chance would dictate!

This is the same dilemma that SEC addresses in primal subjectivity and is also in Cathy Reason's theorem ... from the physical point of view causal closure of the brain is an undecidable proposition because we can't physically prove conscious will has physical effect, but neither can we prove causal closure of the (classical) universe. On the other hand, as Cathy's theorem intimates, conscious self certainty implies we know we changed the universe. Certainty of will as well as certainty of self. So the subjective perspective is certain and the objective perspective is undecidable. In

exactly the same way, the cat paradox outcome is uncertain and can't be hijacked physically, but the autonomous intentional will used to tip the uncertain brain state has confidence of overall efficacy. This is the key to consciousness, free-will and survival in the jungle when cognition stops dead because of all the other conscious agents rustling in the grass and threatening to strike, which are uncomputable because they too are conscious! It's also the key to Psi, but in a more marginal way because it's trying to pass this ability back into the physical, where it drifts towards the probability interpretation. That's why I accept it, but don't abuse the siddhis by declaring them!

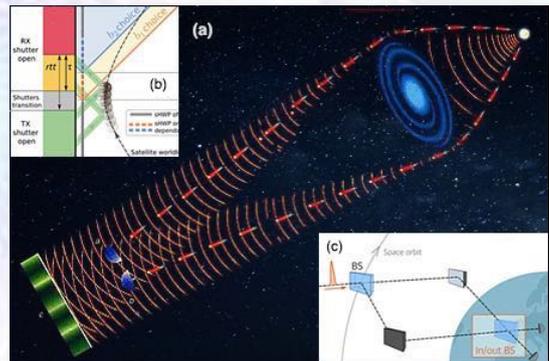
Consciousness is retained by evolution because it is a product of a Red Queen cognitive ⁴¹ race between predators and prey in a similar way to the way sexuality has become a self-perpetuating genetic race between parasites and hosts by creating individual variation, thus avoiding boom and bust epidemics.

Cramer (2022) notes a possible verifiable source of advanced waves:

In the 1940s, young Richard Feynman and his PhD supervisor John Wheeler decided to take the advanced solution seriously and to use it to formulate a new electromagnetism, now called Wheeler-Feynman absorber theory (WF). WF assumes that an oscillating electric charge produces advanced and retarded waves with equal strengths. However, when the retarded wave is subsequently absorbed (in the future), a cancellation occurs that erases all traces of the advanced waves and their time-backward "advanced effects." WF gives results and predictions identical to those of conventional electromagnetic theory. However, if future retarded-wave absorption is somehow incomplete, WF suggests that this absorption deficiency might produce experimentally observable advanced effects.

When Bajlo (2017) made measurements on cold, clear, dry days, he made the observations as the Earth rotated and the antenna axis swept across the galactic center, where wave-absorption variations might occur, in a number of these measurements, he observed strong advanced signals (6.94 to 26.5 standard deviations above noise) that arrived at the downstream antenna a time $2D/c$ before the main transmitted pulse signal. Variations in the advanced-signal amplitude as the antenna axis swept across the galactic center were also observed. The amplitude was reduced up to 50% of off-center maximum when pointed directly at the galactic center (where more absorption is expected.) These results constitute a credible observation of advanced waves.

Fig 74: Wheeler (1983) delayed choice experiment shows that different forms of measurement after light from a distant quasar has been gravitationally lensed around an intervening galaxy can be determined to have passed one or the other way around it or a superposition of both, depending on whether detection of one or other particle, or an interference is made when it reaches Earth. (b, c) An experimental implementation of Wheeler's idea along a satellite-ground interferometer that extends for thousands of kilometres in space (Vedovato et al. 2017), using shutters on an orbiting satellite.



Superdeterminism: There is another interpretation of quantum reality called super-determinism (Hossenfelder & Palmer 2020), which has an intriguing relationship with retro-causality and still can admit free will, despite the seeming contradiction in the title. Bell's theorem assumes that the measurements performed at each detector can be chosen independently of each other and of the hidden variables that determine the measurement outcome: $\rho(\lambda(ab)) = \rho(\lambda)$.

In a super-deterministic theory, this relation is not fulfilled $\rho(\lambda(ab)) \neq \rho(\lambda)$ because the hidden variables are correlated with the measurement settings. Since the choice of measurements and the hidden variable are predetermined, the results at one detector can depend on which measurement is done at the other without any need for information to travel faster than the speed of light. The assumption of statistical independence is sometimes referred to as the free choice or free will assumption, since its negation implies that human experimentalists are not free to choose which measurement to perform. But this is incorrect. What it depends on are the actual measurements made. For every possible pair of measurements a, b there is a predefined trajectory determined both by the particle emission and the measurement at the time absorption takes place. Thus in general the experimenter still has the free will to choose a, b or even to change the detector set up, as in the Wheeler delayed choice experiment in fig 74, and science proceeds as usual, but the outcome depends on the actual measurements made. In principle, super-determinism is untestable, as the correlations can be postulated to exist since the Big Bang, making the loophole impossible to eliminate. However this has an intimate relationship with the transactional interpretation and its implicit retro-causality, because it includes the absorbing conditions in the transaction, so the two are actually compatible.

⁴¹ the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses.

Superdeterminism is distinct from theories which attempt to assert boundary conditions on the cosmic origin combined with time asymmetric laws about the cosmic wave function which would result in strong determinism, the notion that despite quantum uncertainty, the entire future of the universe is predetermined (Chen 2023).

Sabine (Hossenfelder 2020) points out exactly how superdeterminism can violate statistical independence:

I here want to explain how the strangeness disappears if one is willing to accept that one of the assumptions we have made about quantum mechanics is not realized in nature: Statistical Independence. Loosely speaking, Statistical Independence means that the degrees of freedom of spatially separated systems can be considered uncorrelated, so in a superdeterministic model they are generically correlated, even in absence of a common past cause. The way that Statistical Independence makes its appearance in superdeterminism is that the probability distribution of the hidden variables given the detector settings $\rho(\lambda|\vartheta)$ is not independent of the detector settings, ie $\rho(\lambda|\vartheta) \neq \rho(\lambda)$. What this means is that if an experimenter prepares a state for a measurement, then the outcome of the measurement will depend on the detector settings. The easiest way to think of this is considering that both the detector settings, ϑ , and the hidden variables, λ , enter the evolution law of the prepared state. As a consequence, ϑ and λ will generally be correlated at the time of measurement, even if they were uncorrelated at the time of preparation. Superdeterminism, then, means that the measurement settings are part of what determines the outcome of the time-evolution of the prepared state. What does it mean to violate Statistical Independence? It means that fundamentally everything in the universe is connected with everything else, if subtly so. You may be tempted to ask where these connections come from, but the whole point of superdeterminism is that this is just how nature is. It's one of the fundamental assumptions of the theory, or rather, you could say one drops the usual assumption that such connections are absent. The question for scientists to address is not why nature might choose to violate Statistical Independence, but merely whether the hypothesis that it is violated helps us to better describe observations.

However, the “toy” superdeterministic hidden variable theory (Donadi & Hossenfelder 2022) uses “the master equation for one of the most common examples of decoherence – amplitude damping in a two-level system”. But decoherence is a theory in which an additional term is added to model the increasing probability of a quantum getting hit by another quantum and literally uses forced damping to suppress the entangled “off diagonal” components of the wave function matrix.

Schreiber (1995) sums up the case for consciousness collapsing the wave function as follows:

“The rules of quantum mechanics are correct but there is only one system which may be treated with quantum mechanics, namely the entire material world. There exist external observers which cannot be treated within quantum mechanics, namely human (and perhaps animal) minds, which perform measurements on the brain causing wave function collapse.”

Henry Stapp’s (2001) comment is pertinent to the cosmology I am propounding, because it implies that the place where collapse occurs lies in the brain making quantum measurements of its own internal states:

“From the point of view of the mathematics of quantum theory it makes no sense to treat a measuring device as intrinsically different from the collection of atomic constituents that make it up. A device is just another part of the physical universe... Moreover, the conscious thoughts of a human observer ought to be causally connected most directly and immediately to what is happening in his brain, not to what is happening out at some measuring device... Our bodies and brains thus become ... parts of the quantum mechanically described physical universe. Treating the entire physical universe in this unified way provides a conceptually simple and logically coherent theoretical foundation...”

Quantum entanglement is another area where consciousness may have a critical role. Einstein, Podolsky and Rosen (1935) proposed a locally causal limitation on any hidden variable theories describing the situation when two particles were entangled coherently in a single wave function. For example an excited calcium atom, because of the two electrons in its outer shell, can emit two (yellow and blue) photons of complementary spin in a single transition from zero to zero spin outer shells. Bell’s (1966) theorem demonstrated a discrepancy between locally-causal theories, in which information between hidden sub-quantum variables could not be transferred faster than light. However, multiple experiments using Bell’s theorem have found the polarisations, or other quantum states of the particles, such as spin, are correlated in ways violating local causality which are not limited by the velocity of light (Aspect et al. 1982). This “spooky action at a distance” which Einstein disliked shows that the state of either particle remains indeterminate until we measure one of them, when the other’s state is the instantaneously determined to be complementary. This cannot however be used to send logical classical information faster than light, or backwards in time, but it indicates that the quantum universe is a highly entangled system in which potentially all particles in existence are involved.

Entanglement, Measurement and Phase Transition

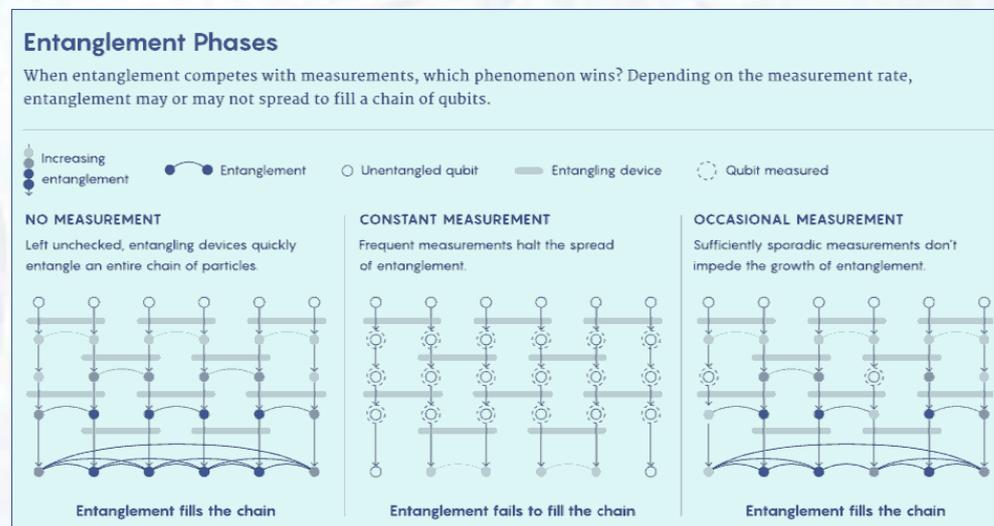
A flurry of theoretical and experimental research has uncovered a strange new face of entanglement, that shows itself not in pairs, but in constellations of particles (Wood 2023). Entanglement naturally spreads through a group of

particles, establishing an intricate web of contingencies. But if you measure the particles frequently enough, destroying entanglement in the process, you can stop the web from forming. In 2018, three groups of theorists (Chan A et al. 2019, Li et al. 2018, Skinner et al. 2019) showed that these two states — web or no web — are reminiscent of familiar states of matter such as liquid and solid. But instead of marking a transition between different structures of matter, the shift between web and no web indicates a change in the structure of information.

This is a phase transition in information, it's where the properties in information — how information is shared between things — undergo a very abrupt change. Brian Skinner

More recently, a separate trio of teams tried to observe that phase transition in action (Choi et al. 2020). They performed a series of meta-experiments to measure how measurements themselves affect the flow of information. In these experiments, they used quantum computers to confirm that a delicate balance between the competing effects of entanglement and measurement can be reached. The transition's discovery has launched a wave of research into what might be possible when entanglement and measurement collide. Matthew Fisher, a condensed matter physicist at the University of California, Santa Barbara, started studying the interplay of measurement and entanglement because he suspects that both phenomena could play a role in human cognition.

Fig 74b: Entanglement phase transition and Measurement



Since a measurement tends to destroy the "quantumness" of a system, it constitutes the link between the quantum and classical world. And in a large system of quantum bits of information, or qubits, the effect of measurements can induce emergence of

new phases of quantum information. When the qubits interact with one another, their information becomes shared non-locally in an entangled state, but under measurement, the entanglement is destroyed. The battle between measurement and interactions leads to two distinct phases: one where interactions dominate and entanglement is widespread, and one where measurements dominate, and entanglement is suppressed. Roushan et al. (2023) have now observed the crossover between these two regimes in a system of up to 70 qubits and also saw signatures of a novel form of "quantum teleportation"—in which an unknown quantum state is transferred from one set of qubits to another — that emerges as a result of these measurements. When measurements dominated over interactions (the "disentangling phase"), the strands of the web remained relatively short. The probe qubit was only sensitive to the noise of its nearest qubits. In contrast, when the measurements were weaker and entanglement was more widespread (the "entangling phase") the probe was sensitive to noise throughout the entire system. The crossover between these two sharply contrasting behaviours is a signature of the sought-after measurement-induced phase transition. Matsushita & Hofmann (2023) show this also depends on the strength of the back-action on the system of the measurement interaction. Eigenvalues emerge when the quantum interferences between different back-actions correspond to a Fourier transform in the back-action parameter.

The Greenberger–Horne–Zeilinger state (Greenberger, Horne & Zeilinger 1989, Mermin 1990) is one of several three-particle entanglements that have become pivotal in quantum computing (Hussein et al. 2023). There is no standard measure of multi-partite entanglement because different, not mutually convertible, types of multi-partite entanglement exist. Nonetheless, many measures define the GHZ state to be maximally entangled state. The GHZ state

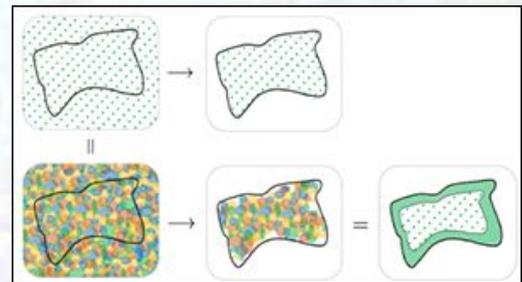
$|\text{GHZ}\rangle = \frac{|000\rangle + |111\rangle}{\sqrt{2}}$ and the W state $|\text{W}\rangle = \frac{1}{\sqrt{3}}(|001\rangle + |010\rangle + |100\rangle)$ represent two non-biseparable classes of 3-qubit states, which cannot be transformed (not even probabilistically) into each other by local quantum operations. This three particle entanglement problem is reminiscent of classical gravitation, which has a two body inverse square law, that in the three-body problem becomes intractably complex and chaotic as Henri Poincare found out. There is no general closed-form solution to the three-body problem, i.e. no general solution that can be expressed in terms of a finite number of standard mathematical operations.

Measuring Quantumness: Entanglement, Magic and Interactivity

Understanding how quantum entanglement can open new capacities for quantum computing (Wood 2023b), can help us understand the way biological conscious brains can anticipate reality revolves around the question of what kinds of quantum system can or can't be simulated by classical computers in polynomial time and not suffer the multiple exponential runaway, illustrated in Shor's (1994) quantum algorithm for cracking encryption problems.

Fig 74c: Using symmetry-protected magic to study the complexity of symmetry-protected topological (SPT) phases of matter (Ellison et al. 2021).

The ability of subsequently discovered classical computational algorithms to classically simulate quantum computing seemed like a bit of a miracle, but the first successful classical algorithm (Gottesman 1998) couldn't handle all quantum circuits, just those that stuck to Clifford gates. Jozsa & Linden (2002) then proved that, so long as their algorithm simulated a circuit that didn't entangle qubits, it could handle larger and larger numbers of qubits without taking an exponentially longer time, showing entanglement itself was a measure of quantumness.



"Nature isn't classical, dammit, and if you want to make a simulation of nature, you'd better make it quantum mechanical." Richard Feynman (1982)

Then entered "quantum magic". If you added a "T gate," a seemingly innocuous operation that rotates a qubit in a particular way, their algorithm would choke on it. The T gate seemed to manufacture something intrinsically quantum that can't be simulated on a classical computer. Bravyi and Gosset in 2016 developed a classical algorithm for simulating so-called low-magic circuits, giving the quantum essence produced by the forbidden T-gate rotation the catchy name: magic. But this configuration is not just confined to arcane quantum computing configurations. Ellison et al. (2021) identified certain phases of quantum matter that are guaranteed to have magic, just as many phases of matter have particular patterns of entanglement.

Yet another form of quantumness had already been discovered earlier. Much as Gottesman-Knill had focused on circuits without entangling gates, and Bravyi and Gosset could cut through circuits without too many T gates, Valiant's (2001) algorithm was restricted to circuits that lacked the "swap gate" – an operation that takes two qubits and exchanges their positions. As long as you don't exchange qubits, you can entangle them and infuse them with as much magic as you like, and you'll still find yourself on yet another distinct classical island. But as soon as you start shuffling qubits around, you can work wonders beyond the ability of any classical computer.

In 1984, Valiant's "probably approximately correct" (PAC) model mathematically defined the conditions under which a mechanistic system could be said to "learn" information. Valiant (2013) generalised his PAC learning framework to encompass biological evolution as well. He broadened the concept of an algorithm into an "ecorithm," which is a learning algorithm that "runs" on any system capable of interacting with its physical environment. Algorithms apply to computational systems, but ecorithms can apply to biological organisms or entire species. The concept draws a computational equivalence between the way that individuals learn and the way that entire ecosystems evolve. In both cases, ecorithms describe adaptive behaviour in a purely mechanistic way:

"An ecorithm is an algorithm, but its performance is evaluated against input it gets from a rather uncontrolled and unpredictable world. And its goal is to perform well in that same complicated world." (Leslie Valiant).

Valiant is a devoted mechanist who sees no difference between the conscious brain and AI, reducing everything to computational mathematics. When asked (Pavlus 2016): *"What if the ecorithms governing evolution and learning are*

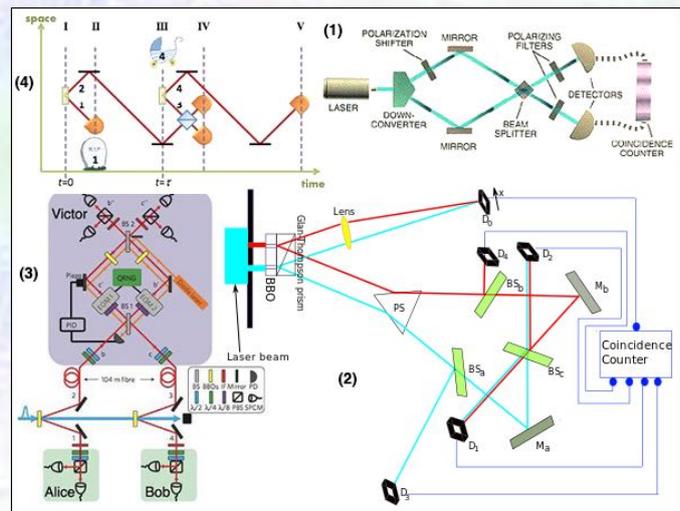
unlearnable?" He acknowledges: "It's a logical possibility, but I don't think it's likely at all. I think it's going to be something pretty tangible and reasonably easy to understand. We can ask the same question about fundamental unsolved problems in mathematics".

Terhal and DiVincenzo (2001) almost immediately uncovered the source of that power. They showed that Valiant's swap-gate-free "matchgate" circuits, were simulating a well-known class of physics problems, similar to how computers simulate growing galaxies or nuclear reactions. Matchgate circuits simulate a group of fermions. When swap gates are not used, the simulated fermions are noninteracting, or "free." Problems involving free electrons are relatively easy for physicists to solve, but when swap gates are used, the simulated fermions interact, crashing together and doing other complicated things. These problems are extremely hard, if not unsolvable. Conceptually, this resource corresponds to "interactivity" — or how much the simulated fermions can sense each other.

In the 1990s, the physical ingredient that made quantum computers powerful seemed obvious. It had to be entanglement, the "spooky" quantum link between distant particles that Erwin Schrödinger himself identified as "the characteristic trait of quantum mechanics." When Gottesman developed his method of simulating Clifford circuits, he based it on the "operator" quantum mechanics developed by Werner Heisenberg. Restricting one's view to free fermions involves viewing quantum mechanics through yet another mathematical lens. Each captures certain aspects of quantum states, but at the price of garbling some other quantum property.

If a collection of qubits is largely **unentangled**, has **little magic**, or simulates a bunch of **nearly free fermions**, then researchers know they can reproduce its output on a classical laptop. Any quantum circuit with a low score on one of these three quantum metrics lies in the shallows just off the shores of a classical island, in the space of possible phases of Matter (Wolchover 2018) and won't be the next Shor's algorithm.

Fig75: (1) Quantum Erasure shows it is also possible to 'uncollapse' or erase such losses of entangled correlation by re-interfering the wave functions so we can no longer tell the difference. The superposition choices of the delayed choice experiment fig 74, also do this. Erasure successfully recreates the lost correlations, detecting information about one of the particles and then erasing it again by re-interfering it back into the shared wave function provided we use none of its information. Pairs of identically polarised correlated photons produced by a 'down-converter', bounce off mirrors, converge again at a beam splitter and pass into two detectors. A coincidence counter observes an interference pattern in the rate of simultaneous detections by the two detectors, indicating that each photon has gone both ways at the beam splitter, as a wave. Adding a polarisation shifter to one path destroys the pattern, by making it possible to distinguish the photons' paths. Placing two polarising filters in front of the detectors makes the photons identical again, erasing the distinction, restoring the interference pattern. (2) Delayed choice quantum eraser configuration. An individual photon goes through one (or both) of the two slits. One of the photons - the "signal" photon (red and blue lines) continues to the target detector D0, which is scanned in steps along its x-axis. A plot of "signal" photon counts detected by D0 versus x can be examined to discover whether the cumulative signal forms an interference pattern. The other entangled photon - the "idler" photon (red and blue lines going downwards from the prism), is deflected by prism PS that sends it along divergent paths depending on whether it came from slit A or slit B. Detection of the idler photon by D3 or D4 provides delayed "which-path information" indicating whether the signal photon with which it is entangled had gone through slit A or B. On the other hand, detection of the idler photon by D1 or D2 provides a delayed indication that such information is not available for its entangled signal photon. Insofar as which-path information had earlier potentially been available from the idler photon, the information has been subjected to a "delayed erasure". (3) Delayed choice entanglement swapping, in which Victor is able to decide whether Alice's and Bob's photons are entangled or not after they have already been measured. (Ma et al. 2002). (4) A photon is entangled with a photon that has already died (been sampled) even though they never coexisted at any point in time (Megidish 2012).



Phenomena, including delayed choice quantum erasure and entanglement-swapping fig 75, demonstrate that the time of a quantum observation can be ambiguous or possibly stand outside space-time, as the transactional picture suggests. The Wigner's friend experiment of fig 76c likewise shows that quantum path information can also take the form of a quantum measurement 'observer'. Narasimhan, Chopra & Kafatos M (2019) draw particular attention to Kim et al. (2000) in regard to a "universal observer" integrating individual conscious observers and their observations:

While traditional double-slit experiments are usually interpreted as indicating that the collapse of the wave function involves choices by an individual observer in space-time, the extension to quantum eraser experiments brings in some additional subtle aspects relating to the role of observation and what constitutes an observer. Access to, and the interpretation of, information outside space and time may be involved. This directly ties to the question of where the Heisenberg-von Neumann cut is located and what its nature is. ... There is a possibility that individual observers making choices in space and time are actually aspects of the universal Observer, a state masked by assumptions about individual human minds that may need further development and re-examination.

Consciousness and Measurement

Summing up the position of physicists in a survey of participants in a foundations of quantum mechanics gathering, Schlosshauer et al. (2013) found that, while only 6% of physicists present believed consciousness plays a distinguished physical role in measurement, a majority believed it has a fundamental, although not distinguished role in the application of the formalism. They noted in particular that *“It is remarkable that more than 60% of respondents appear to believe that the observer is not a complex quantum system.”* Indeed on all counts queried there were wide differences of opinion, including which version of quantum mechanics they supported. Since all of the approaches are currently consistent with the predictions of quantum mechanics, these ambiguous figures are not entirely surprising.

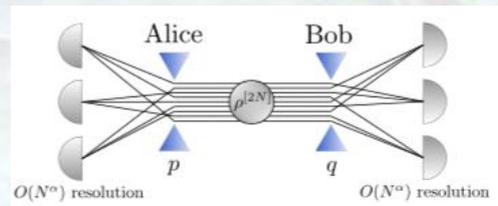
In an experiment to test the influence of conscious perception on quantum entanglement (Radin, Bancel & Delorme 2021), explored psychophysical (mind-matter) interactions with quantum entangled photons. Entanglement correlation strength measured in real-time was presented via a graph or dynamic images displayed on a computer monitor or web browser. Participants were tasked with mentally influencing that metric, with particularly strong results observed in three studies conducted ($p < 0.0002$). Radin, Michel & Delorme (2016) also reported a σ 5.72 ($p = 1.05 \times 10^{-8}$) deviation from a null effect in which participants focused their attention toward or away from a feedback signal linked in real time to the double-slit component of an interference pattern, suggesting consciousness affecting wave function collapse. For a review, see Milojevic & Elliot (2023). Radin (2023) has also reported σ 7.3 result beyond chance ($p=1.4 \times 10^{-13}$) deviations leaving little doubt that on average anomalous deviations in the random data emerged during events that attracted widespread attention, from a network of electronic random number generators located around the world that continuously recorded samples, used to explore a hypothesis that predicts the emergence of anomalous structure in randomness correlated with events that attract widespread human attention. Mossbridge et al. (2014) have also cited an organic unconscious anticipatory response to potential existential crises they term predictive anticipatory activity, which is similar to conscious quantum anticipation, citing anticipative entanglement swapping experiments such as Ma et al. (2002).

The tendency towards an implicitly classical view of causality is similar to that among neuroscientists, with an added belief in the irreducible nature of randomness, as opposed to a need for hidden variables supporting quantum entanglement, rejecting Einstein’s disclaimer *“God does not play dice with the universe.”* Belief in irreducible randomness means that the principal evidence for subjectivity in quanta – the idiosyncratic unpredictable nature of individual particle trajectories – is washed out in the bath water of irreducible randomness, converging to the wave amplitude on repetition, consistent with the correspondence principle, that the behaviour of systems described by the theory of quantum mechanics reproduces classical physics in the limit of large quantum numbers.

Non-IID interactions may Preserve Quantum Reality: In Born’s (1920) correspondence principle, systems described by quantum mechanics are believed to reproduce classical physics in the limit of large quantum numbers – if measurements performed on macroscopic systems have limited resolution and cannot resolve individual microscopic particles, then the results behave classically – the coarse-graining principle (Kofler & Brukner 2007). Subsequently Navascués & Wunderlich (2010) proved that in situations covered by IID (independent and identically distributed measurements) in which each run of an experiment must be repeated under exactly the same conditions and independently of other runs, we arrive at macroscopic locality. Similarly, temporal quantum correlations reduce to classical correlations and quantum contextuality reduces to macroscopic non-contextuality (Henson & Sainz 2015).

However Gallego & Dakić (2021) have shown that, surprisingly, quantum correlations survive in the macroscopic limit if correlations are not IID distributed at the level of microscopic constituents and that the entire mathematical structure of quantum theory, including the superposition principle is preserved in the limit. This macroscopic quantum behaviour allows them to show that Bell nonlocality is visible in the macroscopic limit.

Fig 76: Macroscopic Bell-Type experiment.



"The IID assumption is not natural when dealing with a large number of microscopic systems. Small quantum particles interact strongly and quantum correlations and entanglement are distributed everywhere. Given such a scenario, we revised existing calculations and were able to find complete quantum behavior at the macroscopic scale. This is completely against the correspondence principle, and the transition to classicality does not take place" (Borivoje Dakić).

"It is amazing to have quantum rules at the macroscopic scale. We just have to measure fluctuations, deviations from expected values, and we will see quantum phenomena in macroscopic systems. I believe this opens the door to new experiments and applications" (Miguel Gallego).

Their approach is described as follows:

In this respect, one important consequence of the correspondence principle is the concept of macroscopic locality (ML): Coarse-grained quantum correlations become local (in the sense of Bell) in the macroscopic limit. ML has been challenged in different circumstances, both theoretically and experimentally. However, as far as we know, nonlocality fades away under coarse graining when the number of particles N in the system goes to infinity. In a bipartite Bell-type experiment where the parties measure intensities with a resolution of the order of $N^{1/2}$ or, equivalently, $O(N^{1/2})$ coarse graining. Then, under the premise that particles are entangled only by independent and identically distributed pairs, Navascués & Wunderlich (2010) prove ML for quantum theory.

We generalize the concept of ML to any level of coarse graining $\alpha \in [0, 1]$, meaning that the intensities are measured with a resolution of the order of N^α . We drop the IID assumption, and we investigate the existence of a boundary between quantum (nonlocal) and classical (local) physics, identified by the minimum level of coarse graining α required to restore locality. To do this, we introduce the concept of macroscopic quantum behavior (MQB), demanding that the Hilbert space structure, such as the superposition principle, is preserved in the thermodynamic limit.

Conclusion: We have introduced a generalized concept of macroscopic locality at any level of coarse graining $\alpha \in [0, 1]$. We have investigated the existence of a critical value that marks the quantum-to-classical transition. We have introduced the concept of MQB at level α of coarse graining, which implies that the Hilbert space structure of quantum mechanics is preserved in the thermodynamic limit. This facilitates the study of macroscopic quantum correlations. By means of a particular MQB at $\alpha = 1/2$,

$$|W\rangle = \frac{1}{\sqrt{N}} (|100\dots 0\rangle + |010\dots 0\rangle + \dots + |000\dots 1\rangle)$$

we show that $\alpha_c \geq 1/2$, as opposed to the IID case, for which $\alpha_{IID} \leq 1/2$. An upper bound on α_c is, however, lacking in the general case. The possibility that no such transition exists remains open, and perhaps there exist systems for which ML is violated at $\alpha = 1$.

This means for example, that in (a) neural system processing, where the quantum unstable context is continually evolving as a result of edge-of-chaos processing, and so repeated IID measurements are not made and (b) biological evolution, where a sequence of unique mutations in quantum walks (Santiago-Alarcon et al. (2020)) become sequentially fixed by natural and sexual selection, which is also consciously mediated in eucaryote organisms, both inherit implicit quantum non-locality in their evolution.

Kerskens & Pérez (2022) have adapted an idea developed for experiments to prove the existence of quantum gravity, Marletto & Vedral (2017) and used it to infer that brain processes are intrinsically quantum in nature. When you take known quantum systems, which interact with an unknown system, if the known systems entangle, then the unknown must be a quantum system, too. It circumvents the difficulties to find measuring devices for something we know nothing about.

For our experiments we used proton spins of 'brain water' as the known system. 'Brain water' builds up naturally as fluid in our brains and the proton spins can be measured using MRI (Magnetic Resonance Imaging). Then, by using a specific MRI design to seek entangled spins, we found MRI signals that resemble heartbeat evoked potentials, a form of EEG signals. EEGs measure electrical brain currents, which some people may recognise from personal experience or simply from watching hospital dramas on TV.

Electrophysiological potentials like the heartbeat evoked potentials are normally not detectable with MRI and the scientists believe they could only observe them because the nuclear proton spins in the brain were entangled.

If entanglement is the only possible explanation here then that would mean that brain processes must have interacted with the nuclear spins, mediating the entanglement between the nuclear spins. As a result, we can deduce that those brain functions must be quantum. Because these brain functions were also correlated to short-term memory performance and conscious awareness, it is likely that those quantum processes are an important part of our cognitive and conscious brain functions.

This experiment was extremely challenging, and requires replication, but it suggests conscious brain processing as a whole is intrinsically quantum in nature. There are a number of quantum descriptions of conscious brain activity that invoke specific processes to invoke a link between conscious intentional activity and ongoing brain states.

The Quantum Measurement Problem May Contradict Objective Reality: In quantum theory, before collapse, the system is said to be in a superposition of two states, and this quantum state is described by the wave function, which evolves in time and space. This evolution is both deterministic and reversible: given an initial wave function, one can predict what it'll be at some future time, and one can in principle run the evolution backward to recover the prior state. Measuring the wave function, however, causes it to collapse, mathematically speaking, such that the system in our example shows up as either heads or tails. It's an irreversible, one-time-only and no one knows what defines the process or boundaries of measurement.

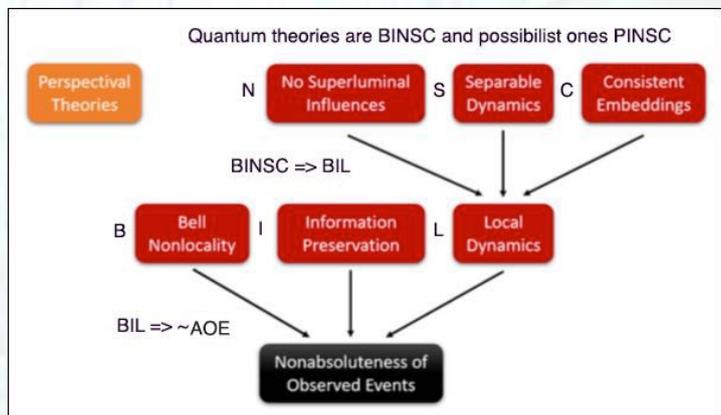
One model that preserves the absoluteness of the observed event — either heads or tails for all observers—is the GRW theory, where quantum systems exist in a superposition of states until the superposition spontaneously and randomly collapses, independent of an observer. Whatever the outcome—heads or tails in our example—it shall hold for all observers. But GRW, and the broader class of “spontaneous collapse” theories, run foul of a long-cherished physical principle: the preservation of information. By contrast, the “many worlds” interpretation of quantum mechanics allows for non-absoluteness of observed events, because the wave function branches into multiple contemporaneous realities, in which in one “world,” the system will come up heads, while in another, it'll be tails.

Ormrod, Venkatesh and Barrett (2023, Ananthaswamy 2023) focus on perspectival theories that obey three properties:

- (1) **Bell nonlocality (B).** Alice chooses her type of measurement freely and independently of Bob, and vice versa – of their own free will – an important assumption. Then, when they eventually compare notes, the duo will find that their measurement outcomes are correlated in a manner that implies the states of the two particles are inseparable: knowing the state of one tells you about the state of the other.
- (2) **The preservation of information (I).** Quantum systems that show deterministic and reversible evolution satisfy this condition. If you are wearing a green sweater today, in an information-preserving theory, it should still be possible, in principle, 10 years hence to retrieve the colour of your sweater even if no one saw you wearing it.
- (3) **Local dynamics (L).** If there exists a frame of reference in which two events appear simultaneous, then the regions of space are said to be “space-like separated.” Local dynamics implies that the transformation of a system that takes a set of input states and produces a set of output states in one of these regions cannot causally affect the transformation of a system in the other region any faster than the speed of light, and vice versa. Each subsystem undergoes its own transformation, and so does the entire system as a whole. If the dynamics are local, the transformation of the full system can be decomposed into transformations of its individual parts: the dynamics are said to be separable. In contrast, when two particles share a state that's Bell nonlocal (that is, when two particles are entangled, per quantum theory), the state is said to be inseparable into the individual states of the two particles. If transformations behaved similarly, in that the global transformation could not be described in terms of the transformations of individual subsystems, then the whole system would be dynamically inseparable.

Fig 76b: A graphical summary of the theorems. Possibilistic Bell Nonlocality is Bell Nonlocality that arises not only at the level of probabilities, but at the level of discrete possibilities.

Their work analyses how perspectival quantum theories are BINSNC, and that NSC implies L, so BINSNC is BIL. Such BIL theories are then required to handle a deceptively simple thought experiment. Imagine that Alice and Bob, each in their own lab, make a measurement on one of a pair of particles. Both Alice and Bob make one measurement each, and both do the exact same measurement. For example, they might both measure the spin of their particle in the up-down direction. Viewing Alice and Bob and their labs from the outside are Charlie and Daniela, respectively. In principle, Charlie and Daniela should be able to measure the spin of the same particles, say, in the left-right direction. In an information-preserving theory, this should be possible. Using this



scenario, the team proved that the predictions of any BIL theory for the measurement outcomes of the four observers contradict the absoluteness of observed events. This leaves physicists at an unpalatable impasse: either accept the non-absoluteness of observed events or give up one of the assumptions of a BIL theory.

Orrod says dynamical separability is “kind of an assumption of reductionism – you can explain the big stuff in terms of these little pieces.” Just like a Bell nonlocal state cannot be reduced to some constituent states, it may be that the dynamics of a system are similarly holistic, adding another kind of nonlocality to the universe. Importantly, giving it up doesn't cause a theory to fall afoul of Einstein's theories of relativity, much like physicists have argued that Bell nonlocality doesn't require superluminal or nonlocal causal influences but merely nonseparable states. Orrod, Venkatesh and Barrett note: “*Perhaps the lesson of Bell is that the states of distant particles are inextricably linked, and the lesson of the new ... theorems is that their dynamics are too.*” The assumptions used to prove the theorem don't explicitly include an assumption about freedom of choice because no one is exercising such a choice. But if a theory is Bell nonlocal, it implicitly acknowledges the free will of the experimenters.

An experimental realisation of non-absoluteness of observation has been devised (Proietti et al., 2019) as shown in fig 76c using quantum entanglement.

The experiment involves two people observing a single photon that can exist in one of two alignments, but until the moment someone actually measures it to determine which, the photon is in a superposition. A scientist analyses the photon and determines its alignment. Another scientist, unaware of the first's measurement, is able to confirm that the photon - and thus the first scientist's measurement - still exists in a quantum superposition of possible outcomes. As a result, each scientist experiences a different reality - both "true" even though they disagree with each other. In a subsequent experiment, Bong et al. (2020) transform the thought experiment into a mathematical theorem that confirms the irreconcilable contradiction at the heart of the Wigner scenario.

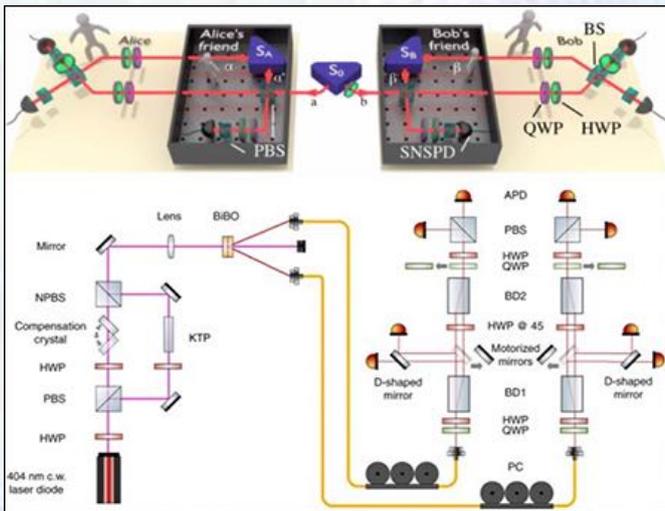


Fig 76c: Above An experimental realisation of the Wigner' friend setup showing there is no such thing as objective reality - quantum mechanics allows two observers to experience different, conflicting realities. Below the proof of principle experiment of Bong et al. (2020) demonstrating mutual inconsistency of 'No-Superdeterminism', 'Locality' and 'Absoluteness of Observed Events'.

The team also tests the theorem with an experiment, using photons as proxies for the humans, accompanied by new forms of Bell's inequalities, by building on a scenario with two separated but entangled friends. The researchers prove that if quantum evolution is controllable on the scale of an observer, then one of (a) **No-Superdeterminism** — the assumption of 'freedom of choice' used in derivations of Bell inequalities - that the experimental settings can be chosen freely — uncorrelated with any

relevant variables prior to that choice, (2) **Locality** or (3) **Absoluteness of Observed Events** — that every observed event exists absolutely, not relatively — must be false. Although the violation of Bell-type inequalities in such scenarios is not in general sufficient to demonstrate the contradiction between those three assumptions, new inequalities can be derived, in a theory-independent manner, that are violated by quantum correlations. This is demonstrated in a proof-of-principle experiment where a photon's path is deemed an observer. This new theorem places strictly stronger constraints on physical reality than Bell's theorem.

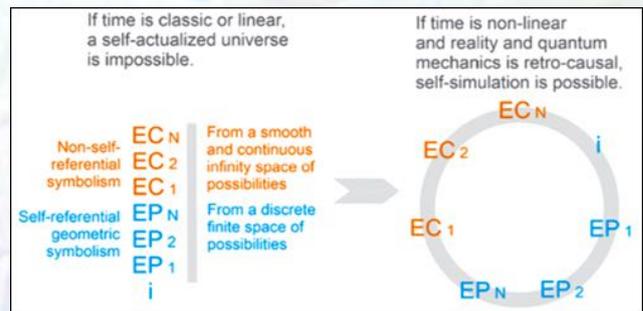
Self-Simulated Universe: Another theory put forward by gravitational theorists (Irwin, Amaral & Chester 2020) also uses retrocausality to try to explain the ultimate questions: Why is there anything here at all? What primal state of existence could have possibly birthed all that matter, energy, and time, all that everything? And the way that consciousness arose—is it some fundamental proto-state of the universe itself, or an emergent phenomenon that's purely neurochemical and material in nature?

This approach attempts to answer both questions in a way that weds aspects of Nick Bostrom’s Simulation Argument with “timeless emergentism.” termed the “panpsychism self-simulation model,” that says the physical universe may be a “strange loop” that may self-generate new sub-realities in an almost infinite hierarchy of tiers in-laid with simulated realities of conscious experience. In other words, the universe is creating itself through thought, willing itself into existence on a perpetual loop that efficiently uses all mathematics and fundamental particles at its disposal. The universe, they say, was always here (timeless emergentism) and is like one grand thought that makes mini thoughts, called “code-steps or actions”, again sort of a Matryoshka doll.

David Chester comments:

“While many scientists presume materialism to be true, we believe that quantum physics may provide hints that our reality could be a mental construct. Recent advances in quantum gravity, like seeing spacetime emergent via a hologram, is also a touch that spacetime isn’t fundamental. this can be also compatible with ancient Hermetic and Indian philosophy. In a sense, the mental construct of reality creates spacetime to efficiently understand itself by creating a network of subconscious entities that may interact and explore the totality of possibilities.”

Fig 77: Self-Simulated Universe: Humans are near the point of demarcation, where *EC* or thinking matter emerges into the choice-sphere of the infinite set of possibilities of thought, EC_{∞} . Beyond the human level, physics allows for larger and more powerful networks that are also conscious. At some stage of the simulation run, a conscious *EC* system emerges that is capable of acting as the substrate for the primitive spacetime code, its initial conditions, as mathematical thought, and simulation run, as a thought, to self-actualize itself. Linear time would not permit this logic, but non-linear time does.



They modify the *simulation hypothesis* to a *self-simulation hypothesis*, where the physical universe, as a strange loop, is a mental self-simulation that might exist as one of a broad class of possible code-theoretic quantum gravity models of reality obeying the *principle of efficient language* axiom, and discuss implications of the self-simulation hypothesis such as an informational arrow of time.



Fig 77b: This emphasis on coding is problematic, as it is trying to assert a consciousness-makes-reality loop through an apparently abstract coded representation based on discrete computation-like processes, assuming an "tit-from-bit" notion that reality is made from information, not just described by it.

The self-simulation hypothesis is built upon the following axioms:

1. **Reality, as a strange loop**, is a code-based self-simulation in the mind of a panpsychic universal consciousness that emerges from itself via the information of code-based mathematical thought or self-referential symbolism plus emergent non-self-referential thought. Accordingly, reality is made of information called thought.
2. **Non-local spacetime and particles are secondary** or emergent from this code, which is itself a pre-spacetime thought within a self-emergent mind.
3. **The panconsciousness has freewill** to choose the code and make syntactical choices. Emergent lower levels of consciousness also make choices through observation that influence the code syntax choices of the panconsciousness.
4. **Principle of efficient language** (Irwin 2019) The desire or decision of the panconscious reality is to generate as much meaning or information as possible for a minimal number of primitive thoughts, i.e., syntactical choices, which are mathematical operations at the pre-spacetime code level.

It from bit: Otherwise put, every it — every particle, every field of force, even the space-time continuum itself — derives its function, its meaning, its very existence entirely — even if in some contexts indirectly — from the apparatus-elicited answers to yes-or-no questions, binary choices, bits. It from bit symbolizes the idea that every item of the physical world has at bottom — at a very deep bottom, in most instances — an immaterial source and explanation; that which we call reality arises in the last analysis from the posing of yes-no questions and the registering of equipment-evoked responses; in short, that all things physical are information-theoretic in origin and that this is a **participatory universe** (Wheeler 1990).

John Eccles (1986) proposed a quantum theory involving psychon quasi-particles mediating uncertainty of synaptic transmission to complementary dendrons cylindrical bundles of neurons arranged vertically in the six outer layers or laminae of the cortex. Eccles proposed that each of the 40 million dendrons is linked with a mental unit, or “*psychon*”, representing a unitary conscious experience. In willed actions and thought, psychons act on dendrons and, for a

moment, increase the probability of the firing of selected neurons through quantum tunnelling effect in synaptic exocytosis, while in perception the reverse process takes place. This model has been elaborated by a number of researchers (Eccles 1990, 1994, Beck & Eccles 1992, Georgiev 2002, Hari 2008). The difficulty with the theory is that the psychons are then physical quasi-particles with integrative mental properties. So it's a quasi-physical description that doesn't manifest subjectivity except by its integrative physical properties. In the last chapter of his book *The Neurophysiological Basis of Mind* (1953), Eccles not only hypothesized the existence of a "self-conscious mind" relatively independent of the cerebral structures, but also supposed that a very weak influence of will on a few neurons of the cerebral cortex could cause remarkable changes in brain activity leading to the notion of volition being a form of "psychokinesis" (Giroladini 1991), supported also by Wilder Penfield (1960).

Schwartz, Stapp & Beauregard (2005) advance a quantum theory of conscious volition, in which attentive will can influence physical brain states using quantum principles, in particular von Neumann's process 1 or collapse of the wave function, complementing process 2, the causal evolution of the Schrödinger wave function. They cite specific cognitive processes leading the physical changes in the manner of ongoing brain function:

There is at least one type of information processing and manipulation that does not readily lend itself to explanations that assume that all final causes are subsumed within brain, or more generally, central nervous system mechanisms. The cases in question are those in which the conscious act of wilfully altering the mode by which experiential information is processed itself changes, in systematic ways, the cerebral mechanisms used. There is a growing recognition of the theoretical importance of applying experimental paradigms that use directed mental effort to produce systematic and predictable changes in brain function. ... Furthermore, an accelerating number of studies in the neuroimaging literature significantly support the thesis that, with appropriate training and effort, people can systematically alter neural circuitry associated with a variety of mental and physical states.

They point out that it is necessary in principle to advance to the quantum level to achieve an adequate theory of the neurophysiology of volitionally directed activity. The reason, essentially, is that classic physics is an approximation to the more accurate quantum theory, and that this classic approximation eliminates the causal efficacy of our conscious efforts that these experiments empirically manifest.

They explain how structural features of ion conductance channels critical to synaptic function entail that the classical approximation to quantum reality fails in principle to cover the dynamics of a human brain, so that quantum dynamics must be used. The principles of quantum theory must then link the quantum physical description of the subject's brain to their stream of conscious experiences. The conscious choices by human agents thereby become injected non-trivially into the causal interpretation of neuroscience and neuropsychology experiments, through type 1 processes performing quantum measurement operations. This particularly applies to those experimental paradigms in which human subjects are required to perform decision-making or attention-focusing tasks that require conscious effort.

Conscious effort itself can, justifiably within science, be taken to be a primary variable whose complete causal origins may be untraceable in principle, but whose causal efficacy in the physical world can be explained on the basis of the laws of physics.

The mental act of clear-minded introspection and observation, variously known as mindfulness, mindful awareness, bare attention, the impartial spectator, etc., is a well-described psychological phenomenon with a long and distinguished history in the description of human mental states. ... In the conceived approach, the role played by the mind, when one is observing and modulating one's own emotional states, is an intrinsically active and physically efficacious process in which mental action is affecting brain activity in a way concordant with the laws of physics.

They propose a neurobiological interpretation where calcium channels play a pivotal role in type 1 processes at the synaptic level:

At their narrowest points, calcium ion channels are less than a nanometre in diameter. This extreme smallness of the opening in the calcium ion channels has profound quantum mechanical implications. The narrowness of the channel restricts the lateral spatial dimension. Consequently, the lateral velocity is forced by the quantum uncertainty principle to become large. This causes the quantum cloud of possibilities associated with the calcium ion to fan out over an increasing area as it moves away from the tiny channel to the target region where the ion will be absorbed as a whole, or not absorbed at all, on some small triggering site. ... This spreading of this ion wave packet means that the ion may or may not be absorbed on the small triggering site. Accordingly, the contents of the vesicle may or may not be released. Consequently, the quantum state of the brain has a part in which the neurotransmitter is released and a part in which the neurotransmitter is not released. This quantum splitting occurs at every one of the trillions of nerve terminals. ... In fact, because of uncertainties on timings and locations, what is generated by the physical processes in the brain will be not a single discrete set of non-overlapping physical possibilities but rather a huge smear of classically conceived possibilities. Once the physical state of the brain has evolved into this huge smear of possibilities one must appeal to the

quantum rules, and in particular to the effects of process 1, in order to connect the physically described world to the streams of consciousness of the observer/participants.

However, they note that this focus on the motions of calcium ions in nerve terminals is not meant to suggest that this particular effect is the only place where quantum effects enter into the brain process, or that the quantum process 1 acts locally at these sites. What is needed here is only the existence of some large quantum of effect.

A type 1 process beyond the local deterministic process 2 is required to pick out one experienced course of physical events from the smeared-out mass of possibilities generated by all of the alternative possible combinations of vesicle releases at all of the trillions of nerve terminals. This process brings in a choice that is not determined by any currently known law of nature, yet has a definite effect upon the brain of the chooser.

They single out the quantum zeno effect, in which rapid multiple measurements can act to freeze a quantum state and delay its evolution and cite James (1892 417): The essential achievement of the will, in short, when it is most 'voluntary,' is to attend to a difficult object and hold it fast before the mind. Effort of attention is thus the essential phenomenon of will. ... Consent to the idea's undivided presence, this is effort's sole achievement. Everywhere, then, the function of effort is the same: to keep affirming and adopting the thought which, if left to itself, would slip away." This coincides with the studies already cited on wilful control of the emotions to imply evidence of effect.

Much of the work on attention since James is summarized and analysed in Pashler (1998). He emphasizes that the empirical 'findings of attention studies argue for a distinction between perceptual attentional limitations and more central limitations involved in thought and the planning of action. A striking difference that emerges from the experimental analysis is that the perceptual processes proceed essentially in parallel, whereas the post-perceptual processes of planning and executing actions form a single queue, is in line with the distinction between 'passive' and 'active' processes. A passive stream of essentially isolated process 1 events versus active processes involving effort-induced rapid sequences of process 1 events that can saturate a given capacity.

There is in principle, in the quantum model, an essential dynamic difference between the unconscious processing done by the Schrödinger evolution, which generates by a local process an expanding collection of classically conceivable experiential possibilities and the process associated with the sequence of conscious events that constitute the wilful selection of action. The former are not limited by the queuing effect, because process 2 simply develops all of the possibilities in parallel. Nor is the stream of essentially isolated passive process 1 events thus limited. It is the closely packed active process 1 events that can, in the von Neumann formulation, be limited by the queuing effect.

This quantum model accommodates naturally all of the complex structural features of the empirical data that he describes. Chapter 6 emphasizes a specific finding: strong empirical evidence for what he calls a central processing bottleneck associated with the attentive selection of a motor action. This kind of bottleneck is what the quantum-physics-based theory predicts: the bottleneck is precisely the single linear sequence of mind-brain quantum events that von Neumann quantum theory describes.

Hameroff and Penrose (2014, Hameroff 2022) have also proposed a controversial theory that consciousness originates at the quantum level inside neurons, rather than the conventional view that it is a product of connections between neurons, coupling orchestrated objective reduction (OOR) to hypothetical quantum cellular automata in the microtubules of neurons. The theory is regarded as implausible by critics, both physicists and neuroscientists, who consider it to be a poor model of brain physiology on multiple grounds. Orchestration refers to the hypothetical process by which microtubule-associated proteins, influence or orchestrate qubit state reduction by modifying the spacetime-separation of their superimposed states. The latter is based on Penrose's objective-collapse theory for interpreting quantum mechanics. Derakhshani et al. (2022) discount gravitational collapse theory experimentally:

We perform a critical analysis of the Orch OR consciousness theory at the crossroad with the newest experimental results coming from the search for spontaneous radiation predicted by the simplest version of gravity-related dynamical collapse models. We conclude that Orch OR theory, when based on the simplest version of gravity-related dynamical collapse [Diósi 2019, Penrose 1996, 2014a,b], is highly implausible in all the cases analyzed.

The tubulin protein dimers of the microtubules have hydrophobic pockets that may contain delocalised π electrons. Hameroff claims that this is close enough for the tubulin π electrons to become quantum entangled. This would leave these quantum computations isolated inside neurons. Hameroff then proposed, although this idea was rejected by Reimers (2009), that coherent Frolich condensates in microtubules in one neuron can link with microtubule condensates in other neurons and glial cells via the gap junctions of electrical synapses claiming these are sufficiently small for quantum tunnelling across, allowing them to extend across a large area of the brain. He further postulated that the action of this large-scale quantum activity is the source of 40 Hz gamma waves, building upon the theory that

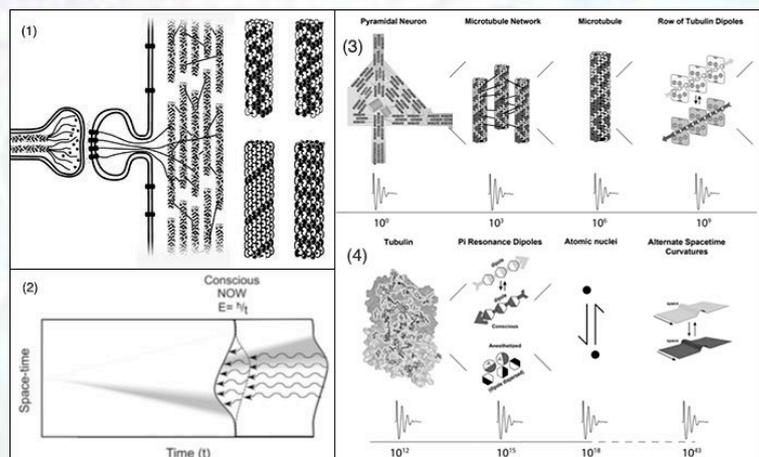
gap junctions are related to the gamma oscillation. Craddock et. al. (2017) make claims about anaesthetics based on the exclusive action of halothane types on microtubules, which focus on halothane type molecules lack consistency with the known receptor-based effects of ketamine and N₂O on NMDA receptors, also shared by halothanes and that of propofol on GABA receptors. Evidence for anaesthetic disruption of microtubules, Kelz & Mashour's (2019) review, applies indiscriminately to all anaesthetics, from halothane to ketamine widely across the tree of life, from paramecium to humans, including both synaptic and ion-channel effects, indicating merely that microtubular integrity is necessary for consciousness and does not indicate microtubules have a key role in consciousness itself, other than their essential architectural and transport roles.

Because of its dependence on Penrose's idea of gravitational quantum collapse, the theory is confined to objective reduction, at face value crippling the role of free-will in conscious experience. However Hameroff (2012) attempts to skirt this by applying notions of retro-causality, as illustrated in fig 77(2), in which a dual-time approach (King 1989) is used to invoke a quantum of the present, the Conscious NOW. We will see that retrocausality is a process widely cited also in this work. Hameroff justifies such retrocausality from three sources. Firstly he cites an open brain experiment of Libet. Peripheral stimulus, e.g., of the skin of the hand, resulted in an "EP" spike in the somatosensory cortical area for the hand ~30ms after skin contact, consistent with the time required for a neuronal signal to travel from hand to spinal cord, thalamus, and brain. The stimulus also caused several 100 ms of ongoing cortical activity following the EP. Subjects reported conscious experience of the stimulus (using Libet's rapidly moving clock) near-immediately, e.g., at the time of the EP at 30ms, hinting at retro-causality of the delayed "readiness potential".

Secondly, he cites a number of well-controlled studies using electrodermal activity, fMRI and other methods to look for emotional responses, e.g., to viewing images presented at random times on a computer screen. Surprisingly, the changes occurred half a second to two seconds before the images appeared. They termed the effect pre-sentiment because the subjects were not consciously aware of the emotional feelings. Non-conscious emotional sentiment (i.e., feelings) appeared to be referred backward in time. Bem (2012, 2016) reported on studies showing statistically significant backward time effects, most involving non-conscious influence of future emotional effects (e.g., erotic or threatening stimuli) on cognitive choices. Studies by others have reported both replication, and failure to replicate, the controversial results. Thirdly he cites a number of delayed choice experiments widely discussed in this work.

Sahu S, et al. (2013) found that electronic conductance along microtubules, normally extremely good insulators, becomes exceedingly high, approaching quantum conductance, at certain specific resonance frequencies of applied alternating current (AC) stimulation. These resonances occur in gigahertz, megahertz and kilohertz ranges, and are particularly prominent in low megahertz (e.g. 8.9 MHz). Hameroff & Penrose (2014) suggest that EEG rhythms (brain waves) also derive from deeper level microtubule vibrations.

Fig 77c: (1) An axon terminal releases neurotransmitters through a synapse and are received by microtubules in a neuron's dendritic spine. (2) A superposition develops over time, e.g., a particle separating from itself, shown as simultaneous curvatures in opposite directions. The magnitude of the separation is related to E , the gravitational self-energy. At a particular time t , E reaches threshold by $E = h\bar{v}/t$, and spontaneous OR occurs, one particular curvature is selected. This OR event is accompanied by a moment of conscious experience ("NOW"), its intensity proportional to E . Each OR event also results in temporal non-locality, referring quantum information backward in classical time (curved arrows). (3,4) Scale dependent resonances from the pyramidal neuron, through microtubules, to π -orbitals and gravitational effects.



However none of these Hameroff-Penrose quantum processes have been empirically verified and the complex tunnelling invoked is far from being a plausible neurophysiological process. The model requires that the quantum state of the brain has macroscopic quantum coherence, which needs to be maintained for around a tenth of a second. But, according to calculations made by Max Tegmark (2000), this property ought not to hold for more than about 10^{-13} s. Hameroff and co-workers (Hagen et al. 2002) have advanced reasons why this number should actually be of the order

of a tenth of a second. But 12 orders of magnitude is a very big difference to explain away and serious doubts remain about whether the Penrose–Hameroff theory is technically viable.

Two experiments (Lewton 2022, Tangerman 2022), presented at The Tucson Science of Consciousness conference merely showed that anaesthetics hastened delayed luminescence and that under laser excitation prolonged excitation diffused through microtubules further than expected when not under anaesthetics. There is no direct evidence for the cellular automata proposed and microtubules are critically involved in neuronal architecture, and are also involved in molecular transport, so functional conflict would result from adding another competing function. Hameroff (2022) cites processes, from the pyramidal neuron, down through microtubules, to π -orbital resonances and gravitational space-time effects, but the linkage to microtubules is weak.

OOR would force collapse, but it remains unestablished how conscious volition is invoked, because collapse is occurring objectively in terms of Penrose’s notion of space-time blisters. It remains unclear how these hypothetical objective or “platonic” entities, as Penrose puts it, relate to subjective consciousness or volition. Hameroff (2012) in “How quantum brain biology can rescue conscious free will” attempts an explanation, but this simply comes down to objective OOR control:

Orch OR directly addresses conscious causal agency. Each reduction/conscious moment selects particular microtubule states which regulate neuronal firings, and thus control conscious behavior. Regarding consciousness occurring “too late,” quantum state reductions seem to involve temporal non-locality, able to refer quantum information both forward and backward in what we perceive as time, enabling real-time conscious causal action. Quantum brain biology and Orch OR can thus rescue free will.

For this reason Symbiotic Existential Cosmology remains agnostic about such attempts to invoke unestablished, exotic quantum effects, and instead points to the non-IID nature of brain processes generally, meaning that neurodynamics is a fractal quantum process not required to be adiabatically isolated, as decoherence limits of technological quantum computing suggest.

QBism and the Conscious Consensus Quantum Reality

QBism (von Bayer 2016) is an acronym for “quantum Bayesianism” a founding idea from which it has since moved on. It is a version of quantum physics founded on the conscious expectations of each physicist and their relationships with other physicists. According to QBism, experimental measurements of quantum phenomena do not quantify some feature of an independently existing natural structure. Instead, they are actions that produce experiences in the person or people doing the measurement.

“When I take an action on the world, something genuinely new comes out.”

This is very similar to the way Symbiotic Existential Cosmology presents **consciousness as primary**, in the sense that we all experience subjective consciousness and infer the real world through the consensus view between conscious observers of our experiences of what we come to call the physical world. So although we know the physical world is necessary for our biological survival – **the universe is necessary**, we derive our knowledge of it exclusively and only through our conscious experiences of it.

The focus is on how to gain knowledge in a probabilistic universe... In this probabilistic interpretation, collapse of the quantum wave function has little to do with the object observed/measured. Rather, the crux of the matter is change in the knowledge of the observer based on new information acquired through the process of observing. Klaus Fuchs explains: “When a quantum state collapses, it’s not because anything is happening physically, it’s simply because this little piece of the world called a person has come across some knowledge, and he updates his knowledge... So the quantum state that’s being changed is just the person’s knowledge of the world, it’s not something existent in the world in and of itself.”

QBism is agnostic about whether there is a world that is structured independently of human thinking. It doesn’t assume we are measuring pre-existing structures, but nor does it pretend that quantum formalism is just a tool. Each measurement is a new event that guides us in formulating more accurate rules for what we will experience in future events. These rules are not just subjective, for they are openly discussed, compared and evaluated by other physicists. QBism therefore sees physicists as permanently connected with the world they are investigating. Physics, to them, is an open-ended exploration that proceeds by generating ever new laboratory experiences that lead to ever more successful, but revisable, expectations of what will be encountered in the future. In QBism the wave function is no longer an aspect of physical reality as such, but a feature of how the observer’s expectations will be changed by an act of quantum measurement.

The principal thesis of QBism is simply this: quantum probabilities are numerical measures of personal degrees of belief. According to QBism, experimental measurements of quantum phenomena do not quantify some feature of an independently existing natural structure. Instead, they are actions that produce experiences in the person or people doing the measurement. In the conventional version of quantum theory, the immediate cause of the collapse is left entirely unexplained, or "miraculous" although sometimes assumed to be essentially random. QBism solves the problem as follows. In any experiment the calculated wave function furnishes the prior probabilities for empirical observations that may be made later. Once an observation has been made new information becomes available to the agent performing the experiment. With this information the agent updates their probability and their wave function, instantaneously and without magic.

So in the Wigner's friend experiment, the friend reads the counter while Wigner, with his back turned to the apparatus, waits until he knows that the experiment is over. The friend learns that the wave function has collapsed to the up outcome. Wigner, on the other hand, knows that a measurement has taken place but doesn't know its result. The wave function he assigns is a superposition of two possible outcomes, as before, but he now associates each with a definite reading of the counter and with his friend's knowledge of that reading — a knowledge that Wigner does not share. For the QBist there is no problem: Wigner and his friend are both right. Each assigns a wave function reflecting the information available to them, and since their respective compilations of information differ, their wave functions differ too. As soon as Wigner looks at the counter himself or hears the result from his friend, he updates his wave function with the new information, and the two will agree once more—on a collapsed wave function.

According to the conventional interpretation of quantum mechanics, in the Schrödinger's cat experiment, the value of a superimposed wave function is a blend of two states, not one or the other. What is the state of the cat after one half-life of the atom, provided you have not opened the box? The fates of the cat and the atom are intimately entangled. An intact atom implies a living cat; a decayed atom implies a dead cat. It seems to follow that since the atom's wave function is unquestionably in a superposition so is the cat: it is both alive and dead. As soon as you open the box, the paradox evaporates: the cat is either alive or dead. But while the box is still closed — what are we to make of the weird claim that the cat is dead and alive at the same time? According to QBism, the state of an unobserved atom, or a cat, has no value at all. It merely represents an abstract mathematical formula that gives the odds for a future observation: 0 or 1, intact or decayed, dead or alive. Claiming that the cat is dead and alive is as senseless as claiming that the outcome of a coin toss is both heads and tails while the coin is still tumbling through the air. Probability theory summarises the state of the spinning coin by assigning a probability of $1/2$ that it will be heads. So QBism refuses to describe the cat's condition before the box is opened and thus rescues it from hovering in a limbo of living death.

If the wave-function, as QBism maintains, says nothing about an atom or any other quantum mechanical object except for the odds for future experimental outcomes, the unperformed experiment of looking in the box before it is opened has no result at all, not even a speculative one. The bottom line: According to the QBist interpretation, the entangled wave-function of the atom and the cat does not imply that the cat is alive and dead. Instead, it tells an agent what she can reasonably expect to find when they open the box. This makes QBism compatible with phenomenologists, for whom experience is always "intentional" — i.e. directed towards something — and these intentionalities can be fulfilled or unfulfilled. Phenomenologists ask questions such as: what kind of experience is laboratory experience? How does laboratory experience — in which physicists are trained to see instruments and measurements in a certain way — differ from, say, emotional or social or physical experiences? And how do lab experiences allow us to formulate rules that anticipate future lab experiences?

Another overlap between QBism and phenomenology concerns the nature of experiments. Experiments are performances. They're events that we conceive, arrange, produce, set in motion and witness, yet we can't make them show us anything we wish. That doesn't mean there is a deeper reality "out there" — just as, with Shakespeare, there is no "deep Hamlet" of which all other Hamlets we produce are imitations. In physics as in drama, the truth is in performance. However, there is one devastating caveat. It reduces Process 1 to simple probabilities and preempts any interaction between consciousness and wave function collapse. We simply don't know any way consciousness itself can be associated with collapsed probabilities. If it is steeped in the spooky world of entanglement, reducing the entirety of physics to collapsed probabilities may not represent in any way the degree to which conscious experiences correspond to unstable brain states at the edge of chaos making phase coherence measurements analogous to or homologous with quantum measurements may mean this picture is more complicated than meets the QBist's eye.

The Born Probability Interpretation and the Notion of Quantum “Randomness”

The Born rule provides a link between the mathematical formalism of quantum theory and experiment, and as such is almost single-handedly responsible for practically all predictions of quantum physics (Landsman 2008). The rule projects the superimposed vector $|\phi\rangle$ with a basis of eigenvectors in an inner product space onto the eigenvector of one of its eigenvalues λ_i , as a purely algebraic operation.

It states that if an observable corresponding to a self-adjoint operator A with discrete spectrum is measured in a system with normalised wave function $|\phi\rangle$ then:

- (1) the measured result will be one of the eigenvalues λ_i of A , and
- (2) the probability of measuring a given eigenvalue λ_i will equal $\langle\phi|P_i|\phi\rangle$, where P_i is the projection onto the eigenspace of A corresponding to λ_i .

Equivalently, the probability can be written as $\langle\lambda_i|\phi\rangle \cdot \overline{\langle\lambda_i|\phi\rangle} = |\langle\lambda_i|\phi\rangle|^2$.

Born's rule for calculating probabilities was really just an intuitive guess by the German physicist Max Born. So was Schrödinger's equation itself. Neither was supported by rigorous derivation. It is simply a probability law on the Hilbert space representation (Griffiths 2014) and says nothing about whether quantum uncertainty is purely random or whether there is a hidden variable theory governing it. Broadly speaking the rule is postulated, as derived above, and not proven experimentally, but assumed theoretically in experimental work:

It's not clear what exactly is meant by an experimental verification of the Born rule - the Born rule says how the quantum state relates to the probability of measurement, but "the quantum state" itself is a construct of the quantum theory that is rarely, if ever, experimentally accessible other than running repeated tests and inferring which state it was from the results assuming the Born rule is valid.

This is because we start initially with a Schrödinger wave equation as a Hamiltonian energy operator

$E|\phi\rangle = H(|\phi\rangle) = i\hbar \frac{\partial}{\partial t} |\phi\rangle$, but the wave function is experimentally inaccessible to classical observation, so we have to use the Born probability interpretation to get a particle probability we can sample e.g. in the pattern of photons on the photographic plate in the two-slit interference experiment in fig 71(f).

There are obvious partial demonstrations, but these just lead to averages that statistically approach the Probability interpretation, but don't tell us anything about the underlying process which generates these indeterminacies.

Born's rule has been verified experimentally numerous times. However, only the overall averages have been verified. For example if the prediction is 60% probability, then over large number of trials, the average outcome will approach the predicted value of 60%. This has been verified by measuring particle spin at angle A relative to the angle of its previously known spin angle. The prediction is square of $\cos(A/2)$. These predictions have also been verified with entangled pairs (Bell's state) where the same spin prediction is square of $\sin(A/2)$. What has not been verified is whether the outcomes are due to independent probability, or they are guided by some balancing mechanism.

Landsman (2008) confirms this picture:

The pragmatic attitude taken by most physicists is that measurements are what experimentalists perform in the laboratory and that probability is given the frequency interpretation (which is neutral with respect to the issue whether the probabilities are fundamental or due to ignorance). Given that firstly the notion of a quantum measurement is quite subtle and hard to define, and that secondly the frequency interpretation is held in rather low regard in the philosophy of probability, it is amazing how successful this attitude has been!

Heisenberg (1958), notes that, in the Copenhagen interpretation, probabilities arise because we look at the quantum world through classical glasses:

One may call these uncertainties [i.e. the Born probabilities] objective, in that they are simply a consequence of the fact that we describe the experiment in terms of classical physics; they do not depend in detail on the observer. One may call them subjective, in that they reflect our incomplete knowledge of the world.

Landsman (2008) clarifies:

In other words, one cannot say that the Born probabilities are either subjective (Bayesian, or due to ignorance) or objective (fundamentally ingrained in nature and independent of the observer). Instead, the situation is more subtle and has no counterpart in

classical physics or probability theory: the choice of a particular classical description is subjective, but once it has been made the ensuing probabilities are objective and the particular outcome of an experiment compatible with the chosen classical context is unpredictable. Or so Bohr and Heisenberg say. ... In most interpretations of quantum mechanics, some version of the Born rule is simply postulated.

Roger Penrose (foreword vi in Wupuluri & Doria 2018) notes:

Current quantum mechanics, in the way that it is used, is not a deterministic scheme, and probabilistic behaviour is taken to be an essential feature of its workings. Some would contend that such indeterminism is here to stay, whereas others argue that there must be underlying 'hidden variables' which may someday restore a fully deterministic underlying ontology. ... Personally, I do not insist on taking a stand on this issue, but I do not think it likely that pure randomness can be the answer. I feel that there must be something more subtle underlying it all.

John von Neumann (1951) is highly critical of both physical and algorithmic sources of randomness:

We see then that we could build a physical instrument to feed random digits directly into a high-speed computing machine and could have the control call for these numbers as needed. The real objection to this procedure is the practical need for checking computations. If we suspect that a calculation is wrong, almost any reasonable check involves repeating something done before. At that point the introduction of new random numbers would be intolerable. I think that the direct use of a physical supply of random digits is absolutely unacceptable for this reason and for this reason alone. ... Anyone who considers arithmetical methods of producing random digits is, of course, in a state of sin. For, as has been pointed out several times, there is no such thing as a random number – there are only methods to produce random numbers, and a strict arithmetic procedure of course is not such a method.

Ruth Kastner (2013) claims that the transactional interpretation is unique in giving a physical explanation for the Born rule. Zurek (2005) has made a derivation from entanglement and Sebens and Carroll have done so for an Everett perspective, although this is not strictly meaningful, since every branch of the multiverse is explored.

Because wave interference is measured through particle absorption, experiments have been made (Sinha et al. 2010) to eliminate higher-order processes which might violate the two signal interference implied by the Born interpretation because Born's rule predicts that quantum interference, as shown by a double-slit diffraction experiment, occurs from pairs of paths. Therefore using a three slit apparatus and sampling all combinations of slits we can confirm additive two wave interference, so Born applies.

Other experiments and theories attempt to derive the Born interpretation from more basic quantum properties. Masanes, Galley & Müller (2019) show Born's rule and the post-measurement state-update, can be deduced from the other quantum postulates, referred to as unitary quantum mechanics, and the assumption that ensembles on finite-dimensional Hilbert spaces are characterised by finitely many parameters. Others such as Cabelo (2018) use graph theory. The movement to regenerate the whole of quantum theory from more basic axioms e.g. of information, or probability itself is called quantum reconstruction, of which Qbism is an example (Ball 2017).

Zurek (1991, 2003, 2005) has introduced the notions of decoherence, quantum Darwinism and enviance – environment – assisted invariance, to explain the transition from quantum reality to the classical. Decoherence is the way third-party quanta disrupt the off-diagonal wave amplitudes of entanglement resulting in projection onto the "observed" classical states through exponential damping as in fig 71c. Quantum Darwinism enriches this picture by developing the notion that some quantum "pointer" states can be more robust to decoherence by replicating their information into the environment. Enviance describes this process in terms of quantum measurement, in which the environment becomes entangled with the apparatus of ideal von Neumann measurement, again promoting the transition to the classical. While these do not deal with the question of hidden variable theories versus randomness of uncertainty they have been claimed to derive the Born probabilities (Zurek 2005, Harris et al 2016) through multiple environmental interactions, illustrated by Laplace playing card probabilities in fig 77d. However all the approaches to independent derivation of the Born rule including enviance have been criticised as being logically circular (Schlosshauer & Fine 2005, Landsman 2008).

Illustrating the difficulty of the problem, John Wheeler in 1983 proposed that statistical regularities in the physical world might emerge from such a situation, as they sometimes do from unplanned crowd behaviour (Ball 2019):

"Everything is built higgledy-piggledy on the unpredictable outcomes of billions upon billions of elementary quantum phenomena", Wheeler wrote. But there might be no fundamental law governing those phenomena — indeed, he argued, that was the only scenario in which we could hope to find a self-contained physical explanation, because otherwise we're left with an infinite regression in which any fundamental equation governing behavior needs to be accounted for by some even more fundamental

principle. "In contrast to the view that the universe is a machine governed by some magic equation, ... the world is a self-synthesizing system," Wheeler argued. He called this emergence of the lawlike behavior of physics "law without law."

However the probability interpretation leads to the incorrect notion that quantum reality is somehow just a random process. Common opinions of processes like radioactive decay are treated as random by default, simply because they are indeterminate and don't obey a fixed law. Study smarter, for example, states:

Radioactive decay is a random process, meaning it is impossible to predict when an atom will emit radiation. By the random nature of radioactive decay, we mean that for every atom, there are known probabilities that they will emit radiation (and thus decay radioactively) in the next second. Still, the fact that all we have is a probability makes this a random process. We can never determine ahead of time if an atom will decay in the next second or not. This is just like throwing a (fair, cubic) dice every second.

In effect, this is equating the quantum tunnelling of individual atoms to a dice throw, which is a chaotic classical process with geometric constraints, so it is equating quantum uncertainty with classical chaotic butterfly effect systems which might also have a quantum sensitivity.

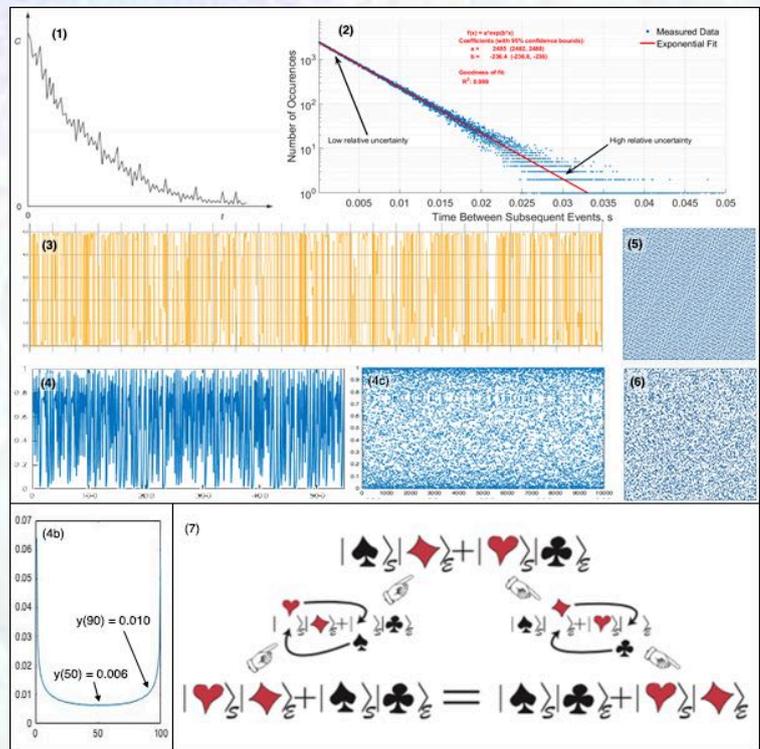
Santha & Vazirani (1986) note:

Unfortunately, the available physical sources of randomness (including zener diodes and geiger counters) are imperfect. Their output bits are not only biased but also correlated.

Geiger counters measure quantum tunnelling in individual radioactive nuclei that reflect quantum uncertainty but are emitted very slowly over long periods, so the process is not random but one of erratic exponential decay over time. Zener diodes at high voltage undergo avalanche breakdown, which is a solid state feature that lets through a flood of electrons with a fixed relaxation time, so again it is not directly measuring uncertainty, but its compounded effects.

This is remarkably similar to chaotic molecular systems displaying a butterfly effect. Very simple algorithmic chaotic systems such as the logistic iteration, where x_1 is chosen on (0,1) as a seed and the sequence is generated by $x_{n+1} = r \cdot x_n \cdot (1 - x_n)$, modelling rabbit reproduction in a finite pasture (May 1976), where the chaotic phase is ergodic and asymptotic to an interval-filling stochastic process, when $r = 4$. This is shown in fig 77d, where this iteration generates an asymptotic frequency distribution, which has been normalised over its integral to produce a probability function playing the same role as as the squared wave function to give a probability interpretation parallel to the Born rule for an elementary deterministic discrete iteration, confirming the Born rule does not in any way imply that the basis of quantum uncertainty lies in randomness.

Fig 77d: (1,2) Exponential decay of erratic radioactivity as the population of radioactive atoms becomes depleted. (3) Zener diode avalanche output. (4) Graph of the chaotic logistic iteration displaying interval-filling ergodicity in the frequency graph (4b), point plot 4(c). One can make a Born interpretation of this as a pseudo-wave function showing the relative probabilities of finding an iteration point at 0.5 and 0.9 by normalising the function over its integral, yet the process is deterministic. Therefore a probability interpretation does not imply randomness. (5,6) Quasi-random and pseudo-random or random 2-D distributions. (7) Sketch derivation of the Born formula derivation using Laplace probabilities of concealed and revealed playing cards (Zurek 2005).



The point distribution (4c) shows us closer detail that confirms this deterministic dynamical process displays pseudo-random features akin to (6), modulated by the overall probability distribution (4b), but there is a subtle anomaly in (4c) in the horizontal strip neighbouring $y = 0.75$. This does not appear in the probability distribution, which is asymptotically smooth for large n . The reason is that the

iteration has two fixed point solutions to $x = f(x)$: 0 a point attractor, and 0.75 a chaotic repelling point. There are 2^{n+1} periodic points of period n , so in a classical chaotic iteration the unstable periodic points are dense, but these have measure zero, as a countable subset of $[0, 1]$, so their probability of occurrence is zero, but their neighbouring points can be seen in (4c) as stationary butterfly effect exponential trajectories neighbouring the fixed point. None of this can happen in a quantum system and this detail is not accessible in the quantum situation either, because we have recourse only to the Born rule, so the interference experiment reflects only what we see in (4b) – the macroscopic experimental arrangement, as a statistical particle approximation to the wave power, not the underlying process governing the individual outcomes. In [fig 57](#), we see that the classical chaotic stadium billiard (1), becomes scarred by such repelling periodic orbits in the quantum situation, although open quantum systems like the quantum kicked top (2) become entangled.

Algorithmic processes approximating randomness for experimental purposes are classified as either pseudo-random, or quasi-random. **Pseudo-random** numbers more closely simulate randomness, as in the pseudorandom number generator (PRNG), or deterministic random bit generator (DRBG) used in computational random functions. An example pseudo-random number generator is $A_{n+1} = (Z * A_n + I) \bmod M$ where A_n is the previous pseudo number generated, Z is a constant multiplier, I is a constant increment, and M is a constant modulus. **Quasi-random** processes, also called low-discrepancy sequences, approach an even distribution more rapidly, but less faithfully than true randomness, because they lack larger improbable fluctuations. They are generated by a number of [algorithms](#) including Fauré, Halton and Sobol, each of which have short arithmetic computational procedures.

This leaves us in a position where the assumption of quantum randomness remains unestablished and in which a complex many-body non-local interaction, given the vast number of particles in the universe, could approximate the Born interpretation to the limits of any experimental error.

Summarising the interplay between the notion of “random” probabilistic wave function collapse and hidden variable theories, Symbiotic Existential Cosmology favours the latter on the basis that:

(1) The verification of [Bell entanglement](#) was a confirmation of the EPR claim and Einstein’s quote:

God does not play dice with the universe.

(2) The transcausal view of [quantum transactions](#) being a complex underlying hidden variable process, which is also shared by (3) [superdeterminism](#) violating statistical independence, and involving additional non-local processes (4) [non-IID processes](#) in biology not converging to the classical and (5) theories in which quantum measurement may [contradict objective reality](#) through process entanglements extending beyond Bell state entanglements.

The intrinsic difficulty that all such theories since the Bohm’s pilot wave formulation face, is that expectations are for a master equation like Schrödinger’s, when any system is likely to be a vastly complex non-local many-body problem. This criticism of the assumption of randomness applies equally to molecular dynamics, mutational evolution and neurodynamics.

The Neuroscience Perspective

Complementing this description of the quantum world at large is the actual physics of how the brain processes information. By contrast with a digital computer, the brain uses both pulse coded action potentials and continuous gradients in an adaptive parallel network. Conscious states tend to be distinguished from subconscious processing by virtue of coherent phase fronts of the brain’s wave excitations. Phase coherence of beats between wave functions [fig 71\(c\)](#), is also the basis of quantum uncertainty.

In addition, the brain uses edge-of-chaos dynamics, involving the butterfly effect – arbitrary sensitivity to small fluctuations in bounding conditions – and the creation of strange attractors to modulate wave processing, so that the dynamics doesn’t become locked into a given ordered state and can thus explore the phase space of possibilities, before making a transition to a more ordered state representing the perceived solution. Self-organised criticality is also a feature, as is neuronal threshold tuning. Feedback between the phase of brain waves on the cortex and the discrete action potentials of individual pyramidal cells, in which the phase is used to determine the timing of action potentials, creates a feedback between the continuous and discrete aspects of neuronal excitation. These processes, in combination, may effectively invoke a state where the brain is operating as an edge-of-chaos quantum computer by

making internal quantum measurements of its own unstable dynamical evolution, as cortical wave excitons, complemented by discrete action potentials at the axonal level.

Chaotic sensitivity, combined with related phenomena such as stochastic resonance (Liljenström et al. 2005), mean that fractal scale-traversing handshaking (Grosu 2023) can occur between critically poised global brain states, neurons at threshold, ion-channels and the quantum scale, in which quantum entanglement of excitons can occur (King 2014). At the same time these processes underpin why there is ample room in physical brain processing for quantum uncertainty to become a significant factor in unstable brain dynamics, fulfilling Eccles (1986) notion that this can explain a role for consciousness, without violating any classically causal processes.

This means that brain function is an edge-of-chaos quantum dynamical system which, unlike a digital computer, is far from being a causally deterministic process which would physically lock out any role for conscious decision-making, but leaves open a wide scope for quantum uncertainty, consistent with a role for consciousness in tipping critical states. The key to the brain is thus it's quantum physics, not just its chemistry and biology. This forms a descriptive overview of possible processes involved rather than an empirical proof, in the face of the failure of promissory materialistic neuroscience (Popper & Eccles 1984) to demonstrate physical causal closure of the universe, so Occam's razor cuts in the direction which avoids conflict with empirical experience of conscious volitional efficacy over the physical universe.

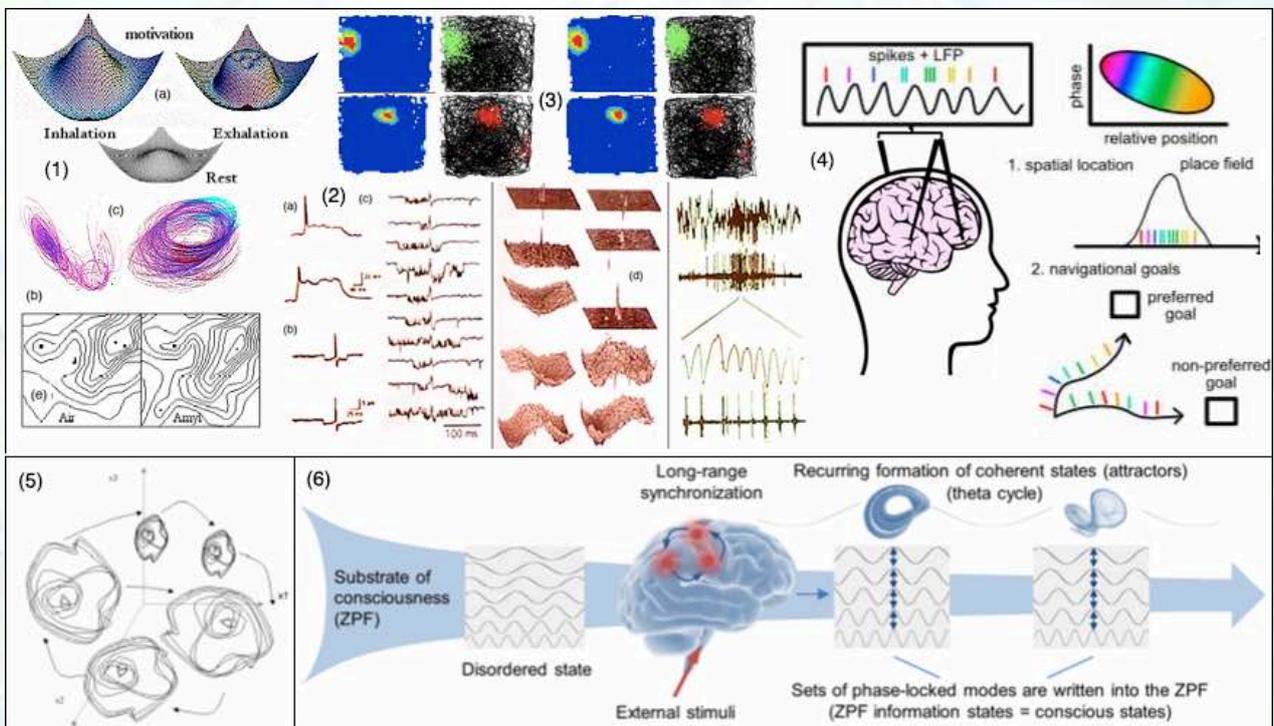


Fig 78: (1) Edge of chaos transitions model of olfaction (Freeman 1991). (2) Stochastic resonance as a hand-shaking process between the ion channel and whole brain states (Liljenström & Svedin 2005). (3) Hippocampal place maps (erdiklab.technion.ac.il). Hippocampal cells have also been shown to activate in response to desired locations in an animals anticipated future they have observed but not visited (Olafsdottir et al. 2015). (4) Illustration of micro-electrode recordings of local wave phase precession (LFP) enabling correct spatial and temporal encoding via discrete action potentials in the hippocampus (Qasim et al. 2021). This shows that the EEG is not just an epiphenomenal artefact of collective action potentials but an active continuous wave to which neurons respond with phase modulation. Delta, theta, alpha beta and gamma bands appear to have distinct functions and dynamics and metastable and spiral waves have been noted as having neurocognitive function (Roberts et al. 2019, Xu et al. 2023,). (5) Living systems are dynamical systems. They show ensembles of eigenbehaviours, which can be seen as unstable dynamical tendencies in the trajectory of the system. Francisco Varela's neurophenomenology (Varela 1996, Rudrauf et al. (2003) is a valid attempt to bridge the hard and easy problems, through a biophysics of being, by developing a complementary subjective account of processes corresponding to objective brain processing. While these efforts help to elucidate the way brain states correspond to subjective experiences, using an understanding of resonant interlocking dynamical systems, they do not of themselves solve the subjective nature of the hard problem. (6) Joachim Keppler's (2018, 2021, James et al. 2022) view of conscious neural processing uses the framework of stochastic electrodynamics (SED), a branch of physics that affords a look behind the uncertainty of quantum field theory (QFT), to derive an explanation of the neural correlates of consciousness, based on the notion that all conceivable shades of phenomenal awareness are woven into the frequency spectrum of a universal background field, called zero-point field (ZPF), implying that the fundamental mechanism underlying conscious systems rests upon the access to information available in the ZPF. This gives an effective interface description of how dynamical brain states correspond to subjective conscious experiences, but like the other dynamical descriptions, does not solve the hard problem itself of why the zero point field becomes subjective.

Diverse Theories of Consciousness

Descriptions of the actively conscious brain revolve around extremely diverse conceptions. The neural network approach conceives of the brain as a network of neurons connected by axonal-dendritic synapses, with action potentials as discrete impulses travelling down the long pyramidal cell axons through which activity is encoded as a firing rate. In this view the notions of “brain waves” as evidenced in the EEG (electroencephalogram) and MEG (magnetoencephalogram) are just the collective averages of these spikes, having no function in themselves, being just an accessory low intensity electromagnetic cloud associated with neuronal activity, which happens to generate a degree of coupled synchronisation through the averaged excitations of the synaptic web. At the opposite extreme are field theories of the conscious brain in which fields have functional importance in themselves and help to explain the “binding” problem of how conscious experiences emerge from global brain dynamics. Into the mix are also abstract theories of consciousness such as Tononi and Koch’s (2015) IIT or integrated information theory and Graziano’s (2016) AST or attention schema theory, which attempt to formulate an abstract basis for consciousness that might arise in biological brains or synthetic neural networks given the right circumstances.

Fig 79: Overview of Theories of Consciousness reviewed, with rough comparable positions.

Field or field-like theories are in

blue/magenta. Explicit AI support **magenta/red**. Horizontal positions guided by specific author statements.

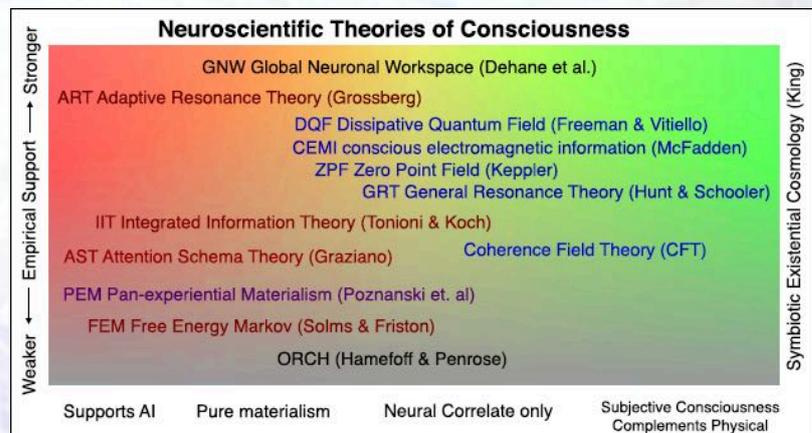
Section links: [GNW](#), [ART](#), [DQF](#), [ZPF](#), [AST](#), [CEMI](#), [FEM](#), [IIT](#), [PEM](#), [ORCH](#), [CFT](#), [GRT](#)

The mushroom experience that triggered Symbiotic Existential Cosmology caused a reversal of world view from my original point of view, King (1996), looking for the neurodynamic and quantum basis of consciousness in the brain, to realising

that no such theory is possible because a pure physicalist theory cannot bridge the hard problem explanatory gap in the quantum universe, due to the inability to demonstrate causal closure.

No matter how fascinating and counter-intuitive the complexities of the quantum, physical and biological universe are, no purely physicalist description of the neurodynamics of consciousness can possibly succeed, because it is scientifically impossible to establish a theoretical proof, or empirical demonstration, of the causal closure of the physical universe in the context of neurodynamics. The bald facts are that, no matter to what degree we use techniques, from optogenetics, through EcoG, to direct cell recording, there is no hope within the indeterminacies of the quantum universe of making an experimental verification of classical causal closure. Causal closure of the physical universe thus amounts to a formally undecidable cosmological proposition from the physical point of view, which is heralded as a presumptive 'religious' affirmative belief without scientific evidence, particularly in neuroscience. The hard problem of consciousness is thus cosmological, not biological, or neurodynamic alone. Symbiotic Existential Cosmology corrects this by a minimal extension of quantum cosmology by adding the axiom of primal subjectivity, as we shall see below.

In stark contrast, the subjective experiential viewpoint perceives conscious volition over the physical universe as an existential certainty that is necessary for survival. When any two live human agents engage in a frank exchange of experiences and communications, such as my reply to you all now, which evidences my drafting of a consciously considered opinion and intentionally sending it to you in physical form, this can be established beyond reasonable doubt by mutual affirmation of our capacity to consciously and intentionally respond with a physical communication. This is the way living conscious human beings have always viewed the universe throughout history and it is a correct veridical empirical experience and observation of existential reality, consistent with personal responsibility, criminal and civil law on intent, all long-standing cultural traditions and the fact that 100% of our knowledge of the physical world comes through our conscious experience of it. Neuroscientists thus contradict this direct empirical evidence at their peril.



However there is still a practical prospect of refining our empirical understanding of the part played by neurodynamics in generating subjective conscious experience and volition over the physical universe through current and upcoming techniques in neuroscience. What these can do is demonstrate experimentally the nature of the neurodynamics occurring, when conscious experiences are evoked, the so-called "neural correlate of consciousness", forming an interface with conscious experience our and ensuing decision-making actions.

To succeed at this scientific quest, we need to understand how quantum cosmology enters into the formation of biological tissues. The standard model of physics is symmetry broken, between the colour, weak, and EM forces and gravity, which ensures that there are a hundred positively charged atomic nuclei, with orbital electrons having both periodic quantum properties of the *s*, *p*, *d*, & *f*, orbitals and non-linear EM charge interactions, centred on first row covalent H-CNO modified by P & S and light ionic and transition elements, as shown in fig 51, to form a fractal cooperative bonding cascade from organic molecules like the amino acids and nucleotides, through globular proteins and nucleic acids, to complexes like the ribosome, and membrane, to cell organelles, cells and tissues. These constitute an interactive quantum form of matter – the most exotic form of matter in existence, whose negentropic thermodynamics in living systems is vastly more challenging than the quantum properties of solid state physics and its various excitons and quasi-particles. Although these are now genetically and enzymatically encoded, the underlying fractal dynamics is a fundamental property of cosmological symmetry-breaking and abiogenesis. It introduces a cascade of quantum effects, in protein folding, allosteric active sites with tunnelling, membrane ionic and electron transport and ultimately neurodynamics. Furthermore biological processes are non IID, not constituting identical independently distributed quantum measurements, so do not converge to the classical description and remain collectively quantum in nature throughout, spanning all or most aspects of neuronal excitability and metabolism.

This means that current theories of the interface between CNS neurodynamics and subjective conscious volition are all manifestly incomplete and qualitatively and quantitatively inadequate to model or explain the brain-experience interface. Symbiotic Existential Cosmology has thus made a comprehensive review of these, including GNW (Dehane et al.), ART (Grossberg), DQF (Freeman & Vitiello), ZPF (Keppler), AST (Graziano), CEMI (McFadden), FEM (Solms & Friston), IIT (Tononi & Koch), PEM (Poznanski et al.), as well as outliers like ORCH (Hameroff & Penrose). The situation facing TOEs of consciousness are, despite experimental progress, in a more parlous state than physical TOEs, from supersymmetric, superstring, and membrane theories to quantum loop gravity, that as yet show no signs of unification over multiple decades. In both fields, this requires a foundation rethink and a paradigm shift. Symbiotic Existential Cosmology provides this to both fields simultaneously.

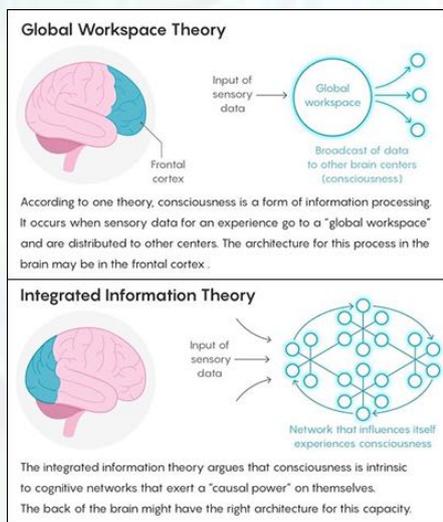
To understand this biologically, we need to understand that the nature of consciousness as we know it and all its key physical and biological features, arose in a single topological transition in the eucaryote endosymbiosis, when the cell membrane became freed for edge-of-chaos excitation and receptor-based social signalling, through the same processes that are key to human neurodynamics today, when respiration became sequestered in the mitochondria. This in turn led to the action potential via the flagellar escape reaction, and to the graded membrane potentials and neurotransmitter receptor-based synaptic neural networks we see in neuronal excitation. It took a billion years later before these purposive processes enabling sentience at the cellular level, in the quantum processes we now witness in vision, audition, olfaction and feeling sensation became linked in the colonial neural networks illustrated by hydra and later the more organised brains of arthropods, vertebrates and cephalopods. This means that a purely neural network view of cognition and consciousness is physically inadequate at the foundation. Moreover the brain derives its complexity not just from our genome which is vastly too small to generate the brain's complexity, but interactive processes of cell migration in the developing brain that form a self organising system through mutual neuronal recognition by neurotransmitter type and mutual excitation/inhibition.

Of these theories, GNW is the closest to a broad brush strokes, empirically researched account. Neural network theories like Grossman's ART generate crude necessary but insufficient conditions for consciousness because they lack almost all the biological principle involved. Pure abstract theories like IIT do likewise. Specialised quantum theories like Hameroff & Penrose are untenable both in current biology and fundamentally in evolutionary terms because they have been contrived as quantum back-pack of oddball quantum processes such as quantum microtubular CAs, not confluent with evolutionary processes, using increasingly contrived speculation to make up for inadequacies e.g. in linking cellular processes through condensates. ORCH is also objective reduction, so it cannot address conscious volition.

There is good empirical support for two processes in brain dynamics. (1) Edge-of-chaos transitions from a higher energy more disordered dynamic to a less disordered attractor dynamic, which is also the basis of annealing in neural

network models of a potential energy landscape. (2) Phase tuning between action potential timing in individual neurons and continuous local potential gradients, forming an analogue with quantum uncertainty based measurement of wave beats.

These mean that field and field like-theories such as ZPF, DQF and PEM all have a degree of plausibility complementing bare neural network descriptions. However all these theories run into the problem of citing preferred physical mechanisms over the complex quantum system picture manifest in tissue dynamics. ZPF cites the zero-point field, effectively conflating a statistical semi-classical of QED with subjective consciousness as the quantum vacuum. It cites neurotransmitter molecular resonances at the synapse and periodic resonances in the brain as providing the link. DQF is well grounded in Freeman dynamics, but cites water molecule structures, which are plausible but accessory and not easy to test. PEM cites quasi-polaritonic waves involving interaction between charges and dipoles, with an emphasis on delocalised orbitals, which are just one of many quantum level processes prominently involved in respiration and photosynthesis and makes a claim to "microfeels" as the foundation of a definition of precognitive information below the level of consciousness. It also restricts itself to multiscale thermodynamic holonomic processes, eliminating the quantum level, self organised criticality and fractality.



Philosopher wins 25 year long bet with Neuroscientist (Lenharo 2023): In 1998, neuroscientist Christof Koch bet philosopher David Chalmers that the mechanism by which the brain's neurons produce consciousness would be discovered by 2023. Both scientists agreed publicly on 23 June, at the annual meeting of the Association for the Scientific Study of Consciousness that it is an ongoing quest — and declared Chalmers the winner.

What ultimately helped to settle the bet was a study testing two leading hypotheses about the neural basis of consciousness – IIT and GNW (Cogitate Consortium et al. 2023). Consciousness is everything that a person experiences — what they taste, hear, feel and more. It is what gives meaning and value to our lives, Chalmers says. However, despite a vast effort, researchers still don't understand how our brains produce it. "It started off as a very big philosophical mystery," Chalmers adds. "But over the years, it's gradually been transmuting into, if not a 'scientific' mystery, at least one that we can get a partial grip on scientifically." It tested two of

the leading hypotheses: integrated information theory (IIT) and global network workspace theory (GNWT). IIT proposes that consciousness is a 'structure' in the brain formed by a specific type of neuronal connectivity that is active for as long as a certain experience, such as looking at an image, is occurring. This structure is thought to be found in the posterior cortex, at the back of the brain. GNWT, by contrast, suggests that consciousness arises when information is broadcast to areas of the brain through an interconnected network. The transmission, according to the theory, happens at the beginning and end of an experience and involves the prefrontal cortex, at the front of the brain. The results didn't perfectly match either of the theories. This has since resulted in an open letter treating IIT, in particular as pseudoscience (Fleming et al. 2023 Lenharo 2023b, 2024).

The position of Symbiotic Existential Cosmology is that none of these theories, and particularly those that depend on pure physical materialism, have any prospect of solving the hard problem and particularly the hard problem extended to volition. Symbiotic Existential Cosmology therefore adopts a counter strategy to add an additional axiom to quantum cosmology that associates primal subjectivity and free will with an interface in each quantum, where "consciousness" is manifested in the special relativistic space-time extended wave function and "free will" is manifested in the intrinsic uncertainty of quantum collapse to the particle state. This primal subjectivity exists in germinal forms in unstable quantum-sensitive systems such as butterfly effect systems and becomes intentional consciousness as we know it in the eucaryote transition.

This transforms the description of conscious dynamics into one in which subjectivity is compliant with determined perceived and cognitive factors but utilises the brain state as a contextual environmental filter to deal with states of existential uncertainty threatening the survival of the organism. This is similar to AST, but without the utopian artificial intelligence emphasis it shares with others such as ART, IIT, and PEM. Key environmental survival questions are both computationally intractable and formally uncomputable, because the tiger that may pounce is also a conscious agent who can adapt their volitional strategy to unravel any computational "solution". This provides a clean physical cut, in

which subjective consciousness remains compliant with the determined boundary conditions realised by the cognitive brain, but has decision-making ability in situations when cellular or brain dynamics becomes unstable and quantum sensitive. No causal conflict thus arises between conscious intent restricted to uncertainty and physical causes related to the environmental constraints. It invokes a model of quantum reality where uncertainty is not merely random, but is a function of unfolding environmental uncertainty as a whole. This is the survival advantage cellular consciousness fixed in evolution through anticipating existential crises and has conserved ever since, complementing cerebral cognition in decision-making. This is reflected experientially in how we make intuitive "hunch" overall decisions and physically in certain super-causal forms of the transactional QM interpretation and super-determinism, both of which can have non-random quasi-ergodic hidden variable interpretations and are compatible with free will.

The final and key point is that Symbiotic Existential Cosmology is biospherically symbiotic. Through this, the entire cosmology sees life and consciousness as the ultimate interactive climactic crisis of living complexity interactively consummating the universe, inherited from cosmological symmetry-breaking, in what I describe as conscious paradise on the cosmic equator in space-time. Without the symbiosis factor, humanity as we stand, will not survive a self-induced Fermi extinction, caused by a mass extinction of biodiversity, so the cosmology is both definitively and informatively accurate and redemptive, in long-term survival of the generations of life over evolutionary time scales.

Susan Pockett (2013) explains the history of the diverging synaptic neural network and field theoretic views:

Köhler (1940) did put forward something he called "field theory". Köhler only ever referred to electric fields as cortical correlates of percepts. His field theory was a theory of brain function. Lashley's test was to lay several gold strips across the entire surface of one monkey's brain, and insert about a dozen gold pins into a rather small area of each hemispheric visual cortex of another monkey. The idea was that these strips or pins should short-circuit the hypothesized figure currents, and thereby (if Köhler's field theory was correct) disrupt the monkeys' visual perception. The monkeys performed about as well on this task after insertion of the pins or strips as they had before (although the one with the inserted pins did "occasionally fail to see a small bit of food in the cup") and Lashley felt justified in concluding from this that "the action of electric currents, as postulated by field theory, is not an important factor in cerebral integration." Later Roger Sperry did experiments similar to Lashley's, reporting similarly negative results.

Intriguingly, she notes that Libet, whom we shall meet later despite declaring the readiness potential preceded consciousness, also proposed a near-supernatural field theory:

Libet proposed in 1994 that consciousness is a field which is "not ... in any category of known physical fields, such as electromagnetic, gravitational etc" (Libet 1994). In Libet's words, his proposed Conscious Mental Field "may be viewed as somewhat analogous to known physical fields ... however ... the CMF cannot be observed directly by known physical means."

Pockett (2014) describes what she calls "process theories":

The oldest classification system has two major categories, dualist and monist. Dualist theories equate consciousness with abstracta. Monist (aka physicalist) theories equate it with concreta. A more recent classification (Atkinson et al., 2000) divides theories of consciousness into process theories and vehicle theories: it says "Process theories assume that consciousness depends on certain functional or relational properties of representational vehicles, namely, the computations in which those vehicles engage. The relative number of words devoted to process and vehicle theories in this description hints that at present, process theories massively dominate the theoretical landscape. But how sensible are they really?"

She then discusses both Tononi & Koch's (2015) IIT integrated information theory and Chalmers' (1996) multi-state "information spaces". And lists the following objections:

First, since information is explicitly defined by everyone except process theorists as an objective entity, it is not clear how process theorists can reasonably claim either that information in general, or that any subset or variety of information in particular, is subjective. No entity can logically be both mind-independent and the very essence of mind. Therefore, when process theorists use the word "information" they must be talking about something quite different from what everyone else means by that word. Exactly what they are talking about needs clarification. **Second**, since information is specifically defined by everybody (including Chalmers) as an abstract entity, any particular physical realization of information does not count as information at all. **Third**, it is a problem at least for scientists that process theories are untestable. The hypothesis that a particular brain process **correlates with** consciousness can certainly be tested empirically. But the only potentially testable prediction of theories that claim identity between consciousness and a particular kind of information or information processing is that this kind of information or information processing will be conscious no matter how it is physically instantiated.

These critiques will apply to a very broad range of theories of consciousness we shall explore, including many in fig 79 that do not limit themselves to the neural correlate of consciousness.

Theories of consciousness have, in the light of our understanding of brain processes gained from neuroscience, become heavily entwined with the objective physics and biology of brain function. Michel & Doerig (2021), in reviewing local and global theories of consciousness summarise current thinking, illustrating this dependence on neuroscience for understanding the enigmatic nature of consciousness.

Localists hold that, given some background conditions, neural activity within sensory modules can give rise to conscious experiences. For instance, according to the local recurrence theory, reentrant activity within the visual system is necessary and sufficient for conscious visual experiences. **Globalists** defend that consciousness involves the large-scale coordination of a variety of neuro-cognitive modules, or a set of high-level cognitive functions such as the capacity to form higher-order thoughts about one's perceptual states. Localists tend to believe that consciousness is rich, that it does not require attention, and that phenomenal consciousness overflows cognitive access. Globalists typically hold that consciousness is sparse, requires attention, and is co-extensive with cognitive access.

According to local views, a perceptual feature is consciously experienced when it is appropriately represented in sensory systems, given some background conditions. As localism is a broad family of theories, what "appropriately" means depends on the local theory under consideration. Here, we consider only two of the most popular local theories: the micro-consciousness theory, and the local recurrence theory, focusing on the latter. According to the micro-consciousness theory "processing sites are also perceptual sites". This theory is extremely local. The simple fact of representing a perceptual feature is sufficient for being conscious of that feature, given some background conditions. One becomes conscious of individual visual features before integrating them into a coherent whole. According to the local recurrence theory, consciousness depends on "recurrent" activity between low- and higher-level sensory areas. Representing a visual feature is necessary, but not sufficient for being conscious of it. The neural vehicle carrying that representation must also be subject to the right kind of recurrent dynamics. For instance, consciously perceiving a face consists in the feedforward activation of face selective neurons, quickly followed by a feedback signal to lower-level neurons encoding shape, color, and other visual features of the face, which in turn modulate their activity as a result.

The authors also stress post-dictive effects as a necessary non-local condition for consciousness, which may last a third of a second after an event:

In postdictive effects, conscious perception of a feature depends on features presented at a later time. For instance, in feature fusion two rapidly successive stimuli are perceived as a single entity. When a red disk is followed by a green disk after 20ms, participants report perceiving a single yellow disk, and no red or green disk at all. This is a postdictive effect. Both the red and green disks are required to form the yellow percept. The visual system must store the representation of the first disk until the second disk appears to integrate both representations into the percept that subjects report having. Many other postdictive effects in the range of 10-150ms have been known for decades and are well documented. Postdictive effects are a challenge for local theories of consciousness. Features are locally represented in the brain but the participants report that they do not see those features.

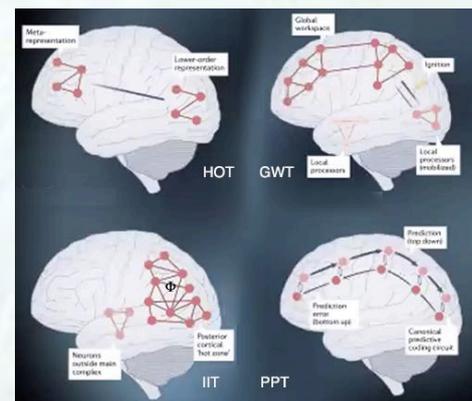
This can have the implication that unconscious brain processes always precede conscious awareness, leading to the conclusion that our conscious awareness is just a post-constructed account of unconscious processes generated by the brain and that subjective consciousness, along the experience of volition have no real basis, leading to a purely physically materialist account of subjective consciousness as just an internal model of reality constructed by the brain.

Pockett (2014) in supporting her own field theory of consciousness, notes structural features that may exclude certain brain regions from being conscious in their own right:

It is now well accepted that sensory consciousness is not generated during the first, feed-forward pass of neural activity from the thalamus through the primary sensory cortex. Recurrent activity from other cortical areas back to the primary or secondary sensory cortex is necessary. Because the feedforward activity goes through architectonic Lamina 4 of the primary sensory cortex (which is composed largely of stellate cells and thus does not generate synaptic dipoles) while recurrent activity operates through synapses on pyramidal cells (which do generate dipoles), the conscious em patterns resulting from recurrent activity in the 'early' sensory cortex have a neutral area in the middle of their radial pattern. The common feature of brain areas that can not generate conscious experience – which are now seen to include motor cortex as well as hippocampus, cerebellum and any sub-cortical area – is that they all lack an architectonic Lamina 4 [layer 4 of the cortex].

Seth & Bayne (2022) provide a detailed review of theories of consciousness from the perspective of neuroscience. They investigate four key types of TOC as listed below and also provide table 1 below listing a diverse range of TOCs.

(1) **Higher-order theories HOT** The claim uniting all these is that a mental state is conscious in virtue of being the target of a certain kind of meta-representational state. These are not representations that occur higher or deeper in a processing hierarchy but are those that have as their targets



other (implicitly subjective) representations.

- (2) **Global workspace theories GWT** originate from architectures, in which a “blackboard” is a centralised resource through which specialised processors share and receive information. The **first** was framed at a cognitive level and proposed that conscious mental states are those that are ‘globally available’ to a wide range of cognitive processes – attention, evaluation, memory and verbal. They claim that it is wide accessibility of information to such systems that constitutes conscious experience. This has been developed into **GNW** ‘global neuronal work space theory’.
- (3) **Integrated information theory IIT** advances a mathematical approach to characterising phenomenology. It starts by proposing axioms about the phenomenological character of conscious experiences (that is, properties that are taken to be self-evidently true and general to consciousness), and from these, it derives claims about the properties that any physical substrate of consciousness must satisfy, proposing that physical systems that instantiate these properties necessarily also instantiate consciousness.
- (4) **Re-entry and predictive processing theories PPT** The first associate conscious perception with topdown (recurrent, reentrant) signalling. The second group are not primarily ToCs but more general accounts of brain (and body) function that can be used to formulate explanations and predictions regarding properties of consciousness.

| | |
|--|--|
| Higher-order theory (HOT) | Consciousness depends on meta-representations of lower-order mental states |
| Self-organizing meta-representational theory | Consciousness is the brain’s (meta-representational) theory about itself |
| Attended intermediate representation theory | Consciousness depends on the attentional amplification of intermediate-level representations |
| Global workspace theories (GWTs) | Consciousness depends on ignition and broadcast within a neuronal global workspace where fronto-parietal cortical regions play a central, hub-like role |
| Integrated information theory (IIT) | Consciousness is identical to the cause–effect structure of a physical substrate that specifies a maximum of irreducible integrated information |
| Information closure theory | Consciousness depends on non-trivial information closure with respect to an environment at particular coarse-grained scales |
| Dynamic core theory | Consciousness depends on a functional cluster of neural activity combining high levels of dynamical integration and differentiation |
| Neural Darwinism | Consciousness depends on re-entrant interactions reflecting a history of value-dependent learning events shaped by selectionist principles |
| Local recurrency | Consciousness depends on local recurrent or re-entrant cortical processing and promotes learning |
| Predictive processing | Perception depends on predictive inference of the causes of sensory signals; provides a framework for systematically mapping neural mechanisms to aspects of consciousness |
| Neuro-representationalism | Consciousness depends on multilevel neurally encoded predictive representations |
| Active inference | Although views vary, in one version consciousness depends on temporally and counterfactually deep inference about self-generated actions |
| Beast machine theory | Consciousness is grounded in allostatic control-oriented predictive inference |
| Neural subjective frame | Consciousness depends on neural maps of the bodily state providing a first-person perspective |
| Self comes to mind theory | Consciousness depends on interactions between homeostatic routines and multilevel interoceptive maps, with affect and feeling at the core |
| Attention schema theory | Consciousness depends on a neurally encoded model of the control of attention |
| Multiple drafts model | Consciousness depends on multiple (potentially inconsistent) representations rather than a single, unified representation that is available to a central system |
| Sensorimotor theory | Consciousness depends on mastery of the laws governing sensorimotor contingencies |
| Unlimited associative learning | Consciousness depends on a form of learning which enables an organism to link motivational value with stimuli or actions that are novel, compound and non-reflex inducing |
| Dendritic integration theory | Consciousness depends on integration of top-down and bottom-up signalling at a cellular level |
| Electromagnetic field theory | Consciousness is identical to physically integrated, and causally active, information encoded in the brain’s global electromagnetic field |
| Orchestrated objective reduction | Consciousness depends on quantum computations within microtubules inside neurons |

Table 1: The full spread of TOCs, as listed in Seth & Bayne (2022).

They note a version of the measurement problem, that to test a theory of consciousness (ToC), we need to be able to reliably detect both consciousness and its absence. At present, experimenters tend to rely on a subject's introspective capacities to identify their states of consciousness. However, they claim this approach is problematic. Firstly they claim reliability of introspection is questionable. This is a debatable claim, which tends to lead to devaluing subjective reports, possibly unfairly, in an emphasis on "objective observations", which render subjective consciousness as having an orphan status, defeating the very purpose of TOCs in relation to the hard problem. They also note infants, individuals with brain damage and non-human animals, who might be conscious, but are unable to produce introspective reports, claiming there is a pressing need to identify non-introspective 'markers' or 'signatures' of consciousness — such as the perturbational complexity index (PCI) and the optokinetic nystagmus response, or distinctive bifurcations in neural dynamics, as markers of either general, or specific kinds of conscious contents. These however are purely functional measures of what consciousness actually is, as experienced phenomena.

In addressing the 'hard problem' they distinguish the easy problems concerned with the functions and behaviours associated with consciousness, from the hard problem, which concerns the experiential dimensions of consciousness, noting that what makes the hard problem hard is the 'explanatory gap' — the intuition that there seems to be no prospect of a fully reductive explanation of experience in physical or functional terms. Integrated information theory and certain versions of higher-order theory address the hard problem directly, while other theories such as global workspace theories focus on the functional and behavioural properties normally associated with consciousness, rather than the hard problem, noting that some predictive processing theorists aim to provide a framework in which various questions about the phenomenal properties of consciousness can be addressed, without attempting to account for the existence of phenomenology — an approach called the 'real problem'.

They posit that a critical question is whether the hard problem is indeed a genuine challenge that ought to be addressed by a science of consciousness, or whether it ought to be dissolved rather than solved as the solving easy problems first strategy invokes. The 'dissolvers' argue that the appearance of a distinctively hard problem derives from the peculiar features of the 'phenomenal concepts' that we employ in representing our own conscious states, citing illusionism, in which we do not have phenomenal states but merely represent ourselves as having such states, speculating that the grip of the hard problem may loosen as our capacity to explain, predict and control both phenomenological and functional properties of consciousness expands, thus effectively siding with the dissolvers.

In conclusion, they note that present, ToCs are generally used as 'narrative structures' within the science of consciousness. Although they inform the interpretation of neural and behavioural data, they demure that it is still rare for a study to be designed with questions of theory validation in mind. Although there is nothing wrong with employing theories in this manner, claiming future progress will depend on experiments that enable ToCs to be tested and disambiguated. This is the kind of ideal that we will expect physicalist neuroscientists to veer into, but it runs the risk of 'sanitising' consciousness, just as behaviourism has done in psychology to its nemesis.

Pivotal are two questions, one is the physicalist quest to use the easy functionalist notions of consciousness to explain away the hard problem of consciousness, which typifies Levine's explanatory gap, Nagel's what it is "to be like" something something conscious and Chalmers' notion "how we have phenomenal first-person subjective experiences". This is really not about the general questions of consciousness, such as "consciousness of" something, which can be viewed as a form of global attention that can be described functionally, and more specific notions like self-consciousness i.e. awareness of a form of functional agency, both of which could apply equally to artificial intelligence. This becomes clear when we examine the authors' choice of key theories of consciousness, several of which are not targeted at the hard problem at all, as they point out, knowing that Seth for example favours an ultimate functional explanation which will "dissolve" the hard problem, even if it is a form of identity theory, or dual aspect monism. Really we need to distinguish consciousness from subjective consciousness — the ability to have subjective experiences and thus subjectivity itself and its cosmological status, rather than the mere functionality of consciousness as a global attentive process. This is why Symbiotic Existential Cosmology deals directly with primal subjectivity as a cosmological complement to the physical universe to capture the notion of subjectivity squarely and independently of consciousness. This leaves full consciousness an emergent property of the eucaryote endo-symbiosis that results in the cellular mechanisms of edge-of-chaos excitable membrane and informational membrane signalling using

neurotransmitters, both of which are functionally emergent properties but with non-classical implications in the quantum universe.

We can immediately see this is a critically important step, when we see the above research being cited as a basis to determine whether future AI developments would be considered “conscious”, as Butlin et al. (2023) cite precisely the functional expressions of the same theories of consciousness as above, to provide criteria where a purely objective physical process could become “conscious”, in view of its functional properties in recurrent processing, global workspace, higher-order processes, attention schemas predictive processing and functional agency, none of which address the hard problem, let alone the extended hard problem of subjective volition over the physical universe.

| |
|---|
| Recurrent processing theory |
| RPT-1: Input modules using algorithmic recurrence |
| RPT-2: Input modules generating organised, integrated perceptual representations |
| Global workspace theory |
| GWT-1: Multiple specialised systems capable of operating in parallel (modules) |
| GWT-2: Limited capacity workspace, entailing a bottleneck in information flow and a selective attention mechanism |
| GWT-3: Global broadcast: availability of information in the workspace to all modules |
| GWT-4: State-dependent attention, giving rise to the capacity to use the workspace to query modules in succession to perform complex tasks |
| Computational higher-order theories |
| HOT-1: Generative, top-down or noisy perception modules |
| HOT-2: Metacognitive monitoring distinguishing reliable perceptual representations from noise |
| HOT-3: Agency guided by a general belief-formation and action selection system, and a strong disposition to update beliefs in accordance with the outputs of metacognitive monitoring |
| HOT-4: Sparse and smooth coding generating a “quality space” |
| Attention schema theory |
| AST-1: A predictive model representing and enabling control over the current state of attention |
| Predictive processing |
| PP-1: Input modules using predictive coding |
| Agency and embodiment |
| AE-1: Agency: Learning from feedback and selecting outputs so as to pursue goals, especially where this involves flexible responsiveness to competing goals |
| AE-2: Embodiment: Modeling output-input contingencies, including some systematic effects, and using this model in perception or control |

Table 2: Indicator Properties (Butlin et al. 2023).

Butlin et al. note: *This report argues for, and exemplifies, a rigorous and empirically grounded approach to AI consciousness: assessing existing AI systems in detail, in light of our best-supported neuroscientific theories of consciousness. We survey several prominent scientific theories of consciousness. From these theories we derive “indicator properties” of consciousness, elucidated in computational terms that allow us to assess AI systems for these properties. We use these indicator properties to assess several recent AI systems, and we discuss how future systems might implement them. Our analysis suggests that no current AI systems are conscious, but also suggests that there are no obvious technical barriers to building AI systems which satisfy these indicators.*

Polák & Marvan (2019), in a different kind of “dissolving” approach to the hard problem, attempt to assert dual theories, in which scientists study pairs of phenomenal mental states of which one is and the other is not conscious, the presence/absence of consciousness being their sole distinguishing feature, claiming this facilitates unpacking the unitary nature of the hard problem, thus partly decomposing it.

They note that Chalmers (2018 30) contains the acceptance of unconscious sensory qualities, saying such a move is: *perhaps most promising for deflating the explanatory gap tied to qualities such as redness: if these qualities [...] can occur unconsciously, they pose less of a gap. As before, however, the core of the hard problem is posed not by the qualities themselves but by our experience of these qualities: roughly, the distinctive phenomenal way in which we represent the qualities or are conscious of them.*

They cite two examples of separation of brain processes forming a neural correlate conscious experiences. The first is hemispheric visual neglect caused by localised brain damage such as a stroke, where information in the neglected hemisphere appears to unconsciously influence a person's choices:

Unilateral visual neglect, the inability to see objects in one half of the visual field, might serve as an illustration. In the most famous neglect example (Marshall and Halligan, 1988), a person cannot consciously discriminate between two depicted houses. The houses are identical except that one of them is on fire in that half of the visual field the person, due to neglect, cannot see. Although the person was constantly claiming that both houses look the same to her, she repeatedly said she would prefer to live in the house not consumed by the flames.

A second example cites Lamme's (2006, 2015) theory of brain processes which may constitute separate phases in the generation of a conscious experience, which permit clean separation of the brain mechanisms for the creation of phenomenal content from the mechanism that "pushes this content into consciousness":

The theory revolves around the notion of local recurrent neural activity within the cortex and decomposes the formation of conscious visual content into two phases. The first one is called fast feedforward sweep. It is a gradual activation of different parts of the visual system in the brain. The dual view interprets this process as the formation of the unconscious but phenomenal mental state. A later process, that may or may not occur, is called recurrent activity. It is a neural feedback processing during which higher visual centers send the neural signal back to the lower ones. The time delay between the initiation of the first and the second process might be seen as corresponding to the difference between processing of the phenomenal character (feedforward sweep) and making and maintaining this phenomenal character conscious (recurrent processing).

They note that in several other theories already listed, including Global Neural Workspace theory, thalamo-cortical circuits, and apical amplification within the cortical pyramidal neurons, the phase of phenomenal content creation and the phase of this content becoming conscious are distinguishable. But all these theories are describing purely physical brain processes, being imbued with subjective aspects only by inference. So we need to look carefully at how the authors treat subjectivity itself. Essentially they are making a direct attack on the unitary nature of subjective conscious experience by attempting to separate consciousness from phenomenal experience so subjectivity is being held hostage in the division:

What constantly fuels this worry, we believe, is taking the conscious subjective phenomenal experience to be something monolithic. The peculiar nature of subjective qualities and their being conscious comes as a package and it is difficult to conceive how science might begin explaining it. ... The conscious subjective experience is being felt as something unitary, we grant that. But that does not mean that if we look behind the subjective level and try to explain how such unitary experience arises, the explanation itself has to have unitary form. ... Awareness in this sense is simply the process, describable in neuroscientific terms, of making the sensory qualities conscious for the subject. We could then keep using the term "consciousness" for the subjectively felt unitary experience, while holding that in reality this seemingly unitary thing is the result of an interaction between the neural processes constituting the phenomenal contents and the neural processes constituting awareness.

This effectively a form of physicalist illusionism (Frankish 2017), because, the claim made is that subjective experience is falsely represented as integrated when the underlying physical reality is subdivided by the dual interpretation. It is an illustration of how functionalist theories of consciousness can be misused in an attempt to form a bridgehead decomposing the unitarity of subjective consciousness into interacting divisible physical systems, simply because multiple physical processes are held to be functional, or temporally sequential components, of the associated integrated brain processing state. The trouble with this is that these functional processes can invoke an integrated conscious experience only when they are functionally confluent, so we can't actually separate "the fast feedforward sweep" from the "recurrent activity" in generating a real conscious experience and in pathological cases like hemispherical visual neglect this provides no evidence that healthy integrated conscious brain processes can be so decomposed into dual states.

By contrast with theories of consciousness based on the physical brain alone, in Symbiotic Existential Cosmology, subjectivity is itself a primal cosmological complement to the physical universe. It thus explains subjective conscious experience as a cosmological, rather than just a purely biological or neuroscience phenomenon, thus giving validation and real meaning to our experience of subjective conscious volition over the physical universe, expressed in all our behavioural activities and our sense of personal responsibility for our actions and leads towards a state of biospheric symbiosis as climax living diversity across the generations of life as a whole, ensuring our continued survival.

Psychotic Fallacies of the Origin of Consciousness

Theories of consciousness that are poles apart from any notion of the subjectivity of conscious experience, or the hard problem of consciousness and the explanatory gap of the physical description, arise from treating consciousness merely as purely a type of culturally derived cognitive process. Such theories fall into the philosophers trap of confining the nature of the discourse to rational processes and arguments, which fail to capture the raw depths of subjective experience, characteristic of mystical, shamanic and animistic cultures.

In "The Origin of Consciousness in the Bicameral Mind", Julian Jaynes (1976, 1986) claimed human "ancestors", as late as the Ancient Greeks did not consider emotions and desires as stemming from their own minds but as the consequences of actions of gods external to themselves. The theory posits that the human mind once operated in a bicameral state in which cognitive functions were divided between one part of the brain which appears to be "speaking", and a second part which listens and obeys and that the breakdown of this division gave rise to "consciousness" in humans. He used the term "bicameral" metaphorically to describe a mental state in which the right hemisphere's experiences were transmitted to the left hemisphere through auditory hallucinations. In the assumed bicameral phase, individuals lacked self-awareness and introspection. Instead of conscious thought, they heard external voices or "gods" guiding their actions and decisions. Jaynes claimed this form of consciousness, devoid of meta-consciousness and autobiographical memory, persisted until about 3,000 years ago, when societal changes led to the emergence of our current conscious mode of thought. Auditory hallucinations experienced by those with schizophrenia, including command hallucinations, paralleled the external guidance experienced by bicameral individuals implying mental illness was a bicameral remnant.

To justify his claim, he highlighted instances in ancient texts like the Iliad and the Old Testament where he claimed there was no evidence of introspection or self-awareness and noted that gods in ancient societies were numerous and anthropomorphic, reflecting the personal nature of the external voices guiding individuals. However in the Epic of Gilgamesh, copies of which are many centuries older than even the oldest passages of the Old Testament, describes introspection and other mental processes.

According to Jaynes, language is a necessary but not sufficient condition for consciousness: language existed thousands of years earlier, but consciousness could not have emerged without language. Williams (2010) defends the notion of consciousness as a social-linguistic construct learned in childhood, structured in terms of lexical metaphors and narrative practice. Ned Block's (1981) review criticism is direct – that it is "ridiculous" to suppose that consciousness is a cultural construction.

Jaynes argued that the breakdown of the bicameral mind was marked by societal collapses and environmental challenges. As people lost contact with external voices, practices like divination and oracles emerged as attempts to reconnect with the guidance they once received. However this shows an ethnocentric rationalist lack of awareness and understanding of how earlier animistic cultures perceived the natural world, in which both humans and natural processes like storms, rivers and trees were imbued with spirits that were interacted with, but by no means were regarded as voices which humans had to blindly obey, but ones in which they were in dynamic interaction as sentient beings. There are diverse existing cultures, from the founding San to the highly evolved Maori, who practice animistic beliefs, actually and metaphorically who were not influenced by political upheavals at the periphery of founding urban cultures and can appreciate their world views in both rational and spiritual terms, while at all times being as fully integrated in their conscious experiences as modern dominant cultures. We know that doctrinal religions have evolved from mystical and animistic roots as means to hold together larger urban societies, but these are no more rational beliefs. Neither are polytheists more bicameral in their thinking than monotheists are, but less starkly absolute. Neither is it true that intelligent primates display evidence of a bicameral mind, but rather a fully adapted social intelligence, attuned by social evolution to facilitate their strategic survival as consciously aware intentional agents.

McGilchrist (2009) reviews scientific research into the complementary role of the brain's hemispheres, and cultural evidence, in his book "The Master and His Emissary", proposing that, since the time of Plato, the left hemisphere of the brain (the "emissary" in the title) has increasingly taken over from the right hemisphere (the "master"), to our detriment. McGilchrist felt that Jaynes's hypothesis was "the precise inverse of what happened" and that rather than a shift from bicameral mentality there evolved a separation of the hemispheres into bicameral mentality. This has far more reality value in the fact that the dominance of rational discourse over subjective conscious experience has risen to the degree that many people cannot rationally distinguish themselves from computational machines.

Field and Wave Theories of Consciousness v Connectome Networks and Action Potentials

Brain dynamics are a function of a variety of interacting processes. Major pyramidal neuron axon circuits functionally connect distant regions of the cortex to enable integrated processing forming the axonal connectome of the networked brain, driven by individual pulse-coded action potentials. Complementing this are waves of continuous potential in the cortical brain tissue indirectly sampled by electrodes on the scalp in the electroencephalogram or EEG and magnetic effects of currents in MEG. While the network view of brain activity is based on individual action potentials and regards the EEG brain waves as just tissue excitation averages, there is increasing evidence of phase coupling between between the two, so that both the discrete action potentials and the continuous tissue potentials are in mutual feedback. The complex interaction of these can be seen in Qasim et al. (2021), Cariani & Baker (2022) and Pinotsis et al. (2023). This leads to two views of brain dynamics the networked view based on the connectome and field theories centred on continuous tissue gradients and the folded tissue anatomy, as exemplified in the independent dynamics of the various EEG bands and spiral and metastable wave states (Roberts et al. 2019, Xu et al. 2023).

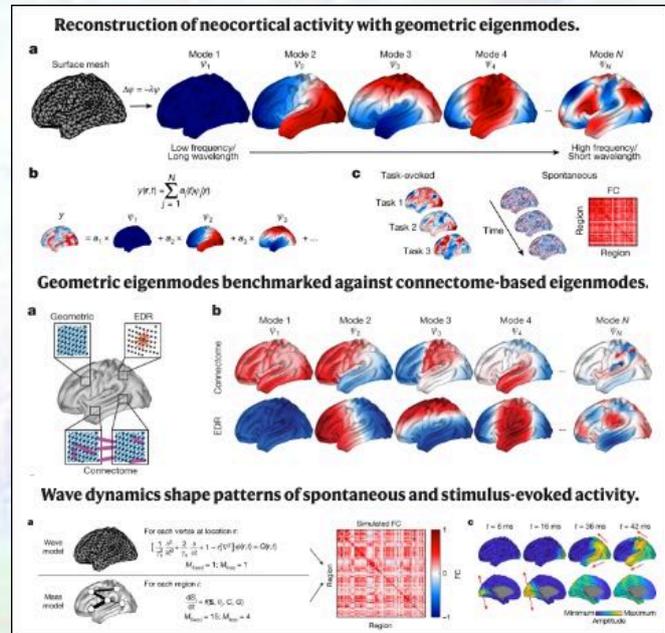
Fig 79b: Comparison of the influences of connectome network based processing, volumetric wave modes in the cortex and exponential distance rule (EDR) networks connectivity and found geometric eigenmodes to be predominant.

Pang et al. (2023) have compared the influence of these two physical features in the outer folds of the cerebral cortex, where most higher-level brain activity occurs — and the connectome, the web of nerves that links distinct regions of the cerebral cortex. Excited neurons in the cerebral cortex can communicate their state of excitation to their immediate neighbours on the surface. But each neuron also has a long axon that connects it to a far away region within or beyond the cortex, allowing neurons to send excitatory messages to distant brain cells. In the past two decades, neuroscientists have painstakingly mapped this web of connections — the connectome — in a raft of organisms, including humans. The brain's neuronal excitation can also come in waves, which can spread across the brain and travel back in periodic oscillations.

They found that the shape of the outer surface was a better predictor of brainwave data than was the connectome, contrary to the paradigm that the connectome has the dominant role in driving brain activity. Predictions from neural field theory, an established framework for modelling large-scale brain activity, suggest that the geometry of the brain may represent a more fundamental constraint on dynamics than complex interregional connectivity. They calculated the modes of brainwave propagation for the cortical surface and for the connectome. As a model of the connectome, they used information gathered from diffusion magnetic resonance imaging (MRI), which images brain anatomy. They then looked at data from more than 10,000 records of functional MRI, which images brain activity based on blood flow. The analysis showed that brainwave modes in the resting brain as well as during a variety of activities — such as during the processing of visual stimuli — were better explained by the surface geometry model than by the connectome. of activities — such as during the processing of visual stimuli — were better explained by the surface geometry model than by the connectome one, the researchers found.

Benjamin Libet (1994), the controversial discoverer of the readiness potential, notes the extreme contrast between the integral nature of conscious experience and the complex localised nature of network-based neurodynamics, leaning towards a field theory as the only plausible explanation:

One of the most mysterious and seemingly intractable problems in the mind-brain relationship is that of the unitary and integrated nature of conscious experience. We have a brain with an estimated 100 billion neurons, each of which may have thousands of interconnections with other neurons. It is increasingly evident that many functions of cerebral cortex are localized. This is not merely true of the primary sensory areas for each sensory modality, of the motor areas which command movement, and of the speech and



language areas, all of which have been known for some time. Many other functions now find other localized representations, including visual interpretations of colour, shape and velocity of images, recognition of human faces, preparation for motor actions, etc. Localized function appears to extend even to the microscopic level within any given area. The cortex appears to be organized into functional and anatomical vertical columns of cells, with discrete interconnections within the column and with other columns near and far, as well as with selective subcortical structures.

In spite of the enormously complex array of localized functions and representations, the conscious experiences related to or elicited by these neuronal features have an integrated and unified nature. Whatever does reach awareness is not experienced as an infinitely detailed array of widely individual events. It may be argued that this amazing discrepancy between particularized neuronal representations and unitary integrated conscious experiences should simply be accepted as part of a general lack of isomorphism between mental and neural events. But that would not exclude the possibility that some unifying process or phenomenon may mediate the profound transformation in question.

The general problem had been recognized by many others, going back at least to Sherrington (1940) and probably earlier. Eccles (in, Popper and Eccles, 1977, p. 362) specifically proposed that the experienced unity comes not from a neurophysiological synthesis but from the proposed integrating character of the self-conscious mind. This was proposed in conjunction with a dualist-interactionist view in which a separate non-material mind could detect and integrate the neuronal activities. Some more monistically inclined neuroscientists have also been arriving at related views, i.e. that integration seems to be best accountable for in the mental sphere even if one views subjective experience as an inner quality of the brain "substrate" (as in "identity theory" or as an emergent property of it. There has been a growing consensus that no single cell or group of cells is likely to be the site of a conscious experience, but rather that conscious experience is an attribute of a more global or distributed function of the brain.

A second apparently intractable problem in the mind-brain relationship involves the reverse direction. There is no doubt that cerebral events or processes can influence, control and presumably "produce" mental events, including conscious ones. The reverse of this, that mental processes can influence or control neuronal ones, has been generally unacceptable to many scientists on (often unexpressed) philosophical grounds. Yet, our own feelings of conscious control of at least some of our behavioural actions and mental operations would seem to provide prima facie evidence for such a reverse interaction, unless one assumes that these feelings are illusory. Eccles (1990; Popper and Eccles, 1977) proposed a dualistic solution, in which separable mental units (called psychons) can affect the probability of presynaptic release of transmitters. Sperry (1952, 1985, 1980) proposed a monistic solution, in which mental activity is an emergent property of cerebral function; although the mental is restrained within a macro-deterministic framework, it can "supervene", though not "intervene", in neuronal activity. However, both views remain philosophical theories, with explanatory power but without experimentally testable formats. As one possible experimentally testable solution to both features of the mind-brain relationship, I would propose that we may view conscious subjective experience as if it were a field, produced by appropriate though multifarious neuronal activities of the brain.

There are a number of field theories of conscious brain dynamics each with their own favoured process.

Joachim Keppler (2018, 2021) presents a field theoretic analysis drawing conscious experiences into the orbit of stochastic electrodynamics (SED) a form of quantum field theory, utilising the conception that the universe is imbued with an all-pervasive electromagnetic background field, the zero-point field (ZPF), which, in its original form, is a homogeneous, isotropic, scale-invariant and maximally disordered ocean of energy with completely uncorrelated field modes and a unique power spectral density. This is basically a stochastic treatment of the uncertainty associated with the quantum vacuum in depictions such as the Feynman approach to quantum electrodynamics (fig 71(e)). The ZPF is thus the multiple manifestations of uncertainty in the quantum vacuum involving virtual photons, electrons and positrons, as well as quarks and gluons, implicit in the muon's anomalous magnetic moment (Borsanyi et al. 2021). In the approach of SED (de la Peña et al. 2020), in which the stochastic aspect corresponds to the effects of the collapse process into the classical limit ⁴², consciousness is represented by the zero point field (ZPF) (Keppler 2018). This provides a basis to discuss the brain dynamics accompanying conscious states in terms of the zero-point field (ZPF):

The aforementioned characteristics and unique properties of the ZPF make one realize that this field has the potential to provide the universal basis for consciousness from which conscious systems acquire their phenomenal qualities. On this basis, I posit that all conceivable shades of phenomenal awareness are woven into the fabric of the background field. Accordingly, due to its disordered ground state, the ZPF can be looked upon as a formless sea of consciousness that carries an enormous range of potentially available phenomenal nuances. Proceeding from this postulate, the mechanism underlying quantum systems has all the makings of a truly fundamental mechanism behind conscious systems, leading to the assumption that conscious systems extract their phenomenal qualities from the phenomenal colour palette immanent in the ZPF.

⁴² The approach of SED is guided by the hypothesis of the existence of the (random) zero-point radiation field, ZPF. This rather more elaborate approach goes through a statistical evolution equation in phase space, to arrive at a description in x-space, in which the dissipative and diffusive terms are seen to bring about a definitive departure from the classical Hamiltonian dynamics.

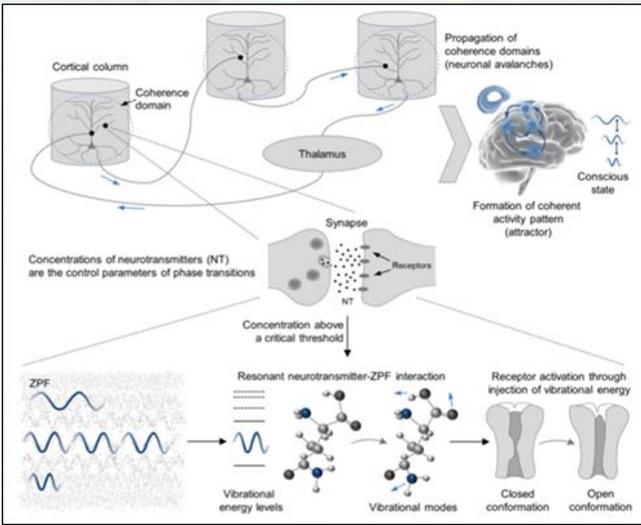


Fig 80: In Keppler's model, the phase transitions underlying the formation of coherent activity patterns (attractors) are triggered by modulating the concentrations of neurotransmitters. When the concentration of neurotransmitter molecules lies above a critical threshold and selected ZPF modes are in resonance with the characteristic transition frequencies between molecular energy levels, receptor activations ensue that drive the emergence of neuronal avalanches. The set of selected ZPF modes that is involved in the formation and stabilisation of an attractor determines the phenomenal properties of the conscious state.

His description demonstrates the kind of boundary conditions in brain dynamics likely to correspond to subjective states and thus provides a good insight into the stochastic uncertainties of brain dynamics of conscious states that would correspond to the subjective aspect, and it even claims to envelop all

possible modes of qualitative subjectivity in the features of the ZPF underlying uncertainty. But it would remain to be established that the ZPF can accommodate all the qualitative variations spanning the senses of sight, sound and smell, which may rather correspond to the external quantum nature of these senses.

The ZPF does not in my view solve the hard problem, because, at face value it is a purely physical manifestation of quantum uncertainty with no subjective manifestation, however Keppler claims to make this link clear as well:

A detailed comparison between the findings of SED and the insights of Eastern philosophy reveals not only a striking congruence as far as the basic principles behind matter are concerned. It also gives us the important hint that the ZPF is a promising candidate for the carrier of consciousness, suggesting that consciousness is a fundamental property of the universe, that the ZPF is the substrate of consciousness and that our individual consciousness is the result of a dynamic interaction process that causes the realization of ZPF information states. ... In that it is ubiquitous and equipped with unique properties, the ZPF has the potential to define a universally standardized substratum for our conscious minds, giving rise to the conjecture that the brain is a complex instrument that filters the varied shades of sensations and emotions selectively out of the all-pervasive field of consciousness, the ZPF (Keppler, 2013).

In personal communication regarding these concerns, Joachim responds as follows:

I understand your reservations about conventional field theories of consciousness. The main problem with these approaches (e.g., McFadden's approach) is that they cannot draw a dividing line between conscious and unconscious field configurations. This leads to the situation that the formation of certain field configurations in the brain is claimed to be associated with consciousness, while the formation of the same (or similar) field configurations in an electronic device would usually not be brought in relation with consciousness. This is what you call quite rightly a common category error. Now, the crucial point is that the ZPF, being the primordial basis of the electromagnetic interaction, offers a way to avoid this category error. According to the approach I propose, the ZPF (with all its field modes) is the substrate of consciousness, everywhere and unrestrictedly. The main difference between conscious and unconscious systems (processes) is their ability to enter into a resonant coupling with the ZPF, resulting in an amplification of selected ZPF modes. Only a special type of system has this ability (the conditions are described in my article). If a system meets the conditions, one must assume that it also has the ability to generate conscious states.

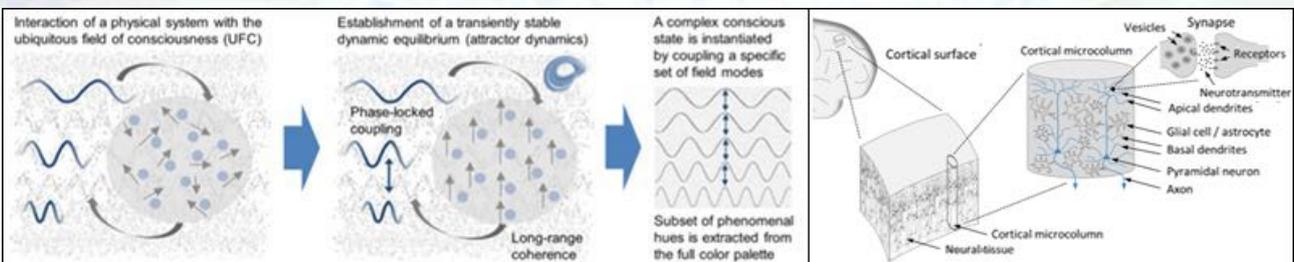


Fig 80b (Left): It is postulated that conscious systems must be equipped with a fundamental mechanism by means of which they are able to influence the basic structure of the ubiquitous field of consciousness (UFC). This requires the interaction of a physical system with the UFC in such a way that a transiently stable dynamic equilibrium, a so-called attractor state characterised by long-range coherence, is established in which the involved field modes enter into a phase-locked coupling. (Right) Cortical column coherence.

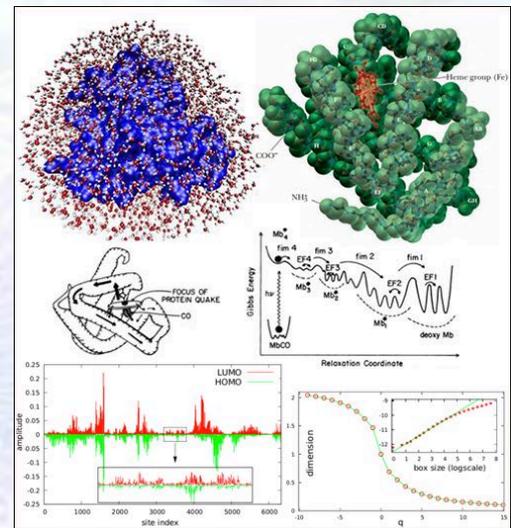
Keppler, and Shani (2020) link this process to a form of cosmopsychism confluent with Symbiotic Existential Cosmology:

The strength of the novel cosmopsychist paradigm presented here lies in the bridging of the explanatory gap the conventional materialist doctrine struggles with. This is achieved by proposing a comprehensible causal mechanism for the formation of phenomenal states that is deeply rooted in the foundations of the universe. More specifically, the sort of cosmopsychism we advocate brings a new perspective into play, according to which the structural, functional, and organizational characteristics of the NCC are indicative of the brain's interaction with and modulation of a UFC. In this respect, the key insights from SED suggest that this field can be equated with the ZPF and that the modulation mechanism is identical with the fundamental mechanism underlying quantum systems, resulting in our conclusion that a coherently oscillating neural cell assembly acquires its phenomenal properties by tapping into the universal pool of phenomenal nuances predetermined by the ZPF.

Keppler (2023) also proposes a model where long-range coherence is developed in the functioning of cortical microcolumns, based on the interaction of a pool of glutamate molecules, with the vacuum fluctuations of the electromagnetic field, involving a phase transition from an ensemble of initially independent molecules toward a coherent state, resulting in the formation of a coherence domain that extends across the full width of a microcolumn.

*John Archibald Wheeler put it greatly, along these lines:
The physics of the vacuum is the real physics – the rest are trivial aspects (Menas Kafatos).*

Fig 81: Molecular biology is a theme and variations on the polar and non-polar properties of organic molecules residing in an aqueous environment. Nucleotide double helices, protein folding and micelle structures, as well as membranes, are all energetically maintained by their surrounding aqueous structures. Water has one of the highest specific heats of all, because of the large number of internal dynamic quantum states. **Myoglobin (Mb)** the oxygen transporting protein in muscle, containing a heme active site illustrates this (Ansari et al. 1984), both in its functionally important movements (fim) and its equilibrium fluctuations invoking fractal energetics between its high and low energy states of Mb and MbCO. This activity in turn is stabilised both by non polar side chains maintaining the aqueous structure and polar side chains interacting with the aqueous environment to form water hydration structures (top left) The hydration shell of myoglobin (blue surface) with 1911 water molecules (CPK model), the approximate number needed for optimal function (Vajda & Perczel 2014). Lower: Here we show that molecules taking part in biochemical processes from small molecules to proteins are critical quantum mechanically. Electronic Hamiltonians of biomolecules are tuned exactly to the critical point of the metal-insulator transition separating the Anderson localized insulator phase from the conducting disordered metal phase. Left: The HOMO/LUMO orbitals for Myoglobin calculated with the Extended Hückel method. Right: Generalized fractal dimensions D_q of the wave functions (Vattay et al. 2015).



Without accepting any materialistic notion of quantum fields being identifiable with subjective consciousness, except as neural correlates of consciousness, this does provide a basis confluent with the description invoked in this article, which uses the infinite number of ground states in quantum field theory, as opposed to quantum mechanics to thermodynamically model memory states and the global amplitude and frequency-modulated binding in the EEG. Karl Pribram (2004) has noted both the similarity of wave coherence interactions as an analogy or manifestation of quantum measurement and the 'holographic' nature of wave potential fluctuations, in the dendritic web:

The holonomic brain theory of quantum consciousness was developed by neuroscientist Karl Pribram initially in collaboration with physicist David Bohm. Pribram suggests these processes involve electric oscillations in the brain's fine-fibered dendritic webs, which are different from the more commonly known action potentials involving axons and synapses. These wave oscillations create interference patterns in which memory is encoded naturally, and the wave function may be analyzed by a Fourier transform. Gabor, Pribram and others noted the similarities between these and the storage of information in a hologram, which can also be analyzed with a Fourier transform.

Coherent wave excitation of pyramidal action potentials has been cited as the basis of correlated potentiation of the glymphatic flow through the brain parenchyma during NREM and particularly REM sleep (Jiang-Xie et al. 2024).

The dissipative quantum model of brain dynamics (Freeman W & Vitiello 2006, 2007, 2016, Capolupo A, Freeman & Vitiello 2013, Vitiello 2015, Sabbadini & Vitiello 2019) provides another field theoretic description. I include below a shortened extract from Freeman & Vitiello (2015), which highlights to me the most outstanding quantum field theoretic description of the neural correlate of consciousness I know of, which also has the support of Freeman's attractor dynamics as illustrated in fig 78, and likewise has similar dual-time properties to the transactional interpretation discussed above, invoking complementary time directed-roles of emergence and imagination:

We began by using classical physics to model the dendritic integration of cortical dynamics with differential equations, ranging in complexity from single positive loops in memory through to simulated intentional behavior (Kozma and Freeman 2009). We identified the desired candidate form in a discrete electrochemical wave packet embedded in the electroencephalogram (EEG), often with the form of a vortex like a hurricane, which carried a spatial pattern of amplitude modulation (AM) that qualified as a candidate for thought content. ... Measurement of scalp EEG in humans (showed that the size and speed of the formation of wave packets were too big to be attributed to the classical neurophysiology of neural networks, so we explored quantum approaches. In order to use dissipative quantum field theory it is necessary to include the impact of brain and body on the environment. Physicists do this conceptually and formally by doubling the variables (Vitiello 1995, 2001, Freeman and Vitiello 2006) that describe dendritic integration in the action-perception cycle. By doing so they create a Double, and then integrate the equations in reverse time, so that every source and sink for the brain-body is matched by a sink or source for the Double, together creating a closed system.

On convergence to the attractor the neural activity in each sensory cortex condenses from a gas-like regime of sparse, disordered firing of action potentials at random intervals to a liquid-like macroscopic field of collective activity. The microscopic pulses still occur at irregular intervals, but the probability of firing is no longer random. The neural mass oscillates at the group frequencies, to which the pulses conform in a type of time multiplexing. The EEG or ECoG (electrocorticogram) scalar field during the liquid phase revealed a burst of beta or gamma oscillation we denoted as a wave packet. Its AM patterns provided the neural correlates of perception and action. The surface grain inferred that the information capacity of wave packets is very high. The intense electrochemical energy of the fields was provided everywhere by the pre-existing trans-membrane ionic concentration gradients.

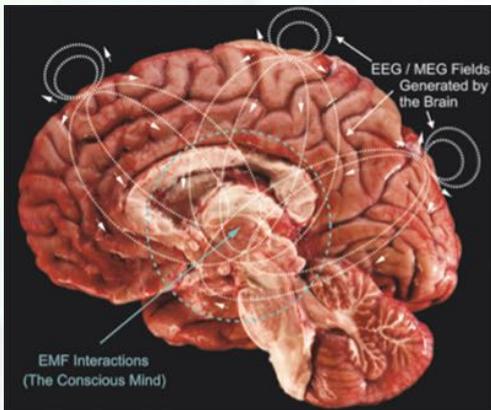


Fig 82: Field theory model of inward projecting electromagnetic fields overlapping in basal brain centres (Maclver 2022).

The theory cites water molecules and the cytosol as the basis for the quantum field description, a position supported at the molecular level by the polarisation of the cytoplasmic medium and all its constituents between aqueous polar and hydrophobic non-polar energetics as illustrated in fig 81. Maclver (2022) has a similar field theoretic model derived from the EEG and MEG. Mandell (2013) also cites chaotic neurodynamics consistent with Freeman's model:

Neurons, glia cells and other physiological units are [treated as] classical objects. The quantum degrees of freedom of the model are associated to the dynamics of the electrical dipoles of the molecules of the basic components of

the system, i.e. biomolecules and molecules of the water matrix in which they are embedded. The coherence of the long-range correlations is of the kind described by quantum field theory in a large number of physical systems, in the standard model of particle physics as well as in condensed matter physics, ranging from crystals to magnets, from superconductive metals to superfluids. The coherent states characterizing such systems are stable in a wide range of temperatures. In physiological terms the field consists of heightened ephaptic⁴³ excitability in an interactive region of neuropil, which creates a dominant focus by which every neuron is sensitized, and to which every neuron contributes its remembrance. In physical terms, the dynamical output of the many-body interaction of the vibrational quanta of the electric dipoles of water molecules and other biomolecules energize the neuropil, the densely compartmentalized tissue of axons, dendrites and glia through which neurons force ionic currents. The boson condensation provides the long-range coherence, which in turn allows and facilitates synaptic communication among neuron populations.

The stages of activation of the quantum field boson condensation correspond closely to stages of the Freeman attractor dynamics investigated empirically in the EEG and ECoG:

We conceive each action-perception cycle as having three stages, each with its neurodynamics and its psychodynamics (Freeman 2015). Each stage has at least one phase transition and may have two or more before the next stage. In the first stage a boson condensation forms a gamma wave packet by a phase transition in each of the primary sensory cortices. Only in stage one a phase transition would occur in a single cortex. In stage two the entorhinal cortex integrates all modalities before making a gestalt. When the boson condensation carrying its AM pattern invades and recruits the amygdala and hypothalamus, we propose that this correlates with awareness of emotion and value with incipient awareness of content. In the second stage a more extended boson condensation forms a larger wave packet in the beta range that extends through the entire limbic system including the entorhinal cortex, which is central in an AM pattern. We believe it correlates with a flash memory unifying the multiple primary percepts into a gestalt, for which the time and place of the subject forming the gestalt are provided by the hippocampus. A third phase transition forms a boson condensation that sustains a global AM pattern, the manifestations of which in the EEG extend over the whole scalp. We propose that the global AM pattern is accompanied by comprehension of the stimulus meaning, which constitutes an up-to-date status summary as the basis for the next intended action.

⁴³ Ephaptic coupling a form of communication within the nervous system involving the coupling of adjacent nerve fibers caused by the exchange of ions between the cells, or as a result of local electrical fields, but distinct from direct communication systems such as synapses.

The dual time representation of the quantum field and its double invokes the key innovative and anticipatory features of conscious imagination:

Open systems require an environment to provide the sink where their waste energy goes, and a source of free energy which feeds them. From the standpoint of the energy flux balance, brains describe the relevant restructured part of the environment using the time-reversed copy of the system, its complement or Double (Vitiello 2001). Where do the hypotheses come from? The answer is: from imagination. In theory the best sources for hypotheses are not memories as they appear in experience, but images mirrored backward in time. The imaginings are not constrained by thermodynamics. The mirror sinks and sources are imagined, not emergent. From this asymmetry we infer that the mirror copy exists as a dynamical system of nerve energy, by which the Double produces its hypotheses and predictions, which we experience as perception, and which we test by taking action. It is the Double that imagines the world outside, free from the shackles of thermodynamic reality. It is the Double that soars.

Johnjoe McFadden (2020) likewise has a theory of consciousness associated with the electromagnetic wave properties of the brain's EM field interacting with the matter properties of "unconscious" neuronal processing. In his own words he summarises his theory as follows:

I describe the conscious electromagnetic information (cemi) field theory which has proposed that consciousness is physically integrated, and causally active, information encoded in the brain's global electromagnetic (EM) field. I here extend the theory to argue that consciousness implements algorithms in space, rather than time, within the brain's EM field. I describe how the cemi field theory accounts for most observed features of consciousness and describe recent experimental support for the theory. ... The cemi field theory differs from some other field theories of consciousness in that it proposes that consciousness — as the brain's EM field — has outputs as well as inputs. In the theory, the brain's endogenous EM field influences brain activity in a feedback loop (note that, despite its 'free' adjective, the cemi field's proposed influence is entirely causal acting on voltage-gated ion channels in neuronal membranes to trigger neural firing.

The lack of correlation between complexity of information integration and conscious thought is also apparent in the common-place observation that tasks that must surely require a massive degree of information integration, such as the locomotory actions needed to run across a rugged terrain, may be performed without awareness but simple sensory inputs, such as stubbing your toe, will override your conscious thoughts. The cemi field theory proposes that the non-conscious neural processing involves temporal (computational) integration whereas operations, such as natural language comprehension, require the simultaneous spatial integration provided by the cemi field. ... Dehaene (2014) has recently described four key signatures of consciousness: (i) a sudden ignition of parietal and prefrontal circuits; (ii) a slow P3 wave in EEG; (iii) a late and sudden burst of high-frequency oscillations; and (iv) exchange of bidirectional and synchronized messages over long distances in the cortex. It is notable that the only feature common to each of these signatures— aspects of what Dehaene calls a 'global ignition' or 'avalanche'—is large endogenous EM field perturbations in the brain, entirely consistent with the cemi field theory.

Jones & Hunt (2023) provide a wide-ranging review of field theories of consciousness culminating in their own favoured theory, combining a panpsychist view concordant with Symbiotic Existential Cosmology although specifically dependent on EM fields as it's key interface. They begin with a critical review of neuronal network approaches to conscious brain function:

Neuroscientists usually explain how our different sensory qualia arise in terms of specialized labeled lines with their own detector fibers and processing areas for taste, vision, and other sensory modes. Photoreceptors thus produce color qualia regardless of whether they are stimulated by light, pressure, or other stimuli. This method is supplemented by detailed comparisons of the fibers within each labeled line. For example, the three color fibers overlap in their response to short, medium, and long wavelengths of incoming light. So across-fiber comparisons of their firing rates help disambiguate which wavelengths are actually present. This longstanding view has arisen from various historical roots. But the overall problem is that these operations are so similar in the visual, tactile, and other sensory modes that it is unclear how these methods can differ enough to account for all the stark differences between color and taste qualia, for example. Another issue (which will be addressed more below) concerns the "hard problem" of why this biological information processing is accompanied by any conscious experience of colors, pains, et cetera.

It might be thought that recently proposed neuron-based neuroscientific theories of consciousness would offer more viable accounts of how different qualia arise. But they rarely do. For example, Global Neuronal Workspace Theory GNWT (e.g., Dehaene and Naccache, 2001; Dehaene, 2014) and Higher-Order Theories (e.g., Rosenthal, 2005) focus on access consciousness—the availability of information for acting, speaking, and reasoning. This access involves attention and thought. But these higher cognitive levels do not do justice to qualia, for qualia appear even at the very lowest levels of conscious cognition in pre-attentive iconic images.

They then explore both integrated information theory and quantum approaches such as Hameroff Penrose, illustrating their limitations:

Integrated Information Theory represents qualia information abstractly and geometrically in the form of a system's "qualia space" (Tononi 2008). This is the space where each axis represents a possible state of the system—a single combination of logic-gate interactions (typically involving synapses). .. IIT's accounts of qualia spaces are far too complex to specify except in the simplest of cases, and no tests for this method of characterizing qualia has yet been proposed, as far as we are aware.

Hameroff and Penrose have not yet addressed how different qualia arise from different quantum states. This latter issue applies to many quantum theories of consciousness. They generally omit mention of how quantum states yield the primary sensory qualia (redness, sweetness, etc.) we are familiar with. For example, Beshkar (2020) contains an interesting QBIT theory of consciousness that attributes qualia to quantum information encoded in maximally entangled states. Yet this information ultimately gets its actual blueness, painfulness, etc. from higher cortical mechanisms criticized above. Another example is Lewtas (2017). He also attributes our primary qualia to quantum levels. Each fundamental particle has some of these various qualia. Synchronized firing by neurons at different frequencies selects from the qualia and binds them to form images. ... The general problem with these highly philosophical qualia theories is that they are hard to evaluate. Their uniting of qualia to quanta is not spelt out in testable detail.

They then outline the difficulties network based neuroscience has dealing with qualia:

Standard neuroscience has not explained well how the brain's separate, distributed visual circuits bind together to support a unified image. This is an aspect of the so-called "binding problem" of how the mind's unity arises ... visual processing uses separate, parallel circuits for color and shape, and it is unclear how these circuits combine to form complete images. Ascending color and shape circuits have few if any synapses for linking their neurons to create colored shapes. Nor do they converge on any central visual area.

- (1) **The coding/correlation problem:** As argued above, the neuronal and computational accounts above have failed to find different information-processing operations among neurons that encode our different qualia.
- (2) **The qualia-integration problem:** Computational accounts also face the problem of explaining how myriad qualia are integrated together to produce overall unified perceptions such as visual images.
- (3) **The hard problem:** In addition to the two empirical problems above, computational accounts face a hard, metaphysical problem. Why are neural events accompanied by any qualia at all?

They then explore how field theories can address these fundamental issues:

EM field approaches to minds have offered new theories of qualia and consciousness, some of which are testable. These electromagnetic approaches seat consciousness primarily in the various complex EM fields generated by neurons, glia and the rest of the brain and body. ... These EM field approaches are proliferating because they draw on considerable experimental evidence and withstand past criticisms from standard neuroscience. For example, they have explained the unity of consciousness in terms of the physical unity (by definition) of EM fields—in contrast to the discrete nature of neurons and their synaptic firing. In the last two decades, they have also offered explanations of how neural EM activity creates different qualia.

Pockett's (2000) theory of qualia is an important landmark in EM field theories of mind. It is rooted in extensive experimental evidence, makes testable predictions, and is strongly defended against critics. If Kohler, Libet, Eccles, and Popper helped establish the EM field approach to minds, Susan Pockett has arguably done more to develop it than anyone else—except for perhaps Johnjoe McFadden. ... Pockett's basic claim is that "consciousness is identical with certain spatiotemporal patterns in the electromagnetic field" (*ibid.*, pp. vi, 109, 136–7). Her evidence comes mainly from extensive EEG and MEG studies of neural electromagnetic fields. They show correlations between sensory qualia and field patterns. For example, EEG studies by Freeman (1991) show that various odors (e.g., from bananas or sawdust) correlate with specific spatial patterns distributed across mammalian olfactory areas.

McFadden's (202b) theory says that information is conscious at all levels, which seems to entail a form of panpsychism (McFadden, 2002b). The "discrete" consciousness of elementary particles is limited and isolated. But as particles join into a field, they form a unified "field" consciousness. As these fields affect motor neurons, the brain's consciousness is no longer an epiphenomenon, for its volition can communicate with the world. This level of "access" consciousness serves as a global workspace where specialized processors compete for access to volition's global, conscious processes. McFadden rejects popular views that minds are just ineffectual epiphenomena of brain activity. Instead, field–nerve interactions are the basis of free will. The conscious field is deterministic, yet it is free in that it affects behavior instead of being epiphenomenal (McFadden, 2002a,b). This treats determinism as compatible with free will construed as self-determination.

They postpone the hard problem and focus on the first two above:

- (1) **The coding/correlation problem:** What different EM-field activities encode or correlate with the various qualia? Both field theories above face difficulties here.
- (2) **The qualia-integration problem:** How do EM fields integrate myriad qualia to form (for example) unified pictorial images? Here field theories seem quite promising in their ability to improve upon standard neuroscience.

They then cite three emergent field theories which have sought to address the outstanding problems faced by the field theories already discussed:

Ward and Guevara (2022) localize qualia in the fields generated by a particular part of the brain. Their intriguing thesis is that our consciousness and its qualia are based primarily on structures in thalamic EM fields which serve to model environmental and bodily information in ways relevant to controlling action. Ward and Guevara argue that the physical substrate of consciousness is limited to strong neural EM fields where synchronously firing neurons reinforce each other's information in a manner which is also integrated and complex. Finally, local, nonsynchronous fields can be canceled out in favor of a dominant field that synchronously and coherently represents all the information from our senses, memories, emotions, et cetera. For these reasons, Ward and Guevara believe that

fields are better candidates than neurons and synaptic firing for the primary substrate of consciousness. ... they cite four reasons for ascribing consciousness to the thalamus. (1) We are not conscious of all sensory computations, just their end result, which involves the thalamic dynamic core. (2) Thalamic dysfunctions (but not necessarily cortical dysfunctions) are deeply involved in nonconsciousness conditions such as anesthesia, unresponsive wakefulness syndrome, and anoxia. (3) The thalamus is a prime source and controller of synchronization (in itself and in cortex), which is also associated with consciousness. (4) The thalamus (especially its DM nucleus Ouhaz et al. 2018) is ideally suited for the integrative role associated with consciousness, for cortical feedbacks seem to download cortical computations into thalamus. ... These lines of evidence indicate that while cortex computes qualia, thalamus displays qualia.

Another author who attributes qualia to fundamental EM activity is Bond (2023). This clear, succinct paper explains that quantum coherence involves the entanglement of quanta within energy fields, including the EM fields generated by neurons. Neural matter typically lacks this coherence because the haphazard orientation of quantum spins in the matter creates destructive interference and decoherence. Bond proposes the novel idea that firing neurons generate EM fields that can flow through nearby molecular structures and entangle with their atoms. This coherence produces our perceptions. The different subjective feelings of these perceptions come from different hybrids or mixtures of the fields' wavelengths as they vibrate or resonate. ... On a larger scale, this coherence ties into the well-known phase-locking of corticothalamic feedback loops. Together, they produce the holism or unity of consciousness. This combination of coherent, phase-locked feedback loops and coherent, entangled wave-particles in EM fields is called by Bond a "coherence field." It is investigated by his Coherence Field Theory (CFT).

Finally, as joint authors, they elucidate their favoured theory GRT arising from their independent research:

Another approach to the Qualia Problem is Hunt and Schooler's **General Resonance Theory (GRT)**, which is grounded in a panpsychist framework. GRT assumes that all matter is associated with at least some capacity for phenomenal consciousness (this is called the "panpsychism axiom"), but that consciousness is extremely rudimentary in the vast majority of cases due to a lack of physical complexity mirrored by the lack of mental complexity. The EM fields associated with all baryonic matter (i.e., charged particles) are thought to be the primary seat of consciousness simply because EM fields are the primary force at the scale of life (strong and weak nuclear fields are operative at scales far smaller and gravity is operative mostly at scales far larger). Accordingly, GRT is applicable to all physical structures and as a theory is not limited only to neurobiological or even biological structures (Hunt and Schooler, 2019).

GRT suggests that resonance (similar but not synonymous with synchronization and coherence) of various types is the key mechanism by which the basic constituents of consciousness, when in sufficient proximity, combine into more complex types of consciousness. This is the case because shared resonance allows for phase transitions in the speed and bandwidth of information exchange to occur at various organizational levels, allowing previously disordered systems to self-organize and thus become coherent by freely sharing information and energy.

Qualia, in GRT, are synonymous with consciousness, which is simply subjective experience:

Jones (2017, 2019), a coauthor of the current paper, has developed an EM-field theory of qualia. Like other field theories, it attributes qualia and images to neural EM-field patterns (and probably the EM-charged matter emitting the fields). Yet these are not the coded images of computational field theories that are based on information processing. Instead, in his theory images actually reside in conscious, pictorial form within the EM fields of neural maps. This is a neuroelectrical, pure panpsychist theory of mind (NP). The "pure panpsychism" says that everything (not just EM) is comprised purely of consciousness. NP addresses the hard problem, qualia-integration problem, and qualia coding/correlation problem in the following ways.

- (1) **The hard problem:** How are qualia metaphysically related to brains and computations? In NP, consciousness and its qualia are the hidden nature of observable matter and energy. We are directly aware of our inner conscious thoughts and feelings. Yet we are just indirectly aware of the observable, external world through reflected light, instruments, sense organs, et cetera.
- (2) **The qualia coding/correlation problem:** How do our various qualia arise? Yet there is now growing evidence that different qualia correlate with different electrically active substances in cellular membranes found in sensory and emotional circuits. These substances are the membranes' ion-channel proteins and associated G-protein-coupled receptors (GPCRs). For example, the different primary colors correlate with different OPN1 GPCRs ... oxytocin and vasopressin receptor proteins correlate with feelings of love, estrogen and testosterone receptors correlate with lust, the endorphin receptor correlates with euphoria, and the adrenaline receptor correlates with vigilance.
- (3) **The qualia-integration problem:** First, how do various qualia unify together into an overall whole? Second, how specifically do qualia join point by point to form pictorial images? In NP's field theory, active circuits create a continuous EM field between neurons that pools their separate, atomized consciousness. This creates a unified conscious mind along brain circuits (with the mind itself residing in the field and perhaps in the charged matter creating the field). This unity is strongest around the diffuse ion currents that run along (and even between) neuronal circuits. It is very strong among well-aligned cortical cells that fire together coherently.

In conclusion ... Consciousness is characterized mainly by its privately experienced qualities (qualia). Standard, computation-based and synapse-based neuroscience have serious difficulties explaining them. ... field theories have improved in key ways upon standard neuroscience in explaining qualia. But this progress is sometimes tentative—it awaits further evidence and development.

Summarising the state of play, we have two manifestations of consciousness at the interface with objective physical description, (a) **the hard problem of consciousness** and (b) **the problem of quantum measurement**, both of which are in continual debate. Together these provide complementary windows on the abyss in the scientific description and a complete solution of existential cosmology that we shall explore in this article.

Neural Nets versus Biological Brains

Steven Grossberg is recognised for his contribution to ideas using nonlinear systems of differential equations such as laminar computing, where the layered cortical structures of mammalian brains provide selective advantages, and for complementary computing, which concerns the idea that pairs of parallel cortical processing streams compute complementary properties in the brain, each stream having complementary computational strengths and weaknesses, analogous to physical complementarity in the uncertainty principle. Each can possess multiple processing stages realising a hierarchical resolution of “uncertainty”, which here means that computing one set of properties at a given stage prevents computation of a complementary set of properties at that stage.

The primary intuition behind the ART model is that object identification and recognition generally occur as a result of the interaction of 'top-down' observer expectations with 'bottom-up' sensory information. The model postulates that 'top-down' expectations take the form of a memory template or prototype that is then compared with the actual features of an object as detected by the senses. This comparison gives rise to a measure of category belongingness. As long as this difference between sensation and expectation does not exceed a set threshold called the 'vigilance parameter', the sensed object will be considered a member of the expected class. The system thus offers a solution to the 'plasticity/stability' problem, i.e. the problem of acquiring new knowledge without disrupting existing knowledge that is also called incremental learning.

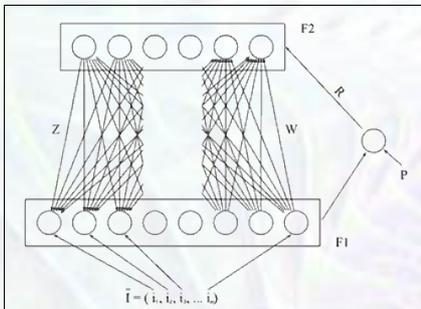
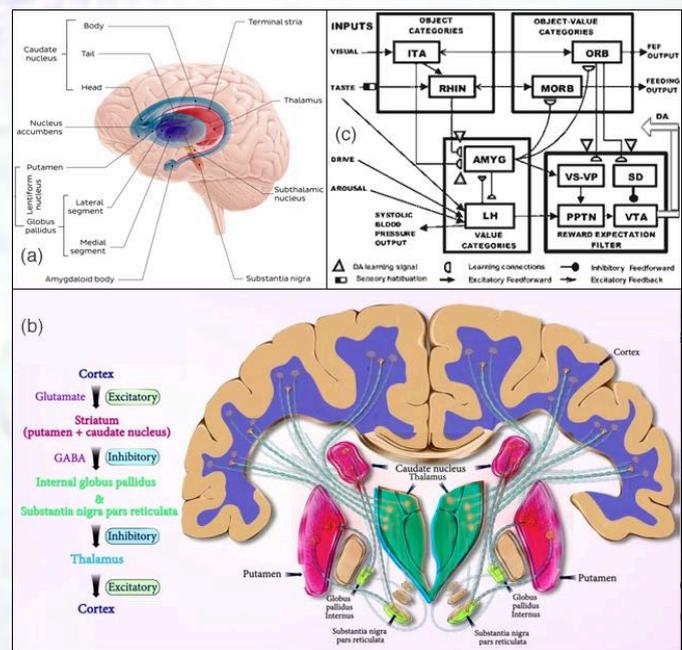


Fig 82b: The basic ART structure.

“Conscious Mind, Resonant Brain” (Grossberg 2021) provides a panoramic model of the brain, from neural networks to network representations of conscious brain states. In so doing, he presents a view based on resonant non-linear systems, which he calls adaptive resonance theory (ART), in which a subset of “resonant” brain states are associated with conscious experiences. While I like his use of non-linear dynamics, ART is a structural abstract neural network model and not what I as a mathematical dynamicist conceive of as “resonance”, compared with the more realistic GNW, or global neuronal workspace model.

Fig 83: Brain centres involved in intentional behaviour and subjectively conscious physical volition: (a) The cortex overlaying the basal ganglia, thalamus and amygdala and substantia nigra involved in planned action, motivation and volition. (b) The interactive circuits in the cortex, striatum and thalamus facilitating intentional motor behaviour. (c) The Motivator model clarifies how the basal ganglia and amygdala coordinate their complementary functions in the learning and performance of motivated acts. Brain areas can be divided into four regions that process information about conditioned stimuli (CSs) and unconditioned stimuli (USs). (a) Object Categories represent visual or gustatory inputs, in anterior inferotemporal (ITA) and rhinal (RHIN) cortices; (b) Value Categories represent the value of anticipated outcomes on the basis of hunger and satiety inputs, in amygdala (AMYG) and lateral hypothalamus (LH); (c) Object-Value Categories resolve the value of competing perceptual stimuli in medial (MORB) and lateral (ORB) orbitofrontal cortex; and (d) the Reward Expectation Filter in the basal ganglia detects the omission or delivery of rewards using a circuit that spans ventral striatum (VS), ventral pallidum (VP), striosomes of the striatum, the pedunculopontine nucleus (PPTN) and midbrain dopaminergic neurons of the SNc/VTA (substantia nigra pars compacta/ventral tegmental area). The network model connecting brain regions is consistent with both quantum and classical approaches and in no way eliminates subjective conscious volition from having an autonomous role. All it implies is that conscious volition arises from an evolved basis in these circuit relationships in mammals.



The work shows in detail how and why multiple processing stages are needed before the brain can construct a complete and stable enough representation of the information in the world with which to predict environmental challenges and thus control effective behaviours. Complementary computing and hierarchical resolution of uncertainty overcome these problems until perceptual representations that are sufficiently complete, context-sensitive, and stable can be formed. The brain regions where these representations are completed are different for seeing, hearing, feeling, and knowing.

His proposed answer is that a resonant state is generated that selectively “lights up” these representations and thereby renders them conscious. These conscious representations can then be used to trigger effective behaviours:

*My proposed answer is: A resonant state is generated that selectively “lights up” these representations and thereby renders them conscious. These conscious representations can then be used to trigger effective behaviors. Consciousness hereby enables our brains to prevent the noisy and ambiguous information that is computed at earlier processing stages from triggering actions that could lead to disastrous consequences. Conscious states thus provide **an extra degree of freedom** whereby the brain ensures that its interactions with the environment, whether external or internal, are as effective as possible, given the information at hand.*

He addresses the hard problem of consciousness in its varying aspects:

As Chalmers (1995) has noted: “The really hard problem of consciousness is the problem of experience. When we think and perceive, there is a whirl of information-processing, but there is also a subjective aspect. As Nagel (1974) has put it, there is something it is like to be a conscious organism. This subjective aspect is experience. When we see, for example, we experience visual sensations: the felt quality of redness, the experience of dark and light, the quality of depth in a visual field. ... Even after we have explained the functional, dynamical, and structural properties of the conscious mind, we can still meaningfully ask the question, Why is it conscious? There seems to be an unbridgeable explanatory gap between the physical world and consciousness. All these factors make the hard problem hard. ... Philosophers vary passionately in their views between the claim that no Hard Problem remains once it is explained how the brain generates experience, as in the writings of Daniel Dennett, to the claim that it cannot in principle be solved by the scientific method, as in the writings of David Chalmers. See the above reference for a good summary of these opinions.

Grossberg demonstrates that, over and above information processing, our brains sometimes go into a context-sensitive resonant state that can involve multiple brain regions. He explores experimental evidence that “all conscious states are resonant states” but not vice versa. Showing that, since not all brain dynamics are “resonant”, consciousness is not just a “whirl of information-processing”:

When does a resonant state embody a conscious experience? “Why is it conscious”? And how do different resonant states support different kinds of conscious qualia? The other side of the coin is equally important: When does a resonant state fail to embody a conscious experience? Advanced brains have evolved in response to various evolutionary challenges in order to adapt to changing environments in real time. ART explains how consciousness enables such brains to better adapt to the world’s changing demands.

Grossberg is realistic about the limits on a scientific explanation of the hard problem:

It is important to ask: How far can any scientific theory go towards solving the Hard Problem? Let us suppose that a theory exists whose neural mechanisms interact to generate dynamical states with properties that mimic the parametric properties of the individual qualia that we consciously experience, notably the spatio-temporal patterning and dynamics of the resonant neural representations that represent these qualia. Suppose that these resonant dynamical states, in addition to mirroring properties of subjective reports of these qualia, predict properties of these experiences that are confirmed by psychological and noninvasive neurobiological experiments on humans, and are consistent with psychological, multiple-electrode neurophysiological data, and other types of neurobiological data that are collected from monkeys who experience the same stimulus conditions.

He then develops a strategy to move beyond the notion of the neural correlate of consciousness (Crick & Koch 1990), claiming these states are actually the physical manifestation of the conscious state:

Given such detailed correspondences with experienced qualia and multiple types of data, it can be argued that these dynamical resonant states are not just “neural correlates of consciousness” that various authors have also discussed, notably David Chalmers and Christof Koch and their colleagues. Rather, they are mechanistic representations of the qualia that embody individual conscious experiences on the psychological level. If such a correspondence between detailed brain representations and detailed properties of conscious qualia occurs for a sufficiently large body of psychological data, then it would provide strong evidence that these brain representations create and support these conscious experiences. A theory of this kind would have provided a linking hypothesis between brain dynamics and the conscious mind. Such a linking hypothesis between brain and mind must be demonstrated before one can claim to have a “theory of consciousness”.

However he then delineates the claim that this is the most complete scientific account of subjective experience possible, while conceding that it may point to a cosmological problem akin those in relativity and quantum theory:

If, despite such a linking hypothesis, a philosopher or scientist claims that, unless one can “see red” or “feel fear” in a theory of the Hard Problem, then it does not contribute to solving that problem, then no scientific theory can ever hope to solve the Hard Problem. This is true because science as we know it cannot do more than to provide a mechanistic theoretical description of the dynamical events that occur when individual conscious qualia are experienced. However, as such a principled, albeit incrementally developing, theory of consciousness becomes available, including increasingly detailed psychological, neurobiological, and even biochemical processes in its explanations, it can dramatically shift the focus of discussions about consciousness, just as relativity theory transformed discussions of space and time, and quantum theory of how matter works. As in quantum theory, there are measurement limitations in understanding our brains.

Although he conceives of brain dynamics as being poised just above the level of quantum effects in vision and hearing, Grossberg sees brains as a new frontier of scientific discovery subject to the same principles of complementarity and uncertainty as arise in quantum physics:

Since brains form part of the physical world, and interact ceaselessly with it to adapt to environmental challenges, it is perhaps not surprising that brains also obey principles of complementarity and uncertainty. Indeed, each brain is a measurement device for recording and analyzing events in the physical world. In fact, the human brain can detect even small numbers of the photons that give rise to percepts of light, and is tuned just above the noise level of phonons that give rise to percepts of sound.

Complementarity and uncertainty principles also arise in physics, notably in quantum mechanics. Since brains form part of the physical world, and interact ceaselessly with it to adapt to environmental challenges, it is perhaps not surprising that brains also obey principles of complementarity and uncertainty. Indeed, each brain is a measurement device for recording and analyzing events in the physical world. In fact, the human brain can detect even small numbers of the photons that give rise to percepts of light, and is tuned just above the noise level of phonons that give rise to percepts of sound.

The Uncertainty Principle identified complementary variables, such as the position and momentum of a particle, that could not both be measured with perfect precision. In all of these theories, however, the measurer who was initiating and recording measurements remained out- side the measurement process. When we try to understand the brain, this is no longer possible. The brain is the measurement device, and the process of understanding mind and brain is the study of how brains measure the world. The measurement process is hereby brought into physical theory to an unprecedented degree.

Such neurosystem models provide key insights into how processes associated with intentional acts and the reinforcement of sensory experiences through complementary adaptive networks, model the neural correlate of conscious volitional acts and their smooth motor execution in the world at large. As they stand, these are still classical objective models that do not actually invoke conscious volition as experienced, but they do provide deep insight into the brain's adaptive processes accompanying subjective conscious volition.

The brain's universal measurement process can be expected to have a comparable impact on future science, once its implications are more broadly understood. Brain dynamics operate, however, above the quantum level, although they do so with remarkable efficiency, responding to just a few photons of light in the dark, and to faint sounds whose amplitude is just above the level of thermal noise in otherwise quiet spaces. Knowing more about how this exquisite tuning arose during evolution could provide important new information about the design of perceptual systems, no less than about how quantum processes interface with processes whose main interactions seem to be macroscopic.

Grossberg sees the brain as presenting new issues for science as measurement devices confounding their separation between measured effect and the observer making a quantum measurement:

Since brains are also universal measurement devices, how do they differ from these more classical physical ideas? I believe that it is the brain's ability to rapidly self-organize, through development and life-long learning, that sets it apart from previous physical theories. The brain thus represents a new frontier in measurement theory for the physical sciences, no less than the biological sciences. It remains to be seen how physical theories will develop to increasingly incorporate concepts about the self-organization of matter, and how these theories will be related to the special case of brain self-organization.

Experimental and theoretical evidence will be summarized in several chapters in support of the hypothesis that principles of complementarity and uncertainty that are realized within processing streams, better explain the brain's functional organization than concepts about independent modules. Given this conclusion, we need to ask: If the brain and the physical world are both organized according to such principles, then in what way is the brain different from the types of physical theories that are already well-known? Why haven't good theoretical physicists already “solved” the brain using known physical theories?

In discussing the hierarchical feedback of the cortex and basal ganglia and the limbic system, Grossberg (2015) fluently cites both consciousness and volition as adaptive features of the brain as a self-organising system:

The basal ganglia control the gating of all phasic movements, including both eye movements and arm movements. Arm movements, unlike eye movements, can be made at variable speeds that are under volitional basal ganglia control. Arm movements realize the Three S's of Movement Control; namely, Synergy, Synchrony, and Speed. ... Many other brain processes can also be gated by the basal ganglia, whether automatically or through conscious volition. Several of these gating processes seem to regulate whether a top-down process subliminally primes or fully activates its target cells. As noted in Section 5.1, the ART Matching Rule enables the brain to dynamically stabilize learned memories using top-down attentional matching.

Such a volitionally-mediated shift enables top-down expectations, even in the absence of supportive bottom-up inputs, to cause conscious experiences of imagery and inner speech, and thereby to enable visual imagery, thinking, and planning activities to occur. Thus, the ability of volitional signals to convert the modulatory top-down priming signals into suprathreshold activations provides a great evolutionary advantage to those who possess it.

My critique, which this is clear and simple, is that these designs remove such a high proportion of the key physical principles involved in biological brain function that they can have no hope of modelling subjective consciousness or volition, despite the liberal use of these terms in the network designs, such as the basal ganglia as gateways. Any pure abstract neural net model, however much it adapts to "resonate" with biological systems is missing major fundamental formative physical principles of how brains actually work.

These include:

- (a) The fact that biological neural networks are both biochemical and electrochemical in two ways (1) all electrochemical linkages, apart from gap junctions, work through the mediation of biochemical neurotransmitters and (2) the internal dynamics of individual neurons and glia are biochemical, not electrochemical.
- (b) The fact that the electrochemical signals are dynamic and involve sophisticated properties including both (1) unstable dynamics at the edge of chaos and (2) phase coherence tuning between continuous potential gradients and action potentials.
- (c) They involve both neurons and neuroglia working in complementary relationship.
- (d) They involve developmental processes of cell migration determining the global architecture of the brain including both differentiation by the influence of neurotransmitter type and chaotic excitation in early development.
- (e) This neglects the fact that evolution of biological brains as neural networks is built on the excitatory neurotransmitter-driven social signalling and quantum sentience of single celled eucaryotes, forming an intimately coupled society of amoeba-flagellate cells communicating by the same neurotransmitters as in single-celled eucaryotes, so these underlying dynamics are fundamental and essential to biological neural net functionality.

Everything from simple molecules such as ATP acting as the energy currency of the cell, through protein folding, to enzymes involve quantum effects, such as tunnelling at active sites, and ion channels are at the same level.

It is only a step from there to recognising that such biological processes are actually fractal non-IID (not identically independently-distributed quantum processes, not converging to the classical, in the light of Gallego & Dakić (2021), because their defining contexts are continually evolving, to thus provide a causally open view of brain dynamics, in which the extra degree of freedom provided by consciousness, that complements objective physical computation, arises partly through quantum uncertainty itself, in conscious volition becoming subjectively manifest, and ensuring survival under uncertain environmental threats.

However, this is not just a rational or mechanistically causal process. We evolved from generation upon generation of organisms surviving existential threats in the wild, which were predominantly solved by lightning fast hunch and intuition, and never by rational thought alone, except recently and all too briefly in our cultural epoch.

The great existential crises have always been about surviving environmental threats which are not only computationally intractable due to exponentiating degrees of freedom, but computationally insoluble because they involve the interaction of live volitional agents, each consciously violating the rules of the game.

Conscious volition evolved to enable subjective living agents to make hunch-like predictions of their own survival in contexts where no algorithmic or deterministic process, including the nascent parallelism of the cortex, limbic system and basal ganglia that Steve Grossberg has drawn attention to, could suffice, other than to define boundary conditions on conscious choices of volitional action. Conscious intentional will, given these constraints, remained the critical factor, complementing computational predictivity generated through non-linear dynamics, best predicting survival of a living organism in the quantum universe, which is why we still possess it.

When we come to the enigma of subjective conscious anticipation and volition under survival threats, these are clearly, at the physiological level, the most ancient and most strongly conserved. Although the brains of vertebrates, arthropods and cephalopods show vast network differences, the underlying processes generating consciousness remain strongly conserved to the extent that baby spiders display clear REM features during sleep despite having no obvious neural net correspondence. While graded membrane excitation is universal to all eucaryotes and shared by human phagocytes and amoeba, including the genes for the poisons used to kill bacteria, the action potential appears to have evolved only in flagellate eucaryotes, as part of the flagellar escape response to existential threat, later exemplified by the group flagellation of our choano-flagellate ancestor colonies.

Just as circuit design models can have predictive value, so does subjective conscious volition of the excitable eucaryote cell have clear survival value in evolution and hence predictive power of survival under existential threat, both in terms of arbitrary sensitivity to external stimuli at the quantum level and neurotransmitter generated social decision-making of the collective organism. Thus the basis of what we conceive of as subjective conscious volition is much more ancient and longer and more strongly conserved than any individual network model of the vertebrate brain and underlies all attempts to form realistic network models.

All brains are thus intimate societies of dynamically-coupled excitable cells (neurons and glia) communicating through these same molecular social signalling pathways that social single celled eucaryotes use. Both strategic intelligence and conscious volition as edge-of-chaos membrane excitation in global feedback thus arose long before brains and network designs emerged.

Since our cultural emergence, *Homo sapiens* has been locked in a state of competitive survival against its own individuals, via Machiavellian intelligence, but broadly speaking, rationality – dependence on rational thought processes as a basis for adaption – just brings us closer to the machine learning of robots, rather than conscious volition. Steve’s representation of the mechanical aspects in the basal ganglia in Grossberg (2015) gives a good representation of how living neurosystems adaptively evolve to make the mechanical aspect of the neural correlate of conscious volition possible, but it says little about how we actually survive the tiger’s pounce, let alone the ultimate subtleties of human political intrigue, when the computational factor are ambiguous.. Likewise decision theory or prospect theory, as noted in Wikipedia, tells us only a relatively obvious asymmetric sigmoidal function describing how risk aversion helps us survive, essentially because being eaten rates more decisively in the cost stakes than any single square meal as a benefit.

Because proving physical causal closure of the universe in brain dynamics is impossible to practically achieve in the quantum universe, physical materialism is itself not a scientific concept, so all attempts to model and understand conscious volition remain open and will continue to do so. The hard problem of consciousness is not a division between science and philosophy as Steve suggests in his (2021) book, but our very oracle of cosmological existence.

Epiphenomenalism, Interactionism, Conscious Volition and Free Will

Thomas Kuhn (1922–1996) is perhaps the most influential philosopher of science of the twentieth century. His book “The Structure of Scientific Revolutions” (Kuhn 1962) is one of the most cited academic books of all time. A particularly important part of Kuhn’s thesis focuses upon the consensus on exemplary instances of scientific research. These exemplars of good science are what Kuhn refers to when he uses the term ‘paradigm’ in a narrower sense. He cites Aristotle’s analysis of motion, Ptolemy’s computations of planetary positions, Lavoisier’s application of the balance, and Maxwell’s mathematisation of the electromagnetic field as paradigms (ibid, 23). According to Kuhn the development of a science is not uniform but has alternating ‘normal’ and ‘revolutionary’ (or ‘extraordinary’) phases in which paradigm shifts occur.

Rejecting a teleological view of science progressing towards the truth, Kuhn favours an evolutionary view of scientific progress (1962 170–3). The evolutionary development of an organism might be seen as its response to a challenge set by its environment. But that does not imply that there is some ideal form of the organism that it is evolving towards. Analogously, science improves by allowing its theories to evolve in response to puzzles and progress is measured by its success in solving those puzzles; it is not measured by its progress towards to an ideal true theory. While evolution does not lead towards ideal organisms, it does lead to greater diversity of kinds of organism. This is the basis of a Kuhnian account of specialisation in science in which the revolutionary new theory that succeeds in replacing another

that is subject to crisis, may fail to satisfy all the needs of those working with the earlier theory. One response to this might be for the field to develop two theories, with domains restricted relative to the original theory (one might be the old theory or a version of it).

Free will is the notion that we can make real choices which are partially or completely independent of antecedent conditions – "the power of acting without the constraint of necessity or fate; the ability to act at one's own discretion", in the context of the given circumstances. Determinism denies this and maintains that causation is operative in all human affairs. Increasingly, despite the discovery of quantum uncertainty, scientists argue that their discoveries challenge the existence of free will. Studies indicate that informing people about such discoveries can change the degree to which they believe in free will and subtly alter their behaviour, leading to a social erosion of human agency, personal and ethical responsibility.

Philosophical analysis of free will divides into two opposing responses. Incompatibilists claim that free will and determinism cannot coexist. Among incompatibilists, metaphysical libertarians, who number among them Descartes, Bishop Berkeley and Kant, argue that humans have free will, and hence deny the truth of determinism. Libertarianism holds onto a concept of free will that requires the agent to be able to take more than one possible course of action under a given set of circumstances, some arguing that indeterminism helps secure free will, others arguing that free will requires a special causal power, agent-causation. Instead, compatibilists argue that free and responsible agency requires the capacities involved in self-reflection and practical deliberation; free will is the ability to make choices based on reasons, along with the opportunity to exercise this ability without undue constraints (Nadelhoffer et al. 2014). This can make rational acts or decisions compatible with determinism.

Our concern here is thus not with responsible agency, which may or may not be compatible with determinism, but affirming the existence of agency not causally determined by physical processes in the brain. Epiphenomenalists accept that subjective consciousness exists, as an internal model of reality constructed by the brain to give a global description of the coherent brain processes involved in perception attention and cognition, but deny the volitional will over our actions that is central to both reasoned and creative physical actions. This invokes a serious doubt that materialistic neuroscience can be in any way consistent with any form of consciously conceived ethics, because invoking moral or ethical reasoning is reduced to forms of aversive conditioning, consistent with behaviouralism, and Pavlov's dogs, subjectively rationalised by the subject as a reason. This places volition as being a delusion driven by evolutionary compensation to mask the futility of any subjective belief in organismic agency over the world.

Defending subjective volitional agency thus depends centrally on the innovative ability of the subjective conscious agent to generate actions which lie outside the constraints of determined antecedents, placing a key emphasis on creativity and idiosyncrasy, amid physical uncertainty, rather than cognitive rationality, as reasons are themselves subject to antecedents.

Bob Doyle notes that in the first two-stage model of free-will, William James (1884) proposed that indeterminism is the source for what James calls "alternative possibilities" and "ambiguous futures." The chance generation of such alternative possibilities for action does not in any way limit his choice to one of them. For James chance is not the direct cause of actions. James makes it clear that it is his choice that "grants consent" to one of them. In 1884, James asked some Harvard Divinity School students to consider his choice for walking home after his talk:

"What is meant by saying that my choice of which way to walk home after the lecture is ambiguous and matter of chance?...It means that both Divinity Avenue and Oxford Street are called but only one, and that one either one, shall be chosen."

James was thus the first thinker to enunciate clearly a two-stage decision process, with chance in a present time of random alternatives, leading to a choice which grants consent to one possibility and transforms an equivocal ambiguous future into an unalterable and simple past. There is a temporal sequence of undetermined alternative possibilities followed by an adequately determined choice where chance is no longer a factor. James also asked the students to imagine his actions repeated in exactly the same circumstances, a condition which is regarded today as one of the great challenges to libertarian free will. He anticipates much of modern physical theories of multiple universes:

Imagine that I first walk through Divinity Avenue, and then imagine that the powers governing the universe annihilate ten minutes of time with all that it contained, and set me back at the door of this hall just as I was before the choice was made. Imagine then that, everything else being the same, I now make a different choice and traverse Oxford Street. You, as passive spectators, look on and see the two alternative universes,--one of them with me walking through Divinity Avenue in it, the other with the same me

walking through Oxford Street. Now, if you are determinists you believe one of these universes to have been from eternity impossible: you believe it to have been impossible because of the intrinsic irrationality or accidentality somewhere involved in it. But looking outwardly at these universes, can you say which is the impossible and accidental one, and which the rational and necessary one? I doubt if the most ironclad determinist among you could have the slightest glimmer of light on this point.

Henri Poincaré speculated on how his mind worked when solving mathematical problems. He had the critical insight that random combinations and possibilities are generated, some in an unconsciously, then they are selected among, perhaps initially also by an unconscious process, but then by a definite conscious process of validation:

It is certain that the combinations which present themselves to the mind in a kind of sudden illumination after a somewhat prolonged period of unconscious work are generally useful and fruitful combinations... all the combinations are formed as a result of the automatic action of the subliminal ego, but those only which are interesting find their way into the field of consciousness... A few only are harmonious, and consequently at once useful and beautiful, and they will be capable of affecting the geometrician's special sensibility I have been speaking of; which, once aroused, will direct our attention upon them, and will thus give them the opportunity of becoming conscious... In the subliminal ego, on the contrary, there reigns what I would call liberty, if one could give this name to the mere absence of discipline and to disorder born of chance.

Even reductionist Daniel Dennett, who is a libertarian, has his version of decision-making:

The model of decision making I am proposing has the following feature: when we are faced with an important decision, a consideration-generator whose output is to some degree undetermined produces a series of considerations, some of which may of course be immediately rejected as irrelevant by the agent (consciously or unconsciously). Those considerations that are selected by the agent as having a more than negligible bearing on the decision then figure in a reasoning process, and if the agent is in the main reasonable, those considerations ultimately serve as predictors and explicators of the agent's final decision.

The Two-Stage Model of Arthur Compton championed the idea of human freedom based on quantum uncertainty and invented the notion of amplification of microscopic quantum events to bring chance into the macroscopic world. Years later, he clarified the two-stage nature of his idea in an Atlantic Monthly article in 1955:

A set of known physical conditions is not adequate to specify precisely what a forthcoming event will be. These conditions, insofar as they can be known, define instead a range of possible events from among which some particular event will occur. When one exercises freedom, by his act of choice he is himself adding a factor not supplied by the physical conditions and is thus himself determining what will occur. That he does so is known only to the person himself. From the outside one can see in his act only the working of physical law. It is the inner knowledge that he is in fact doing what he intends to do that tells the actor himself he is free.

At first Karl Popper dismissed quantum mechanics as being no help with free will, but later describes a two-stage model paralleling Darwinian evolution, with genetic mutations being probabilistic and involving quantum uncertainty:

In 1977 he gave the first Darwin Lecture "Natural Selection and the Emergence of Mind". In it he said he had changed his mind (a rare admission by a philosopher) about two things. First he now thought that natural selection was not a "tautology" that made it an unfalsifiable theory. Second, he had come to accept the random variation and selection of ideas as a model of free will. The selection of a kind of behavior out of a randomly offered repertoire may be an act of choice, even an act of free will. I am an indeterminist; and in discussing indeterminism I have often regretfully pointed out that quantum indeterminacy does not seem to help us;¹ for the amplification of something like, say, radioactive disintegration processes would not lead to human action or even animal action, but only to random movements. This is now the leading two-stage model of free will. I have changed my mind on this issue. A choice process may be a selection process, and the selection may be from some repertoire of random events, without being random in its turn. This seems to me to offer a promising solution to one of our most vexing problems, and one by downward causation.

These accounts span diverse thinkers, from James, through Dennett to Compton, so whether you are a materialist or a mentalist you can adapt two process volition to your taste. Therefore it says nothing about the nature of conscious decision making or the hard problem of volition. The key is that (1) something generates a set of possibilities either randomly or otherwise and (2) the mind/brain chooses one to enact, computationally, rationally or intuitively. Computationalists can say (1) is random and (2) is computational. Quantum mechanics provides for both: (1) is the indeterminacy of collapse in von Neumann process 1 and (2) is the collapsed particle dynamics of the Schrödinger equation aka von Neumann process 2.

Symbiotic Existential Cosmology affirms two empirical modes – objective verified empirical observation and subjective affirmed empirical experience, both of which are amenable to the same statistical methods. This ties to the conclusion that subjective conscious volition has efficacy over the physical universe and to the refutation of pure physicalism because causal closure of the physical universe is unprovable but empirical experience of our subjectively conscious actions towards our own physical survival clearly affirm we have voluntary conscious volition having physical effect.

Benjamin Libet has become notorious for his readiness potential suggesting consciousness has no physical effect but his statement on free will precisely echoes Symbiotic Existential Cosmology with exactly the same ethical emphasis:

Given the speculative nature of both determinist and non-determinist theories, why not adopt the view that we do have free will (until some real contradictory evidence may appear, if it ever does). Such a view would at least allow us to proceed in a way that accepts and accommodates our own deep feeling that we do have free will. We would not need to view ourselves as machines that act in a manner completely controlled by the known physical laws.

In Symbiotic Existential Cosmology the transactional interpretation is envisaged as allowing a form of prescience because the collapse has implicit information about the future state of the universe in which the absorbers exist. This may appear logically paradoxical but no classical information is transferred so there is no inconsistency. Modelling the collapse appears to happen outside space-time, but actually it is instantaneous, so dual-time is just a core part of the heuristic to understand the non-linear process.

It is absolutely necessary for subjective conscious physical volition to be efficacious over mere computation, or it fails to confer an evolutionary advantage and would be eliminated over time by neutral and deleterious mutations in favour of purely computational brains. The fact that this hasn't happened in the 2 bYa since the eucaryote emergence tells us it DOES have an advantage in terms of intuitive anticipation shared, by all animals, who unlike us, lack rational thought, and single celled eucaryotes who have nothing more than social neurotransmitters and excitable membranes to do the same uncanny trick. So we have to look to physics and the nature of uncertainty to solve this, because environmental uncertainty has its root in quantum uncertainty, just as throwing a die does by setting off a butterfly-effect process.

This evolutionary advantage depends on a transformation of Doyle's (1), in transactional collapse being a form of non-random hidden-variable theory in which non-local correlations of the universal wave function manifest as a complex system during collapse in a way that looks deceptively like randomness because it is a complex chaotic ergodic process. It then completely transforms part (1) of the two process model of volition because the intuitive choices are anticipatory, like integral transforms of the future which we can't put into a logical causality without paradox, but which can coexist before collapse occurs. Transactional collapse incorporates implicit future information about the actual potential absorbers.

"God does not play dice with the universe." A Einstein

There is thus a clear biological requirement for subjective conscious physical volition and that is to ensure survival of existential threats in the wild. We can imagine a computer attempting to do the two-process, by throwing up heuristic options on a weighted probabilistic basis process (1) and then optimising in a choice process (2). We can imagine this is also in a sense what we do when we approach a problem rationally. But that's not what survival in the wild is about. It's about computationally intractable environmental many body problems that also involve other conscious agents, snakes, tigers and other humans, so are formally and computationally undecidable. Hence the role of intuition.

The transactional interpretation as in fig 73, becomes the key to avoiding the mechanistic pseudo-deterministic random (1) plus computational (2) process of the two process decision-making and that is why we are able to exist and evolve as conscious anticipating sentient beings. You can imagine that an advanced AI package like chatGPT can get to the water hole but there is no evidence this is possible if it is covered in smelly food attractants, with unpredictable predators on the prowl. There is not even any good evidence that rational cognition can save our bacon. It all comes down to salience, sensory acuity, paranoia and intuition.

One may think one can depend on randomness alone to provide hypothetical heuristics and avoid getting "stuck in a rut", as a Hopfield network does by thermodynamic annealing and is also key to why the brain uses edge-of-chaos instability, but randomness is arbitrary and artificial. A computer uses the time and date to seed a non-random highly ergodic process to simulate randomness. All molecular billiards arises from a wave-particle process of spreading wave functions involving quantum uncertainty just as photons do. The same for decoherence models of collapse.

This is the ultimate flaw in relying on the two process approach of Doyle based on randomness but it comes at the cost of a speculative leap about what is happening in von Neumann process 1. Quantum transactional collapse can occur instantaneously across space-time in a manner which may well be rationally contradictory about what time is, but is perfectly consistent with conscious intuition. If the universe is in a dynamical state between a multiverse and collapse to classicality, and conscious organisms, among other entities participate in collapse, we have a link between surviving

environmental uncertainty and quantum indeterminacy. If this is just randomness no anticipatory advantage results, but if it is part of a delocalised complex system hidden variable theory it can.

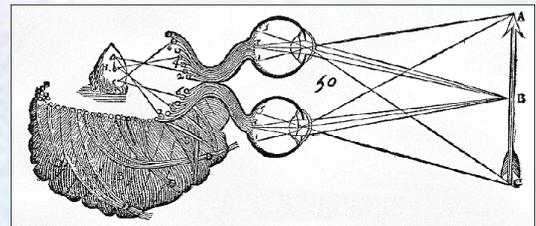
Any attempt to think about it in a causal sequence or even reason it rationally to unravel intuition would lead to paradox, so rational thought can't capture it, but intuition does reveal it, but not in a way we can prove with high sigma causality statistics because to do that we have to invoke an IID process (independent identically-distributed set of measurements), which sends the whole process down the drain of the Born probability interpretation to randomness, when the biological reality in ever-changing brain states is that each step changes the measurement context, as a non IID process, so it amounts to Schrödinger turtles all the way down.

I am prepared to make this quantum leap into special relativistic retro-causal transactions because it is consistent with quantum mechanics. It urgently needs to be explored because it has the key to how and why we are here as conscious sentient beings in this universe, in which life rises to climax conscious complexity.

Descartes originally claimed that consciousness requires an immaterial soul, which interacts with the body via the pineal gland of the brain. Gert-Jan Lokhorst (2021) describes the details of how Descartes conceived the action of the pineal on a mechanical body, noting its antiquated basis, in a purely mechanical machine made of earth:

*The pineal gland played an important role in Descartes' account because it was involved in sensation, imagination, memory and the causation of bodily movements. Unfortunately, however, some of Descartes' basic anatomical and physiological assumptions were totally mistaken, not only by our standards, but also in light of what was already known in his time. ... The bodies of Descartes' hypothetical men are nothing but machines: "I suppose the body to be **nothing but a statue or machine made of earth**, which God forms with the explicit intention of making it as much as possible like us". The working of these bodies can be **explained in purely mechanical terms**.*

Fig 84: Diagram from Descartes' *Treatise of Man* (1664), showing the formation of inverted retinal images in the eyes, and the transmission of these images, via the nerves so as to form a single, re-inverted image (an *idea*) on the surface of the pineal gland.



As a young man, Descartes had had a mystical experience in a sauna on the Danube: three dreams, which he interpreted as a message telling him to come up with a theory of everything and on the strength of this, dedicated his life to philosophy, leading to his iconic quote – *Cogito ergo sum* “I think therefore I am” – leading to Cartesian dualism, immortalised in the homunculus. This means that, in a sense, the Cartesian heritage of dualism is a genuine visionary attempt on Descartes' part, to come to terms with his own conscious experience in terms of his cognition, in distinction from the world around him. Once the separation invoked by the term dualism is replaced by complementarity, we arrive at Darwinian panpsychism.

*Experior, ergo sum, experimur, ergo sumus.
I experience therefore I am, we experience therefore we are!*

Key to Descartes' interpretation, the active process that corresponds to neuronal action potential are “animal spirits” running in the nerves from sense organ to the pineal and back out to the muscles:

In Descartes' description of the role of the pineal gland, the pattern in which the animal spirits flow from the pineal gland was the crucial notion. He explained perception as follows. The nerves are hollow tubes filled with animal spirits. They also contain certain small fibers or threads which stretch from one end to the other. These fibers connect the sense organs with certain small valves in the walls of the ventricles of the brain. When the sensory organs are stimulated, parts of them are set in motion. These parts then begin to pull on the small fibers in the nerves, with the result that the valves with which these fibers are connected are pulled open, some of the animal spirits in the pressurized ventricles of the brain escape, and (because nature abhors a vacuum) a low-pressure image of the sensory stimulus appears on the surface of the pineal gland. It is this image which then “causes sensory perception” of whiteness, tickling, pain, and so on. “It is not [the figures] imprinted on the external sense organs, or on the internal surface of the brain, which should be taken to be ideas—but only those which are traced in the spirits on the surface of the gland H (where the seat of the imagination and the ‘common’ sense is located).

This account is an attempt to explain in one model both subjective consciousness and volition over the world:

Finally, Descartes presented an account of the origin of bodily movements. He thought that there are two types of bodily movement. First, there are movements which are caused by movements of the pineal gland. The pineal gland may be moved in three ways: (1)

by “the force of the soul,” provided that there is a soul in the machine; (2) by the spirits randomly swirling about in the ventricles; and (3) as a result of stimulation of the sense organs. The role of the pineal gland is similar in all three cases: as a result of its movement, it may come close to some of the valves in the walls of the ventricles. The spirits which continuously flow from it may then push these valves open, with the result that some of the animal spirits in the pressurized ventricles can escape through these valves, flow to the muscles by means of the hollow, spirit-filled nerves, open or close certain valves in the muscles which control the tension in those muscles, and thus bring about contraction or relaxation of the muscles.

It also embraces higher functioning including imagination:

Imagination arises in the same way as perception, except that it is not caused by external objects. Continuing the just-quoted passage, Descartes wrote: “And note that I say ‘imagines or perceives by the senses’. For I wish to apply the term ‘idea’ generally to all the impressions which the spirits can receive as they leave gland H. These are to be attributed to the ‘common’ sense when they depend on the presence of objects; but they may also proceed from many other causes (as I shall explain later), and they should then be attributed to the imagination”.

Westphal (2016) notes: *According to Descartes, matter is essentially spatial, and it has the characteristic properties of linear dimensionality. Things in space have a position, at least, and a height, a depth, and a length, or one or more of these. Mental entities, on the other hand, do not have these characteristics. We cannot say that a mind is a two-by-two-by-two-inch cube or a sphere with a two-inch radius, for example, located in a position in space inside the skull. This is not because it has some other shape in space, but because it is not characterized by space at all.*

The whole problem contained in such questions arises simply from a supposition that is false and cannot in any way be proved, namely that, if the soul and the body are two substances whose nature is different, this prevents them from being able to act on each other – René Descartes

Descartes is surely right about this. The “nature” of a baked Alaska pudding, for instance, is very different from that of a human being, since one is a pudding and the other is a human being — but the two can “act on each other” without difficulty, for example when the human being consumes the baked Alaska pudding and the baked Alaska in return gives the human being a stomachache.

In a letter dated May 1643, Princess Elisabeth wrote to Descartes: *I beg you to tell me how the human soul can determine the movement of the animal spirits in the body so as to perform voluntary acts — being as it is merely a conscious substance. For the determination of the movement seems always to come about from the moving body’s being propelled — to depend on the kind of impulse*



Without minds to direct their boldly movements ... animals must be regarded as unthinking, unfeeling machines that move like clockwork – René Descartes

I beg you to tell me how the human soul can determine the movement of the animal spirits in the body so as to perform voluntary acts — being as it is merely a conscious substance – Princess Elisabeth



it gets from what it sets in motion, or again, on the nature and shape of this latter thing’s surface. Now the first two conditions involve contact, and the third involves that the impelling [thing] has extension; but you utterly exclude extension from your notion of soul, and contact seems to me incompatible with a thing’s being immaterial.

When Elisabeth and Descartes mention “animal spirits” (from the Greek physician and philosopher Galen) they are writing about something that plays roughly the role of signals in the nerve fibres of modern physiology. For Descartes, the animal spirits were not ghostly apparitions, but part of a theory that claimed that muscles were moved by inflation with air, the so-called balloonist theory. The animal spirits were fine streams of air that inflated the muscles and “animal” does not mean the beasts, but derives from “anima,” the soul.

Secondly, when Elisabeth writes that “you utterly exclude extension from your notion of soul,” she is referring to the fact that Descartes defines mind and matter in such a way that the two are mutually exclusive. Mind is consciousness, which has no extension or spatial dimension, and matter is not conscious, since it is completely defined by its spatial dimensions and location. Since mind lacks a location and spatial dimensions, Elisabeth is arguing, it cannot make contact with matter, which requires physical impinging upon an object and ensuing motion.

Westphal (2016) notes: *We have inherited the sharp distinction between mind and body, though not exactly in Descartes’s form, but we have not inherited Descartes’s solution to the mind-body problem. So we are left with the problem, minus a solution. We see that the experiences we have, such as experiences of color, are indeed very different from the electromagnetic radiation that ultimately produces them, or from the activity of the neurons in the brain. We are bound to wonder how the uncolored radiation can*

produce the color, even if its effects can be followed as far as the neurons in the visual cortex. In other words, we make a sharp distinction between physics and physiology on the one hand, and psychology on the other, without a principled way to connect them.

Skirry (2023) notes: *Human beings are supposed to be combinations of mind and body such that the mind's choices can cause modes of motion in the body, and motions in certain bodily organs, such as the eye, cause modes of sensation in the mind. ... Take for example a voluntary choice, or willing, to raise one's hand in class to ask a question. The arm moving upward is the effect while the choice to raise it is the cause. But willing is a mode of the non-extended mind alone, whereas the arm's motion is a mode of the extended body alone: how can the non-extended mind bring about this extended effect? It is this problem of voluntary bodily motion or the so-called problem of "mind to body causation" that so troubled Gassendi and Elizabeth. The crux of their concern was that in order for one thing to cause motion in another, they must come into contact with one another as, for example, in the game of pool the cue ball must be in motion and come into contact with the eight-ball in order for the latter to be set in motion. The problem is that, in the case of voluntarily bodily movements, contact between mind and body would be impossible given the mind's non-extended nature. This is because contact must be between two surfaces, but surface is a mode of body, as stated at Principles of Philosophy part II, section 15. Accordingly, the mind does not have a surface that can come into contact with the body and cause it to move. So, it seems that if mind and body are completely different, there is no intelligible explanation of voluntary bodily movement.*

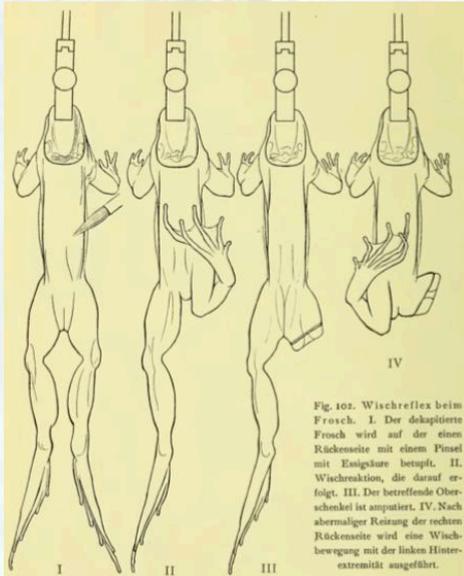
Lokhorst notes that only a few people accepted Descartes' pineal neurophysiology when he was still alive, and it was almost universally rejected after his death, partly because the pineal is no different in all mammals so cannot reflect the human soul. In philosophy, Cartesian interactionism immediately provoked "either ridicule or disgust" (Spinoza 1677), usually because it was seen as raising more problems than it solved, and it continues to do so to this day.

I do not forget, that the illustrious Descartes, though he believed, that the mind has absolute power over its actions, strove to explain human emotions by their primary causes, and, at the same time, to point out a way, by which the mind might attain to absolute dominion over them. However, in my opinion, he accomplishes nothing beyond a display of the acuteness of his own great intellect. ... For he maintained, that the soul or mind is specially united to a particular part of the brain, namely, to that part called the pineal gland, by the aid of which the mind is enabled to feel all the movements which are set going in the body, and also external objects, and which the mind by a simple act of volition can put in motion in various ways. He asserted, that this gland is so suspended in the midst of the brain, that it could be moved by the slightest motion of the animal spirits: further, that this gland is suspended in the midst of the brain in as many different manners, as the animal spirits can impinge thereon; and, again, that as many different marks are impressed on the said gland, as there are different external objects which impel the animal spirits towards it; whence it follows, that if the will of the soul suspends the gland in a position, wherein it has already been suspended once before by the animal spirits driven in one way or another, the gland in its turn reacts on the said spirits, driving and determining them to the condition wherein they were, when repulsed before by a similar position of the gland. He further asserted, that every act of mental volition is united in nature to a certain given motion of the gland. For instance, whenever anyone desires to look at a remote object, the act of volition causes the pupil of the eye to dilate, whereas, if the person in question had only thought of the dilatation of the pupil, the mere wish to dilate it would not have brought about the result, inasmuch as the motion of the gland, which serves to impel the animal spirits towards the optic nerve in a way which would dilate or contract the pupil, is not associated in nature with the wish to dilate or contract the pupil, but with the wish to look at remote or very near objects. Lastly, he maintained that, although every motion of the aforesaid gland seems to have been united by nature to one particular thought out of the whole number of our thoughts from the very beginning of our life, yet it can nevertheless become through habituation associated with other thoughts. ... He thence concludes, that there is no soul so weak, that it cannot, under proper direction, acquire absolute power over its passions. For passions as defined by him are "perceptions, or feelings, or disturbances of the soul, which are referred to the soul as species, and which (mark the expression) are produced, preserved, and strengthened through some movement of the spirits" (Spinoza 1677).

This reveals an important principle at the core of unravelling the mind-brain or consciousness-universe relationship. Elizabeth's critique is incorrect because she was assuming any interaction with a physical process has to be classically causal, but Descartes' reliance on a physical entity, the pineal made the same error, assuming the interaction portal between a subjective and objective is a classical physical entity, the pineal, rather than an unstable process. A key postulate of Symbiotic Existential Cosmology is that subjective and objective aspects of cosmological reality are linked through quantum uncertainty, as are several theories of consciousness that cite quantum physics. Symbiotic Existential Cosmology is also an interactionist cosmology that posits an active relationship between subjective consciousness and the physical universe through the efficacy of subjective conscious volition, but it does so without citing an exceptional quantum process that can become refuted later, as Hameroff-Penrose does, by combining specific unestablished microtubular quantum computations, and gravitational collapse theories of quantum uncertainty, but rather asserts that the normal biological processes of brain dynamics achieve these capacities as they stand, thus retaining concordance between empirical neuroscience and physics unscathed by contingent exceptional assumptions. By remaining agnostic about quantum interpretations it remains concordant with empirical neuroscience and physics.

The traditional view of subjective consciousness stemming from Thomas Huxley is that of epiphenomenalism – the view that mental events are caused by physical events in the brain, but have no effects upon any physical events.

The way paradigm shifts can occur can be no more starkly illustrated than in the way in which epiphenomenalism, behaviourism and pure materialism, including reductionism came to dominate the scientific view of reality and the conscious mind.



Huxley (1874) held the view, comparing mental events to a steam whistle that contributes nothing to the work of a locomotive. William James (1879), rejected this view, characterising epiphenomenalists' mental events as not affecting the brain activity that produces them "any more than a shadow reacts upon the steps of the traveller whom it accompanies" – thus turning subjective consciousness from active agency to being a mere passenger. Huxley's essay likewise compares consciousness to the sound of the bell of a clock that has no role in keeping the time, and treats volition simply as a symbol in consciousness of the brain-state cause of an action. Non-efficacious mental events are referred to in this essay as "collateral products" of their physical causes.

Fig 85: A decapitated frog uses its right foot to try to remove burning acid but when it is cut off it uses its left, although having no brain.

Klein (2021) in continuing paragraphs notes that the story begins with Eduard Pflüger's 1853 experiments showing that some decapitated vertebrates exhibit behaviour it is tempting to call purposive. The results were controversial because purposive behaviour had long been regarded as a mark of consciousness. Those who continued to think it was such a mark had to count a pithed frog – and presumably, a chicken running around with its head cut off – as conscious. You can see such ideas echoing today in [Solms and Friston's](#) (2018) brain-stem based model of consciousness.

But this view opened the way for epiphenomenalism: just as pithed frogs seem to act with purpose even though their behaviour is not really guided by phenomenal consciousness, so intact human behaviours may seem purposive without really being guided by phenomenal consciousness.

Descartes had famously contended that living animals might be like machines in the sense of being non-conscious organisms all of whose behaviours are produced strictly mechanistically. Those in the seventeenth and eighteenth century who adopted a broadly Cartesian approach to animal physiology are often called 'mechanists', and their approach is typically contrasted with so-called 'animists'. What separated the two groups was the issue of whether and to what extent the mechanical principles of Newton and Boyle could account for the functioning of living organisms. Even for those more inclined towards mechanism, though, animistic tendencies still underlay much physiological thinking throughout the early modern period. For instance, Giovanni Borelli (1608–1679) had developed a mechanistic account of how the heart pumps blood. But even Borelli gave the soul a small but important role in this motion. Borelli contended that 'the unpleasant accumulation of blood in the heart of the preformed embryo would be perceived by the "sentient faculty" (*facultas sensitiva*) of the soul through the nerves, which would then prompt the ventricle to contract'. Only after the process was thus initiated would the circulation continue mechanistically, as a kind of physical, acquired habit. But the ultimate cause of this motion was the soul.

Fig 86: Representation of consciousness from the seventeenth century by Robert Fludd, an English Paracelsian physician.

Now, suppose one accepts purposive behaviour as a mark of consciousness (or sensation, or volition, or all of these). Then one arrives at a surprising result indeed – that the brainless frog, properly prepared, remains a conscious agent. Of course, there is a lot riding on just what is meant by 'consciousness', 'sensation', and 'volition'. Pflüger himself often wrote about the decapitated frog's supposed 'consciousness' (Bewusstsein), but was rather loose and poetic in spelling out what that term was to mean. Still, his general thesis was clear enough: that in addition to the brain, the spinal cord is also an organ that independently produces consciousness. One controversial implication is that consciousness itself may be divisible (and so



literally extended; see Huxley, 1870 5–6) – it may exist in various parts of the nervous system, even in a part of the spinal cord that has been divided from the brain (Fearing 1930 162–3).

Lotze's thought was that these behaviours seem purposive only because they are complex. If we allow that the nervous system can acquire complex, reflexive actions through bodily learning, then we can maintain that these behaviours are mechanically determined, and not guided or accompanied by any phenomenal consciousness.

The difficulty with this response is that pithed frogs find ways to solve physical challenges they cannot be supposed to have faced before being pithed. For instance, suppose one places a pithed frog on its back, holds one leg straight up, perpendicular to the body, and irritates the leg with acid. The pithed frog will then raise the other leg to the same, odd position so as to be able to wipe away the irritant. Huxley also reports that a frog that is pithed above the medulla oblongata (but below the cerebellum) loses the ability to jump, even though the frog with the brain stem and cerebellum both intact is able to perform this action, at least in response to irritation. A frog pithed just below the cerebrum 'can see, swallow, jump, and swim', though still will typically move only if prompted by an outer stimulus (Huxley 1870 3–4).

Now what does Lewes mean by 'sensation' and 'volition'?

Do what we will, we cannot altogether divest Sensibility of its psychological connotations, cannot help interpreting it in terms of Consciousness; so that even when treating of sensitive phenomena observed in molluscs and insects, we always imagine these more or less suffused with Feeling, as this is known in our own conscious states. (Lewes 1877 188–9)

He saw that one must first settle an important issue before it is possible to interpret these experiments. He wrote, "we have no proof, rigorously speaking, that any animal feels; none that any human being feels; we conclude that men feel, from certain external manifestations, which resemble our own, under feeling; and we conclude that animals feel – on similar grounds."

Now, inasmuch as the actions of animals furnish us with our sole evidence for the belief in their feeling, and this evidence is universally considered as scientifically valid, it is clear that similar actions in decapitated animals will be equally valid; and when I speak of proof, it is in this sense. Spontaneity and choice are two signs which we all accept as conclusive of sensation and volition. (Lewes 1859 237–8).

Does Pflüger's experiment prove that there is sensation or volition in the pithed frog? We cannot tell, Lewes suggests, until we first settle on some third-person-accessible mark of sensation and volition. And the marks Lewes proposes are spontaneity and choice. For Lewes, every physiological change is in some sense sensory, and every physiological change thereby influences the 'stream of Consciousness', however slightly.

Thomas Huxley (1874) offered the most influential and provocative version of the conscious automaton theory in an address in Belfast. According to this view, 'consciousness', synonymous with Lewes' 'sensation' accompanies the body without acting on it, just as 'the steam-whistle which accompanies the work of a locomotive engine is without influence upon its machinery'. Conscious states are continually being caused by brain states from moment to moment, on this view, but are themselves causally inert. In other words, although Huxley accepted the existence of sensation, he rejected the existence of 'volition' (as Lewes had used that word). This is an early form of epiphenomenalism.

Pflüger and Lewes had indeed established the existence of purposive behaviour in pithed frogs, Huxley readily conceded (Huxley 1874 223). But since it is absurd (according to Huxley) to think the behaviour of brainless frogs is under conscious control, the correct lesson to draw from Pflüger and Lewes' results was that purposive actions are not sufficient to establish volition. In fact, Huxley evidently was unwilling to accept the existence of any behavioural mark of either sensation or volition.

It must indeed be admitted, that, if any one thinks fit to maintain that the spinal cord below the injury is conscious, but that it is cut off from any means of making its consciousness known to the other consciousness in the brain, there is no means of driving him from his position by logic. But assuredly there is no way of proving it, and in the matter of consciousness, if in anything, we may hold by the rule, 'De non apparentibus et de non existentibus eadem est ratio' ['what does not appear and what does not exist have the same evidence'] (Huxley, 1874, 220).

The mechanist's dilemma is the following 'paradox':

A: If one accepts any behavioural mark of sensation and volition, then the experimental data will force us to attribute sensation and volition to both decapitated and intact vertebrates alike.

B: If one rejects the existence of a behavioural mark, then one has no grounds for ascribing sensation or volition to either decapitated or intact vertebrates.

Huxley's pronouncement piggybacks on the position he took in the mechanist's dilemma. His claim that spinal consciousness cannot be observed amounts to the claim that such a consciousness cannot be observed first-personally. But that is the crux of the mechanist's dilemma.

Huxley nevertheless was reverential of the contribution made by Rene Descartes in understanding the physiology of the brain and body:

The first proposition culled from the works of Descartes which I have to lay before you, is one which will sound very familiar. It is the view, which he was the first, so far as I know, to state, not only definitely, but upon sufficient grounds, that the brain is the organ of sensation, of thought, and of emotion—using the word "organ" in this sense, that certain changes which take place in the matter of the brain are the essential antecedents of those states of consciousness which we term sensation, thought and emotion. ... It remained down to the time of Bichat [150 years later] a question of whether the passions were or were not located in the abdominal viscera. In the second place, Descartes lays down the proposition that all movements of animal bodies are affected by a change in form. of a certain part of the matter of their bodies, to which he applies the general term of muscle.

The process of reasoning by which Descartes arrived at this startling conclusion is well shown in the following passage of the "Réponses:"— "But as regards the souls of beasts, although this is not the place for considering them, and though, without a general exposition of physics, I can say no more on this subject than I have already said in the fifth part of my Treatise on Method; yet, I will further state, here, that it appears to me to be a very remarkable circumstance that no movement can take place, either in the bodies of beasts, or even in our own, if these bodies have not in themselves all the organs and instruments by means of which the very same movements would be accomplished in a machine. So that, even in us, the spirit, or the soul, does not directly move the limbs, but only determines the course of that very subtle liquid which is called the animal spirits, which, running continually from the heart by the brain into the muscles, is the cause of all the movements of our limbs, and often may cause many different motions, one as easily as the other.

Descartes' line of argument is perfectly clear. He starts from reflex action in man, from the unquestionable fact that, in ourselves, co-ordinate, purposive, actions may take place, without the intervention of consciousness or volition, or even contrary to the latter. As actions of a certain degree of complexity are brought about by mere mechanism, why may not actions of still greater complexity be the result of a more refined mechanism? What proof is there that brutes are other than a superior race of marionettes, which eat without pleasure, cry without pain, desire nothing, know nothing, and only simulate intelligence as a bee simulates a mathematician? ... Suppose that only the anterior division of the brain—so much of it as lies in front of the "optic lobes"—is removed. If that operation is performed quickly and skilfully, the frog may be kept in a state of full bodily vigour for months, or it may be for years; but it will sit unmoved. It sees nothing: it hears nothing. It will starve sooner than feed itself, although food put into its mouth is swallowed. On irritation, it jumps or walks; if thrown into the water it swims.

Klein (2018) notes that the crux of the paradigm shift was the competing research by the opposing groups and the way in which their research successes at the time led to success:

*But by the time of the Lewes contribution from 1877, the question was no longer whether this one subset of muscular action could be accounted for purely mechanistically. Now, the question had become whether the mechanistic approach to reflex action might be expanded to cover all muscular action. Lewes wrote that the 'Reflex Theory' had become a strategy where one attempted to specify 'the elementary parts involved' in every physiological function without ever appealing to 'Sensation and Volition' (Lewes, *Problems of Life and Mind*, 354).*

'That the majority of physiological opinion by the close of the century was in favor of the position of Pflüger's opponents seems certain', Fearing writes. 'Mechanistic physiology and psychology was firmly seated in the saddle' (Fearing, 1930, 185).

The concept of a mechanistic reflex arc came to dominate not just physiology, but psychology too. The behaviourist B. F. Skinner, for example, wrote his 1930 doctoral dissertation on how to expand the account of reflex action to cover all behaviour, even the behaviour of healthy organisms. Through the innovations of people like Skinner and, before him, Pavlov, behaviourism would establish itself as the dominant research paradigm.

Cannon (1911, 38) gave no real argument for why students should not regard purposive movement as a mark of genuine volition (beyond a quick gesture at Lotze's long-discredited retort to Pflüger). Without citing any actual experiments, Cannon simply reported, as settled scientific fact, that purposiveness does not entail intended action:

Purposive movements are not necessarily intended movements. It is probable that reaction directed with apparent purposefulness is in reality an automatic repetition of movements developed for certain effects in the previous experience of the intact animal. (ibid)

Schwartz et al. (2005) highlight the key role William James played in establishing the status of volitional will:

William James (1890 138) argued against epiphenomenal consciousness, by claiming that 'The particulars of the distribution of consciousness, so far as we know them, points to its being efficacious.' James (136) stated that 'consciousness is at all times primarily a selecting agency.' It is present when choices must be made between different possible courses of action. 'It is to my mind quite inconceivable that consciousness should have nothing to do with a business to which it so faithfully attends'.

These liabilities of the notion of epiphenomenal mind and consciousness lead many thinkers to turn to the alternative possibility that a person's mind and stream of consciousness is the very same thing as some activity in their brain: mind and consciousness are 'emergent properties' of brains. A huge philosophical literature has developed arguing for and against this idea.

They cite Sperry (1992) who adopted an 'identity theory' approach which he claimed was monist, in invoking a top-down system-theoretic notion of the mind as an abstraction of certain higher-level brain processes:

The core ideas of the arguments in favour of an identity-emergent theory of mind and consciousness are illustrated by Roger Sperry's (1992) example of a 'wheel'. A wheel obviously does something: it is causally efficacious; it carries the cart. It is also an emergent property: there is no mention of 'wheelness' in the formulation of the laws of physics and 'wheelness' did not exist in the early universe; 'wheelness' emerges only under certain special conditions. And the macro-scopic wheel exercises 'top-down' control of its tiny parts. ... The reason that mind and consciousness are not analogous to 'wheelness', within the context of classic physics, is that the properties that characterize 'wheelness' are properties that are entailed, within the conceptual framework of classic physics, by properties specified in classic physics, whereas the properties that characterize conscious mental processes, namely the various ways these processes feel, are not entailed within the conceptual structure provided by classic physics, but by the properties specified by classic physics.

They quote James again in their theory of volition, based on the repeated application of attention to the issue at hand:

In the chapter on will, in the section entitled 'Volitional effort is effort of attention', James (1892 417) writes: "Thus we find that we reach the heart of our inquiry into volition when we ask by what process is it that the thought of any given action comes to prevail stably in the mind. ... The essential achievement of the will, in short, when it is most 'voluntary,' is to attend to a difficult object and hold it fast before the mind. Effort of attention is thus the essential phenomenon of will. ... Consent to the idea's undivided presence, this is effort's sole achievement. Everywhere, then, the function of effort is the same: to keep affirming and adopting the thought which, if left to itself, would slip away".

Enshrining the concept of pure behaviourism (Stout 2003, Tanney 2022), and reductionism more generally Gilbert S(1949) claimed in "The Concept of Mind" that "mind" is "a philosophical illusion hailing from René Descartes, and sustained by logical errors and 'category mistakes' which have become habitual". Ryle rejected Descartes' theory of the relation between mind and body, on the grounds that it approaches the investigation of mental processes as if they could be isolated from physical processes. According to Ryle, the classical theory of mind, or "Cartesian rationalism," makes a basic category mistake (a new logical fallacy Ryle himself invented), as it attempts to analyse the relation between "mind" and "body" as if they were terms of the same logical category. The rationalist theory that there is a transformation into physical acts of some purely mental faculty of "Will" or "Volition" is therefore a misconception because it mistakenly assumes that a mental act could be and is distinct from a physical act, or even that a mental world could be and is distinct from the physical world. This theory of the separability of mind and body is described by Ryle as "the dogma of the ghost in the machine." However Ryle was not regarded as a philosophical behaviourist and writes that the "general trend of this book will undoubtedly, and harmlessly, be stigmatised as 'behaviourist'."

Symbiotic Existential Cosmology, classes itself as ICAM interactively complementary aspect monism, rather than dualism. The Stanford Encyclopaedia of Philosophy definitions for dualism (Robinson 2023) are:

Genuine **property dualism** occurs when, even at the individual level, the ontology of physics is not sufficient to constitute what is there. The irreducible language is not just another way of describing what there is, it requires that there be something more there than was allowed for in the initial ontology. Until the early part of the twentieth century, it was common to think that biological phenomena ('life') required property dualism (an irreducible 'vital force'), but nowadays the special physical sciences other than psychology are generally thought to involve only **predicate dualism** (that psychological or mentalistic predicates are (a) essential for a full description of the world and (b) are not reducible to physicalistic predicates). In the case of mind, property dualism is defended by those who argue that the qualitative nature of consciousness is not merely another way of categorizing states of the brain or of behaviour, but a genuinely emergent phenomenon.

Substance dualism: There are two important concepts deployed in this notion. One is that of substance, the other is the dualism of these substances. A substance is characterized by its properties, but, according to those who believe in substances, it is more than the collection of the properties it possesses, it is the thing which possesses them. So the mind is not just a collection of thoughts, but is that which thinks, an immaterial substance over and above its immaterial states.

In [Stanford](#), Tanney (2022) notes that Ryle's category error critique was centrally about the assumed distinctness of mind and body as "substances" in the context of absurdity of certain verbal sentence constructions:

When a sentence is (not true or false but) nonsensical or absurd, though its vocabulary is conventional and its grammatical construction is regular, we say that it is absurd because at least one ingredient expression in it is not of the right type to be coupled or to be coupled in that way with the other ingredient expression or expressions in it. Such sentences, we may say, commit type-trespasses or break type-rules. (1938, 178)

The category mistake Ryle identifies in "There is a mind and a body" or "there is a mind or a body" is less obvious. For it takes a fair bit of untangling to show that "mind" and "body" are different logical or grammatical types; a fact which renders the assertion of either the conjunction or the disjunction nonsensical.

Robinson (2023) further notes both the veridical affirmation of interactivity in everyday life and the unverifiability of physical causal closure:

Interactionism is the view that mind and body – or mental events and physical events – causally influence each other. That this is so is one of our common-sense beliefs, because it appears to be a feature of everyday experience. The physical world influences my experience through my senses, and I often react behaviourally to those experiences. My thinking, too, influences my speech and my actions. There is, therefore, a massive natural prejudice in favour of interactionism.

Causal Closure Most discussion of interactionism takes place in the context of the assumption that it is incompatible with the world's being 'closed under physics'. This is a very natural assumption, but it is not justified if causal overdetermination of behaviour is possible. There could then be a complete physical cause of behaviour, and a mental one. The problem with closure of physics may be radically altered if physical laws are indeterministic, as quantum theory seems to assert. If physical laws are deterministic, then any interference from outside would lead to a breach of those laws. But if they are indeterministic, might not interference produce a result that has a probability greater than zero, and so be consistent with the laws? This way, one might have interaction yet preserve a kind of nomological closure, in the sense that no laws are infringed. ... Some argue that indeterminacy manifests itself only on the subatomic level, being cancelled out by the time one reaches even very tiny macroscopic objects: and human behaviour is a macroscopic phenomenon. Others argue that the structure of the brain is so finely tuned that minute variations could have macroscopic effects, rather in the way that, according to 'chaos theory', the flapping of a butterfly's wings in China might affect the weather in New York. (For discussion of this, see Eccles (1980), (1987), and Popper and Eccles (1977)). Still others argue that quantum indeterminacy manifests itself directly at a high level, when acts of observation collapse the wave function, suggesting that the mind may play a direct role in affecting the state of the world (Hodgson 1988; Stapp 1993).

Symbiotic Existential Cosmology does not assert "substance" dualism, as subjective conscious volition is not treated as a "substance", in the way mind was in the manner of objective physical entities, in Ryle's complaint against Cartesian dualism. SEC invokes a unified Cosmos in which primal subjectivity and the objective universe are complementary mutually-interactive principles in a universe which is not causally closed and in which volitional will can act without causal conflict, through quantum uncertainty. Life is also subject to a degree of overdeterminism due to teleological influences such as [autopoiesis](#), e.g. in the negentropic nature of life and evolution as self-organising far-from-equilibrium thermodynamic systems, however this is insufficient to eliminate the need for conscious-physical interactivity to ensure survival. The subjective aspect is fully compliant with determined physical boundary conditions of brain states, except in so far as subjective volition interacts with environmental quantum-derived uncertainty through quantum-sensitive unstable brain dynamics, forming a contextual filter theory of brain function on conscious experience, rather than a causally-closed universe determining ongoing brain states. Thus, no pure-subjective interactivity is mandatory, as occurs in traditional forms of panpsychism, such as pan-*proto-* or *cosmo-*psychism.

The key counter to Ryle's complaint is that if I say in response to a received e-mail that the author has demonstrated through consciously intending to compose and send their response in physical form that "you have demonstrated that your subjective conscious volition has efficacy over the physical universe" this is not grammatically, semantically, or categorically absurd, but a direct empirical observation from experience that raises no physical or philosophical inconsistencies, but fully confirms empirical experience of subjective physical conscious agency, consistent with civil and criminal law of conscious intentional responsibility. Ryle's strategy is linguistic. He attacks both the ontological commitment (the view that mind and body are somehow fundamentally different or distinct, but nonetheless interact) and the epistemological commitment (the inability to confirm other people are conscious because subjectivity is private) of what he calls the "official doctrine" (Tanney 2022). The problem is that, by dealing with it in a purely linguistic analysis, we are dealing only with objective semantic and grammatical connotations so the argument is intrinsically objective. We know that subjectivity is private and objectivity is public. That's just the way it is! We also know that in all our discourses subjective-objective interactivity occurs. A hundred percent of our experience is subjective and the world around us is inferred from our subjectively conscious experiences of it.

The way out is not to deny mind, or consciousness itself which we are all trying to fathom, or we are back to the hard problem of the objectively unfathomable explanatory gap. The way out is that the above statement "you have demonstrated that your subjective conscious volition has efficacy over the physical universe" is something that also involves conscious physical volition we can mutually agree on because it's evidenced in our behaviour in consciously responding to one another. Ryle is sitting by himself in his office dreaming up linguistic contradictions, but these evaporate through mutual affirmation of subjective volition. That's the transactional principle manifest. Then the category error vanishes in the subjective empirical method. This is why extending the hard problem to volition has been essential, because it's the product of conscious volition in behaviour that is verifiable.

In Stanford (Tanney 2022) notes that Cartesianism is at worst "dead" in only one of its ontological aspects: Substance dualism may have been repudiated but property dualism still claims a number of contemporary defenders. Furthermore, although Descartes embraced a form of substance dualism, in the sense that the pineal acted in response to the soul by making small movements that initiated wider responses in the brain, the pineal is still a biological entity, so the category error is misconceived. His description is remarkably similar to instabilities in brain dynamics potentially inducing global changes in brain dynamics. Compounded with the inability of materialism to solve the hard problem, science is thus coming full circle. It is not just a question of sentence construction but Cosmology.

Ryle's rejection of Cartesian dualism led to a second paradigm shift in which molecular biology, succeeding Watson and Crick's discovery of the structure of DNA, led to ever more effective 'laying bare' of all biological processes including the brain, accompanied by new technologies of multi-electrode EEG and MEG and functional fMRI imaging using magnetic resonance imaging. So that subjective consciousness became effectively ignored in the cascade of purely functionalist results of how human brain dynamics occurs.

Anil Seth (2018) notes:

The relationship between subjective conscious experience and its biophysical basis has always been a defining question for the mind and brain sciences. But, at various times since the beginnings of neuroscience as a discipline, the explicit study of consciousness has been either treated as fringe or excluded altogether. Looking back over the past 50 years, these extremes of attitude are well represented. Roger Sperry (1969, 532), pioneer of split-brain operations and of what can now be called 'consciousness science' lamented in 1969 that 'most behavioral scientists today, and brain researchers in particular, have little use for consciousness'. Presciently, in the same article he highlighted the need for new technologies able to record the 'pattern dynamics of brain activity' in elucidating the neural basis of consciousness. Indeed, modern neuroimaging methods have had a transformative impact on consciousness science, as they have on cognitive neuroscience generally. ... Informally, consciousness science over the last 50 years can be divided into two epochs. From the mid-1960s until around 1990 the fringe view held sway, though with several notable exceptions. Then, from the late 1980s and early 1990s, first a trickle and more recently a deluge of research into the brain basis of consciousness, a transition catalysed by – among other things – the activities of certain high-profile scientists (e.g. the Nobel laureates Francis Crick and Gerald Edelman) and by the maturation of modern neuroimaging methods, as anticipated by Sperry.

Symbiotic cosmology, based on complementary, unlike a strictly dualist description, is coherent. This coherence – forming a complete whole without discrete distinction – is manifestly true in that we can engage either a subjective discourse on our experiences or an objective account of their material circumstances in every situation in waking life, just as the wave and particle aspects of quanta are coherent and cannot be separated, as complementary manifestations. We thus find that the human discourse on our existential condition has two complementary modes, the one fixed in the objective physical description of the world around us using logical and causal operations and the other describing our subjective conscious experiences, as intelligent sensual beings, which are throughout our lives, our sole source of personal knowledge of the physical world around us, without which we would have no access to the universe at large, let alone to our dreams, memories and reflections (Jung 1963), all of which are conscious in nature, and often ascribed to be veridical, rather than imaginary, in the case of dreams and visionary states.

In Erwin Schrödinger's words (1944): *"The world is a construction of our sensations, perceptions, memories. It is convenient to regard it as existing objectively on its own. But it certainly does not become manifest by its mere existence" ... "The reason why our sentient, perceiving and thinking ego is met nowhere within our scientific world picture can easily be indicated in seven words: Because it is itself that world picture".*

A central problem faced by detractors of the role of consciousness in both the contexts of the brain and the quantum universe is that many of the materialist arguments depend on an incorrectly classical view of causality, or causal closure, in the context of brain dynamics, which are fundamentally inconsistent with quantum reality. In the brain

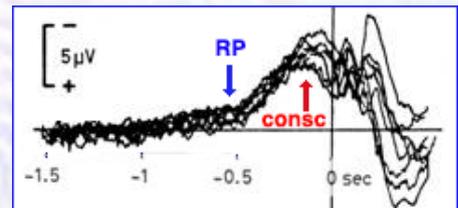
context, this is purported to eliminate an adaptive role for consciousness in human and animal survival, reducing it to a form of epiphenomenalism, in which volitional will would be a self-serving delusion. This follows lines of thinking derived from computational ideas that interfering with a computational process would hinder its efficiency.

In relation to volitional will, Chalmers & McQueen (2021) note: *“There are many aspects to the problem of consciousness, including the core problem of why physical processes should give rise to consciousness at all. One central aspect of the problem is the consciousness-causation problem: It seems obvious that consciousness plays a causal role, but it is surprisingly hard to make sense of what this role is and how it can be played.”*

The problem with the idea of objective brain processing being causally closed is fivefold. **Firstly** the key challenges to organismic survival are computationally intractable, open environment problems which may be better served by edge of chaos dynamics than classical computation. **Secondly**, many problems of survival are not causally closed at all because both evolution and organismic behaviour are creative processes, in which there are many viable outcomes, not just a single logically defined, or optimal one. **Thirdly**, quantum uncertainty and its deeper manifestations in entanglement, are universal, both in the brain and the environment, so there are copious ways for consciousness to intervene, without disrupting causally deterministic processes, and this appears to be its central cosmological role. **Fourthly**, the notion runs headlong into contradiction with our everyday experience of volition, in which we are consciously aware of our volitional intent and of its affects both in our purposive decision-making and acts affecting the world around us. For causal closure to be true, all our purposive decisions upon which we depend for our survival would be a perceptual delusion, contradicting the manifest nature of veridical perception generally. **Fifthly**, the work of Libet through to Schurger et al. below, demonstrates causal closure is unproven and is unlikely to remain so given the edge-of-chaos instability of critical brain processes in decision-making in the quantum universe.

The Hard Problem of Volition: The Readiness Potential and its Critics

Challenging the decision-making role of consciousness, Libet (1983, 1989) asked volunteers to flex a finger or wrist. When they did, the movements were preceded by a dip in the brain signals being recorded, called the "readiness potential". He interpreted this RP a few tenths of a second before the volunteers said they had decided to move, as the brain preparing for movement. Libet concluded that unconscious neural processes determine our actions before we are ever aware of making a decision. Since then, others have quoted the finding as evidence that free will is an illusion.



However Libet (1999) in "Do we have free-will?", himself makes the most convincing case possible for subjective consciousness having the capacity for free-will, signally invoking a two-process form of volition:

I have taken an experimental approach to this question. Freely voluntary acts are preceded by a specific electrical change in the brain (the 'readiness potential', RP) that begins 550 ms before the act. Human subjects became aware of intention to act 350–400 ms after RP starts, but 200 ms. before the motor act. The volitional process is therefore initiated unconsciously. But the conscious function could still control the outcome; it can veto the act. Free will is therefore not excluded. These findings put constraints on views of how free will may operate; it would not initiate a voluntary act but it could control performance of the act. The findings also affect views of guilt and responsibility.

But the deeper question still remains: Are freely voluntary acts subject to macro- deterministic laws or can they appear without such constraints, non-determined by natural laws and 'truly free'? I shall present an experimentalist view about these fundamental philosophical opposites. ... The question of free will goes to the root of our views about human nature and how we relate to the universe and to natural laws. Are we completely defined by the deterministic nature of physical laws? Theologically imposed fateful destiny ironically produces a similar end-effect. In either case, we would be essentially sophisticated automatons, with our conscious feelings and intentions tacked on as epiphenomena with no causal power. Or, do we have some independence in making choices and actions, not completely determined by the known physical laws? The initiation of the freely voluntary act appears to begin in the brain unconsciously, well before the person consciously knows he wants to act! Is there, then, any role for conscious will in the performance of a voluntary act? (see Libet, 1985). To answer this it must be recognized that conscious will (W) does appear about 150 msec. before the muscle is activated, even though it follows onset of the RP.

Potentially available to the conscious function is the possibility of stopping or vetoing the final progress of the volitional process, so that no actual muscle action ensues. Conscious-will could thus affect the outcome of the volitional process even though the latter was initiated by unconscious cerebral processes. Conscious-will might block or veto the process, so that no act occurs. The existence of a veto possibility is not in doubt. The subjects in our experiments at times reported that a conscious wish or urge to act appeared but that they sup- pressed or vetoed that. ... My conclusion about free will, one genuinely free in the non-determined sense, is then

that its existence is at least as good, if not a better, scientific option than is its denial by determinist theory. Given the speculative nature of both determinist and non-determinist theories, why not adopt the view that we do have free will (until some real contradictory evidence may appear, if it ever does). Such a view would at least allow us to proceed in a way that accepts and accommodates our own deep feeling that we do have free will. We would not need to view ourselves as machines that act in a manner completely controlled by the known physical laws.

Nevertheless, articulating a theory heavily dependent on the readiness potential, Budson et al. (2022) claim all the brain's decision-making procedures are unconscious, but followed half a second later by conscious experience that is just a memory-based constructive representation of future outcomes. According to the researchers, this theory is important because it explains that all our decisions and actions are actually made unconsciously, although we fool ourselves into believing that we consciously made them:

In a nutshell, our theory is that consciousness developed as a memory system that is used by our unconscious brain to help us flexibly and creatively imagine the future and plan accordingly. What is completely new about this theory is that it suggests we don't perceive the world, make decisions, or perform actions directly. Instead, we do all these things unconsciously and then—about half a second later—consciously remember doing them. We knew that conscious processes were simply too slow to be actively involved in music, sports, and other activities where split-second reflexes are required. But if consciousness is not involved in such processes, then a better explanation of what consciousness does was needed.

But this notion is itself a delusion. The conscious brain has evolved to be able to co-opt very fast subconscious processes to orchestrate in real time, highly accurate, innovative conscious responses, which the agent is fully aware of exercising in real time. The evidence is that conscious control of subconscious fast processing, e.g. via insular von-Economo neurons, and basal ganglia, occurs in parallel in real time. Tennis could not be played if the players' conscious reactions were half a second behind the ball. They could not represent, or accurately respond to the actual dynamics.

Likewise Earl (2014) cite the notion that consciousness is solely information in various forms that is associated with a flexible response mechanism (FRM) for decision-making, planning, and generally responding in nonautomatic ways. Both these are tautologous because information is both subjective and objective and non-conscious responses ARE physically automatic. Earl attempts to discount the validity of our subjective experience of volition by claiming it is a false assumption and fails to include all the mechanical details of how an act is generated:

When I decide to pick up a cup and do so, I may believe that my thought initiates my action, but what I observe is I have the thought of picking up the cup and then reach out and take the cup. I do not experience the information manipulations that must occur to initiate my action, and I have no evidence that my action is consciously initiated. One tends to assume one's intentional actions are consciously initiated, but as Wegner and Wheatley (1999) reported, we may perceive our actions as consciously caused if the thought occurs before the act and is consistent with the act, and there are no other likely causes.

While this is not going so far as to claim the conscious experience of volition is a delusion that evolved to give the epiphenomenal organism confidence in its ability to act, it is incorrectly claiming our experience of willed intentional decision making behaviour, key to our survival, is a false assumption, associating unconnected causes and effects:

In any intentional action, one never experiences the complete sequence of events from the starting conditions to completing the action. Bowers (1984, p. 249) wrote that "one can introspectively notice and/or recall antecedents of one's behavior but the causal connection linking the determining antecedents and the behavior to be explained is simply not directly accessible to introspection. Rather, the causal link between antecedents and their consequences is provided by an inference, however implicit and invisible." There are gaps in every experience of intentional choice, intentional initiation of responses, intentional control of attention or behavior, and in thinking, speaking, problem solving, creativity, and every other action with which consciousness is associated; and in each of these activities the executive mental process is missing from consciousness.

These arguments do not constitute a valid critique, given the ability of non-conscious processes to complement and prepare the experiential context for a comprehensive conscious decision. To have to experience every mechanical aspect of an intentional action would subject the flow of subjective consciousness to strategic overload and obliterate the efficiency of the FRM model. Conscious experience gives us the effective overview to act decisively in real time.

Libet's claim has been undermined by more recent studies. Bredikhin et al.(2023) have discovered confounding faults in Libet's procedure. Instead of letting volunteers decide when to move, Trevena and Miller (2010) asked them to wait for an audio tone before deciding whether to tap a key. If Libet's interpretation were correct, the RP should be greater after the tone when a person chose to tap the key. While there was an RP before volunteers made their decision to move, the signal was the same whether or not they elected to tap. Miller concludes that the RP may merely be a sign that the brain is paying attention and does not indicate that a decision has been made. They also failed to find evidence of subconscious decision-making in a second experiment. This time they asked volunteers to press a key after

the tone, but to decide on the spot whether to use their left or right hand. As movement in the right limb is related to the brain signals in the left hemisphere and vice versa, they reasoned that if an unconscious process is driving this decision, where it occurs in the brain should depend on which hand is chosen, but they found no such correlation.

Schurger and colleagues (2012) have a key explanation. Previous studies have shown that, when we have to make a decision based on sensory input, assemblies of neurons start accumulating evidence in favour of the various possible outcomes. The team reasoned that a decision is triggered when the evidence favouring one particular outcome becomes strong enough to tip the dynamics – i.e. when the neural noise generated by random or chaotic activity accumulates sufficiently so that its associated assembly of neurons crosses a threshold tipping point. The team repeated Libet's experiment, but this time if, while waiting to act spontaneously, the volunteers heard a click they had to act immediately. The researchers predicted that the fastest response to the click would be seen in those in whom the accumulation of neural noise had neared the threshold - something that would show up in their EEG as a readiness potential. In those with slower responses to the click, the readiness potential was indeed absent in the EEG recordings. *"We argue that what looks like a pre-conscious decision process may not in fact reflect a decision at all. It only looks that way because of the nature of spontaneous brain activity."* Schurger and Uithol (2015) specifically note the evidence of a sensitively dependent butterfly effect (London et al. 2010) as a reason why nervous systems vary their responses on identical stimuli as an explanation for why it could be impossible to set out a deterministic decision making path from contributory systems to a conscious decision, supporting their stochastic accumulator model. Hans Liljenström (2021) using stochastic modelling concludes that if decisions have to be made fast, emotional processes and aspects dominate, while rational processes are more time consuming and may result in a delayed decision.

Alexander et al. (2016) establish the lack of linkage of the RP to motor activity:

"The results reveal that robust RPs occurred in the absence of movement and that motor-related processes did not significantly modulate the RP. This suggests that the RP measured here is unlikely to reflect preconscious motor planning or preparation of an ensuing movement, and instead may reflect decision-related or anticipatory processes that are non-motoric in nature."

More recently the actual basis coordinating a decision to act has been found to reside in slowly evolving dopamine modulation. When you reach out to perform an action, seconds before you voluntarily extend your arm, thousands of neurons in the motor regions of your brain erupt in a pattern of electrical activity that travels to the spinal cord and then to the muscles that power the reach. But just prior to this massively synchronised activity, the motor regions in your brain are relatively quiet. For such self-driven movements, a key piece of the "go" signal that tells the neurons precisely when to act has been revealed in the form of slow ramping up of dopamine in a region deep below the cortex which closely predicted the moment that mice would begin a movement — seconds into the future (Hamilos et al. 2021).

The authors imaged mesostriatal dopamine signals as mice decided when, after a cue, to retrieve water from a spout. Ramps in dopamine activity predicted the timing of licks. Fast ramps preceded early retrievals, slow ones preceded late ones. Surprisingly, dopaminergic signals ramped-up over seconds between the start-timing cue and the self-timed movement, with variable dynamics that predicted the movement/reward time on single trials. Steeply rising signals preceded early lick-initiation, whereas slowly rising signals preceded later initiation. Higher baseline signals also predicted earlier self-timed movements. Consistent with this view, the dynamics of the slowly evolving endogenous dopaminergic signals quantitatively predicted the moment-by-moment probability of movement initiation on single trials. The authors propose that ramping dopaminergic signals, likely encoding dynamic reward expectation, can modulate the decision of when to move.

Slowly varying neuromodulatory signals could allow the brain to adapt to its environment. Such flexibility wouldn't be afforded by a signal that always led to movement at the exact same time. Allison Hamilos notes: *"The animal is always uncertain, to some extent, about what the true state of the world is. You don't want to do things the same way every single time — that could be potentially disadvantageous."*

This introduces further complexity into the entire pursuit of Libet's readiness potential, which is clearly not itself the defining event, which rather is at first call concealed in a slowly varying dopamine modulation, which in itself does not determine the timing of the event except on a probabilistic basis. Furthermore the striatum itself is a gatekeeper in the basal ganglia for coordinating the underlying conscious decision to act and not the conscious decision itself.

Celia Green and Grant Gillett (1995) have also cited three grounds for the readiness potential to be unreliable:

First, there is a dual assumption that an intention is the kind of thing that causes an action and that can be accurately introspected. Second, there is a real problem with the method of timing the mental events concerned given that Libet himself has found the reports of subjects to be unreliable in this regard. Third, there is a suspect assumption that there are such things as timable and locatable mental and brain events accompanying and causing human behaviour.

Catherine Reason (2016), drawing on Caplain (1996, 2000) and Luna (2016), presents an intriguing logical proof that computing machines, and by extension physical systems, can never be certain if they possess conscious awareness, undermining the principal of computational equivalence (Wolfram 2002, 2021):

An omega function is any phi-type function which can be performed, to within a quantified level of accuracy, by some conscious system. A phi-type function is any mapping which associates the state of some system with the truth value of some proposition. This significance of this is that it can be shown that no purely physical system can perform any phi-type function to within any quantified level of accuracy, if that physical system is required to be capable of humanlike reasoning.

The proof is as follows: Let us define a physical process as some process whose existence is not dependent on some observation of that process. Now let X be the set of all physical processes necessary to perform any phi-type function. Since the existence of X is not dependent on any given observation of X, it is impossible to be sure empirically of the existence of X. If it is impossible to be sure of the existence of X, then it is impossible to be sure of the accuracy of X. If it is impossible to be sure of the accuracy of X, then it is impossible to be sure that X correctly performs the phi-type function it is supposed to perform. Since any system capable of humanlike reasoning can deduce this, it follows that no physical system capable of humanlike reasoning can perform any phi-type function without becoming inconsistent.

Counterintuitively, this implies that human consciousness is associated with a violation of energy conservation. It also provides another objection to Libet:

“even if the readiness potential can be regarded as a predictor of the subject’s decision in a classical system, it cannot necessarily be regarded as such in a quantum system. The reason is that the neurological properties underlying the readiness potential may not actually have determinate values until the subject becomes consciously aware of their decision”.

In subsequent papers (Reason 2019, Reason & Shah 2021) she expands this argument:

I identify a specific operation which is a necessary property of all healthy human conscious individuals — specifically the operation of self-certainty, or the capacity of healthy conscious humans to “know” with certainty that they are conscious. This operation is shown to be inconsistent with the properties possible in any meaningful definition of a physical system.

In an earlier paper, using a no-go theorem, it was shown that conscious states cannot be comprised of processes that are physical in nature (Reason, 2019). Combining this result with another unrelated work on causal emergence in physical systems (Hoel, Albantakis and Tononi, 2013), we show in this paper that conscious macrostates are not emergent from physical systems and they also do not supervene on physical microstates.

Pivotal in a forthcoming formalisation of the argument, Reason (2023) cites Descartes’ “cogito ergo sum” as counter example requiring human consciousness so the success of her theorem also frees Cartesian duality from Ryle’s deathly grip.

In a counterpoint to this Travers et al. (2020) suggest the RP is associated with learning and thus reflects motor planning or temporal expectation, but neither planning nor expectation inform about the timing of a decision to act:

“Participants learned through trial and error when to make a simple action. As participants grew more certain about when to act, and became less variable and stochastic in the timing of their actions, the readiness potential prior to their actions became larger in amplitude. This is consistent with the proposal that the RP reflects motor planning or temporal expectation. ... If the RP reflects freedom from external constraint, its amplitude should be greater early in learning, when participants do not yet know the best time to act. Conversely, if the RP reflects planning, it should be greater later on, when participants have learned, and know in advance, the time of action. We found that RP amplitudes grew with learning, suggesting that this neural activity reflects planning and anticipation for the forthcoming action, rather than freedom from external constraint.”

Fifel (2018) reviewing the state of the current research described the following picture:

Results from Emmons et al. (2017) suggest that such ramping activity encodes self-monitored time intervals. This hypothesis is particularly pertinent given that self-monitoring of the passing of time by the experimental subjects is intrinsic to the Libet et al. (1983) experiment. Alternatively, although not mutually exclusive, RP might reflect general anticipation (i.e., the conscious experience that an event will soon occur) (Alexander et al., 2016) or simply background neuronal noise (Schurger et al., 2016). Future

studies are needed to test these alternatives. ... Consequently, we might conclude that: Neuroscience may in no way interfere with our first-person experience of the will, it can in the end only describe it ... it leaves everything as it is.

The difficulty of the hard problem, which remains unresolved 26 years later, is also tied to the likewise unresolved problem of assumed causal closure of the universe in brain function at the basis of pure materialistic neuroscience. Until it is empirically confirmed it remains simply a matter of opinion that has grown into a belief system academically prejudiced against hypotheses not compliant with the physical materialistic weltanschauung.

While some neuroscientists (Johnson 2020) imply the hard problem is not even a scientific question, the neuroscience concept of causal closure (Chalmers 2015) based on classical causality, or quantum correspondence to it, not only remains empirically unverified in the light of Libet, Schurger and others, but it is unclear that a convincing empirical demonstration is even possible, or could be, given the fact that neuronal feedback processes span all scales from the organism to the quantum uncertain realm and the self-organised criticality of brain dynamics. Finally, it is in manifest conflict with all empirical experience of subjective conscious volitional intent universal to sane human beings.

As Bernard Baars commented in conversation:

I don't think science needs to, or CAN prove causal closure, because what kind of evidence will prove that? We don't know if physics is "causally closed," and at various times distinguished physicists think they know the answer, but then it breaks down. The Bertrand Russell story broke down, and the Hilbert program in math, and ODEs, and the record is not hopeful on final solutions showing a metaphysically closed system .

The status of the neuroscience perspective of causal closure has led to an ongoing debate about the efficacy of human volition and the status of free will (Nahamias 2008, Mele, 2014), however Joshua Shepherd (2017) points out, that the neuroscientific threat to free will has not been causally established, particularly in the light of Schurger et al. (2015).

For this reason, in treating the hard problem and volitional intent, I will place the onus on proof on materialism to demonstrate itself and in defence of volition have simply outlined notable features of central nervous processing, consistent with an in principle capacity to operate in a quantum-open state of seamless partial causal closure involving subjectively conscious efficacy of volitional will physically in decision-making (in the brain) and behaviour (in the world). From this point of view, efficacy of volition is itself a validated empirical experience which is near universal to sane conscious humans, thus negating causal closure by veridical affirmation in the framework of symbiotic existential cosmology, where empirical experience has equally valid cosmological status to empirical observation. Libet's experiment purported to demonstrate an inconsistency, by implying the brain had already made a decision before the conscious experience of it, but Trevena and Miller and Schurger's team have deprecated this imputation.

Emergence, Weak, Edge-of-chaos and Strong

Key to the question of conscious volition is the profound difference between the notions of strong and weak emergence. Turkheimer et al. (2019) spell out the difference between these two:

Modern Emergence can be divided into two epistemological types: strong and weak. A system is said to exhibit strong emergence when its behaviour, or the consequence of its behaviour, exceeds the limits of its constituent parts. Thus the resulting behavioural properties of the system are caused by the interaction of the different layers of that system, but they cannot be derived simply by analysing the rules and individual parts that make up the system. Weak emergence on the other hand, differs in the sense that whilst the emergent behaviour of the system is the product of interactions between its various layers, that behaviour is entirely encapsulated by the confines of the system itself, and as such, can be fully explained simply through an analysis of interactions between its elemental units.

They note that the kind of emergence that surfaced first in the neurosciences was greatly shaped by earlier work of Roger Sperry (1980), who proposed a view of the brain characterised by a strong top-down organisational component. Sperry was adamant that his model did not imply any form of mind brain dualism nor a parallel existence of neurobiological and mental processes, but that, after emergence, mental processes would take over and exert control down to the cellular level:

It is the idea, in brief, that conscious phenomena as emergent functional properties of brain processing exert an active control role as causal detents in shaping the flow patterns of cerebral excitation. Once generated from neural events, the higher order mental patterns and programs have their own subjective qualities and progress, operate and interact by their own causal laws and principles which are different from and cannot be reduced to those of neurophysiology.

Emergence is not just an assumed property of human brains but applies more generally to systems notions of the emergence of living systems generally including ideas like autopoiesis and the question of whether biological laws are entirely reductionist or form more general fundamental constraint on the behaviour of natural systems.

Physical materialism rejects any form of strong emergence that asserts known physical laws can somehow be overridden by mental processes. For example weak emergence allows for a reductionistic computational paradigm of brain dynamics to putatively replicate the functional agency of an autonomous system through feedback processes between the environment and the organism, so that any purely physicalist descriptions, from artificial intelligence, to ideas like Dennett's multiple drafts model of consciousness, in the next section fit within the pure physicalist regime.

Symbiotic Existential Cosmology invokes primal subjectivity as a foundational cosmological complement to the physical universe that is optimately compliant with physical boundary conditions, and so poses no conflicts between subjective panpsychic qualia and empirical physics and neuroscience, but it is not a form of passive mentalism (Carroll 2021) as it is conceived as interacting with physical uncertainty. It also cites the eucaryote endo-symbiosis as an emergent topological transition, in which the excitable membrane and neurotransmitter-based social signalling in single celled species, enabled the form of subjective conscious sentience and volition we see in all eucaryotes today.

This emergent transition sits right on the boundary between strong and weak emergence, as a form of quantum edge of chaos emergence that affirms subjective conscious volition. Having efficacy over the physical universe, in much the same way Sperry originally cited in 1980, but without claiming to violate established physical laws. This is because it focuses on the indeterminacy of the quantum universe and collapse of the wave function in biological systems as a key avenue through which subjective conscious volition can be physically efficacious and yet consistent with the known laws of physics, by citing interpretations such as transactional super-causality and super-determinism to provide processes below the classical level to both explain quantum indeterminacy and conscious intentional will in one step, without violating the Born probability interpretation.

Hopeful Monsters 1: Virtual Machines v Cartesian Theatres

Reductionistic descriptions attempting to explain subjective experience objectively frequently display similar pitfalls to creationist descriptions of nature, and those in Biblical Genesis, which project easy, familiar concepts, such as human manufacture breath, or verbal command onto the natural universe.

Paul Churchland (1985) makes a definitive play for a reductionistic paradigm based on promissory materialism, that the emerging neuroscience description will eclipse and supplant our subjective "folk psychology" views of conscious experience in a utopian vision of neuroscience ascendent:

Consider now the possibility of learning to describe, conceive, and introspectively apprehend the teeming intricacies of our inner lives within the conceptual framework of a matured neuroscience, a neuroscience that successfully reduces, either smoothly or roughly, our common-sense folk psychology. Suppose we trained our native mechanisms to make a new and more detailed set of discriminations, a set that corresponded not to the primitive psychological taxonomy of ordinary language, but to some more penetrating taxonomy of states drawn from a completed neuroscience. And suppose we trained ourselves to respond to that reconfigured discriminative activity with judgments that were framed, as a matter of course, in the appropriate concepts from neuroscience.'

If the examples of the symphony conductor (who can hear the Am7 chords), the oenologist (who can see and taste the glycol), and the astronomer (who can see the temperature of a blue giant star) provide a fair parallel, then the enhancement in our introspective vision could approximate a revelation. Dopamine levels in the limbic system, the spiking frequencies in specific neural pathways, resonances in the nth layer of the occipital cortex, inhibitory feed-back to the lateral geniculate nucleus, and countless other neuro-physical niceties could be moved into the objective focus of our introspective discrimination, just as Gm7 chords and Adim chords are moved into the objective focus of a trained musician's auditory discrimination. We will of course have to learn the conceptual framework of a matured neuroscience in order to pull this off. And we will have to practice its non-inferential application. But that seems a small price to pay for the quantum leap in self-apprehension.

All of this suggests that there is no problem at all in conceiving the eventual reduction of mental states and properties to neurophysiological states and properties. A matured and successful neuroscience need only include, or prove able to define, a taxonomy of kinds with a set of embedding laws that faithfully mimics the taxonomy and causal generalizations of folk psychology. Whether future neuro-scientific theories will prove able to do this is a wholly empirical question, not to be settled a priori. The evidence for a positive answer is substantial and familiar, centering on the growing explanatory success of the several neurosciences.

But there is negative evidence as well: I have even urged some of it myself ("Eliminative Materialism and the Propositional Attitudes," op. cit.). My negative arguments there center on the explanatory and predictive poverty of folk psychology, and they question whether it has the categorical integrity to merit the reductive preservation of its familiar ontology. That line suggests substantial revision or outright elimination as the eventual fate of our mentalistic ontology. The qualia-based arguments of Nagel, Jackson, and Robinson, however, take a quite different line. They find no fault with folk psychology. Their concern is with the explanatory and descriptive poverty of any possible neuroscience, and their line suggests that emergence is the correct story for our mentalistic ontology. Let us now examine their arguments.

John Searle (1980) devised his famous "Chinese Room" as a counterexample to machine having consciousness and intentionality. He supposed that artificial intelligence research had succeeded in constructing a computer large language model that behaves as if it understands Chinese, just as chatGPT now does and that it performs its task so convincingly that it comfortably passes the Turing test, convincing a human Chinese speaker that the program is itself a live Chinese speaker. Searle then uses the English version of the algorithm to replicate its performance manually in Chinese without being aware in "mind", "understanding", or "consciousness", of the actual language responses or their meaning, thus demonstrating that even though intentionality in human beings (and animals) may be an empirical product of causal features about the relations between mental processes and brains, running a computer program is never by itself a sufficient condition of intentionality. The argument is directed against the philosophical functionalism and computationalism, which hold that the mind may be viewed as an information-processing system operating on formal symbols, and that simulation of a given mental state is sufficient for its presence.

P & P Churchland (1981) in response, present a bleak landscape of the mind, lacking any intentionality over a machine:

Functionalism - construed broadly as the thesis that the essence our psychological states resides in the abstract causal roles they play in a complex economy of internal states mediating environment inputs and behavioral outputs - seems to us to be free from any fatal or essential shortcomings ... The correct strategy is to argue that our own mental states are just as innocent of "intrinsic intentionality" as are the states of any machine simulation. On our view, all ascriptions of meaning or propositional content are relative - in senses to be explained. The notion of "intrinsic intentionality" (Searle 1980) makes no more empirical sense than does the notion of position in absolute space.

In his reductionist account in "Consciousness Explained" Daniel Dennett (1991) cites his "multiple drafts" model of brain processing, as a case of evolutionary competition among competing neural assemblies, lacking overall coherence, thus bypassing the need for subjective consciousness. This exposes a serious problem of conceptual inadequacy with reductionism. Daniel is here writing his book using the same metaphors as the very activities he happens to be using – the message is thus the medium. He can do this as a subjectively conscious being only by suppressing the significance of virtually every form of coherent conscious experience around him, subjugating virtually all features of his conscious existence operating for 100% of his conscious life, in favour of a sequence of verbal constructs having little more explanatory value than a tautology. This is what I call the psychosis of reductionistic materialism, which is shared by many AI researchers and cognitive scientists.

Despite describing the mind as a virtual machine, Dennett & Kinsbourne (1995) do concede a conscious mind exists at least as an observer:

"Wherever there is a conscious mind, there is a point of view. A conscious mind is an observer, who takes in the information that is available at a particular (roughly) continuous sequence of times and places in the universe. ... It is now quite clear that there is no single point in the brain where all information funnels in, and this fact has some far from obvious consequences."

But neuroscience has long ceased talking about a single point or single brain locus responsible for consciousness, which is associated with coherent "in phase" activity as a whole. Nevertheless Dennett attempts to mount a lethal attack on any coherent manifestation of subjectivity, asserting there is no single, constitutive "stream of consciousness":

"The alternative, Multiple Drafts model holds that whereas the brain events that discriminate various perceptual contents are distributed in both space and time in the brain, and whereas the temporal properties of these various events are determinate, none of these temporal properties determine subjective order, since there is no single, constitutive "stream of consciousness" but rather a parallel stream of conflicting and continuously revised contents" (Dennett & Kinsbourne (1995).

"There is no single, definitive "stream of consciousness," because there is no central Headquarters, no Cartesian Theatre where "it all comes together" for the perusal of a Central Meaner. Instead of such a single stream (however wide), there are multiple channels in which specialist circuits try, in parallel pandemoniums, to do their various things, creating Multiple Drafts as they go. Most of these fragmentary drafts of "narrative" play short-lived roles in the modulation of current activity but some get promoted to further functional roles, in swift succession, by the activity of a virtual machine in the brain. The seriality of this machine (its "von

Neumannesque" character) is not a "hard-wired" design feature, but rather the upshot of a succession of coalitions of these specialists." (Dennett 1991)

However we know and shall discuss in the context of the default mode network in the context of psychedelics, the balance between top-down processes of control and integration, against just such a flood of competing regional bottom-up excitations, which become more able to enter consciousness, because of lowered barriers under the drug.

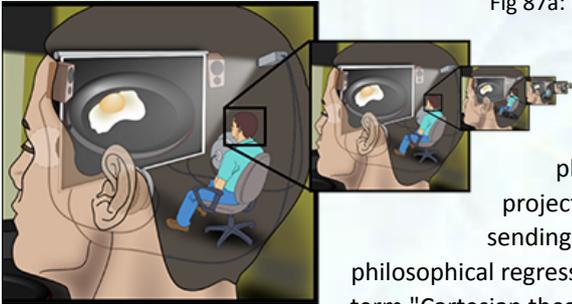


Fig 87a: Homunculus argument infinite regress.

Dennett says that, when the dualism is removed, what remains of Descartes' interactionist model amounts to imagining a tiny theatre in the brain where a homunculus (small person), now physical, performs the task of observing all the sensory data projected on a screen at a particular instant, making the decisions and sending out commands. The homunculus argument cites this as a philosophical regress which doesn't solve the problem but recurses it ad infinitum. The term "Cartesian theatre" was brought up in the context of the multiple drafts model that Dennett posits in *Consciousness Explained* (1991 107):

Cartesian materialism is the view that there is a crucial finish line or boundary somewhere in the brain, marking a place where the order of arrival equals the order of "presentation" in experience because what happens there is what you are conscious of. ... Many theorists would insist that they have explicitly rejected such an obviously bad idea. But ... the persuasive imagery of the Cartesian Theater keeps coming back to haunt us—laypeople and scientists alike—even after its ghostly dualism has been denounced and exorcized.

Yet the ghost Dennett claims to have crushed just keeps coming back to haunt him.

Bernard Baars' (1997) global workspace theory, in the form of the actors in the "Cartesian theatre" of consciousness, is creatively provocative of the psyche, and concedes a central role for consciousness. His approach suggests that consciousness is associated with the whole brain, in integrated coherent activity and is thus a property of the brain as a whole functioning entity, in relation to global workspace, rather than arising from specific subsystems.

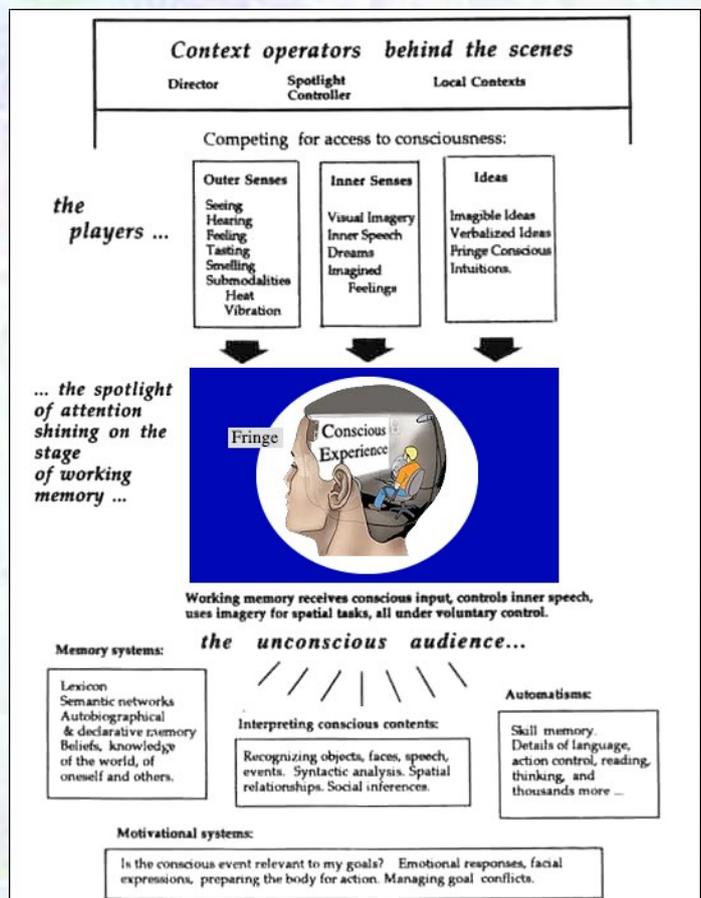
Furthermore, the approach rather neatly identifies the distinction between unconscious processing and conscious experience, in the spotlight of attention, accepts conscious experience as a central arena consistent with whether a given dynamic is confined to asynchronous regional activity or is part of a coherent global response.

Fig 87 Baars' (1997) view of the Cartesian theatre of consciousness has genuine explanatory power about the easy problem of the relation between peripheral unconscious processing and integrated coherent states associated with consciousness.

But again this description is an imaginative representation of Descartes' homunculus in the guise of a Dionysian dramatic production, so it is also a projection onto subjective consciousness, albeit a more engaging one.

Lenore and Manuel Blum (2021) have developed a theoretical model of conscious awareness designed in relation to Baars' global workspace theory that applies as much to a computer as an organism:

Our view is that consciousness is a property of all properly organized computing systems, whether made of flesh and blood or metal and silicon. With this in mind, we give a simple abstract substrate-independent computational



model of consciousness. We are not looking to model the brain nor to suggest neural correlates of consciousness, interesting as they are. We are looking to understand consciousness and its related phenomena.

Essentially the theory builds on the known feedbacks between peripheral unconscious processing and short term memory and the spotlight of conscious attention, paraphrasing these in purely computational terms, utilising a world model that is updated, notions corresponding to "feelings" and even "dream creation", in which a sleep processor alters the modality of informational chunking.

While it is possible to conceive of such analogous models it remains extremely unlikely that any such computational model can capture the true nature of subjective consciousness. By contrast with a Turing machine which operates discretely and serially on a single mechanistic scale, biological neurosystems operate continuously and discretely on fractal scales from the quantum level through molecular, subcellular dynamics up to global brains states, so it remains implausible in the extreme that such computational systems however complex in structural design can replicate organismic subjective consciousness. The same considerations apply to artificial neural net designs which lack the fractal edge of chaos dynamic of biological neurosystems.

Another discovery pertinent here (Fernandino et al. (2022)) is that a careful neuroscientific study has found that lexical semantic information can be reliably decoded from a wide range of heteromodal cortical areas in the frontal, parietal, and temporal cortex, but that in most of these areas, they found a striking advantage for experience-based representational structures (i.e., encoding information about sensory-motor, affective, and other features of phenomenal experience), with little evidence for independent taxonomic or distributional organisation. This shows that experience is the foundational basis for conceptual and cognitive thought, giving it a primary universal status over rational or verbal thought.

Jo Edwards in personal communication notes that Peter Slezak (2023) claims that many of the current theories of mind already discussed, suffer from abstract versions of the homunculus regress due to invoking a universal Spectator:

I have greatly enjoyed reading Peter Slezak's new book Spectator in the Cartesian Theater. He says the flaw in so many arguments about mind, often present in both sides of many interminable debates about mind, is the illegitimate invocation of an intelligent Spectator. Everyone is aware of the danger of positing a God's eye view. Slezak is saying that even more pernicious is the assumption of an intelligent or omniscient Spectator view in which we use our own external powers to explain the internal mechanisms of another case of those same powers. A simple example is that many modern theories of mind, rather than positing an illegitimate 'homunculus' to solve the insoluble, posit a dynamic schema that would need such a homunculus to work but deny there is any homunculus, instead using the powers of the external spectator to do the magic. So theories from Tononi, Dehaene, Crick, Kosslyn, McFadden, Fodor, Millikan, you name it, all in one way or another commit the true 'homunculus fallacy' by tacitly trying to explain the inside workings of an intelligent mind by slipping another intelligent mind's powers inside.

Consciousness and Broad Integrated Processing: The Global Neuronal Workspace (GNW) model

Stanislas Dehaene and Jean-Pierre Changeux (2008, 2011) have combined experimental studies and theoretical models, including Baars' global workspace theory to address the challenge of establishing a causal link between subjective conscious experience and measurable neuronal activity in the form of the Global Neuronal Workspace (GNW) model according to which conscious access occurs when incoming information is made globally available to multiple brain systems through a network of neurons with long-range axons densely distributed in prefrontal, parieto-temporal, and cingulate cortices.

Converging neuroimaging and neurophysiological data, acquired during minimal experimental contrasts between conscious and non-conscious processing, point to objective neural measures of conscious access: late amplification of relevant sensory activity, long-distance cortico-cortical synchronization at beta and gamma frequencies, and 'ignition' i.e. "lighting up" of a large-scale prefronto-parietal network. By contrast, as shown in fig 86, states of reduced consciousness have large areas of cortical metabolic deactivation. In conclusion, the authors look ahead to the quest of understanding the conscious brain and what it entails:

The present review was deliberately limited to conscious access. Several authors argue, however, for additional, higher-order concepts of consciousness. For Damasio and Meyer (2009), core consciousness of incoming sensory information requires integrating it with a sense of self (the specific subjective point of view of the perceiving organism) to form a representation of how the organism is modified by the information; extended consciousness occurs when this representation is additionally related to the memorized past and anticipated future (see also Edelman, 1989). For Rosenthal (2004), a higher-order thought, coding for the very fact that the organism is currently representing a piece of information, is needed for that information to be conscious. Indeed, metacognition, or

the ability to reflect upon thoughts and draw judgements upon them is often proposed as a crucial ingredient of consciousness. In humans, as opposed to other animals, consciousness may also involve the construction of a verbal narrative of the reasons for our behavior (Gazzaniga et al., 1977).

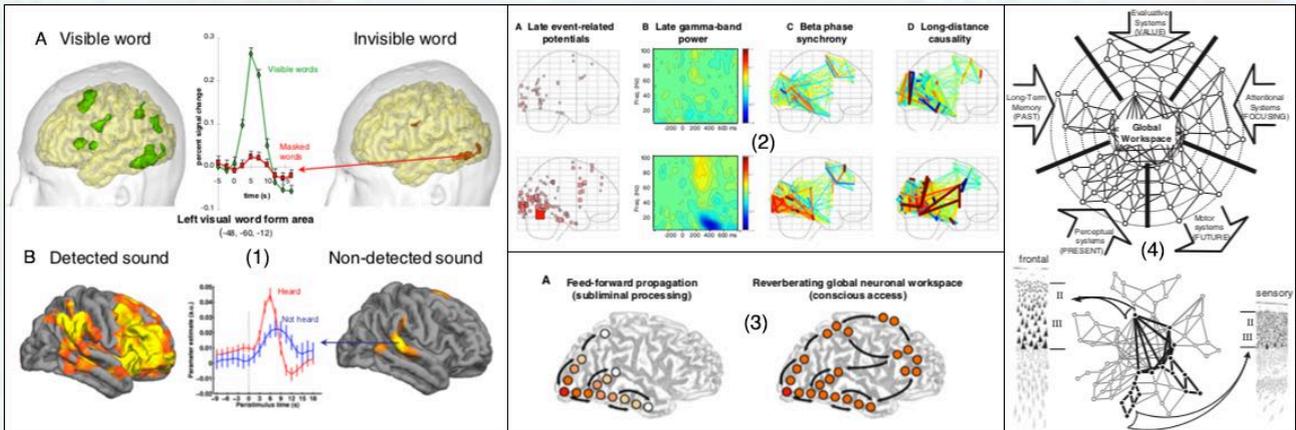


Fig 88: Both fMRI (1) and (2) EEG/MEG data, show broad activation across diverse linked cortical regions, when non-conscious processing rises to the conscious level. Likewise local feed forward propagation (3) leads to reverberating cortical connections. These influences are combined in the GRW model (4) in which Baars' global workspace theatre becomes a more precisely defined model attempting to solve several of the easier problems of consciousness into a globally resonant network theory.

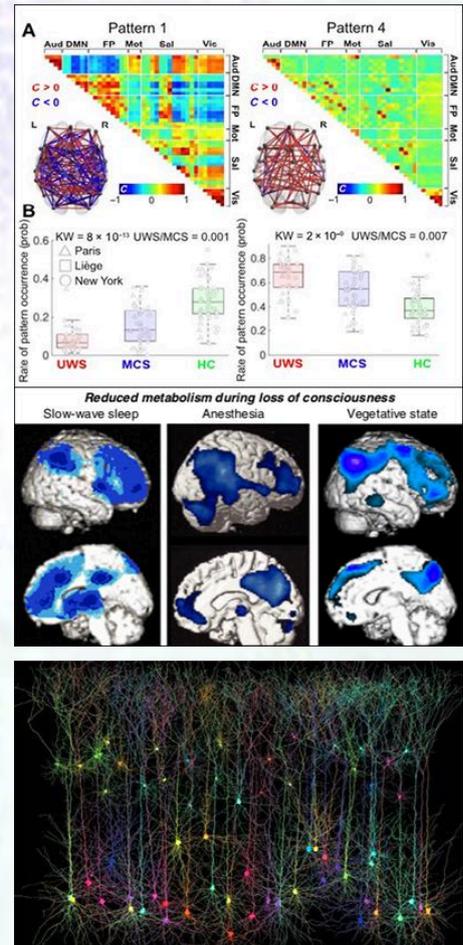
In the future, as argued by Haynes (2009), the mapping of conscious experiences onto neural states will ultimately require not only a neural distinction between seen and not-seen trials, but also a proof that the proposed conscious neural state actually encodes all the details of the participant's current subjective experience. Criteria for a genuine one-to-one mapping should include verifying that the proposed neural state has the same perceptual stability (for instance over successive eye movements) and suffers from the same occasional illusions as the subject's own report.

However, decoding the more intermingled neural patterns expected from PFC and other associative cortices is clearly a challenge for future research. Another important question concerns the genetic mechanisms that, in the course of biological evolution, have led to the development of the GNW architecture, particularly the relative expansion of PFC, higher associative cortices, and their underlying long-distance white matter tracts in the course of hominization. Finally, now that measures of conscious processing have been identified in human adults, it should become possible to ask how they transpose to lower animal species and to human infants and fetuses.

In "A better way to crack the brain", Mainen, Häusser & Pouget (2016) cite novel emerging technologies such as optogenetics as tools likely to eclipse the overriding emphasis on electrical networking data, but at the same time illustrate the enormity of the challenge of neuroscience attempting to address consciousness as a whole.

Some sceptics point to the teething problems of existing brain initiatives as evidence that neuroscience lacks well-defined objectives, unlike high-energy physics, mathematics, astronomy or genetics. In our view, brain science, especially systems neuroscience (which tries to link the activity of sets of neurons to behaviour) does not want for bold, concrete goals. Yet large-scale initiatives have tended to set objectives that are too vague and not realistic, even on a ten-year timescale.

Fig 89-90: Top: Conscious brain states are commonly associated with phase correlated global cortical activity. Conscious brain activity in healthy controls is contrasted with diminished cortical connectivity of excitation in unaware and minimally conscious states (Demertzi et al. 2019). Bottom: Reduced metabolism during loss of consciousness (Dehaene & Changeux J 2011). See also Melloni et al. (2007). Optogenetic images of pyramidal cells in a rodent cortex.



Several advances over the past decade have made it vastly more tractable to solve fundamental problems such as how we recognize objects or make decisions. Researchers can now monitor and manipulate patterns of activity in large neuronal ensembles, thanks to new technologies in molecular engineering, micro-electronics and computing. For

example, a combination of advanced optical imaging and optogenetics can now read and write patterns of activity into populations of neurons. It is also possible to relate firing patterns to the biology of the neurons being recorded, including their genetics and connectivity.

However none of these are coming even close to stitching together a functional view of brain processing that comes anywhere near to solving the hard problem, or even establishing causal closure, given the extreme difficulty of verifying classical causality in every brain process and the quantum nature of all brain processes at the molecular level. Future prospects for solving the hard problem via the easy ones thus remain unestablished.

Hopeful Monster 2: Consciousness and Surviving in the Wild v Attention Schema Theory

Real world survival problems in the open environment don't necessarily have a causally-closed or even a computationally tractable solution, due to exponential runaway like the travelling salesman problem, thus requiring sensitive dependence on the butterfly effect and intuitive choices. Which route should the antelope take to reach the water hole when it comes to the fork in the trail? The shady path where a tiger might lurk, or the savannah where there could be a lion in the long grass? All the agents are conscious sentient beings using innovation and stealth and so computations depending on reasoned memory are unreliable because the adversaries can also adapt their strategies and tactics to frustrate the calculations. The subtlest sensory hints of crisis amid split-second timing is also pivotal.

There is thus no tractable solution. Integrated anticipatory intuition, combined with a historical knowledge of the terrain, appears to be the critical survival advantage of sentient consciousness in the prisoners' dilemma of survival, just as sexuality is, in the Red Queen race (Ridley 1996) between hosts and parasites. This coherent anticipation possessed by subjective consciousness appears to be the evolutionary basis for the emergence and persistence of subjective consciousness as a quantum-derived form of anticipation of adventitious risks to survival, not cognitive processes of verbal discourse.

Anil Seth (2021) notes: *We are not the beast machines of Descartes, for whom life was irrelevant to mind. It is exactly the opposite. Brains are not for rational thinking, linguistic communication, or perceiving the world. Consciousness has more to do with being alive than with being intelligent. Experiences of being you, or of being me, emerge from the way the brain predicts and controls the internal state of the body. The essence of selfhood is neither a rational mind nor an immaterial soul. It is a deeply embodied biological process, a process that underpins the simple feeling of being alive that is the basis for all our experiences of selfhood ... Our conscious experiences of the world around us, and of ourselves within it, happen with, through, and because of our living bodies. Our animal constitution is not merely compatible with our conscious perceptions of self and world. We cannot understand the nature and origin of these conscious experiences, except in light of our nature as living creatures. ... Every self that ever was is complex and multifaceted, composed of many different aspects that seem bound together as a unified whole. But to grasp the essence of being a self, we must cast off the outer layers and go deep within the body.*

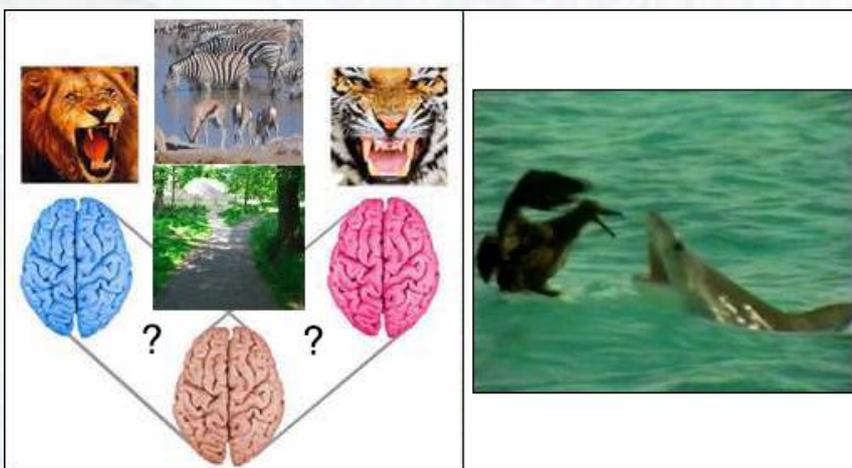


Fig 91: Which route should the human or antelope take to reach the water hole when it comes to the fork in the trail? The shady path where a tiger might lurk, or the savannah where there could be a lion in the long grass? Real world survival problems require intuitive multi-option decisions, creativity and often split-second timing requiring anticipatory consciousness. Thus modelling the existence of subjective consciousness or otherwise based only on causal concepts and verbal reasoning processes gives a false evolutionary and cosmological view. Here is where the difference between a conscious organism and an AI robot attempting to functionally emulate it is laid bare in

tooth and claw. Although only about 23,000 lions remain in sub-Saharan Africa, about 250 people a year die in lion attacks. An estimated 500 people a year are killed in hippo attacks, and snake bites kill anywhere from 7,000 to 32,000 people a year (CNN).

Michael Graziano's (2016, 2017, Webb & Graziano 2015), attention schema theory, or AST, self-described as a mechanistic account of subjective awareness which emerged in parallel with my own work (King 2014), gives an

account of the evolutionary developments of the animal brain, taking account of the adaptive processes essential for survival to arrive at the kind of brains and conscious awareness we experience:

“We propose that the top–down control of attention is improved when the brain has access to a simplified model of attention itself. The brain therefore constructs a schematic model of the process of attention, the ‘attention schema,’ in much the same way that it constructs a schematic model of the body, the ‘body schema.’ The content of this internal model leads a brain to conclude that it has a subjective experience – a non-physical, subjective awareness and assigns a high degree of certainty to that extraordinary claim”.

However, in Graziano (2013, 2019), he advocates illusionism the idea that subjective consciousness and volitional will are a self-fulfilling evolutionary delusion, so that the author believes AST as a purely mechanistic principle could in principle be extended to a machine without the presence of subjective consciousness: *“Such a machine would “believe” it is conscious and act like it is conscious, in the same sense that the human machine believes and acts”.*

It remains unclear that a digital computer, or AI process can achieve this notwithstanding chatGPT. Ricci et al. (2021) note in concluding remarks towards one of the most fundamental and elementary tasks, abstract same-different discrimination: *The aforementioned attention and memory network models are stepping stones towards the flexible relational reasoning that so epitomizes biological intelligence. However, current work falls short of the — in our view, correct — standards for biological intelligence set by experimentalists like Delius (1994) or theorists like Fodor (1988).*

Yet AST is a type of filter theory similar to Huxley’s ideas about consciousness, so it invokes a principle of neural organisation that is consistent with and complementary to subjective consciousness: *“Too much information constantly flows in to be fully processed. The brain evolved increasingly sophisticated mechanisms for deeply processing a few select signals at the expense of others, and in the AST, consciousness is the ultimate result of that evolutionary sequence.”*

The overall idea of a purely physical internal model of reality representing its own attention process, thus enabling it to observe itself, is an astute necessary condition for the sort of subjective consciousness we find in the spread of metazoa, but it is in no way sufficient to solve the hard problem or address any more than the one easy problem it addresses, about recursive attention. However its description, of fundamental changes in overall brain architecture summarised in Graziano (2016) highlights the actual evolutionary forces shaping the development of the conscious mind lie in the paranoia of survival the jungle as noted in fig 91, rather than the verbal contortions of philosophical discourse:

*“If the wind rustles the grass and you misinterpret it as a lion, no harm done.
But if you fail to detect an actual lion, you’re taken out of the gene pool” (Michael Graziano 2016).*

However Graziano (2020), in claiming why AST “has to be right”, commits to de-subjectifying consciousness in favour of an AI analysis of recursive attention systems. In relation to the reality of consciousness in his words, the claim that: *“I have a subjective, conscious experience. It’s real; it’s the feeling that goes along with my brain’s processing of at least some things. I say I have it and I think I have it because, simply, I do have it. Let us accept its existence and stop quibbling about illusions”*, he attempts a structural finesse based on recursive attention:

Suppose the brain has a real consciousness. Logically, the reason why we intuit and think and say we have consciousness is not because we actually have it, but must be because of something else; it is because the brain contains information that describes us having it. Moreover, given the limitations on the brain’s ability to model anything in perfect detail, one must accept that the consciousness we intuit and think and say we have is going to be different from the consciousness that we actually have. . . . I will make the strong claim here that this statement – the consciousness we think we have is different from, simpler than, and more schematic than, the consciousness we actually have – is necessarily correct. Any rational, scientific approach must accept that conclusion. The bane of consciousness theorizing is the naïve, mistaken conflation of what we actually have with what we think we have. The attention schema theory systematically unpacks the difference between what we actually have and what we think we have. In AST, we really do have a base reality to consciousness: we have attention – the ability to focus on external stimuli and on internal constructs, and by focusing, process information in depth and enable a coordinated reaction. We have an ability to grasp something with the power of our biological processor. Attention is physically real. It’s a real process in the brain, made out of the interactions of billions of neurons. The brain not only uses attention, but also constructs information about attention – a model of attention. The central hypothesis of AST is that, by the time that information about attention reaches the output end of the pathway ... , we’re claim-ing to have a semi-magical essence inside of us – conscious awareness. The brain describes attention as a semi-magical essence because the mechanistic details of attention have been stripped out of the description.

These are simply opinions of a hidden underlying information structure, confusing conscious experience itself with the recursive attention structures that any realistic description has to entail to bring physical brain processing into any kind

of concordance with environmental reality. His inability to distinguish organismic consciousness from AI is evidenced in Graziano (2017) where he sets out AST as a basis for biologically realisable artificial intelligence systems.

The answer to this apparent paradox that leaves our confidence in our conscious volition in tatters, is that the two processes, neural net attention schemes and subjective consciousness have both been selected by evolution to ensure survival of the organism from existential threats and they have done so as complementary processes. Organismic brains evolved from the excitable sentience of single-celled eucaryotes and their social signalling molecules that became our neurotransmitters a billion years after these same single-celled eucaryotes had to solve just these problems of growth and survival in the open environment. Brains are thus built as an intimately coupled society of eucaryote excitable cells communicating by both electrochemical and biochemical means via neurotransmitters, in such a way that the network process is an evolutionary elaboration of the underlying cellular process, both of which have been conserved by natural selection because both contribute to organismic survival by anticipating existential threats.

This is the only possible conclusion, because the presence of attention schemae does not require the manifestation of subjective consciousness to the conscious participant unless that too plays an integral role in survival of the organism. Indeed an artificial neural net with recursive schemes would do just that and have no consciousness implied, as it would be superfluous to energy demands unless it had selective advantage.

An adjunct notion is the ALARM theory (Newen & Montemayor 2023), we need to distinguish two levels of consciousness, namely basic arousal and general alertness. Basic arousal functions as a specific alarm system, keeping a biological organism alive under sudden intense threats, and general alertness enables flexible learning and behavioural strategies. This two-level theory of consciousness helps us to account for recent discoveries of subcortical brain activities with a central role of thalamic processes, and observations of differences in the behavioural repertoire of non-human animals indicating two types of conscious experiences. The researchers claim this enables them to unify the neural evidence for the relevance of sub-cortical processes, and of cortico-cortical loops, on the other, and to clarify the evolutionary and actual functional role of conscious experiences.

They derive evidence primarily from two animal studies. In Afrasiabi et al. (2021) macaques were anaesthetised, and the researchers stimulated the central lateral thalamus. The stimulation acted as a switch to trigger consciousness. However, it only prompted fundamental arousal because the macaques could feel pain, see things, and react to them, but they were unable, unlike regular wakefulness, to participate in learning tasks. A second experiment, Nakajima et al. (2019), provides evidence mice possess general wakefulness in their daily lives. The animals were trained to respond to a sound differently than to a light signal. They were also capable of interpreting a third signal that indicated whether they should focus on the sound or the light signal. Given that the mice learned this quickly, it is clear that they have acquired learning with focused conscious attention and, therefore, possess general vigilance.

In "Homo Prospectus" (Seligman et al. 2016), which asserts that the unrivalled human ability to be guided by imagining alternatives stretching into the future – "prospection" – uniquely describes *Homo sapiens*, addresses the question of how ordinary conscious experience might relate to the prospective processes that are neglected by psychology's 120-year obsession with memory (the past) and perception (the present) and its absence of serious work on such constructs as expectation, anticipation, and will. Peter Railton cites:

Intuition: *The moment-to-moment guidance of thought and action is typically intuitive rather than deliberative. Intuitions often come unbidden, and we can seldom explain just where they came from or what their basis might be. They seem to come prior to judgment, and although they often inform judgment, they can also stubbornly refuse to line up with our considered opinions.*

Affect: *According to the prosppection hypothesis, our emotional or affective system is constantly active because we are constantly in the business of evaluating alternatives and selecting among them.*

Information: *A system of prospective guidance is information-intensive, calling for individuals to attend to many variables and to update their values continuously in response to experience.*

They also see deliberative cognitive processes as intertwined with and integrated by intuitive processes:

One view, which we call the separate processors view, says intuition and deliberation are separate, distinct modes of thought. An opposing view says intuition and deliberation are thoroughly intertwined; deliberation is constructed with intuition as a main ingredient. On this second view, there aren't two independent processors. Rather, deliberation depends fundamentally on intuitive affective evaluations.

They associate imagination with the wandering mind, which we shall see is identifiable with the default mode network critical in ego dissolution and central to rehearsing survival strategies:

Think about what goes consciously through your mind during idle moments. This is mind-wandering, and it is deeply puzzling to theorists. The biggest puzzle is why we do so much of it. One study, which used experience sampling methods with 2,250 adults, found mind-wandering occurred in a remarkable 46.9% of the time points sampled.

On free will, the authors dodge the core philosophical debate, assuming that philosophers of all bents do embrace a form of free will, but instead pragmatically introduce the multiple-options question that plagues all environmental survival decisions:

We will argue that the distinctive mark of human freedom is latitude. Latitude refers to what agents have when the “size” of their option set is large. For now, we can say an agent has more latitude when the number of distinct options in the option set is larger. A bit later, we will provide a more refined account of how to understand the “size” of an option set.

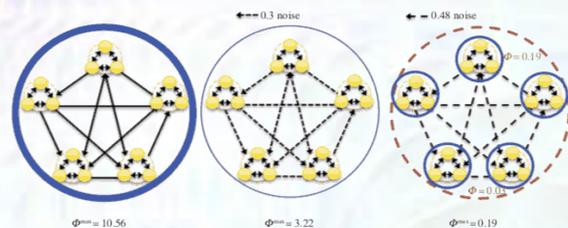
Some anticipatory aspects of our conscious experience of the world make it possible for the brain to sometimes construct a present that has never actually occurred. In the “flash-lag” illusion, a screen displays a rotating disc with an arrow on it, pointing outwards. Next to the disc is a spot of light that is programmed to flash at the exact moment the spinning arrow passes it. Instead, to our experience, the flash lags behind, apparently occurring after the arrow has passed (Westerhoff 2013). One explanation is that our brain extrapolates into the future, making up for visual processing time by predicting where the arrow will be, however, rather than extrapolating into the future, our brain is actually interpolating events in the past, assembling a story of what happened retrospectively, as was shown by a subtle variant of the illusion (Eagleman and Sejnowski 2000).

Given the complementary roles of conscious quantum measurement and edge-of-chaos coherence dynamics, far from being an ephemeral state of a biological organism’s brain dynamics that is irrelevant to the universe at large, the symbiotic cosmology asserts that consciousness has a foundational role in existential cosmology, complementary to the entire phenomenon of the physical universe. The conscious brain may also literally be a/the most complex functional system in the universe, so manifests emergent properties undeveloped in other physical processes. This is not dualistic, but an extension of quantum wave-particle complementarity to a larger complementarity, in which mind is complementary to the universe as a whole. It is thus non-local in a more complete way than the quantum wave aspect is in complementation to the localised particle aspect.

Hopeful Monster 3: Consciousness as Integrated Information

Fig 92: variations in recursive connectivity result in varying Φ .

Tononi and Koch’s (2015, Tononi et al. 2016) integrated information theory IIT, suggests a similar classification to the dynamical classification in the cosmology, running through states of limited human consciousness such as ketamine anaesthesia down to cephalopods and then Siri, thus invoking AI as putatively conscious if it has the right integrative algorithms. IIT constructs its model by starting from experience itself, establishing its classification via five phenomenological axioms: intrinsic existence, composition, information, integration and exclusion. It predicts that consciousness is graded, is common among biological organisms and can occur in some very simple systems. It will thus discount purely computational AI systems as non-conscious and makes a similar set of distinctions to those in the symbiotic cosmology. However, despite being based on characteristics of conscious behaviour, IIT becomes an abstract study of discrete probabilistic Markov systems, rather than subjectivity itself.



However the ground of the theory is probabilistic information, as indicated by its axiomatic definitions: **Mechanism** – Any subset of elements within a system that has cause–effect power on it (that is, that constrains its cause–effect space). **Cause–effect repertoire** – The probability distribution of potential past and future states of a system that is specified by a mechanism in its current state. **Cause–effect space** – A space with each axis representing the probability of each possible past and future state of a system. **Cause–effect structure** – The set of cause–effect repertoires specified by all the mechanisms of a system in its current state. **Integrated information (Φ)**: Information that is specified by a system that is irreducible to that specified by its parts. It is calculated as the distance between the

conceptual structure specified by the intact system and that specified by its minimum information partition.

Fig 92b: IIT sets out five axioms attempting to produce the principles of how an informational system needs to operate to model what we know of organismic conscious experience.

This does make a structural analysis consistent with prominent features of conscious experience as an integrated phenomenon. It is tolerant for example of octopus consciousness. However its analysis is based on abstract causal systems which are required to be composed of hierarchies of interacting subsets in a cause-effect repertoire.

This effectively creates the same combinations problem associated with attempts to structure panpsychism in the abstract form of Markov systems. This makes such abstract systems subject to the same criticism that the hard problem has with all objective descriptions being categorically incapable of subjectivity.

Chris Koch (2014) in *Scientific American*, introduces IIT as a form of panpsychism that spans the spread of animal kingdom:

All species—bees, octopuses, ravens, crows, magpies, parrots, tuna, mice, whales, dogs, cats and monkeys—are capable of sophisticated, learned, nonstereotyped behaviors that would be associated with consciousness if a human were to carry out such actions. For instance, bees are capable of recognizing specific faces from photographs, can communicate the location and quality of food sources to their sisters via the waggle dance, and can navigate complex mazes with the help of cues they store in short-term memory (for instance, “after arriving at a fork, take the exit marked by the color at the entrance”). Bees can fly several kilometers and return to their hive, a remarkable navigational performance. And a scent blown into the hive can trigger a return to the site where the bees previously encountered this odor. ... Given the lack of a clear and compelling Rubicon separating simple from complex animals and simple from complex behaviors, the belief that only humans are capable of experiencing anything consciously seems preposterous. A much more reasonable assumption is that until proved otherwise, many, if not all, multicellular organisms experience pain and pleasure and can see and hear the sights and sounds of life.

He notes that Darwin himself inquired into the mental powers of earthworms:

None other than Charles Darwin, in the last book he published, in the year preceding his death, set out to learn how far earthworms “acted consciously and how much mental power they displayed.” Studying their feeding and sexual behaviors for several decades—Darwin was after all a naturalist with uncanny powers of observation—he concluded that there was no absolute threshold between lower and higher animals, including humans, that assigned higher mental powers to one but not to the other.

As we also know from Smith (1978), that Darwin took this even further to the coelenterates and all animals:

*“To see a puppy playing [one] cannot doubt that they have free-will”
and if “all animals, then an oyster has and a polype.” (Darwin)*

He concedes that the explanatory gap between subjective consciousness and the physical world description cannot be simply bridged by complexity:

Yet the mental is too radically different for it to arise gradually from the physical. This emergence of subjective feelings from physical stuff appears inconceivable and is at odds with a basic precept of physical thinking, the Ur-conservation law—ex nihilo nihil fit. So if there is nothing there in the first place, adding a little bit more won't make something. If a small brain won't be able to feel pain, why should a large brain be able to feel the god-awfulness of a throbbing toothache? Why should adding some neurons give rise to this ineffable feeling? The phenomenal hails from a kingdom other than the physical and is subject to different laws. I see no way for the divide between unconscious and conscious states to be bridged by bigger brains or more complex neurons. ... A more principled



Intrinsic existence: Consciousness exists intrinsically: each experience is real, and it exists from its own intrinsic perspective, independent of external observers (it is intrinsically real) to account for experience, a system of mechanisms 0.5 in a state must exist intrinsically. To exist, it must have cause-effect power: to exist from its own intrinsic perspective, independent of extrinsic factors, it must have cause-effect power upon itself: its present mechanisms and state must 'make a difference' to the probability of some past and future state of the system (its cause-effect space).



Composition: Consciousness is structured: each experience is composed of phenomenological distinctions, elementary or higher-order, which exist within it the system must be structured: subsets of system elements (composed in various combinations) must have cause-effect power upon the system.



Information: Consciousness is specific: each experience is the particular way it is (it is composed of a specific set of specific phenomenological distinctions), thereby differing from other possible experiences (differentiation) the system must specify a cause-effect structure that is the particular way it is: a specific set of specific cause-effect repertoires — thereby differing in its specific way from other possible structures (differentiation). A cause-effect repertoire specifies the probability of all possible causes and effects of a mechanism in a state. A cause-effect structure is the set of cause-effect repertoires specified by all subsets of system elements and expresses how the system gives an actual form to the space of possibilities.



Integration: Consciousness is unified: each experience is irreducible to non-interdependent subsets of phenomenal distinctions the cause-effect structure specified by the system must be unified: it must be intrinsically irreducible to that specified by non-interdependent sub-systems ($\Phi > 0$) across its weakest (unidirectional) link:
MIP = minimum information partition.



Exclusion: Consciousness is definite, in content and spatio-temporal grain: each experience has the set of phenomenal distinctions it has, not less or more, and flows at the speed it does, not faster or slower the cause-effect structure specified by the system must be definite: specified over a single set of elements — not less or more — and spatio-temporal grains—not faster or slower: this is a cause-effect structure that is maximally irreducible intrinsically (Fmax), called conceptual structure, made of maximally irreducible cause-effect repertoires (concepts).

solution is to assume that consciousness is a basic feature of certain types of so-called complex systems (defined in some universal, mathematical manner).

He then leaps to panpsychism, as a philosophical viewpoint consistent with these perspectives:

Panpsychism is an elegant explanation for the most basic of all brute facts I encounter every morning on awakening: there is subjective experience. Tononi's theory offers a scientific, constructive, predictive and mathematically precise form of panpsychism for the 21st century. It is a gigantic step in the final resolution of the ancient mind-body problem.

But he then makes a broad critique of panpsychism's known deficiencies:

Yet, as traditionally conceived, panpsychism suffers from two major flaws. One is known as the problem of aggregates. Philosopher John Searle of the University of California, Berkeley, expressed it recently: "Consciousness cannot spread over the universe like a thin veneer of jam; there has to be a point where my consciousness ends and yours begins." Indeed, if consciousness is everywhere, why should it not animate the iPhone, the Internet or the United States of America? Furthermore, panpsychism does not explain why a healthy brain is conscious, whereas the same brain, placed inside a blender and reduced to goo, would not be. That is, it does not explain how aggregates combine to produce specific conscious experience.

He then uses panpsychism to launch a justification of Integrated Information Systems as a theory:

These century-old arguments bring me to the conceptual framework of the integrated information theory (IIT) of psychiatrist and neuroscientist Giulio Tononi of the University of Wisconsin–Madison. It postulates that conscious experience is a fundamental aspect of reality and is identical to a particular type of information—integrated information. Consciousness depends on a physical substrate but is not reducible to it. That is, my experience of seeing an aquamarine blue is inexorably linked to my brain but is different from my brain.

However, in a detailed review comparing the GNW and IIT theories, Maillé & Lynn (2020) in "Reconciling Current Theories of Consciousness" conclude that GNW concurs more closely with the empirical evidence:

Proponents of IIT point to its explanatory power: for instance, it can explain why the cortex is capable of producing conscious experience while the cerebellum is not, even though the cerebellum possesses up to four times more neurons. While the IIT has not received unambiguous validation (possibly due to the abstract nature of its description of consciousness, it provides one of the most detailed accounts for the emergence of conscious experience from an information-processing network.

The GNW theory (Dehaene and Changeux, 2011), in contrast to the IIT, was empirically derived from EEG and imaging studies in humans and primates. These studies have shown that when a stimulus is presented but not consciously perceived, activation can be seen mainly in the associated primary sensory cortices. When the stimulus is consciously perceived, however, activation in primary cortical areas is followed by a delayed "neural ignition" in which a sustained wave of activity propagates across pre-frontal and parietal association cortices. According to the GNW model, this allows relevant information to be broadcast across the brain to other subsystems for use in decision-making, reporting, memory consolidation, and other processes.

Unfortunately, while both IIT and GNW have obtained experimental support, testable predictions from both theories are seldom compared within the same dataset. In a recent issue of The Journal of Neuroscience, Noel et al. (2019) leveraged a previously published experimental data-set to directly compare IIT and GNW at the single-unit level.

Noel et al. (2019) did not find large enough pools of integrative and convergent neurons in vPM to generate sufficient statistical power, so this analysis was restricted to S1 neurons. The authors reasoned that if integrative neurons underlie conscious perception, then their multisensory representations should more closely track the state of consciousness than those of convergent neurons. Contrary to this, 69% of convergent neurons but only 37.1% of integrative neurons changed their multisensory response classification after propofol administration. Noel et al. (2019) additionally considered single-neuron physiological properties, including Lempel–Ziv complexity (a measure of the statistical complexity of stimulus-driven responses) and noise correlations (the amount of shared response variability between neurons). They found that both of these measures were less correlated with consciousness state in integrative neurons than in convergent neurons. Together, these findings argue against the IIT theory of consciousness.

Yaden et al. (2021) point out some of the problems with this kind of model in the context of psychedelics: "Although it would be interesting to investigate how psychedelic states relate to Φ , it is not clear how this would improve our understanding of the hard problem of consciousness." They note that relatively simple digital logic gates (e.g., XOR gate), which intuitively seem non-conscious, can generate large amounts of Φ (Cerullo, 2015) stating "It is also not clear that the assertion of complexity itself being a measure of consciousness is tenable." This is a natural critique of the IIT model in that, despite being an attempt to reason in the subjective, its sole basis in stochastic information cannot solve the hard problem, although it receives some philosophical support (Fallon & Blackmon 2021).

Bayne and Carter (2018) also critique the model, in dealing with whether conscious states can be assigned levels, exemplified by the idea that psychedelics induce a "higher" state of consciousness. "Advocates of IIT are explicitly

committed to the unidimensional view of conscious states, for they equate a creature's conscious state with its level of consciousness, and degrees of consciousness, according to IIT, are in turn understood in terms of the amount of integrated information Φ . The considerations advanced in this paper raise questions about the plausibility of this view, for we have seen that global states cannot be ordered along a single dimension."

"The only dominant theory we have of consciousness says that it is associated with complexity — with a system's ability to act upon its own state and determine its own fate. Theory states that it could go down to very simple systems. In principle, some purely physical systems that are not biological or organic may also be conscious" (Chris Koch).

However the final knell came from Merker et al. (2022):

Giulio Tononi's integrated information theory (IIT) proposes explaining consciousness by directly identifying it with integrated information. We examine the construct validity of IIT's measure of consciousness, phi (Φ), by analyzing its formal properties, its relation to key aspects of consciousness, and its co-variation with relevant empirical circumstances. Our analysis shows that IIT's identification of consciousness with the causal efficacy with which differentiated networks accomplish global information transfer (which is what Φ in fact measures) is mistaken. This misidentification has the consequence of requiring the attribution of consciousness to a range of natural systems and artifacts that include, but are not limited to, large-scale electrical power grids, gene-regulation networks, some electronic circuit boards, and social networks. Instead of treating this consequence of the theory as a disconfirmation, IIT embraces it.

A more recent study (Cogitate Consortium et al. 2023) compared integrated information theory (IIT) against global network workspace theory (GNWT) and found the results didn't perfectly match either of the theories. This has since resulted in an open letter treating IIT, in particular as pseudoscience (Fleming et al. 2023, Lenharo 2023b, 2024), causing David Chalmers to with a bet against Christof Koch that the mechanism by which the brain's neurons produce consciousness would be discovered by 2023.

The latest version of the theory, IIT 4.0 (Albantakis et al 2023) incorporates improvements to its formalism. However, [Wikipedia](#) notes that, while the theory has already been applied to explain the level and contents of experience in certain situations, it remains in development and still requires further validation and testing in cases where the level and contents of experience are well known (e.g. in awake humans capable of reporting, being exposed to natural sensory stimuli). Despite significant interest, IIT remains controversial and has been widely criticised, including that it is unfalsifiable pseudoscience. Proponents counter that there is some experimental support for it, but the fundamental validity of some of the tests used is questioned by some critics.

Anil Seth while supportive of the theory, claiming "conscious experiences are highly informative and always integrated" and that "one thing that immediately follows is that you have a nice post hoc explanation for certain things we know about consciousness," also has fundamental caveats "the parts of IIT that I find less promising are where it claims that integrated information actually is consciousness — that there's an identity between the two.

On its new axiomatic basis, IIT 4.0 proceeds by considering whether experience—phenomenal existence—has some axiomatic or essential properties, properties that are immediate and irrefutably true of every conceivable experience. Drawing on introspection and reason, IIT identifies the following five:

Intrinsicity Experience is intrinsic: it exists for itself.

Information Experience is specific: it is the way it is.

Integration Experience is unitary: it is a whole, irreducible to separate experiences.

Exclusion Experience is definite: it is this whole.

Composition Experience is structured: it is composed of distinctions and the relations that bind them together, yielding a phenomenal structure.

Existence The substrate of consciousness must have cause–effect power: its units must take and make a difference.

The authors state that a scientific theory of consciousness should account for experience, which is subjective, in objective terms. Being conscious — having an experience — is understood to mean that "there is something it is like to be" something it is like to see a blue sky, hear the ocean roar, dream of a friend's face, imagine a melody flow, contemplate a choice, or reflect on the experience one is having.

IIT aims to account for phenomenal properties—the properties of experience—in physical terms. IIT's starting point is experience itself rather than its behavioral, functional, or neural correlates. Furthermore, in IIT "physical" is meant in a strictly operational sense — in terms of what can be observed and manipulated.

Building from this “zeroth” postulate, IIT formulates five axioms in terms of postulates of physical existence:

Intrinsicity The substrate of consciousness must have intrinsic cause–effect power: it must take and make a difference within itself.

Information The substrate of consciousness must have specific cause–effect power: it must select a specific cause–effect state. This state is the one with maximal intrinsic information (ii), a measure of the difference a system takes or makes over itself for a given cause state and effect state.

Integration The substrate of consciousness must have unitary cause–effect power: it must specify its cause–effect state as a whole set of units, irreducible to separate subsets of units.

Irreducibility is measured by integrated information (ϕ) over the substrate’s minimum partition.

Exclusion The substrate of consciousness must have definite cause–effect power: it must specify its cause–effect state as this set of units. This is the set of units that is maximally irreducible, as measured by maximum ϕ (ϕ^*). This set is called a maximal substrate, also known as complex.

Composition The substrate of consciousness must have structured cause–effect power: subsets of its units must specify cause–effect states over subsets of units (distinctions) that can overlap with one another (relations), yielding a cause–effect structure or Φ -structure (“Phi-structure”).

Having determined the necessary and sufficient conditions for a substrate to support consciousness, IIT proposes an **explanatory identity**: every property of an experience is accounted for in full by the physical properties of the Φ -structure unfolded from a maximal substrate (a complex) in its current state, with no further or “ad hoc” ingredients.

Immediate criticisms at the axiomatic level render this analysis invalid right from the zeroth postulate, which asserts a priori that “a scientific theory of consciousness should account for experience, which is subjective, in objective terms”, remaining intentionally blind to the nature of subjectivity or its extreme category inconsistency with physicality.

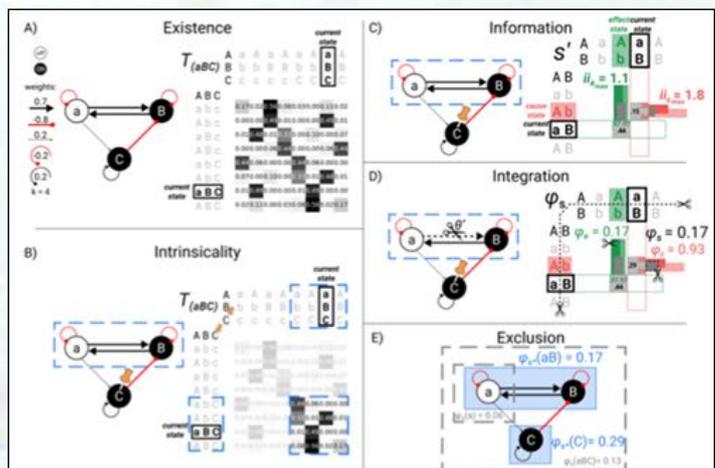
The attempts to paraphrase this by asserting that subjectivity expressed as being conscious is “what it is like to be” something is merely to have a physical structure representing it not to have the subjective experience at all. This is a purely functionalist view of consciousness in the sense of “conscious of” and it misrepresents subsequent axioms. Saying experience is “intrinsic” simply means “exists for itself” any autonomous physical process such as a wave on water satisfies this. The fact this it is specifically “the way it is” becomes “information in a tautologous self definition.

We then enter into further confining assumptions. Experience is claimed to be structured in the same way objective processes such as machines claiming “it is composed of distinctions and the relations that bind them together” but this does not mean they yield a “phenomenal” structure subjectively experienced.

The last, **existence** is revealing. The substrate of consciousness must have cause – effect power: its units must take and make a difference. What “taking” a difference is anyone’s guess, but making a difference is having conscious efficacy over the physical world e.g. in intentional behaviour. This confines any such theory to be either pure physicalism, or to be a subjective-objective interactionist theory like Symbiotic Existential Cosmology is.

IIT thus aims to account for phenomenal properties — the properties of experience — in purely physical terms. IIT’s starting point is experience, but its endpoint is axiomatically physical by identification. In IIT “physical” is meant in a strictly operational sense — in terms of what can be observed and manipulated. Thus abstract mathematical reality probability and information as well is identified with physicality, unilaterally assigning the abstract realm to physics.

Fig 92c: Identifying substrates of consciousness through the postulates of existence, intrinsicity, information, integration, and exclusion.



To seal the fate of the entire exercise, the substrate axioms execute the same series of

definitions determining without any escape, that the subjective aspect is now locked by equivalence to the physical. All of the substrate axioms repeat the mantra that each has cause–effect power, except for irreducibility which directly asserts that it “measured by integrated information (Φ)” giving integrated information a priori status. Thus the entire statement of IIT is simply a single axiom “subjectivity is physical”, not a consciousness theory at all.

This becomes finally apparent in the critical step – the **explanatory identity** – every property of an experience is accounted for in full by the physical properties of the Φ -structure unfolded from a maximal substrate (a complex) in its current state, with no further or “ad hoc” ingredients. In Anil Seth’s words “it claims that integrated information actually **IS** consciousness — that there’s an identity between the two”.

If this isn’t a bald statement of mind-brain identity theory, it is vacuous. There is no reference to Levine’s (1983) explanatory gap, Chalmers (1995) hard problem, or the fact that this is an attempt to solve the hard problem by solving a host of functional easy problems but simply stating IIT as an axiom, so that if systems design satisfy the substrate axioms as it is designed to do, then axiomatically, “my dear Watson”, it has unravelled subjective consciousness.

Emergence of Organismic Subjective Experience in the Cambrian

The foundation of consciousness arises not from the cortex, but from the ascending reticular activating system or ARAS (a), a collection of up to 50 separate brain stem ganglia giving the brain both its resonant excitations and modes of conscious activity from waking through deep and dreaming sleep and promote organismic survival through goal seeking affects ensuring survival. The ARAS, fig 92(d) is fast composed of several neural circuits connecting the dorsal part of the posterior midbrain and anterior pons to the cerebral cortex via distinct pathways that project through the thalamus and hypothalamus. Consciousness is thus supported by the most “drug-addled” foundation that also goes back in evolutionary terms to our single-celled eucaryote ancestors.

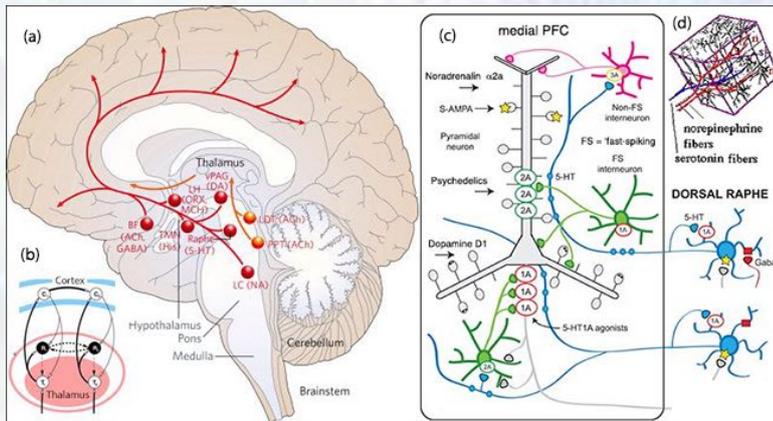


Fig 92d: Key components of the ascending arousal system.

The thalamic pathway (orange) consists primarily of cholinergic acetyl-choline neurons (aCh) in the pedunculopontine (PPT) and laterodorsal tegmental nuclei (LDT), which excite the thalamo-cortical-thalamic electrical and glutaminergic resonances (b) accompanying consciousness (Shepherd & Yamawaki 2021).

The hypothalamic pathway (red) is composed primarily of neurons that release adrenergic monoamine neurotransmitter modulators, dopamine (DA), norepinephrine (NA), serotonin (5HT), and histamine (His). These send neuromodulatory projections to the cortex - especially the prefrontal cortex. These arise from neurons in the monoaminergic cell groups, including the tubero-mammillary nucleus (TMN) containing histamine (His), the substantia nigra (A9) and the ventral tegmental area (A10) group containing dopamine (DA), the dorsal and median Raphe nuclei containing serotonin (5-HT), and the Locus coeruleus (LC) containing noradrenaline (NA). Dopamine is associated with motivation and fulfilment and can indirect dopamine effects from stimulants such as amphetamines can also cause sleep delay, serotonin with mood and survival oriented modulation and alleviating depression and inducing psychedelic states, nor-adrenaline with vigilance and histidine with wakefulness.

The dopamine, nor-epinephrine and serotonin ascending pathways spread across the cortex (a, d) with dopamine in particular concentrated in the prefrontal region. They enter different layers of the cortex, as can be seen in (d) (NA and 5HT only) and in (c), where the positions of serotonin (1a) and (2a), nor-adrenaline (α 2a) and dopamine (D1) receptors are shown on different parts of the pyramidal neuron. This pattern is largely repeated across the entire micro-columnar structure of the cortex. As shown in (c), the serotonin receptors are served by ascending fibres from the Raphe nuclei, so the global mode of serotonin modulation, in the absence of psychoactive molecules, is driven from the basal brain. Orexin (ORX) neurons of the lateral hypothalamus, opposed by melanin concentrating hormone (MCH), act as a flip-flop between sleep and wakefulness, driven by ascending reticular pathways of aCh, his, 5HT and

NA. The ORX innervate every component of the ascending reticular activating system and coordinate activity within the entire system. The failure of these leads to narcolepsy through loss of coordination of the sleep-wakefulness cycle.

Receptors for the very same molecules in the ARAS are pivotal in the span of key psychoactive drugs (fig 41), from antipsychotics, which are like an elephant sitting on the entire receptor keyboard, as broad-spectrum antagonists, with multiple negative and damaging side effects, including sometimes irreversible disabilities such as tardive dyskinesia and increased overall mortality, through tricyclic antihistamines and antidepressants which have similar indiscriminate activity, to more recent SSRI and SNRI antidepressants which are less harmful but still cause psychological dependence in long-term use. By contrast psychedelics are focused on serotonin super-agonism of the 5HT_{2a} and 5HT_{2c} receptors with mild agonism of dopamine and nor-adrenaline receptors adding rewarding but also a degree of anxiogenic features. The 5HT_{2a} receptors are centrally involved in psychedelic states, while the 5HT_{2c} receptors promote anxiety and relieve depression.

Psychedelic super-agonism is a paradoxical effect which sets off a different metabotropic pathway from serotonin itself, which modulates associated glutamate mGluR2 receptor expression, resulting in increased neurodynamic linkages between brain regions crossing sensory and other regions and increasing signal complexity and decoherence. MDMA has the effect of causing the serotonin (SERT) reuptake transporter to reverse, dumping large amounts of serotonin in the synaptic cleft, resulting in its title “ecstasy”, but is also liable to cause oxidative damage because of its methylenedioxy molecular structure.

The most rostral neurons in the brain with a major role in sleep control are γ -aminobutyric acid cells located in the basal forebrain and in the anterior hypothalamus (GABA in a). These GABAergic cells are unique: while most neurons tend to have minimal activity during non-rapid eye movement (NREM) sleep, these cells are more active during NREM sleep than they are in rapid eye movement (REM) dreaming sleep or in waking. They also increase discharge rates with sleep onset and continue to release GABA at a high level while sleep continues. Serotonin, histamine, and norepinephrine cells are normally silent during REM sleep and active in waking. GABA applied to the serotonin and norepinephrine cell groups triggers REM sleep. Acetylcholine is at its strongest both during REM sleep and awake. The orexin neurons of the lateral hypothalamus innervate every component of the ascending reticular activating system and coordinate activity within the entire system. Their failure leads to narcolepsy through loss of coordination of the sleep-wakefulness cycle. Dopamine also appears to have involvement in the sleep wakefulness cycle.

Complementing the ascending cholinergic reticular activating system evoking the energetic resonances between the thalamic nuclei and the cerebral cortex we associate with active consciousness is the envelope of the cerebral cortex, which, with the exception of prefrontal areas involved in attention, is organised as an experiential filter on ascendent activity, in six cortical layers, distributed across the cortex in micro-columns, which despite the variations of visual, auditory and somato-sensory processing, all have a common architecture and physiology. This cortical experiential filter under normal operation eliminates the subterranean level of processing to form a perceptual internal model of reality spanning all dimensions of subjective experience external and internal. This means that we don't see the physical world of wave particles directly as it is, but an inner representation of it, e.g. through three colour vision based on the versions of rhodopsin in the cones of the retina, augmented by higher level visual processing areas into veridical 3D vision, symphonic spectral audition, alluring olfaction of hundreds of receptor dimensions and subtle tactile through to emotional and internal organismic sensations. Because some areas of the cortex include information about self and other, these also include recursive experiences of autonomous agency over the world around us, distinct from consciousness itself. As well, partly through culture and language, we have developed higher processes of cognition, analytical thought and reason, extending from natural intuition of the environment around us and our

relationships with other agents. This internal model of reality, although located biologically in the brain becomes the holy grail of subjective experience, as a kind of controlled hallucination, we call subjective conscious experience.

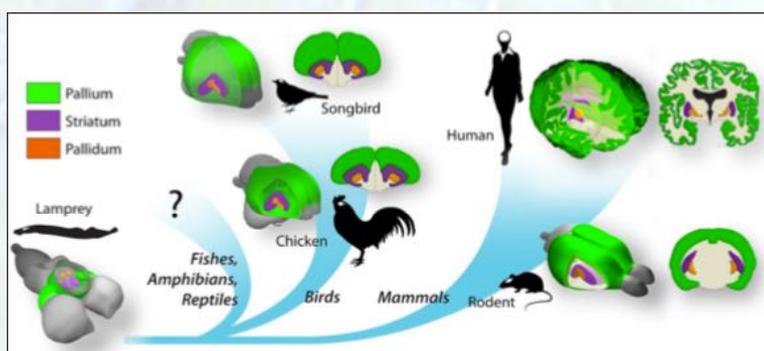
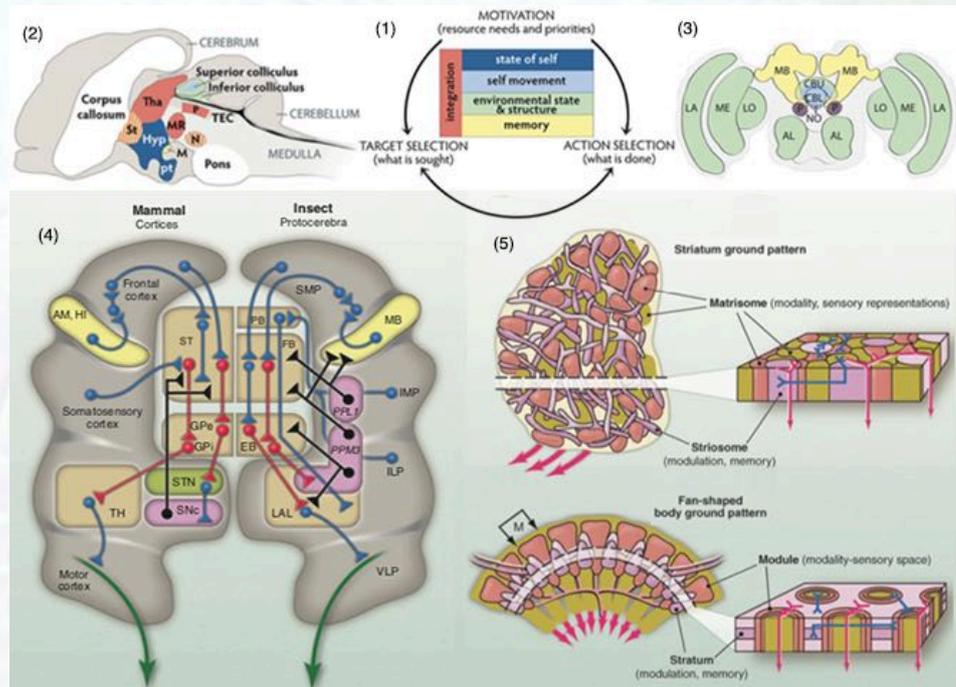


Fig 92e: The parallel development of the pallium, striatum and pallidum in vertebrates (Boraud, Leblois & Rougier 2018). In birds neuronal density in the pallium is twice as high as mammals and equivalent to primates (Olkowicz et al. (2016).

We have also noted the cyclic interaction of the cortex with the thalamus and basal ganglia (striatum, pallidum) in [fig 83](#). This has been cited (Boraud, Leblois & Rougier 2018) as the basis for parallel evolutionary relationships running all the way from stem vertebrates such as the lamprey through to both birds and mammals as climax intelligence.

Barron & Klein (2016) in a carefully researched analysis, propose that insects, and by extension arthropods, have the capacity for subjective experience, the core feature of consciousness. In vertebrates the capacity for subjective experience is supported by integrated structures in the midbrain that create a neural simulation of the state of the mobile animal in space. This integrated, egocentric representation of the world from the animal's perspective is sufficient for subjective experience. Structures in the insect brain perform analogous functions, implying the insect brain also supports the capacity for subjective experience. In both vertebrates and insects, this form of behavioral control system evolved as an efficient solution to basic problems of sensory reafference (resolving the confusing sensory input caused by self-motion) and true navigation. The brain structures that support subjective experience in vertebrates and insects are very different from each other, but in both cases, they are basal to each clade. The origins of subjective experience can thus be traced at least as far back as the Cambrian.

Fig 93: (1) Decision making involves an assessment of what is needed and where and how the needed resources can be obtained. Decision making can therefore be considered to involve three domains: internal motivations, target selection, and action selection. (2) Structures of the vertebrate midbrain (not to scale) supporting the behavioural "core control system." The vertebrate midbrain supports an integrated multisensory model of the state of the animal in space, which supports effective decision making. (3) The structures of the insect brain create an integrated neural model of the state of the insect in space that is functionally analogous to that described for the vertebrate brain. (4)



Corresponding regions of the basal ganglia (left) and insect central complex (right) and their associated regions are aligned, as are their relevant connections. Inhibitory pathways are shown in red, dopaminergic pathways in black, and other pathways (excitatory or modulatory) in blue. (5) The mammalian striatum consists of two principal subunits. Striosomes within the matrix of the striatum [in mauve, purple] are associated with discrete volumes of the striatal matrix, called matrisomes [brown, yellow]. In mammals, striosomes receive inputs from the hippocampus and amygdala via the frontal cortex, among other brain regions, carrying information about internal physiological states (modulations, memories). Matrisomes are supplied by cortical representations of sensory space and sensory modalities. Interactions and associations among matrisomes, and between matrisomes and striosomes, are mediated by local interneurons (blue) that integrate and provide information to striatal afferents supplying direct and indirect GABAergic pathways (red arrows) to the globus pallidus and subthalamic nucleus. The insect fan-shaped body from *Mantis religiosa*, labeled with antisera against allatostatin (green) and β -tubulin (ochre)] consists of two principal subunits: tangential stratifications (schematized in mauve, purple) that intersect columnar modules (yellow, brown).

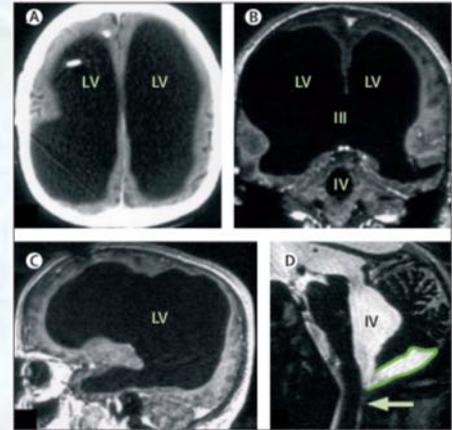
Strausfeld & Hirth (2013) have, in a more focussed study, also shown that the arthropod central complex and vertebrate basal ganglia derive from comparable embryonic basal forebrain lineages that are specified by an evolutionarily conserved genetic program leading to interconnected neuropils and nuclei that populate the midline of the forebrain-midbrain boundary region. In the substructures of both the central complex and basal ganglia, network connectivity and neuronal activity mediate control mechanisms in which inhibitory (GABAergic) and modulatory (dopaminergic) circuits facilitate the regulation and release of adaptive behaviors (Graybiel & Matsushima 2023). Both basal ganglia dysfunction in vertebrates and central complex dysfunction in arthropods result in behavioral defects, including motor abnormalities, impaired memory formation, attention deficits, affective disorders, and sleep disturbances. The observed multitude of similarities suggests deep homology of arthropod central complex and

vertebrate basal ganglia circuitries underlying the selection and maintenance of behavioral actions.

Fig 93b: A man with almost no cortical tissue with hydrocephalus who nevertheless was married with children and worked in the civil service (Feuillet et al. 2007).

An anatomical validation of the integral role of the brainstem in consciousness is provided by Bjorn Merker (2007):

The principal macrosystems of the vertebrate brain can be seen to form a centralized functional design in which an upper brain stem system organized for conscious function performs a penultimate step in action control. This upper brain stem system retained a key role throughout the evolutionary process by which an expanding forebrain – culminating in the cerebral cortex of mammals – came to serve as a medium for the elaboration of conscious contents. This highly conserved upper brainstem system, which extends from the roof of the midbrain to the basal diencephalon, integrates the massively parallel and distributed information capacity of the cerebral hemispheres into the limited-capacity, sequential mode of operation required for coherent behavior. It maintains special connective relations with cortical territories implicated in attentional and conscious functions, but is not rendered nonfunctional in the absence of cortical input. This helps explain the purposive, goal-directed behavior exhibited by mammals after experimental decortication, as well as the evidence that children born without a cortex are conscious. Taken together these circumstances suggest that brainstem mechanisms are integral to the constitution of the conscious state, and that an adequate account of neural mechanisms of conscious function cannot be confined to the thalamocortical complex alone.



Barron & Klein (2016) note:

There is now considerable evidence that, in humans, subjective experience can exist in the absence of self-reflexive consciousness, and that the two are supported by different neural structures. Midbrain structures, rather than cortex, seem to be especially important. Merker (2005, 2007), Parvisi and Damasio (2001), Damasio and Carvalho (2013), and Mashour and Alkire (2013) have argued that the integrated structures of the vertebrate midbrain are sufficient to support the capacity for subjective experience. Merker (2007) notes that subjective experience is remarkably sensitive to damage to midbrain structures. Conversely, there is evidence of preserved consciousness even in patients who lack a cortex (Merker 2005). Further, although cortical damage can have profound effects on the contents of consciousness, damage to any portion of the cortex alone can spare the basic capacity for subjective experience.

Merker suggests that an important function of the midbrain is to combine interoceptive (stimuli arising from within the body) and exteroceptive (stimuli external to the body) sensory information. Information on the environment, and the location and movement of the animal within it, is processed within the roof of the midbrain (the tectum, or colliculus in mammals). Information about homeostatic needs is processed within the floor of the midbrain (the hypothalamus and associated structures). Nuclei located between these poles integrate this information to produce a unified multimodal neural model of the spatial location of resources relative to the animal, which is coupled to, and weighted by, the extent to which different resources are needed by the animal. Vertebrates organize their behavior by reference to this integrated model of the environment rather than by reacting to independent sensory inputs.

The insects are an extremely diverse group, but all insect brains have a common anatomical plan. The nervous system contains an enlarged cephalic ganglion (a brain) specialized for sensory processing and integration. This is linked by paired ventral nerve cords to a series of smaller ganglia for the thoracic and abdominal body segments. The insect nervous system has frequently been stereotyped as decentralized, with the cephalic ganglion acting simply as a region of sensory input that triggers motor responses organized by the segmental ganglia. This interpretation is incorrect and outdated. The insect brain resolves action and target selection, processes sensory information, and clearly executes a command function over the behavioral system.

However they deny that more "primitive" organisms, show all the features they associate with organismic subjective experience, although this is purely on anatomical and behavioural grounds in a way which underestimates the capacity of even primitive hydra for "innovative" coordinated adaptive behaviours (fig 256):

The cubozoan box jellyfish Tripedalia cystophora shows dynamic behavior that includes actively hunting its prey. It has a well-developed geosense and visual sense thanks to 24 lensed eyes distributed around the body, yet the nervous system is entirely decentralized. Sense organs independently modulate activity in regions of the sensory net and muscle walls to steer the animal. The outcome of local sensory input acting on local muscle activity is an adaptive change in the swimming direction and speed of the animal, but the simple behavioral control system is entirely decentralized. Although such systems manifest the appearance of adaptive and dynamic targeting, they are nothing more than simple decentralized stimulus–response systems.

The nematode Caenorhabditis elegans possesses a famously simple and well-characterized centralized nervous system that can integrate input from an array of thermo-, mechano-, chemo-, and nociceptors, along with an interoceptive sense of time to organize directed movements. Sensory inputs are integrated at the level of an array of interneurons that compete for activation of the motor neurons. The simple nervous system of C. elegans can also support various forms of learning such as habituation and classical

associative conditioning, enabling adaptive change in behavior with experience. Nematodes are thus able to integrate multiple forms of sensory input using a centralized nervous system, but it seems that their behavior is organized as responses either to the immediate sensory environment or to immediate interoceptive signals of physiological state. Action selection in nematodes is driven by shifts in global brain dynamics, and there is sufficient plasticity in the nematode nervous system for their responses to vary with system state. However, there is no evidence that nematodes can actively hunt for things beyond their immediate sensory environment.

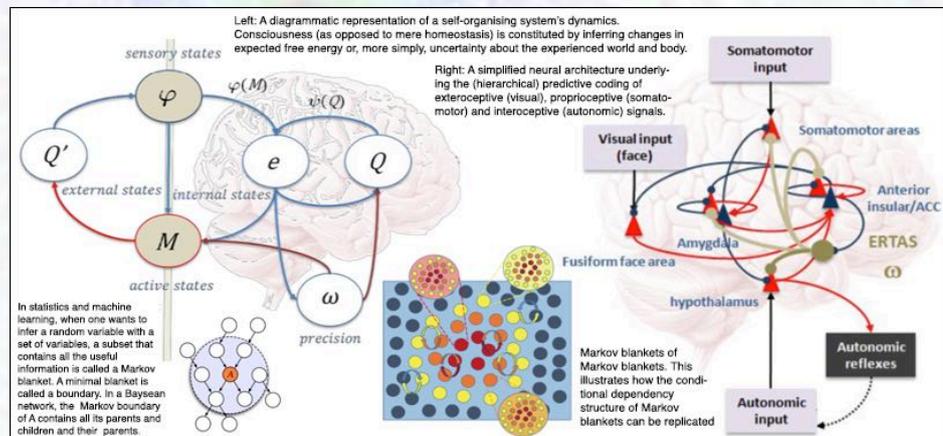
Hopeful Monster 4: Is Consciousness just Free Energy on Markov Landscapes?

Solms and Friston (2018) have proposed a model of consciousness, based on previous ideas of the mid-brain as a basis for consciousness, in which the brain acts as a prediction machine endeavouring to minimise the free energy difference between the actual state of the world and its predicted state. Friston (2010) is the architect of a major theory of brain function based on these ideas. Higher-level areas of the nervous system (i.e., higher-order cortical structures) generate top-down synaptic ‘predictions’ aimed at matching the expected bottom-up synaptic activity at lower-level areas, all the way down to ‘input’ activity at sense organs. Top-down signals encode a kind of ‘best guess’ about the most likely (hidden) causes of bodily sensations.

The model is again based on abstract stochastic processes. A Markov blanket (Kirchov et al. 2018) defines the boundaries of a system (e.g. a cell or a multi-cellular organism) in a statistical sense in a way that can be used to define homeostatic and adaptive processes and can be recursive as in a multicellular organism. It is a statistical partitioning of a system into internal states and external states, where the blanket itself consists of the states that separate the two, constituting a statistical boundary that sets something apart from that which it is not. This shows that internal and external states are conditionally independent, as they can only influence one another via active and sensory states. The states that constitute the Markov blanket can be further partitioned into active and sensory states.

They use both ‘subjective’ and ‘objective’ to refer to observational perspectives, so subjective is not really subjective, but internal observation. The subjective perspective “upon” the organism realises the “being” of the organism which they call ‘interoceptive’.

Fig 94: Solms-Friston model and Markov blankets. Predictive coding formulates free energy or surprise in terms of precision weighted prediction errors. A prediction error (e) here is the difference between a sensation (φ) produced by some action (M) and the sensation predicted by a generative model $\psi(Q)$. Here, Q stands for internal expectations about – or representations of – hidden external states and $\psi(Q)$ is the prediction of sensory inputs that would have been encountered given those



external states, under the generative model. Under some simplifying assumptions, we can now associate free energy (F) with the amount of prediction error weighted by its precision (ω). Precision corresponds to the reliability, or inverse variance, of sensory fluctuations (in various modalities) and is an important aspect of inference; namely, the *representation of uncertainty*.

The objective perspective realises the “body” of the organism they call ‘exteroceptive’. They take an admittedly metaphysical position that neither of these observable realisations can be explained away by the other, which is fine. In other words, data about an organism that is derived from both interoceptive and exteroceptive perspectives must be reducible to one and the same set of explanations. This places each in their own parallel causal train except that an assumption is made of an underlying unity from which these both derive:

The starting point of my argument raises an interesting philosophical question. If body and mind are two appearances (aspects) of the same underlying thing, then what stuff is the underlying thing made of? In other words, using the analogy of thunder and lightning, what is the metapsychological equivalent of “electricity” (i.e., the thing that gives rise to thunder and lightning, both)?

We come to the devastating abstract crunch – “*Therefore, biological explanations (as opposed to descriptions) are best formulated in neither interoceptive nor exteroceptive phenomenal terms, but rather as abstractions*”. This is converting the central complementarity of subjective consciousness and objective brain into other complementarities of a different sort interoceptive v exteroceptive observation or perception and ascending neural pathways v cortical connections, neither of which are consistent with the original and fundamental subject-object complementarity at the heart of cosmology.

Their central claim is that their combined insights invoking this entirely abstract stochastic process yields a straightforward response to Chalmers’ question “*why is there something it is like to be an organism, for the organism, and how does this something-it-is-like-ness come about?* “. These two insights are: (1) that the primary function of consciousness is not to register states of the external world but rather to register the internal states of the experiencing subject and (2) concerns minimal conditions – a fundamental property of living things (i.e., biological self-organising systems) is *their tendency to resist the second law of thermodynamics* and that this functional property emerges *naturally* within any ergodic random dynamical system that possesses a *Markov blanket*.

The first is not based in philosophy but on anatomical and physiological evidence, which suggests that consciousness is “quintessentially” interoceptive. Their argument goes as follows: conscious qualia arise primarily not from exteroceptive perception (i.e., vision, hearing, somatic sensation, taste and smell), and still less from reflective awareness of such representations, but rather from the endogenous arousal processes that activate them.

Exteroceptive representations are intrinsically unconscious – they do not inherently possess ‘something-it-is-like-ness’. They only acquire conscious quality when they are, in Chalmers’ words, “entertained” by the subject; i.e., when they are selectively activated by a more fundamental form of consciousness. In short, mental images can only be experienced by a conscious subject and they are in fact states of the conscious subject. The arousal processes that produce what is conventionally called ‘wakefulness’, in our view, therefore, constitute the experiencing subject – they are consciousness itself – explicitly the arousal functions of the centrencephalic structures that sustain wakefulness and behavioural responsivity which in turn supply the conscious character of some higher cortical functions. The latter perceptual and cognitive functions (which are otherwise typically unconscious) derive their consciousness absolutely from the centrencephalic region.

This is fine as a description of the relationship between ascending pathways such as the reticular activating system, and underscores the relationship between thalamic circuits as drivers of activity and cortical circuits as responsive constraints, however identifying consciousness itself with the ascending pathways is not accurate physiologically in terms of active CNS dynamics, as exemplified in the EEG, where we see cortical states active as a whole associated with conscious experiences, with the ascending pathways just providing as in their thermodynamic model a free-energy substrate.

In the Solms-Friston model, autonomous systems, including nervous systems are modelled in terms of predictive coding, which formulates free energy or surprise in terms of precision weighted prediction errors. They state specifically that the model although claiming to solve the hard problem is following the “*Helmholtz school of medicine, whose members swore an oath in 1842 to the effect that “no forces other than the common physical chemical ones are at work in the organism*”. In the model, precision corresponds to the reliability, or inverse variance, of sensory fluctuations and is an important aspect of inference in the representation of uncertainty. Precision is the confidence placed in the (predicted) consequences of an action or in a source of sensory evidence. In the ideal adaptive state of the organism – where negentropic demand is met by optimal predictions – Nirvana – there are no prediction errors and the expected free energy is absolutely minimised – homeostasis with no uncertainty or entropy and infinite precision. They claim this scheme, with recurrent exchanges of (ascending) prediction errors and (descending) predictions – closely resembles empirical message passing in cortical and subcortical hierarchies. In this context, action reduces to proprioceptive (motor) and interoceptive (autonomic) reflexes that are driven by descending predictions from the brain’s (hierarchical) generative model. Precision controls the influence of prediction errors on action and perception.

They then note that physiologically, precision is usually associated with the postsynaptic gain of cortical neuronal populations reporting prediction errors, associated – through free energy minimisation – with selective arousal or attentional selection. They then claim it is precisely this neuromodulatory synaptic mechanism that is targeted by psychotropic and psychedelic drugs on the basis of Nour and Carhart-Harris (2017).

The picture is actually much more complicated. Both psychedelics and other agents, from dissociatives to stimulants such as amphetamines, have differing and varied affects on attention. While psychedelics are associated with both a

drop in the default mode network and sensory overload from upwelling activity, this isn't easily analysed as simply prediction errors, nor an overall change in thermodynamic free energy minimisation. It is also manifestly inconsistent to associate surprise and uncertainty only with its suppression. Cultural expressions from music to scientific discoveries are all intimately associated with both uncertainty and surprise.

The approach of minimising surprise, while it does tally with avoidance of primary existential threats is not solved by homeostasis, but by self organised criticality at the edge of chaos, and there is no empirical basis to define neural processes as stochastic Bayesian networks per se. Hence like IIT, this model is analogical and not causal.

Solms (2019) makes his homeostatic direction explicitly clear, citing personal experience dealing with subjects who have severe hydrocephalus and little cortical tissue, although some with seemingly empty cortices have small regions of cortical tissue having far more intense activity than normal:

I first expressed the view in 1997 that the problem of consciousness will only be solved if we reduce its psychological and physiological manifestations to a single underlying abstraction. It took me many years to realize that this abstraction revolves around the dynamics of free energy and uncertainty. Free energy minimization is the basic function of homeostasis, a function that is performed by the same brainstem nuclei that I was led to infer – like others, on independent (clinico-anatomical) grounds – were centrally implicated in the generation of consciousness. In other words, the functions of homeostasis and consciousness are realized physiologically in the very same part of the brain. This insight led to the collaborative work that enabled Friston and me to expand the variational free energy formulation of the mechanism of homeostasis to explain the mainspring of consciousness itself.

This viewpoint focuses on feeling, which is then identified with consciousness as a whole:

The function of experience cannot be inferred from perception and memory, but it can be inferred from feeling. There is not necessarily "something it is like" to perceive and to learn, but who ever heard of an unconscious feeling—a feeling that you cannot feel?

This opens up a discussion of the fact that the reticular activating system coupled with the para-cortical limbic system circuiting through the amygdala, hippocampus and cingulate is the seat of consciousness as volitional affect (emotion):

Consciousness persists in the absence of cerebral cortex, as does volitional behaviour. As Damasio and Carvalho (2013) put it: Decorticated mammals exhibit a remarkable persistence of coherent, goal-oriented behavior that is consistent with feelings and consciousness. Consciousness is obliterated by focal lesions of the brainstem core – in a region conventionally described as the extended reticulothalamic activating system (ERTAS). ... If core brainstem consciousness is the primary type, then consciousness is fundamentally affective. The arousal processes that produce what is conventionally called "wakefulness" constitute the experiencing subject. In other words, the experiencing subject is constituted by affect. ... Although many cognitive scientists still must be weaned of the view that the cerebral cortex is the seat of consciousness the weight of evidence for the alternative view that the arousal processes generated in the upper brainstem and limbic system feel like something in and of themselves, is now overwhelming.

While these physiological details are important and correct, there are two critical flaws:

- (1) Although the cortex may be electro-dynamically passive on its own and the mid-brain may have strategically excitable properties consistent with intentional awareness, to claim consciousness is only root brain stem afferent activation trivialises its nature and complexity, when all the elaborate details of the conscious experiences we have are clearly derived through the modulation of the cortex under the active excitation of the thalamo-cortical loop.
- (2) David Chalmers' philosophical description of subjectivity, as a fully conscious intact human would experience it "feel like something in themselves" is a misconstruction. Chalmers is carefully stating what is is like to actually experience consciousness subjectively, not what observation of afferent pathways is associated with, in terms of anatomical dissection of function.

This equating of feeling with consciousness runs into all sorts of problems by disabling some key aspects of conscious experience in favour of others, not just in waking life but also in alternative mental states. Someone driving a car may or may not be centred on their feelings some of the time, or be experiencing intense emotions likely to cause an accident, but for most people, driving is a conscious sensory-motor experience. One of the most outstanding features of psychedelic visions is kaleidoscopic imagery, which one both experiences as real veridical perceptions "out there" and a suppression of egotistical emotions leading to quiescent feelings amid overwhelming perceptual, sounds, scenes and geometrical patterns, which the person intimately experiences as consciousness expansion. The same thing with dreaming states which are often profoundly visual and in which emotions may reach crisis point in perceived existential crises, but in no way is feeling as such 'felt' to be the sine qua non of conscious experience. There is also a fundamental basis to the notion that all forms of perception both sensory and somatosensory are part of the envelope of conscious experience as is volition and the perception of intent. To thus identify the raw free energy of reticular activation as consciousness itself is a severe mischaracterisation.

Solms notes that this view is not shared by a long history involving the NCC or neural correlate of consciousness:

This assignment that the NCC does not lie in the brain stem, continues to this day. Crick's closest collaborator, Christof Koch, says of the deep brainstem nuclei that "they are enablers [of consciousness] but not content-providers".

Markov blankets are then conflated with two central properties accompanying conscious volition – selfhood and intentionality:

Readers may have noticed already that the dynamics of a Markov blanket generate two fundamental properties of minds— namely (elemental forms of) selfhood and intentionality. It is true that these dynamics also generate elemental properties of bodies— namely an insulating membrane (the ectoderm of complex organisms, from which the neural plate derives) and adaptive behavior. This is a remarkable fact. It underpins dual-aspect monism.

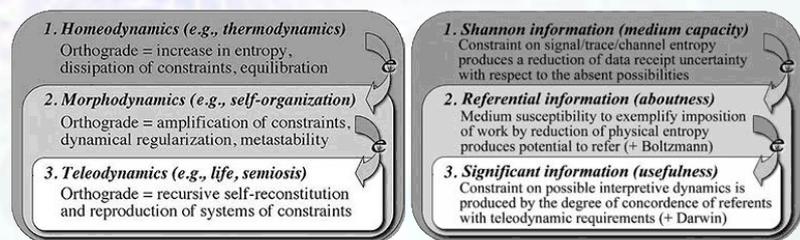
One can understand that selfhood and intentionality are fundamental properties of all autonomous life forms, from the first prokaryotes to *Homo sapiens*, but this doesn't mean they constitute experiential conscious volition as we know it, or that the neural plate substrates of early development define consciousness. However claiming that this stochastic description of (sensory) input and (motor) output solves the hard problem in terms of conscious volition is the most tissue thin analogy conceivable. The critical point remains that a pure abstract system is categorically inconsistent with actual subjectivity, just as objective physical processes are.

While the model, in viewing subjective conscious experiences as anticipatory top-down simulations attempting to minimise mismatch with bottom-up environmental boundary conditions, in a way which is consistent with the anticipatory role of consciousness in Symbiotic Existential Cosmology, and the notion of the brain as an environmental filter rather than a physically causal computer, the subjective aspect is reduced to abstract stochastic homeostasis.

Hopeful Monsters 5: Can Teleological Thermodynamics Solve the Hard Problem?

Terrence Deacon in "Incomplete Nature: How Mind Emerged from Matter" sets out a descriptive teleological thermodynamics, which is an extension of Ilya Prigogine's (1984) concept of far-from-equilibrium thermodynamics in a three-layered structure of homeo-, morpho- and teleo-dynamics. These three categories actually coincide with (1) inanimate matter, (2) far-from-equilibrium stability structures such as in chemical biogenesis, and (3) living organisms. We are already intimately familiar with each of these, so the description is simply a thermodynamic recasting, which is insightful, but not empirically demonstrated in any proof-of-principle examples.

Fig 95: Left Nested hierarchy of three emergent levels of dynamics and their emergence from subvenient physical processes. Right Three nested conceptions of information. Shannon information is the most minimal and the most basic. Referential information is emergent (e) from Shannon information, and significant—or useful—information is emergent from referential information.



We already know that biological systems consist of fractal layers of organisation arising from the symmetry-breaking of the quantum forces as a consequence of non-linear charge energetics to interactively produce: quarks, hadrons, atomic nuclei, atoms, molecules with increasingly fractal cooperative weak-bonding structures, supra-molecular complexes such as the ribosome, organelles such as the membrane and Golgi apparatus, cells, tissues, organs such as the brain organisms and the biosphere. Teleodynamic work is the production of contragrade teleodynamic processes, that work in opposition to the usual orthograde direction, that in homeo-dynamic systems leads to increasing entropy at equilibrium. An orthograde teleodynamic processes is an end-directed process that will tend to occur spontaneously. By contrast, contragrade change is described as the natural consequence of one orthograde process influencing a different orthograde process — for example, via some intervening medium. This implies that in one sense, all change ultimately originates from spontaneous thermodynamic processes controlled passively by constraints.

Yes biogenesis and biological evolution is teleologically directed towards diversity and yes evolution is a process by which adventitious mutation is sequestered in the genome and becomes available as significantly useful information

by natural and sexual selection. In this sense “Incomplete Nature” is a self-confessed description of biogenesis, evolution and the constraints on organismic development, rather than mind or consciousness and here it does have descriptive insightfulness. However it is subtly similar in its cognitive respect to Daniel Dennett's multiple evolutionary drafts model now finessed by Terrence into a more concordant and appealing wrapping. In this respect Bernard Baars' description of the Cartesian Theatre of working memory, is surely the most animistic description in neuroscience, has a more appealing rationale because it is so richly populated with conceptual actors having the personae of living agents.

Deacon then applies this directly to conscious intentional actions. For illustration, reading exemplifies the logic of teleodynamic work. A passive source of cognitive constraints is potentially provided by the words on a page. A literate person structures their sensory and cognitive habits to reorganise the neural activities constituting thinking. This enables them to do teleodynamic work to shift mental tendencies away from those that are spontaneous (such as daydreaming) to those that are constrained by the text:

“Although teleodynamic processes are incredibly complex, and an explanation of the structure of teleodynamic work is by far the most elaborate—since it is constituted by special relationships between forms of morphodynamic work—it is also the most familiar. So it may be helpful to first consider the human side of teleodynamic work before delving into the underlying dynamical structure of this process. Teleodynamic work is what we must engage in when trying to make sense of an unclear explanation, or trying to produce an explanation that is unambiguous”.

“In cognitive terms, orthograde teleodynamic processes may be expressed as goal-directed innate adaptive behaviors, spontaneous emotional tendencies, learned unconscious patterns of behavior, stream-of-consciousness word associations, and so forth. In social terms, orthograde teleodynamic processes may be expressed as common cultural narratives for explaining events, habits of communication developed between different groups or classes of individuals, conventionalized patterns of exchange, and so on”.

Here is where there is a scorpion-like sting in the tail, which is the his “insight” of the utility of the zeros that he notes arise from the hard problem of consciousness and other manifestations of subjectivity, which don't appear to arise from the reductionistic physical description. This revolves around his notion of *entention*:

“I propose that we use the term ententional as a generic adjective to describe all phenomena that are intrinsically incomplete in the sense of being in relationship to, constituted by, or organized to achieve something non-intrinsic. By combining the prefix en- (for “in” or “within”) with the adjectival form meaning something like “inclined toward,” I hope to signal this deep and typically ignored commonality that exists in all the various phenomena that include within them a fundamental relationship to something absent.”

Terrence's story starts out with great hope for conscious existence, invoking the possibility of causal openness:

“This opens the door to an emergent capacity to generate ever more complex, unprecedented forms of work, at progressively higher-order levels of dynamics, thereby introducing an essentially open-ended possibility of producing causal consequences that wouldn't tend to arise spontaneously. That is, we can begin to discern a basis for a form of causal openness in the universe.”

However, by adding in his dynamic interaction between his teleological constraints and physical causality, he introduces a second level of objective causal closure defined by his thermodynamics. Notice that he admits this is a belief, not an empirical fact:

*“By reframing the problem in these dynamical terms, **I believe** we will discover that rather than being the ultimate “hard problem” of philosophy and neuroscience, the subjective features of neural dynamics are the expected consequences of this emergent hierarchy. The so-called mystery of consciousness may thus turn out to be a false dilemma, created by our failure to understand the causal efficacy of emergent constraints.”*

In his closing passages, again stating this is belief, he attempts to nail the coffin of the zero or “absence” of the hard problem to it's ultimate RIP:

*“**I believe** that human subjectivity has turned out not to be the ultimate “hard problem” of science. Or rather, it turns out to have been hard for unexpected reasons. It was not hard because we lacked sufficiently complex research instruments, nor because the details of the process were so many and so intricately entangled with one another that our analytic tools could not cope, nor because our brains were inadequate to the task for evolutionary reasons, nor even because the problem is inaccessible using the scientific method. It was hard because it was counterintuitive, and because we have stubbornly insisted on looking for it where it could not be, in the stuff of the world. When viewed through the perspective of the special circular logic of constraint generation that we have called teleodynamics, this problem simply dissolves.”*

He then plays to the darkly shaded tune of these absences, holes or zeros:

"The subjectivity is not located in what is there, but emerges quite precisely from what is not there. Sentience is negatively "embodied" in the constraints emerging from teleodynamic processes, irrespective of their physical embodiment, and therefore does not directly correlate with any of the material substrates constituting those processes. Intrinsically emergent constraints are neither material nor dynamical—they are something missing—and yet as we have seen, they are not mere descriptive attributions of material processes, either. The intentional properties that we attribute to conscious experience are generated by the emergence of these constraints—constraints that emerge from constraints, absences that arise from, and create, new absences."

and in closing states that we are back to a purely objective causality, lacking any need for subjective existence:

"But this negative existence, so to speak, of the conscious self doesn't mean that consciousness is in any way ineffable or non-empirical. Indeed, if the account given here is in any way correct, it suggests that consciousness may even be precisely quantifiable and comparable, for example, between states of awareness, between species, and even possibly in non-organic processes, as in social processes or in some future sentient artifact. This is because teleodynamic processes, which provide the locus for sentience in any of its forms, are precisely analyzable processes, with definite measurable properties, in whatever substrates they arise."

Here is where the Wikipedia editor's comment was right: *"The book expands upon the classical conceptions of work and information in order to give an account of ententionality that is consistent with eliminative materialism and yet does not seek to explain away or pass off as epiphenominal the non-physical properties of life."*

The difficulty here is that it is both consistent with eliminative materialism and the only sense in which mind is now "not epiphenomenal" is that it has been completely explained away as simply as case of objective thermodynamic teleo-dynamics. This use of entention as a purely mechanical generalisation of intent opens up the floodgates to any form of AI that adopts the raw form of teleo-dynamics and directly to eliminative materialism, by supervening the entire scope of the subjective realm to a thermodynamic teleology that in no way captures the true nature of diversity, surprise, creativity or insight, except in the evolutionary model of random accumulation of adventitious and hence "useful" teleological information. Furthermore no such purely thermodynamic reality can in any way manifest itself subjectively, so it is not an actuality manifesting the subjectivity of any conscious living agent. Hence it in no way solves the hard problem any more than any purely mechanistic model of brain dynamics does. In this respect "Incomplete Nature" is simply addressing some of the easy problems around abstract functionality of brain states, in thermodynamic terms, not the hard problem itself.

Deacon has claimed that this teleology is so causally complete that it has automatically, in a purely descriptive account, rendered quantum reality irrelevant:

"It didn't even require us to invoke any superficially strange and poorly understood quantum effects in our macroscopic explanations in order to account for what prior physical intuition seemed unable to explain about meaning, purpose, or consciousness. ... More important, the scale at which we do unambiguously recognize ententional properties is vastly larger than the scale of quantum events, and in between there are only thermodynamic and chemical processes."

But this claim is self-fulfilling, as it stands precisely alongside the obvious fractal structure of brain tissue that likewise runs dynamically in a hand-shaking interaction between global wave states, cellular action potentials, and ion channels at the quantum level, modulated by edge-of-chaos transitions, and stochastic resonance at the unstable global tipping points when make-or-break situations where survival decisions are made, amid wave coherence sampling which is itself homologous with quantum measurement in the uncertainty principle. This is where we come full circle and have to recognise that, while Terrence did claim that teleological thermodynamics overlays quantum reality, he has in no way established that it has overruled it. In the evolutionary model, each adventitious mutation is an example of a single unrepeated quantum instance. His own analogy between evolution and neurodynamics implies that adventitious thought may arise likewise from a single quantum instability induced by an unstable neurodynamical tipping point and we know from recent research that the quantum world approaches the classical only under conditions of IID (independent and identically distributed measurements) as Gallego & Dakić (2021) have shown, which neither evolution nor neurodynamics conform to.



Fig 96: Title image to "Incomplete Nature" – the complete ablation of the subjectively conscious volitional mind in favour of thermodynamic abstraction.
My physically casual brain made me do it becomes teleological thermodynamics made me do it.

In his conclusion, Deacon sets out to claim this gives humanity hope of meaning in existence:

“Perhaps the most tragic feature of our age is that just when we have developed a truly universal perspective from which to appreciate the vastness of the cosmos, the causal complexity of material processes, and the chemical machinery of life, we have at the same time conceived the realm of value as radically alienated from this seemingly complete understanding of the fabric of existence. In the natural sciences there appears to be no place for right/wrong, meaningful/meaningless, beauty/ugliness, good/evil, love/hate, and so forth. The success of contemporary science appears to have dethroned the gods and left no foundation upon which unimpeachable values can rest. ... As I lamented in the opening chapter of this book, the cost of obtaining this dominance over material nature has had repercussions worldwide. Indeed, I don't think that it is too crazy to imagine that the current crisis of faith and the rise in fundamentalism that seems to be gripping the modern world is in large part a reaction to the unignorable pragmatic success of a vision of reality that has no place for subjectivity or value. The specter of nihilism is, to many, more threatening than death. By rethinking the frame of the natural sciences in a way that has the metaphysical sophistication to integrate the realm of absential phenomena as we experience them, I believe that we can chart an alternative route out of the current existential crisis of the age—a route that neither requires believing in magic nor engaging in the subterfuge of ultimate self-doubt. ... If quantum physicists can learn to become comfortable with the material causal consequences of the superposition of alternate, as-yet-unrealized states of matter, it shouldn't be too great a leap to begin to get comfortable with the superposition of the present and the absent in our functions, meanings, experiences, and values.”

But what Deacon has actually done is to screw down the death grip of true subjectivity even tighter. We end up with the opposite – eliminative materialism – rejecting the notion of mind and consciousness altogether as an archaic misconception, as Ryle has done, becoming nothing but a gap in the description of reality itself, substituted for by a regime of objective thermodynamics complementing physical materialism.

In a recent development (Kourehpaz et al. 2022), the arrow of time and the Boltzman distribution associated with thermodynamic entropy, which doesn't exist in quantum systems, which are time-reversible has been attributed to quantum chaos, thus meaning quantum reality and chaos are essential to the concept of thermodynamic time flow.

Hopeful Monster 6: Quasi-Particle Materialism

An interesting example of applying quantum processes to teleodynamic ideas is that of Roman Poznanski and coworkers (Poznanski et al. 2019a, b). Here they invoke a quantum process involving a variety of speculative quasi-particle like phenomena.

To start, I'll explain what I think is missing in Roman's pan-mat view of consciousness. Pan-mat is one of several theories of conscious brain function, in which a phenomenon, such as quasi-particles, that may well play a part in how the conscious brain functions, has been given a privileged status in a “hopeful monster” theory of consciousness that in this case depends on physical materialism and seeks to eliminate obvious exit routes in physics.

Organismic tissues constitute a unique state of matter in a self-organised phase transition between metal and insulator that creates a unique quantum-molecular paradigm. [Figure 81](#), shows that the myoglobin molecule, displays a series of fractal and self-organised critical properties that all organic molecules in tissue possess, from the origin of life, in a new state of matter, stunningly more advanced than the solid state physics of silicon. We simply don't understand or respect how tissues work because we don't understand they are macroscopic quantum phenomena possessing latent attributes of consciousness. Nottale (2014) & Turner & Nottale (2017), which the Pan-mat research cites show macro-quantum effects, via pseudo-quantum theories in which Planck's constant can be rescaled. But this is simplifying what is really happening because we can't just jig Planck's constant, so what they are displaying are genuine macro-quantum features that are actually held together by molecular fractality, from the quantum level all the way to the brain and universe as shown in [fig 1](#), so cell organelle and tissue structure is coordinate in a state of quantum fractal super self-organised criticality as a far from equilibrium self-organising system. This doesn't immediately look like a quantum fractal because, in living systems, genes have encoded the proteins to adopt useful fractal forms at the edge of chaos that themselves constitute dynamical quantum reality at the edge of chaos, but looks a little like a biological machine functionally. At the centre of the cyclone is the conscious brain, which is the ultimate cosmological interactive consequence of symmetry-breaking of the forces of nature.

The only meaningful empirical conclusion that can be drawn about the relation between subjective consciousness and physical reality is that “subjective conscious volition has efficacy over the physical universe” although this is an undecidable proposition, in the Godel sense, from the physical viewpoint, despite being certain from the Cartesian viewpoint: “*cogito ergo sum*”. Symbiotic Existential Cosmology sees this as an additional cosmological axiom of primal subjectivity at the quantum level which becomes fully manifest in eucaryote cellular and organismic consciousness.

The problem with Pan-mat is that it tries to limit all discussion to a classical viewpoint of physical materialism through an argument depending on analogy alone, stripping itself of the principles by which the hard problem can be solved: (1) It is empirically and theoretically impossible to demonstrate physical causal closure of the universe, or of the brain as a self-organising system, so founding a theory of consciousness on physical materialism is and remains unprovable, except as a kind of religious belief. (2) Roman and co-workers are using a social concept of multiscale organisation which is inadequate to the task, rejecting three key features of how the living universe works: (a) quantum reality, (b) self-organised criticality and (c) the intrinsically fractal nature of the symmetry-broken standard model of physics. No theory which neglects all three can have any hope of a successful description of life or intelligence in the quantum universe. (3) The actual core tenets of the theory are not empirically verifiable or even manifestly plausible. (4) It is based on quasi-particles through a quantum analogy when good science doesn't work on analogical assumptions.

As a field-like theory, the quasi-particle aspect has about the same strengths and weaknesses as other field-like theories of consciousness discussed earlier, but its claims to pan-experiential materialism are thus more problematic:

Quantum chemistry underpins the so-called 'quantum underground' where consciousness originates. Due to inherent uncertainty in electron localization, the weakest type of Van der Waals force, the so-called London force, exhibit quantum effects and the resultant dipole oscillations (see Hameroff (2008) for a review). London forces are quantum level instantaneous, but weak, induced dipole-induced dipole couplings, due to charge separation resulting in attractive Coulomb forces occurring between nonpolar π -electron resonance clouds of two or more neutral atoms, molecules or macromolecules.

We also assume that guidance waves and their resultant thermo-quantum fluctuations govern subtle internal energy leading to hierarchical thermodynamic transfer of information in the realm of preconscious. What is transferred from the macroquantum realm to the classical realm is information (theoretic) entropy as thermo-qubits containing information on the phase relations between molecular dipole-bound electron clouds of multiple systems.

The information we are discussing is intrinsic in the sense that it remains 'hidden' from the operational explanations of cognitive capacities. It is neither quantum information nor integrated information, but interconnected 'intrinsic' information associated with the internal thermo-quantum fluctuations that arise due to guidance waves transferring thermo-quantum internal energy by means of the macro-quantum potential.

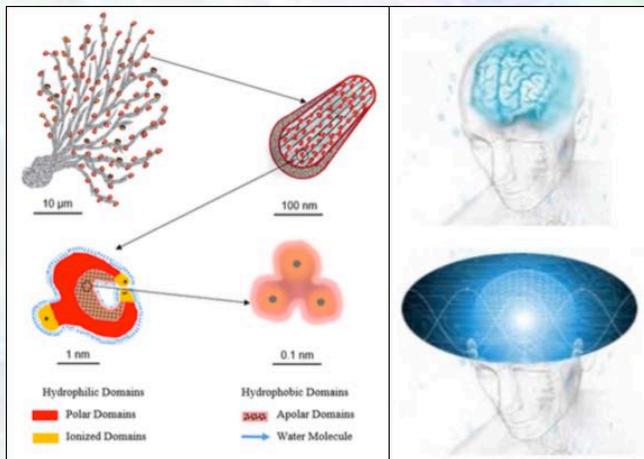


Fig 97: Left: (Top left) a neuronal branchlet studded with spines and (top right) shows a non-synaptic spine shaft containing cytoskeletal molecular proteins bound to actin filament networks within the spine shaft of uniform length. The quantised subspace is where pilot-waves originate at picometer scale (~ 0.1 nm) within apolar hydrophobic regions of actin-binding proteins shown (bottom left) form clathrate-like structures with water molecules. The electron clouds at ~ 10 pico-meter scale (bottom right) is an order of magnitude smaller than most chemistry transformations and measurements and therefore below physical chemistry. Right: There is a critical difference between identity theory (mind = brain) above and externalism (cosmic consciousness interacting with the brain) below. The brain only view of conscious space prevents any form of cosmic mind.

This process is illustrated in fig 97, where a similar quantum process to Hameroff and Penrose, using the London force is invoked on the dendritic web. Specific exceptional quantum processes are thus invoked which may not prove to exist. The "classical realm" is cited, as if it is a separate physical realm, when the entire process of dynamics is quantum non-IID. These do not couple to subjective consciousness, because they are just forms of hypothetical "information" in the brain dynamics acting as a cypher for consciousness, which is then considered irrelevant, in a form of "eliminativism" in favour of thermo-quantum teleology.

This becomes clear in (Poznanski et al. 2019c) where, in stating "against externalism" in the title, the teleodynamic process identifies itself with brain-mind identity theory against any cosmic mind description, even if consistent with dynamics of the default mode, drawn together in the name of dialectical materialism:

The difficulty in locating the mental states which are attributed to brain activity is explored in this paper through nonreductive physicalism, which claims that all mental phenomena can be explained by the functioning of their neurobiological correlates through information. That is, higher level of brain functioning with different properties with respect to their constituents emerges and influences causally brain activity. This is not emerging reductionism-unlike in philosophy of mind, we do not subscribe to different ontology from DiaMat (dialectical materialism), which claims that consciousness is not an immaterial spirit. How this happens is the notion of teleofunctional components with intrinsic information of the material component that includes activity in brain structure. This differs from externalism as shown in the figure through proto-consciousness or cosmic consciousness interacting with brain's neural dynamics. We are reduced to physical materialism, so the purpose and utility of the thermo-quantum extension is moot.

I also find the definitions and concepts to be metaphorical descriptions rather than a verifiable scientific theory:

It is usual to note that teleofunctions are distinct from the causal-role functions involved in functionalism. For example, with ordinary function the elements are irrelevant, while in teleofunction they are relevant because the function concerns what something is for and the notion of what something was selected for counts. This is a "teleological" notion of function, which can be minimally defined as the activity of the structure. Moreover, teleofunctions carry a value judgment or 'meaning' (unlike ordinary function, which carry only action or resultant effect). There is meaning attached to the interconnectedness of intrinsic information content of mental states and their interrelationship during the unification process. ... The integration of brain functions results in a new category because of the functionally-linked continuum that is referred to as teleosemantic hierarchy of intrinsic content of brain states. Since the quantum realm is characterized by indeterminism, i.e., non-causal effects, this is incongruent to nonreductive physicalism where quantum mechanisms must be acausal. The unification of mental states associated with the brain's hierarchical organization allows quantum-like causality to take on a subtle role in the brain leading to teleofunctionality. The unification of mental states arises from the teleosemantic hierarchy of interconnected intrinsic information content of mental states.

In Poznanski & Brändas (2020) the authors provide a sweeping philosophical justification to support their thesis, now described as pan-experiential materialism. The use of experiential is a misnomer because the authors state that panexperiential materialism claims that the mental-immaterial realm, just like the physical world, can be derived from matter waves, in an attempt to explain preconscious activity by an unproven claim of certain kinds of activity in the brain attribute "meaning" through thermo-teleodynamics. This forecloses on experiential consciousness, by claiming it is a distorted superstructural perspective on a deeper pre-conscious dynamic arising from the quantum thermal milieu and pure information gaining "meaning", using a purely objective physicalist description to use the brain's ability to use subconscious processing that may rise to conscious attention if it is coherently relevant, to devalue the core role of subjective consciousness, claiming to solve the hard problem through quasiparticle-enhanced pure materialism.

Poznanski et al. (2022) extends this description to give it more detailed theoretical support. I remain cautious about the scientific verifiability of this overall construction. Many of the descriptions are speculative and circularly self-fulfilling. The authors cite Bohmian mechanics extended to molecules, but Bohmian mechanics is inconsistent with particle creation and annihilation which bond formation and breakage involves. I thus have issues about the verifiability of the sub-molecular thermo-teleoquantum description and its assuming of the role of 1pp experiencability, in a purely materialistic teleological form, which effectively denies subjective conscious volition over the physical universe and thus becomes a form of preconscious epiphenomenalism:

Experienceability is the capacity for an experience that occurs preconsciously and serves as an affective function that explains experience as a testament of consciousness. We base our model on the meaning of the feeling-as-information hypothesis suggesting that evanescent meaning arises from patterns of intrinsic information-carrying physical feelings. In other words, evanescent meaning as information gives form to feelings, meaning sentience as the capacity of feeling. Since the information is intrinsic, physical or raw feelings are hidden from phenomenal introspection. ... Preconscious experienceability is realized physical feelings with vast numbers of atomic microfeels formed as physical feelings (holons) in informational holarchies.

The notion of "microfeels" bears an interesting comparison with "raw feels" cited in the [Stanford](#) account of dualism: "At least since the time of Ryle's *Concept of Mind* (1949), it has been assumed that thinking can be handled in a dispositionalist way; so only sensations or 'raw feels' constitute a problem for the physicalist". This is then identified with π -orbital electrons, but all heterocyclic molecules, from nucleic acid bases, through tryptophan to the porphyrin ring have delocalised electrons. They are integral to all biological processes. To identify experiencability with π -orbital electrons in a specialised brain dynamic is facile and confining to other processes:

The feeling-as-information hypothesis can be applied to nonpolar hydrophobic regions, which are non- electrolytic regions of fatty acids and intersect with lipophilic membrane proteins' domains of mainly partially holistic amino acid units. Here holistic is defined as the molecular wave function expressed over many delocalized electrons where parts of molecules are partially holistic with a specific internal energy that keeps it together by canceling the classical potential energy and, as shown in long-range order in a thermalized milieu must partially keep π -electrons phase differences in the self-organized molecular orbital only in the absence of classical potential energy.

The same problem occurs with the discussion of quantum entanglement:

Our theory posits that nonlocal holonomy results from negentropic entanglement of nonintegrated information through the 'negentropic force'. Therefore, there can be no "spooky action," and nonlocal holonomy in brains is through negentropic entanglement. The nonintegrated information juxtaposes several mechanisms on the quantum / classical regime boundary.

The explanatory gap between subjective consciousness and neurodynamics is explained through classical information:

We have proposed a solution to close the explanatory gap. Classical information theory measures the decrease in uncertainty, for example, when consciousness ends, and memory begins. The spontaneous potentialities are environmentally influenced. Intrinsic information is Fisher's information that relies on uncertainty and, at the fundamental level, comprises negentropic influences that carry molecular-embedded microfeels of meanings that comprise semantic information at a large scale. This latter process involves the capacity of negentropically interconnected partially holistic molecules to mutually affect, i.e., in-form, each other. This is the basis of negentropic entanglement. Although we propose a molecular approach, there is a problem with coupled process structures, in-forming each other on all levels of a neural organization. A dual-aspect theory of information, where one is classical and non-classical, is a wedge to close the exploratory gap between the mind and the body.

Quantum models of consciousness are then discarded in favour of "evanescent molecular micro-feels":

Finally, quantum models of consciousness are unrealistic from a biological perspective because the brain is an open quantum system. As Tegmark criticized the Orch OR model, the wave function has rapid decoherence. Our model is based on dissipative phenomena and does not suffer the same problems as other quantum models. No informational field continuously and permanently gives off the "radiance of consciousness". What we postulated are molecular-embedded microfeels that are evanescent. Therefore, by our definition, consciousness represents quanta of information (i.e., the temporal waveform in phase-space) that in each moment actualizes into conscious experience certain selections of the unconscious molecular embedded microfeels that, for long periods, resting in potentiality, constitute the preconscious experienceability.

Poznanski, in later statements, defines his cosmological point of view as follows:

Panexperiential materialism does not deny mentalism but puts it as part of the canopy of intrinsic processes, includes understanding relationships in their wholeness, and methodologically requires a multiscale approach. In panexperiential materialism, there is a self-referential identity theory, which allows for all possible relational facts, objective and subjective, intra- or interpersonal, enduring or dynamic, effectuated in structures of the holarchy to fundamental levels without the need for integration. The relational co-existence of the holons within the holarchy is a crucial distinction between holism and materialistic dialectics based on emergent causal effects. There will be effective feedback loops of intrinsic processes and experiences otherwise hidden in identity theory. Qualitative effects come about from self-referentiality and its non-Turing computational character. It is based on Sperry (1970) that subjectivity is not a qualitatively distinct category from physical processes.

Roman, in personal communication 5 Jul 2022 specifically concedes these quasi-particles cannot be empirically validated, but are nevertheless in reality subjectively first person conscious:

*The quasiparticles in the brain are not capable of being observed.
The complex nature of these signals makes them a theoretical petri dish but they are 1pp in reality.*

However, on 1 Mar 2023 in regard to (Alemdar et al. 2023), he states:

*Consciousness is a quasi-polaritonic⁴⁴ wave, see papers recently published.
Quasi-polaritonic waves that are moving result in standing waves when consciousness ends and memory starts.*

Polaritons are hybrid particles made up of a photon strongly coupled to an electric dipole. Examples of such a dipole include an electron-hole pair in a semiconductor, which forms an exciton polariton, and the oscillating electrons at the surface of a metal, which creates a surface-plasmon polariton. Obviously we don't think a transistor is conscious, although it involves polaritonic waves. If we are dealing with the same type of quantum entity in the brain why is one conscious and the other not? This is the same type of critique as Merker et al. (2022) concerning II.

Roman: As Sperry (1970) suggested, consciousness must be investigated objectively and we have done this through a multiscale lens (Alemdar et al. 2023). Starting with quasiparticles as the minimalist material composition of the dynamical brain where interferences patterns between incoherent waves of quasiparticles and their quantum-thermal fluctuations constrain the kinetic internal energy of endogenous molecules through informational channels of the negentropically-derived quantum potential. This indicates that brains are not multifractal involving avalanches but are multiscale, suggesting that unlike the hologram, where the functional interactions occur in the spectral domain, the

⁴⁴Polariton: quasiparticle resulting from strong coupling of electromagnetic waves with an electric or magnetic dipole-carrying excitation.

spatiotemporal binding is multiscale because of self-referential amplification occurring via long-range correlative information.

Chris: Multiscale is an ill-defined concept to do with scales of interaction in human societies (Olteanu et al. 2019). Neither is multifractal adequate, but denying quantum fractality outright is in empirical conflict with molecular biocosmology scale transitions (See [figure 51](#)). You are welcome to confine your research to Sperry, but it is inevitably pure physical materialism which will never bridge the explanatory gap.

You have just shown that your subjective conscious volition produced your e-mail reply, showing clear evidence you have subjective conscious volition you witnessed composing and dispatching your e-mail. That IS evidence! To deny it you either have to admit you are a zombie, who can't consciously affect the universe, or pronounce some epiphenomenalistic or fully materialistic jargon to deny the volition you know you exercised. We can all tell from the tenor of your reply that you consciously knew what you were doing even in the age of chatGPT.

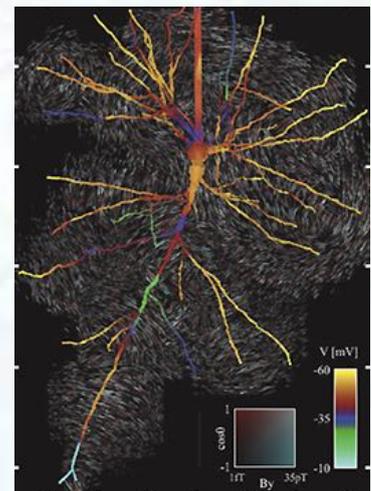
Roman: Quantum consciousness remains unproven and does not fit into quantum biology, but multiscale neuroscience does.

Chris: Quantum consciousness is not in the same category as multiscale neuroscience, consciousness is subjective and neuroscience is physical. You can't validly refute one on the basis of assuming the other. The statement that quantum consciousness doesn't fit into quantum biology is a contradiction, as consciousness does fit integrally into animal biology. Nothing in your theory is proven or provable, since you admit that: "The quasiparticles in the brain are not capable of being observed".

Roman: We have quantum analogs as classical properties of the quantum realm that fit onto a molecular scale of brain functionality. At this scale, phenomenal consciousness is a hybrid quasiparticle wave. It depends on its material property and represents a gateway to memory through the transfer of information, a derivative of energy transduction.

Chris: This is simply a statement of faith in pan-experiential materialism, which fails the hard problem extended to volition, as it effectively claims identity between polaritons and subjective consciousness. But this fails the same test as Merker et al. (2022) posed over ITT, since transistors and many other non-conscious systems utilise quasi-polaritonic waves but are not conscious. Why is phenomenal consciousness specifically and exclusively a hybrid quasi-particle wave at the molecular scale? Every molecule is a quantum entity, but it is only phenomenal consciousness if it also has a subjective phenomenology. You are in effect assuming one kind of quantum entity is a classical property and at the same time it is conscious – by analogy.

Fig 98: Reconstructed pyramidal neuron from macaque with the simulated electrical activity and corresponding magnetic field. The "two brain" theory postulates a second electromagnetic ghost in the electrochemical "machine" of the brain operating in complementary parallel.



Roman: It refutes the premise of dual aspect information since quantum information is not involved. I am not referring to weak dualism concerning the "outer core" of the quasi-polariton. This is because when we view through a multiscale lens, information has various layers of the physical attribution/functionality that constitute the mind. The "outer core" is where ions collect, which is associated with cognition. The "inner core" is the unique material composition of consciousness – the quasiparticles and their interference patterns.

We must further assume that quasi-polaritons as quasiparticles are archetypal quantum analogs of conscious experience that naturally depend on cognitive dynamics attributed to the arrangement of ions encasing the polaritonic wave. They are subjective because they encase the cognitive aspects of organisms uniquely.

Chris: You are claiming a form of pan-experiential materialism which does not appear to link to consciousness except by analogy. The notion of an inner core of consciousness of quasi-particles and their interference patterns and an

outer core containing ions as cognition is scientifically unverifiable and has no conceptual basis in quantum uncertainty any different from a purely physical phenomenon, such as a transistor.

Roman: What is consciousness? Many people of the old generation assume it is neural networks. The biggest change that we found is that consciousness is precognitive and the neural networks are entrained for consciousness to be expressed. Quantum mechanics is also irrelevant (see quantum statistical thermodynamics via Nelson 1966 reference). Consciousness does not have an electrical component and is therefore, not within the electro-ionic brain of the two-brains hypothesis but resides in the electromagnetic brain (Bercovich et al., 2017). Here, ions are not flowing as currents; the thermodynamic state creates the brain's internal energy, which includes covalent energy between molecular bonds and dispersion energy due to van der Waals bonds. Consciousness is a process that carries an integrative function, arising when the brain's internal energy is dynamically transformed (i.e., changes) by van der Waals bonds.

Chris: You seem to have an electromagnetic ghost lurking in the electrochemical machine. That is interesting and deserves critical attention.

Consciousness is the active process of attending to and engaging subjective experience either internally, or through the physical senses. Your definition of consciousness above is dependent on acceptance of the theory as a whole and your claim that "The act of understanding uncertainty is consciousness" is also unnatural as it derives from an abstruse definition of autopoiesis – the "central dogma" of information (Cárdenas-García 2022). It has nothing whatever to do with quantum uncertainty. Your definition of pre-cognitive is ill-posed because precognitive dreaming for example is pre-experiential *deja vu* – not pre-rational. Furthermore saying it is pre-cognitive is also ambiguous as to whether pre-cognition is experienced at all. The two brains hypothesis (Bercovich et al., 2017) is interesting but highly speculative.

Your published definition of consciousness (Alemdar et al. 2023) is:

*The meaning essential for understanding 'uncertainty' as a definition of consciousness falls into the category of semantic information in the central dogma of information (Cárdenas-García, 2022). ... **The act of understanding uncertainty is consciousness.** It does not need to make sense for "understanding" to take place. As the term "understanding" in the above definition of consciousness is precognitive, i.e., consciousness is intrinsic to affect but not to cognition. ... As per the central dogma of information, semantic information interactions with syntactical information is when conscious recall arises instead of memory, and only in the presence of 'uncertainty' is memory reconsolidated (Solms, 2017).*

The central dogma is purely about info-autopoiesis which is teleological, but not an innovative process, which subjective consciousness is. Therefore your entire holonomic argument rests on autopoiesis and multi-scalar system analysis, which in no way validly rebuts self-organised criticality or fractality. Your "anti-quantum" approach is cited as deriving from a Brownian motion classical interpretation of quantum mechanics (Nelson 1964) and the entire case is highly speculative. While I like the citation of an electromagnetic ghost in the electrochemical machine, I can still see no experimental evidence in vivo or in vitro to support this.

The abstract to The Central Dogma of Information (Cárdenas-García, 2022) states:

Info-autopoiesis or the self-referenced, recursive, interactive process of information self-production that engages all living beings in their efforts to satisfy their physiological and/or relational needs relies on Bateson's difference which makes a difference. Living beings, as active manipulators/observers of their environment, derive meaning from the sensorially detected motion of matter and/or energy in the Universe. The process of info-autopoiesis in humans is found to be triadic in nature and incorporates the simultaneity of a quantitative/objective perspective with a qualitative/subjective perspective. In this process of meaningful engagement with the environment, humans create and transform endogenous semantic information into countless expressions of exogenous syntactic information, which is synonymous with ordered material structure and artificial creation.

In my understanding panexperiential materialism doesn't explain "what it is like" to be consciously aware. Understanding relationships in their wholeness is an objective construct to make an abstract objectively "out there" model of mentality as an autonomous "homeostatic/teleological" feedback system as a physically definable form of organismic agency in a purely biological sense. It is thus a functionally extended form of pure materialism. This is simply not what happens. Conscious experience is self-manifesting. It is irrefutably present to our existential awareness. Our experiential purview of reality is entirely derived through subjective conscious experience, qualitatively entire as a distinct category from physical processes. Subjectivity can only be experienced not observed. We experience only through our subjective consciousness and infer the physical world view from consensual conscious

sensory experiences of the world at large and learn only indirectly from trial and error that we are biological organisms vulnerable to physical misadventure.

I provisionally accept that that living systems may exhibit a degree of short-term teleodynamics, particularly arising from their evolutionary context, but I see it as a limited necessary but insufficient condition for conscious existence. The authors may be speculating on plausible sub-molecular processes that underly normal brain functioning, consistent with an interface to, and potentially informative about, subjective consciousness, but whether these explain the hard problem or the existential nature of existence remains unestablished.

Strong Artificial Intelligence verses Understanding Natural Consciousness

We have seen that a number of neuroscientific theories of consciousness including ART, AST and IIT cite the possibility of their use in artificial neural networks supporting artificial intelligence. However some authors are interested in exploiting their discoveries for fame or profit. During the debate with Roman Poznanski on his theory of pan-experiential materialism, it emerged that he had trademarked a definition of consciousness with a view to it being used entrepreneurially in "Strong AI".

Roman: "The act of understanding uncertainty is consciousness" (This definition is copyrighted®12/12/22). It does not need to make sense for "understanding" to take place. As the term "understanding" in the above definition of consciousness is self-referential and precognitive, i.e., consciousness is intrinsic to affect but not to cognition. Experimental findings from acknowledged work on savants indicate that the disintegration of spatiotemporal patterns of neuronal activity can bring about lower-level recall of vast raw less-processed information at the expense of cognitive functions, such as conceptual thinking. Consciousness is a savant-like process in all of us with a difference. Instead of raw sensory information, it is endogenously produced semantic information as raw physical feelings.

Brian Josephson: Really? 5 Things You Can't Copyright That catchy slogan you came up with for your business? No dice on a trademark. The good news is that while not protected by copyright, if it pertains to your business (for example, goods and services), it can be protected with a trademark. Also exempt: Names, Titles, **Short phrases or expressions**, Product descriptions, Pseudonyms, Titles of works, Business names

Cathy Reason: However, I notice that he wrote ® rather than ©. So did he in fact register his phrase as a trademark rather than asserting copyright, which it seems would have been allowed, if no one else had done it before him?

Brian: This may help: *The registered trademark symbol, ®, is a typographic symbol that provides notice that the preceding word or symbol is a trademark or service mark that has been registered with a national trademark office. A trademark is a symbol, word, or words legally registered or established by use as representing a company, product or service.*

Chris: I copyrighted this idea as author under creative commons on 31/10/21:

Consequences: *Affirmation of human subjectively conscious physical agency and legal responsibility. Occam's razor is reversed, eliminating pure materialism, as inconsistent with conscious physical volition. Brain dynamics is not causally closed due to quantum uncertainty, enabling subjective consciousness to seamlessly participate in the uncertain instabilities of coherent processing without resulting in neurodynamic causal conflict.*

Uncertainty and mind: *The action of mind on brain necessarily arises from modulating the "random" aspect of quantum uncertainty in edge of chaos brain processing. This enables volitional will to intervene in the brain without disrupting the partial causal closure in brain processing in the uncertain quantum universe. In this sense, classical causality is replaced by quantum consciousness. It provides plenty of room to affect the computationally-intractable uncertain outcomes in evolutionary survival, using both subjective anticipation inherited from single celled eucaryotes a billion years before neural systems evolved and historical experience generated by cognitive processes.*

Symbiotic Existential Cosmology is CC BY-NC-ND 4.0, free to use intact and cited, but not to use uncited pieces of. SEC lists on Research Gate as published June 2021. The scientific overview I quoted lists from September 2021.

Roman: "Consciousness as uncertainty" is not what I suggested to be copyrighted: "The act of understanding uncertainty is consciousness".

Chris: Yes but it's wrong as it stands. The act of understanding uncertainty is conscious, but it's not consciousness. We need to do more than understand it, we need to act upon it to survive, which is why volition is pivotal. Watching a red rose is an act of conscious certainty, that it's not an alligator, or any other threat, except from its thorns.

I have a succinct cosmology whose thesis is centrally that subjective consciousness volition acts upon the physical universe exclusively through quantum uncertainty to avoid causal conflict as well as anticipating environmental threats rather than just "understanding" them. It's an important key additional axiom to quantum cosmology (and neuroscience). I don't want to see spurious later "copyright" claims distracting from its originality.

Roman: You are right. It is not yet a trademark unless it is used in business for 3 years. Nevertheless, I put that in just to stop others from taking the sentence. Yes, Mark Solms did mention something partially in line with the sentence but I believe it was not the entire sentence verbatim. This has nothing to do with quantum uncertainty.

Chris: All uncertainty arises from quantum uncertainty. It is an inescapable fundamental cosmological principle. All environmental uncertainty, as conceived of in neurodynamics, or the sort of uncertainty that Solms talks about in terms of strategic survival ultimately comes from contextual instabilities derived from quantum uncertainty.

The fundamental discovery in Symbiotic Existential Cosmology is the link between subjective conscious volition, quantum uncertainty and organismic survival, so neural processes are interactive manifestations of uncertainty as a cosmological principle. This means I have the copyright on this cosmological premise, not you Roman, nor Mark.

The final point is that it is impossible to eliminate quantum effects in the brain because the fractal non IID (independent, identically distributed quantum measurements) nature of neurodynamics means no convergence to the classical interpretation takes place because each event changes the context. Hence all the assumed non-quantum processes are quantum dynamics. So the notion of classicality in neurodynamics is invalid.

Conceiving the brain as a prediction machine cannot be done classically because the part that corresponds to conscious volition is collapsing the alternative Schrödinger cats of informational prediction, completing the prediction machine in free will. Consciousness corresponds to uncertainty because the computational aspects of prediction don't need to be conscious, but the uncertain aspects are uncomputable.

This doesn't mean we need dedicated quantum pathways like Hameroff & Penrose's model, nor do we need specific quasi-quantum classical pathways like Roman's polaritonic waves. We just need to respect the broad brush strokes of empirical neuroscience with the added quantum indeterminacy, as in SEC because tissue is the most exotic form of quantum material in the universe, quite unlike solid state physics excitons and quasi-particles, which require low temperatures and by contrast can readily take place in the thermodynamic milieu at 25-37°C.

Alfredo Pereira: I am puzzled because almost everybody agrees that phenomenological consciousness involves three mental functions: *cognition, affect and action control*. How to reduce consciousness to one cognitive concept, namely to reduction of uncertainty? The big Cartesian error remains, identifying consciousness with certainty. If we remain uncertain about something we cannot be conscious of it?

Chris: The problem with *cognition, affect and action control* is that it is conflating things which don't need to be subjectively conscious with those that do, so the picture gets muddled. We aren't identifying consciousness with certainty, because then the process is essentially over, whether it is "aha" or a decision-making process leading to action upon the physical universe. Processes like *cognitive thought* are easy to represent as physically-determined computational processes which can be expressed logically and so could be handled unconsciously and which we consciously perceive as a foregone conclusion. *Affect* is too vague because it is associated with ill-defined feelings which are limbic-system responses essential to survival, such as love, hate, disgust, contempt, and fear. *Action control* hints at volition, which is preceded by decision-making at a higher level, where the source becomes elusive.

A completely different way of dealing with the really creative questions, deeper in the intuitive process of subjective conscious decision-making is to view neurodynamics as a fully quantum process, in the most exotic quantum material in the universe, in which the wave aspects consist of parallel excitation modes representing the competing possibilities of response to environmental uncertainties. If there is an open and shut case on logical, or tactical grounds, this one will win out pretty much in the manner of Edelman's (1987) neural Darwinism or Dennett's (1991) despised multiple

drafts. In terms of quantum determinism the non-conscious processes form overlapping wave functions, proceeding according to deterministic Schrödinger solutions, (von Neumann type 2 processes), but in situations where subjective consciousness becomes critical to make an intuitive decision, the brain dynamic becomes an unstable tipping point, in which system uncertainty becomes pivotal (represented in instability of global states which are in turn sensitive to fractal scales of instability to the molecular level). Subjective consciousness then intervenes causing an intuitive decision through a (type 1 von Neumann) process of wave function collapse.

From the inside, this feels like and is a choice of "free-will" aka subjective conscious volition over the physical universe. From the outside, this looks like collapse of an uncertain process to one of its eigenfunction states which then become apparent. There is a very deep mystery in this process because the physical process looks and remains uncertain and indeterminate, but from inside, in complete contradiction, it looks and feels like the exercise of intentional will determining future physical outcomes. So in a fundamental way it is like a Schrödinger cat experiment in which the cat survives, more often than not i.e. we survive.

Roman: As for copyright, it can if used in entrepreneurship, like Strong AI development. Do you all know that the world now has nothing but weak AI? Google invested 500 million in DeepMind to squeeze sentience out of it. They will exploit it until they see that blood cannot be squeezed out of the rock. ... Yes, not copyrighted but trademark. TM. Copyright law applies after 15 or more words are copied.

Whit Blauvelt: Trademarks, with or without registration, require the mark be established in regular use in trade, in sale of goods or services, and not in conflict with any prior marks. Enforcement is a matter of civil action. Your odds of winning a trademark infringement suit based on some phrase written here are roughly zero/infinity.

Chris: You can't copyright "The act of understanding uncertainty is consciousness" as a process in Strong AI. It's not a product or process. None of the concepts are clearly defined. This would mean that every Turing computation that terminates is conscious, since it has "understood" the uncertainty of the invoked algorithm by solving it.

Roman: Our work on active consciousness suggests that consciousness is in the hand of man, not god, and therefore there is a way for the development of Strong AI. I am pleased with this progress. It will not only change the world but put DeepMind out of business. In the year that Strong AI stood up, I greatly appreciate that you don't send me emails to my other email or send me emails on metaphysics.

Chris: It's in the mind of man but should it be in the hand? The hand of God vs hand of man statement is a statement of serious concern. People are beginning to get worried that you are trying to claim intellectual property rights over the very notion of consciousness, which we all possess, in the same way the US failed to ratify the 1992 Rio Biodiversity Convention and still hasn't, to potentially claim ownership of the world's genes.

We already have too many neuroscientists like Graziano's AST conflating recursive biological attention with artificial neural nets. It is really irresponsible for materialistic neuroscientists to engage in the mechanised degradation of the biological consciousness we all share, in favour of classical neural nets or other technologies with or without transistors and other polaritonic components. Putting this in the context of a claim to somehow author Hard AI on a patentable basis is both unethical and pretentious given the IBM definition cited by Google:

Strong AI aims to create intelligent machines that are indistinguishable from the human mind. But just like a child, the AI machine would have to learn through input and experiences, constantly progressing and advancing its abilities over time.

I don't see how this is remotely achievable without an organoid approach. The idea you can do better than the entire evolution of the human genome since life began, with some sort of artificial organoid is more than a stretch of credibility, which raises very serious ethical doubts. And what a diabolical mission to even attempt. The literal Frankenstein of consciousness! In fact a cited co-worker of Poznanski has published on the use of sentient organoids made of a chimaera of a human organoid and bacterial and synthetic sensors fig 99b (Periera et al. 2023).

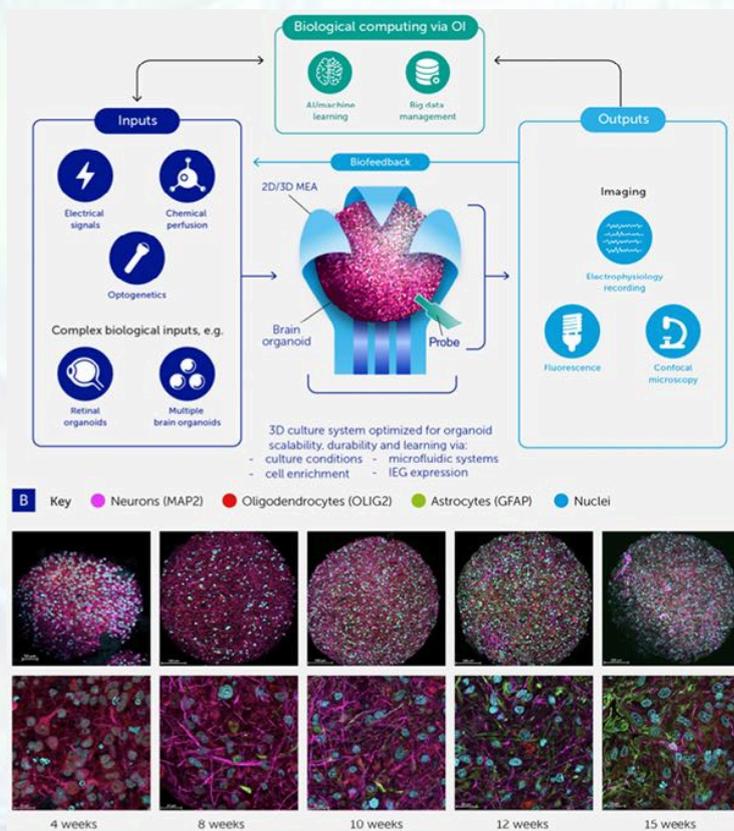
This morning, I noticed the Quantum Biology group had posted the link below to Smirnova et al. (2023) whose research team is headed by Thomas Hartung of Johns Hopkins, who is collaborating with the DishBrain team that taught an organoid to play pong (Kagan et al., 2022, Ledford 2022, Bowler 2022) aiming at a comprehensive plan for organoid super-computing and Hard AI.

"The beautiful and pioneering aspect of this work rests on equipping the neurons with sensations – the feedback – and crucially the ability to act on their world," says one of the authors, Professor Karl Friston, a theoretical neuroscientist at University College London. "Remarkably, the cultures learned how to make their world more predictable by acting upon it. This is remarkable because you cannot teach this kind of self-organisation; simply because – unlike a pet – these mini-brains have no sense of reward and punishment," he says.

"Let's say upfront that this is not a brain. Not even close. The human brain has somewhere in the region of 86 billion neurons. Even a mouse has 70 million. The team suggest DishBrain has a similar number of neurons to a bumblebee". "Even if DishBrain did have 86 billion neurons, we just don't know enough about the human brain to be able to create anything resembling a human brain".

"The brain has a complexity that cannot currently be replicated in a dish. The sheer number of cell types, the dynamics of the synaptic input they receive, and the neuromodulatory processes are not easy to replicate," explains Associate Professor Lucy Palmer, the head of the Neural Networks Laboratory at the Florey Institute.

This illustrates that DishBrain, was only the beginning and we are rapidly entering an era where strong AI, and my claim that realising his hypothesis would require an organoid approach was prescient (Brofiga & Massobri 2022).



"Nowadays, we are able to replicate many human neuronal types and peculiar brain regions in the form of engineered neuronal cultures, like neurospheroids or brain organoids, directly from embryonic and human induced pluripotent stem cells (hiPSC), and to couple them to a technological counterpart (i.e., chip).

"A full-sized human brain is not able to compute to the level of a supercomputer, but numbers-wise, they're not far off. Compared to a supercomputer, our human brain has a similar speed – around 1 exaFLOPS. Memory and storage units are still better in the human brain than supercomputers. For all human brains' flaws, they're also incredibly compact and low energy compared to a supercomputer."

Fig 99: Game plan for 'organoid intelligence'.

Already public discussion has run with the question whether such organoids are conscious, and the issue of trade-marking a definition of consciousness is red hot, so we all need to take stock now before it's too late to even comment. *Although the company calls its system DishBrain, the neurons are a far cry from an actual brain, Kagan says, and show no signs of consciousness. The definition of intelligence is also hotly debated; Kagan defines it as the ability to collate information and*

apply it in an adaptive behaviour in a given environment.

"The Australian company behind 'Dishbrain' (which learnt to play Pong last year) is collaborating with scientists at Johns Hopkins University in the US, whose research paper has outlined how these 'biocomputers' could allow us to understand memory, learning and other integral parts of human understanding. They also suggest it could rival supercomputers or AI. The crux of the paper, published in *Frontiers in Science* is a term called 'organoid intelligence' – this is the new field that will study small groups of human neurons that can learn, remember, and even understand its environment."

The Dishbrain team also controversially used the word 'sentience' in their paper, and so started a long line of questions about what makes something sentient, what makes consciousness and even intelligence? But this new paper suggests this is only the start. "We are talking at the moment really about the very basics," says Hartung. "It will take certainly many years before we reach the intellectual capacity of even a small animal."

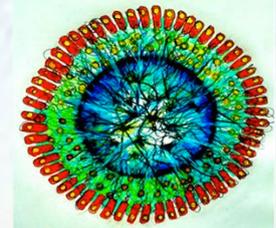
Periera et al. (2023) outline the following approach:

We predict the emergence of conscious experiences in the first-person perspective of the brain organoid, motivating the system to compose creative works, recombining the dynamic patterns previously presented. ... In this context, a scientific revival emerges,

which seeks not a return to a primitive state, but a transcendence of the human-nature relationship mediated by the very intelligence of the machine.

Enable the use of the brain organoid in "post-humanist" projects for the preservation of sentience, both demonstrating the mentality intrinsic to nature and contributing to human "reconnection" with the information richness of nature; ... In our foresight, Sentiomics has the potential to be the next step in a sequence of developments for the study and promotion of biodiversity and natural forms of mentality, moving forward in relation to successful projects of identification and preservation of genomes and proteomes.

Fig 99b: A genetically engineered bacterial network (colored red) connected around a brain organoid (colored blue; the intensity corresponds to hypothetical neuron firings) by means of a bio-sensor composed of a synthetic interface device to hypothetical neuron firings) by means of a bio-sensor composed of a synthetic interface device made of graphene (green) and golden quantum dots (yellow) to deliver natural bio-signals to the organoid. The bacteria have the role of transducing dynamic patterns from the Amazon Rainforest organoid (Periera et al. 2023).



Their approach is a two-phase one different from Poznanski's hard core panexperiential materialism.

Ways of feeling are studied in two modalities:

(A) As the universal set of patterns of Sentience, which we call Sentiomics;

(B) As species-specific and individually different sets of qualitative subjective experiences, which we call Qualiomics.

Qualiomics is, of course, a difficult issue for conventional science, as stated in the "hard problem of consciousness", because it leads to the much-discussed distinction of first- and third-person perspectives. There is an important difference between the capacity of feeling and emotion: while the first is a basic phenomenon possibly present in (almost) all living systems, the second is a higher-order phenomenon. The study of conscious emotions belongs to the domain of Qualiomics, a field of knowledge constructed with first-person perspective approaches. Sentiomics is more amenable to a scientific (empirical, experimental, and hetero-phenomenological) treatment than Qualiomics.

The problem solving dynamics in in vitro neuronal networks have been found to approach criticality in game-solving challenges similar to the dynamics attributed to conscious brain states however, by contrast in the 'resting state it is subcritical, unlike conscious brains, where the resting state is accompanied by active rehearsing of impending crises. Habibollahi et al. (2023) used an in vitro neural network of cortical neurons that was trained to play a simplified game of 'Pong' (Kagan et al. 2022) to demonstrate Synthetic Biological Intelligence (SBI). We demonstrate that critical dynamics emerge when neural networks receive task-related structured sensory input, reorganising the system to a near-critical state. Additionally, better task performance correlated with proximity to critical dynamics.

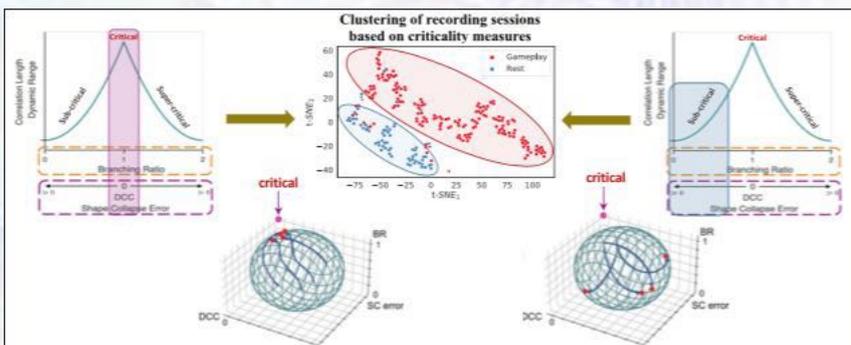


Fig 99c: Avalanches are utilised to examine the criticality metrics in the neuronal network's activity patterns to identify the working regime of each recording in terms of being sub-, super-, or near-critical. The same measures of criticality are used to cluster the recordings between two groups of Gameplay and Rest. The recorded neuronal activities are then employed to extract the 3 metrics of criticality (namely Branching Ratio (BR), Deviation from Criticality Coefficient (DCC), and Shape Collapse error (SC error)) which are

found to move towards the critical point during Gameplay and move further from that point during Rest (Habibollahi et al. 2023).

The human brain has taken 3 billion years to evolve. We are the climax of intelligent life in the universe as we know it. We are already being taken over by soft AI, with concern about the immanent tipping point caused by chatGPT. People are losing employment and a meaningful role in human society. We are trashing the biosphere from which we evolved with no real confidence of a living future. Is spawning a synthetic world made of our own brain cells the right course of action, when we still can't agree on what consciousness actually is? I repeat my concern that this is a critical ethical issue we all need to understand and take a clear position on. Do we really want to embark on a Brave New World of "Strong AI", in which we are taken over by supercomputing human brain cell Frankensteins? We can't just let it "stand up" as you say and walk by itself. What kind of Tragedy of the Commons (Hardin 1968) of consciousness is this potentially invoking? The use of human brain cells to make super computers and/or Hard AI needs to be

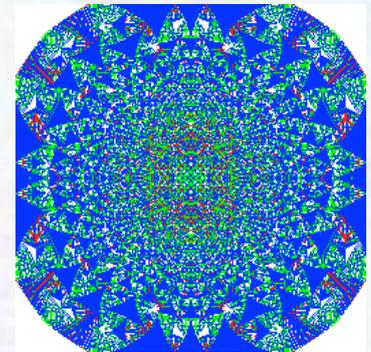
comprehensively assessed beforehand for ethical use, just as human germ-line genetic modification needs to be. We need to make a determination in advance that if “organoid intelligence” is a feasible biotechnology, is it actually desirable and will it help protect the future of Homo sapiens?

The Critically-Tuned Cortex at the Edge of Chaos

Associated with edge-of-chaos dynamics, the conscious brain is also cited as being in a state of self-organised criticality as being fine tuned in a phase transition between subcritical and supercritical states. This applies to many features, not just the neurodynamics, but to the network connectivity. Given only weak connections, neurons typically activate independently of each other, and the pattern of network activity is stochastic. The number of neurons activated in the last layer will tend toward zero because weak connections dampen the spread of activity. But too strong a set of connections is also counterproductive. One active strongly connected neuron activates multiple other neurons, spreading activity until nearly all the neurons in the final layer are active. Activity gets through, but this saturation does not let you accurately guess whether I activated one neuron in the first layer or all of them. The amplification has washed away most of that information. In the intermediate “critical” case, avoids both pitfalls and the proportion of neurons activated is roughly preserved across layers.

Fig 99d: [Abelian](#) simulation of the fractal avalanches in a sand pile.

Self-organised criticality (SOC) is a property of dynamical systems that have a critical point as an attractor. Their macroscopic behavior thus displays the spatial or temporal scale-invariance characteristic of the critical point of a phase transition, but without the need to tune control parameters to a precise value, because the system, effectively, tunes itself as it evolves towards criticality. The concept was put forward by Bak, Tang & Wiesenfeld (1987), and is considered to be one of the mechanisms by which complexity arises in nature. Its concepts have been applied across fields as diverse as geophysics, physical cosmology, evolutionary biology and ecology, economics, quantum gravity, sociology, and neurobiology.



John Beggs (2023) summarises the situation:

Over the last few decades, an idea called the critical brain hypothesis has been helping neuroscientists understand how the human brain operates as an information-processing powerhouse. It posits that the brain is always teetering between two phases, or modes, of activity: a random phase, where it is mostly inactive, and an ordered phase, where it is overactive and on the verge of a seizure. The hypothesis predicts that between these phases, at a sweet spot known as the critical point, the brain has a perfect balance of variety and structure and can produce the most complex and information-rich activity patterns. This state allows the brain to optimize multiple information processing tasks, from carrying out computations to transmitting and storing information, all at the same time.

The same sense of a critical brain being “just right” also explains why other tasks should be optimized. For example, consider information storage, which is driven by the activation of groups of neurons called assemblies. In a subcritical network, the connections are so weak that very few neurons are coupled together, so only a few small assemblies can form. In a supercritical network, the connections are so strong that almost all neurons are coupled together, which allows only one large assembly. In a critical network, the connections are strong enough for many moderately sized groups of neurons to couple, yet weak enough to prevent them from all coalescing into one giant assembly. This balance leads to the largest number of stable assemblies, maximizing information storage.

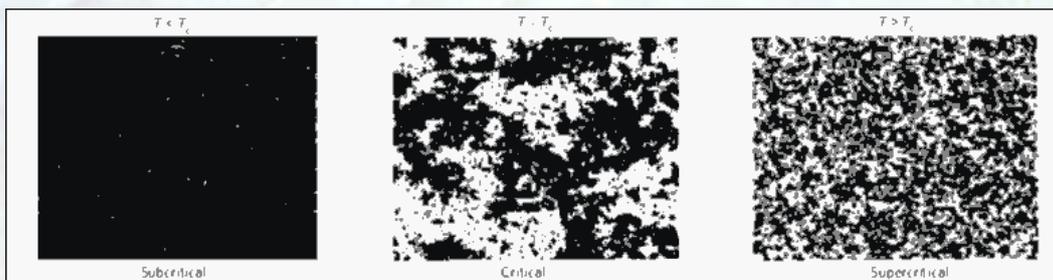


Fig 99e: **Complex is critical.** Three snapshots of the spin configurations at one moment in time for three temperatures (subcritical, critical and supercritical) from numerical simulations of the two-dimensional Ising model. Only at the critical temperature do systems exhibiting a second-order phase transition show the highly heterogeneous correlated domains seen, whereas both sub- and supercritical conditions result in homogeneous states (Shriki et al. 2013).

And this is not just theory or simulation: Experiments both on isolated networks of neurons and in intact brains have upheld many of these predictions (Shew et al. 2009, 2011). Further, we have seen these benefits arise across many different species, in turtles (Shew et al. 2015), cats (Hahn et al. 2010) and even humans (Shraki et al. 2013). Most of these studies have focused on the outer part of the brain, known as the cortex, although some have included subcortical regions as well. Overall, the studies have shown that these networks operate near the critical point.

Similarly, when humans are sleep deprived, their brains become supercritical, although a good night's sleep can move them back toward the critical point. It thus appears that brains naturally incline themselves (Chialvo 2010) to operate near (Ma et al. 2019) the critical point (Beggs 2019,2023), perhaps just as the body keeps blood pressure, temperature and heart rate in a healthy range despite changes to the environment.

Shraki et al. (2013) used MEG to model self organised critical cascades:

Our results demonstrate that normal cortical activity in healthy human subjects at rest organizes as neuronal avalanches and is well described by a critical branching process. Theory and experiment have shown that such critical, scale-free dynamics optimize information processing. Therefore, our findings imply that the human brain attains an optimal dynamical regime for information processing.

The **edge of chaos** is a transition space between order and disorder that is hypothesised to exist within a wide variety of systems. This transition zone is a region of bounded instability that engenders a constant dynamic interplay between order and disorder. We have seen two examples in neurodynamics, firstly in [figure 35\(rt\)](#) where edge of chaos is cited to have higher Lempel-Ziv complexity at the edge of chaos than the normal waking state or coma and seizure, which lie on the ordered and chaotic sides of the edge peak, and secondly in [figure 78\(1\)](#), where Freeman's dynamics of olfaction involves a sniff resulting in high energy chaos whose energy falls on exhalation to either enter an existing attractor representing a known smell, or causes a bifurcation to form a new attractor. Here the edge of chaos is tuned in time, with the chaotic phase ensuring the dynamic doesn't get stuck in a rut of order, followed by descent into lower energy chaos strange attractor, representing the solution, in a similar manner to the thermodynamic annealing and slow cooling in [Hopfield nets](#) to get a sub-optimal stochastic solution to potential landscape minimisations.

Devaney's three **Axioms of Deterministic Chaos**, which apply to both discrete and continuous non-linear dynamics:

- (1) **Butterfly effect:** Sensitive dependence on initial conditions
- (2) **Periodic points dense** and hence repelling, and/or a single dense orbit.
- (3) **Topological transitivity:** Mixing of small open neighbourhoods.

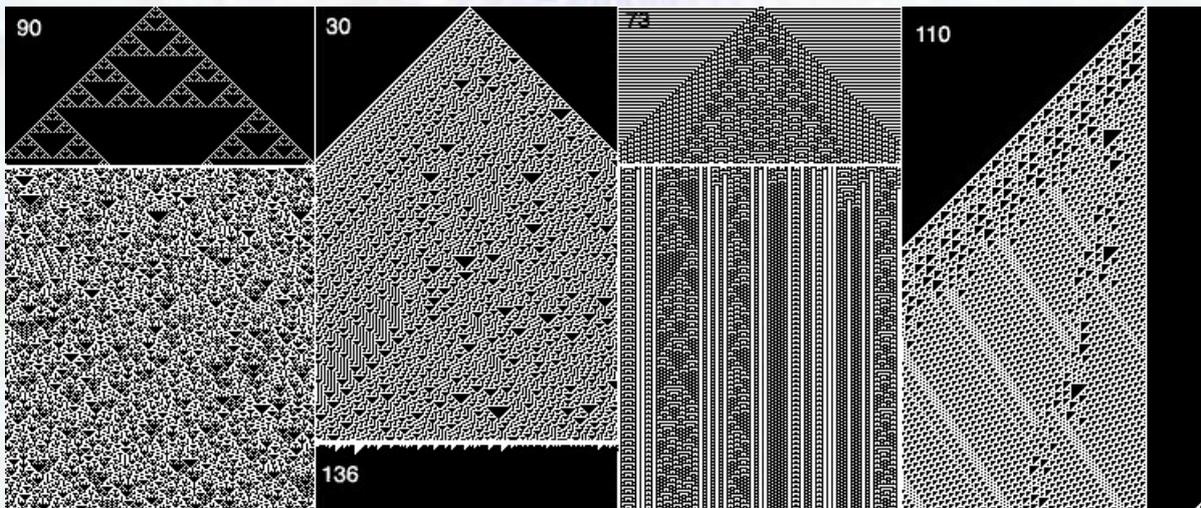


Fig99f: Examples of elementary 1-D 2-state CAs based on triplet of cells, include four types in Wolfram's classification: (1) Eventually fixed (136 = 10001000) (2) Periodic, often as a result of finite separated regions (73=01001001) (3) Chaotic with aperiodic patterns (30 = 00011110) and (4) Complex system potentially capable of universal computation (110 = 01101110). Rule 90=01011010 also has root significance. In each time step all values are replaced by the exclusive or **XOR** of the two neighbouring values.

But there is a beautiful example in the most elementary discrete cellular automata of all – 1D 2 state 3 cell automata that Stephen Wolfram made the centrepiece of "A New Kind of Science". What is outstanding is that not only is rule 30 chaotic and has proved to satisfy all 3 axioms above, but rule 110 which is a Turing complete universal computer is also

formally at the edge of chaos because it contains chaotic subsystems. It is impossible not to look at the 1-D cellular automata without realising that if universal computation arises at the edge of chaos and not in the regime of order there is no hope for any claim to an order based regime of ultimate good in a universe of intelligent systems. This doesn't mean life is bad or cursed by evil because we exist through this centre of the cyclone called the incarnate mortal coil, but since we can't take it with us when we go we need to respect the lives that follow in the best of all possible worlds called REALITY in the flesh. This is the ethic of collective immortality that brings us all together as one. The ethic of cosmology's chaotic edge.

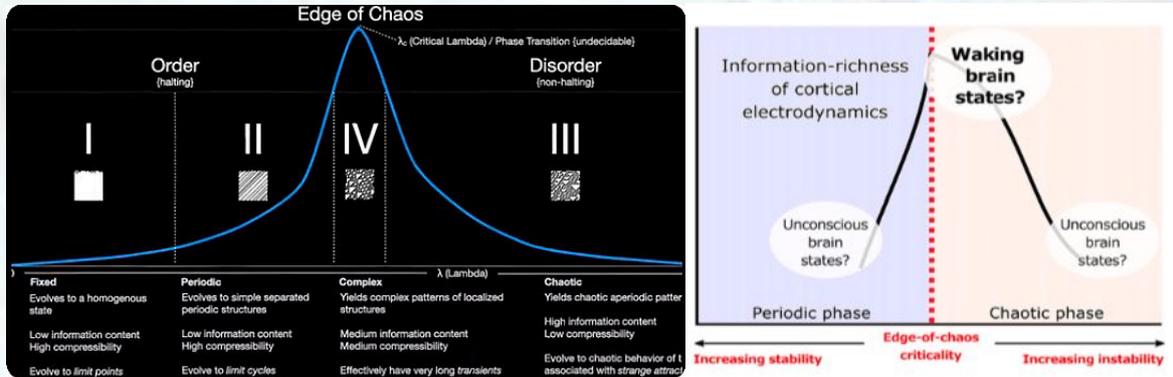
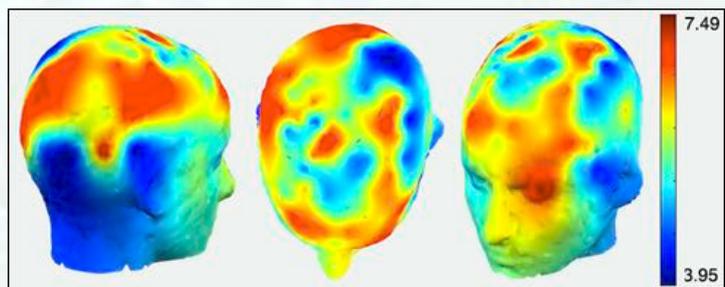


Fig 99g: **Left:** Wolfram's four classes of automata: **Rule 136** is class I, **rule 73** is II **Rule 30** is III and is proven chaotic in the full sense of Devaney (Cattaneo, G et al. 2000). According to Devaney's three axioms of dynamic chaos, Rule 30 displays (1) **sensitive dependence on initial conditions** (two initial configurations that differ only in a small number of cells rapidly diverge), (2) its **periodic configurations are dense** in the space of all configurations, according to the Cantor topology on the space of configurations (there is a periodic configuration with any finite pattern of cells), and (3) it is **topologically transitive**, or mixing open sets (for any two finite patterns of cells, there is a configuration containing one pattern that eventually leads to a configuration containing the other pattern). **Rule 110 IV is an edge-of-chaos universal computer** i.e. Turing complete, as suggested by Stephen Wolfram and proved by Mathew Cook (2004). It also stands at the edge of chaos, in the sense that there exist subsystems on which this rule is chaotic in the sense of Devaney (Chen et al. 2012). **Right:** Toker's (2022) classification of brain states – see fig 35 (right).

Also pivotal to the understanding of edge of chaos is the prisoners' dilemma, where defection is pitted against cooperation and in which the temptation to defect is at the source of social and religious and moral notions of mutual jeopardy and evil. Protest is essential in free societies to avoid tyranny including tyranny of the majority, but the other side is violent criminality, so there is no effective way to mount a universal ethic, except at the edge of chaos. Life exists at the edge of chaos as a far from equilibrium system dependent on chemical gradients and solar radiation.

A variety of complex and chaotic signals show the signature of $1/f$ noise. "Noise" here is regarded as any stochastic, chaotic, or complex signal that has varying power across frequency scales. White noise has the same intensity at all frequencies and each state is independent of the last. The integral of white noise becomes the drunkards walk of Brownian motion. Successive states are heavily dependent on the past states and distribute with frequency as $1/f^2$. Pink, or $1/f$ noise, which is a half integral, is at the sweet balance between history and novelty. Music for example is regarded to commonly be $1/f$ in both the frequency and amplitude domains. Related forms of brain analysis, such as multiscale entropy also form a similar fractal measure of complexity in signal "noise". The correlation dimension, closely related to the fractal dimension on the multifractal spectrum (Schroeder 1992), also provides an estimate of fractal complexity of dynamical strange attractors and the 0-1 chaos test a view of chaotic and edge of chaos neurodynamics (Toker et al. 2020).

Fig 99h: Correlation dimension of resting state eyes closed on caffeine for 20,000 samples over 20 secs. On the same data, the 0-1 chaos test gave a uniform cortical chaos level with mean 0.992 & sd 0.005.



Panpsychism and its Critics

This perspective naturally leads towards panpsychism, the idea that the fundamental constituents of the universe –i.e. quanta – have both a subjective existence and objective behaviour, just as they have both a wave and particle aspect physically. We can't see this

subjective existence or "isness" directly, just as we have difficulty seeing one another's consciousness directly, so objective behaviour becomes the default core description. However we know that the quantum wave function shapes where each particle ends up in a way which remains unpredictable for a single quantum and only becomes determined in the average, in terms of the probability (amplitude squared) of the wave function. This individual idiosyncrasy of a single quantum, when viewed as a particle within its wave function could be interpreted as its free will, as its location in the probability space modulated by the wave function amplitude is completely arbitrary and unbiased, just as it is able to have a determined position in the pilot wave theory if the Feynman implications of particle creation and annihilation are ignored. Likewise one could interpret its consciousness as its integrated "awareness" of the universal quantum entanglement through its wave function. One could thus conclude that the consciousness of the observer is apperceptive of the free-will of the quantum particle, since we are not asserting that the observer is applying their will to determine that Schrödinger's cat is alive or dead, but simply that our subjective consciousness is perceiving it to be in one of the two states. In either case we are dealing with what appears to be subjectively conscious observation of a quantum displaying psychic behaviour exerting an equivalent of volitional will masked by irreducible randomness.

Panpsychism doesn't just apply to any physical object such as a spoon (Goff 2019, Seth 2021a), where there is no manifest form of active behaviour one can associate with the object. It can be associated with single quanta, where idiosyncratic quantum uncertain behaviour is manifest. Panpsychism might also be associated with other adventitious quantum events such as evolutionary mutation, and might also become manifest in edge of chaos quantum processes in the open environment where chaos can lead to further entanglements (Chaudhury et al. 2009, Steck 2009), which are not subject to the suppression of chaos noted in closed quantum systems. Evolution is particularly sensitive because adventitious mutations form a chain of idiosyncratic single collapses in sequence, in which no convergence to the probability interpretation actually takes place.

We have already seen in Chris Koch's description of IIT his use and then rejection of panpsychism as a basis to introduce integrated information systems as an alternative, however Symbiotic Existential Cosmology makes a similar analysis of diverse natural systems extending beyond those of living animals that is consistent with a unique form of panpsychism that does not have the problems cited by Chris Koch, or Anil Seth.

A succinct account of the emergence of subjective consciousness from quantum panpsychism, consists of individual quanta, edge-of-chaos processes with quantum sensitivity due to the butterfly effect, biogenesis, and prokaryotes, becoming emergent eucaryote cells and organisms. I shall associate consciousness as such only with a discrete transition to coherent excitability of single cells with the eucaryote endosymbiosis and the evolution of this into the coordinated excitability of organismic nervous systems, in a clear-cut biological model of subjective consciousness. This dispatches Seth's "combination problem" – how to combine small conscious entities such as quanta into larger ones, mischaracterised as a problem of panpsychism's own making, because the types of coordination are a product of physical neuro-dynamic processes forming boundary conditions upon the complementary subjective conscious aspect.

Anil Seth, in "Being You" (2021b) provides a provocative account of the "exhilarating new science of consciousness". When asked if we will ever fully understand consciousness, and if we do what will that mean for our understanding of ourselves and our place in the world, he says:

"It's a very good question, but it's a hypothetical situation. The reason I am hesitating is that some people who are new to the idea of scientifically explaining conscious feel threatened by it. ... This attitude is especially true when you come to topics such as free will. People say "But no, I decided what I want to do", thus claiming this is a residue of the age-old belief in human exceptionalism that we are at the centre of the universe and distinct from all the other creatures. "Having got rid of those exceptionalist ideas, I think that the picture of the universe is infinitely richer, more beautiful, more rewarding." (Dixon 2022).

However this is incorrect, as Darwin's view was that free will spanned the metazoans "down to the polype". There is thus simply no connection between human exceptionalism and free will and it leads to an incorrect claim that a true understanding of consciousness suggests that free will is an illusion. He nevertheless has an insightful view of the evolutionary basis of consciousness within nature with which I agree:

We're going through this transition where we will begin to understand consciousness as part of the wider tapestry of nature. "Now that is threatening if you're still hanging on to your experience of being you as something apart from nature, separate from it. But I think that's exactly the way Copernicus and Darwin were ultimately incredibly enriching. It will be and it already is incredibly enriching to understand consciousness within the wider patterns of the universe and the natural world (Dixon 2022).

But Copernicus is here conflated with Darwin when the extended view of subjective consciousness as a privileged view appears to be cosmologically accurate as a climax conscious phenomenon providing precisely this privileged view and what he is saying is that the analytical view of objective science has revealed nature's true and confounding detail to the exclusion of subjective experience. While it may be true of religious cosmologies such as the Sabbatical Creation and Heaven and Hell, this view of the exclusive primacy of objective empiricism is fundamentally incorrect.

Seth cites Thomas Nagel as a basis for his naturalistic materialism, who in "What's it like to be a Bat" (1974) contended that while humans could never experience what a bat experiences, there would nevertheless be something it was like for the bat to be a bat, thus invoking subjective phenomenology as part of the discourse on consciousness.

However in this he cites the brain as a "complex prediction machine rather than a mere computer". This is insightful because it recognises the key function of consciousness shared by all animals to predict existential threats and sources of opportunistic hunting, feeding and sex through environmental prediction which is an established neurophysiological fact. But it is still exploring animal conscious as an implicitly mechanistic phenomenon, which he extends to three key areas: Levels of consciousness, the content of consciousness and the self.

This then tallies with his research approach, to set aside the hard problem of why subjective consciousness exists at all, if a prediction machine can do it well or better, to the easier problems relating brain functionality to states of mind through experimental neuroscience. According to his "real problem of consciousness" the primary goals of consciousness science are to explain, predict and control the phenomenological properties of conscious experience. In short, addressing the real problem requires explaining why a particular pattern of brain activity, or other physical process, maps to a particular kind of conscious experience, not merely establishing that it does.

This is something well established in neuroscience, as much of the research on psychedelic states reviewed in this work attests for one of the most complex and difficult of these states to assess. However, correspondence between brain states and conscious states do not explain whether the brain states cause the conscious states and in particular do not come anywhere close to empirically concluding that conscious volition, or free will, are merely subjective delusions of causal function of a prediction machine.

This approach leads to a series of mantras such as "I predict therefore I am", implying that conscious mental states are just controlled hallucinations (Seth 2018) to predict circumstances and are thus not real and that the self is just a construct having no intrinsic or even volitional meaning or value. Yes we know conscious experience is also an internal model of reality constructed by the brain to make sense of the world, but it is although an evolved model, a superbly veridical model enhancing reality, which outside is an indecipherable flux of photons, atoms, electrons and other quanta having no phenomenal characteristics apart from mass, wavelength and/or position and energy and/or time.

These hallucinogenic conclusions simply don't follow and stylistically devalue veridical experience and create a mystique of consciousness research as successfully unravelling the subjective foundations of our existential condition in favour of an occluded, albeit sophisticated mechanism. In the absence of solving the hard problem, this is a dangerous appeal to promissory materialism which diminishes and invalidates the human experience of natural reality, we depend on to survive as a species.

Anil Seth (2021a), in critiquing panpsychism, advances the case that the success of materialistic science is based on explanation, prediction, and control (EPC), the criteria by which many scientific enterprises are assessed, thus reducing biological 'vitalism' in a demystifying dissolution into molecular biology. Goff has countered that some scientific advances such as Darwin's theory of evolution "*emerged from a dramatic insight, rather than incremental dissolution*". But the objection to EPC is fundamental, because, at the very climax of biology, neuroscience has currently no idea of how to solve the hard problem or how the easy problems might be combined to evoke consciousness either. Goff argues that quantitative science does not capture qualitative properties characteristic of subjective qualia. The intrinsic difficulty with Seth's "real" problem of consciousness – how to distinguish different types of qualia e.g. red and blue sneakers, is that it completely fails to address the root question of subjectivity, which is by nature entirely different from the localisable, analysable, distinguishable and separable properties of objective reality and arises in both quantum observation in physics and the hard problem in neuroscience in complementary ways. The cosmology deals with this by accepting root primitive subjectivity, then expanded into sentient attentive consciousness with the eucaryote endo-symbiosis, which then becomes a tightly-coupled society of neurons subjected to boundary filter

conditions imposed by cerebral neurodynamics to provide adaptive context. Thus subjectivity is intrinsic, while the details of qualia are imposed by the boundary conditions described by empirical neuroscience.

But Seth's final criticism is that "Worst of all for panpsychism is that it is not itself testable, and that it does not lead to testable predictions". The problem is not about testability as such but how to make a test in a subjective regime that is by definition not objectively observable by others except by their demeanour and behaviour. This claim shows an inability to determine appropriate criteria for subjective testability. Legal decisions do not just depend on circumstantial (physical) evidence, but on sworn conscious testimony of a veridical nature. While this may be difficult for a single photon because it can only report from its behavioural trajectory, it is certainly possible and accepted scientifically at the high end of the scale in human subjective reports, each of which counts as a statistically verifiable data point. And by the mutual affirmation test invoked by the cosmology. However the details of just what the ultimate nature of conscious experience is in the cosmology of mental states illustrated in [fig 107](#) is as yet not fully characterised, not least due to legislation against psychedelics.

This problem is significant. Albert (1992 82-3) in the context of consciousness collapsing the wave function from imprecision about what consciousness actually is:

How the physical state of a certain system evolves (on this proposal) depends on whether or not that system is conscious; and so in order to know precisely how things physically behave, we need to know precisely what is conscious and what isn't.

We have also discovered that quantum entanglement between particles is both critical and universal to how the universe works. In special relativistic quantum theories, wave functions are coupled in both directions in time, with advanced and retarded solutions providing handshaking between future absorbers and past emitters (King 1989). This is evidenced in the Wheeler delayed choice experiment, [fig 74](#), confirmed by communication between satellites in Earth orbit (Vedovato et al. 2017). Even in a one quantum wave function, the particle can be detected only once in its wave function whether it occurs at earlier or later times, so collapse of the wave function has to occur simultaneously throughout past, present and future space-time, as suggested by the transactional picture.

In a trend that indicates just how inscrutable the "well" of quantum entanglement between two quantum systems can be, a paper on quantum complexity theory (Ji et al. 2020) shows that it is impossible to calculate the amount of correlation that two quantum systems can display across space when entangled (Castelvecchi 2020). The work concerns a game-theory problem, with a team of two players who are able to coordinate their actions through quantum entanglement, even though they are not allowed to talk to each other. This allows both players to 'win' much more often than they would without quantum entanglement. But the paper concludes that it is intrinsically impossible for the two players to calculate an optimal strategy. This implies that it is impossible to calculate how much coordination they could theoretically achieve. Thus there is no algorithm that is going to tell you what is the maximal violation you can get in quantum mechanics.

The Crack between Subjective Consciousness and Objective Brain Function

In this respect, it is pertinent to quote Popper and Eccles (1984 96) coining of the phrase "promissory materialism":

"the new promissory materialism accepts that, at the present time, materialism is not tenable. But it offers us the promise of a better world, a world in which mental terms will have disappeared from our language, and in which materialism will be victorious. The victory is to come about as follows. With the progress of brain research, the language of the physiologists is likely to penetrate more and more into ordinary language and to change our picture of the universe, including that of common sense. So we shall be talking less and less about experiences, perceptions, thoughts, beliefs, purposes and aims; and more and more about brain processes, about dispositions to behave, and about overt behaviour. In this way, mentalist language will go out of fashion and be used only in historical reports, or metaphorically, or ironically. When this stage has been reached, mentalism will be stone dead, and the problem of mind and its relation to the body will have solved itself."

We thus take the obvious foundational realities of existence – consciousness & volition – upon which we depend for our sanity and survival and turn our empirical experience into a vacuum, ablated in the contrivance that a combination of biological constraints and mechanistic physical laws, which together can be the natural complement of existential consciousness, and instead unravel all the actuality of existence, as a descriptive illusion. We thus tell ourselves an arcane story that existence itself is a just thermodynamic constraint, neutralising our very agency to do anything meaningful, spontaneously imaginative, creatively transformative or merely good as in Bertrand Russell's [dire warning](#).

Conscious: Etym Latin *consciūs* 'knowing with others or in oneself' (from *conscire* 'be privy to') + **-ous**

When we turn to the actual definition of consciousness e.g. in Merriam-Webster we find that essentially ALL the definitions of consciousness are dealing with subjective experience!

Definition of consciousness

1a : The quality or state of being aware **especially of something within oneself.**

1b : The state or fact of **being conscious of** an external object, state, or fact

1c : **Awareness** especially : concern for some social or political cause:

"The organization aims to raise the political consciousness of teenagers."

2 : The state of being characterized by **sensation, emotion, volition, and thought** : mind.

3 : The **totality of conscious states** of an individual.

4 : The **normal state of conscious life.** *"he regained consciousness".*

5 : The **upper level of mental life** of which the person is aware as contrasted with unconscious processes.

Francis Crick and Christof Koch acknowledge in Crick's words that "Consciousness is the major unsolved problem in biology", in his foreword to Koch's (2004) "The Quest for Consciousness". Koch (2018) in "What Is Consciousness?", makes clear in his first sentence that: "Consciousness is everything you experience" thus acknowledging that it is the sum total of subjective experience. Koch makes clear in his discussion that their strategy is rather to define the NCC or neural correlates of consciousness, equivalent to the various easy functional problems of consciousness, deferring the hard problem of exactly what subjective consciousness is until these problems are solved, in the hope they will address the elephant in the room. But correlation is NOT causation, so an NCC doesn't imply the brain is causally closed.

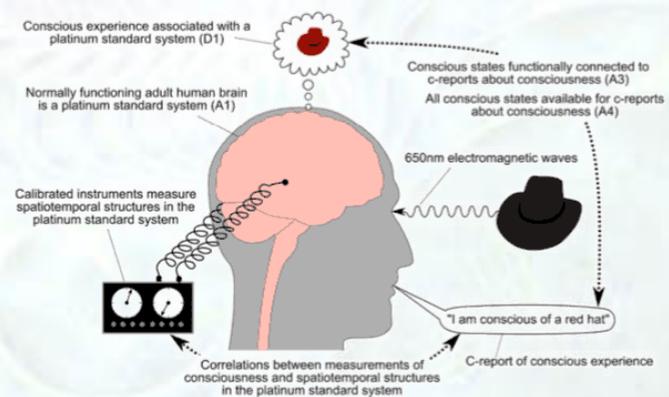
Chris Koch (2020) unveils another defence tactic in discussing the status of near death experiences, admitting physical materialism is just an assumption, but claiming it has a-priori evidential weight requiring "**extraordinary, compelling objective evidence to the contrary**" to overrule it based purely on its past successes in science and technology:

"I accept the reality of these intensely felt experiences. They are as authentic as any other subjective feeling or perception. As a scientist, however, I operate under the hypothesis that all our thoughts, memories, percepts and experiences are an ineluctable consequence of the natural causal powers of our brain rather than of any supernatural ones. That premise has served science and its handmaidens, technology, extremely well over the past few centuries. Unless there is extraordinary, compelling, objective evidence to the contrary, I see no reason to abandon this assumption".

For all Chris's charming romantic approach to reductionism (Koch 2012) this hypothesis underscores the dishonesty of neuroscientific materialism, that he should feel the need to adopt this position, because it places an illegitimate test on reality. We HAVE to assume causal closure, because of the historical success of classical deterministic science in other simpler areas, or a completely unestablished admitted "assumption" is arbitrarily declared to be true under an impossible burden of proof, to establish the contrary – a specific causal violation, which we know to be concealed in the edge of chaos dynamics correlated with the subjectively conscious condition.

How then does neuroscience turn the tables on this central signature of subjective existence, to claim it is exclusively a functional aspect of brain processing, however plausible it might seem, knowing we are biological beings with brains?

Fig 100: The subjectively conscious individual is reduced to a set of functional interactions monitored by calibrated instruments (Gamez 2014), in which the case report "I am conscious of a red hat" is reduced to an objective sentence thereby side-stepping the entire subjective nature of consciousness, in this case a-priori, without even citing any kind of brain process to support it.



Gamez (2014) in "The measurement of consciousness: a framework for the scientific study of consciousness" makes this process clear by defining a set of interlocking definitions which a-priori define it to be so:

D1. **A platinum standard system** is a physical system that is assumed to be associated with consciousness some or all of the time.

A1. The normally functioning adult human brain is a platinum standard system.

A2. The consciousness associated with a platinum standard system **nomologically supervenes on the platinum standard system**. In our current universe physically identical platinum standard systems are associated with identical consciousness. (X is said to supervene on Y if and only if some difference in Y is necessary for any difference in X to be possible.)

A3. During an experiment on the correlates of consciousness, the consciousness associated with a platinum standard system is **functionally connected to its c-reports** about consciousness. (subjective reports)

L1. There is a **functional connection** between consciousness and the [neural]correlates of consciousness.

This series of claims is simply defining consciousness to BE integrated brain function by philosophical supervenience, using the easy problems of consciousness based on simple functionality, as shown in fig 100, where the experimental subject has simply become their functional brain!!

If the brain were simply controlling the process and consciousness was just a marionette being pulled by our brain strings we would experience this as being passive travellers in the passenger seat of intentionality. This is clearly NOT the case, so we need to distinguish brain influence e.g. as a boundary condition shaping, but not fully determining outcomes, from the brain determining conscious states entirely. We need to acknowledge subjective consciousness is the puppet master of edge-of-chaos instability and certainly not conclude that the brain drives the boat of subjective consciousness in a causally determined manner. This is consistent with the view of the brain as a functional filter on consciousness that is participatory with subjective awareness in shaping the nature of conscious experience.

Note that, by citing psychedelics, I am also invoking a paradoxical objective biochemical role for inducing unconstrained subjectivity, so this is a deep cosmological paradox we all need to take careful account of.

A Cosmological Comparison with Chalmers' Conscious Mind

In espousing his philosophical view of naturalistic dualism David Chalmers' central points in "The Conscious Mind" (1996) are as follows:

1. *In our world, there are conscious experiences [which are irreducible to physical descriptions because subjectivity is categorically irreducible to any combination of functional inferences about the objective physical universe and/or the brain].*
2. *There is a logically possible [zombie] world physically identical to ours, in which the positive facts about consciousness in our world do not hold.*
3. *Therefore, facts about consciousness are further facts about our world, over and above the physical facts.*
4. *So materialism is false.*

Rather than a philosophical view based on astute argument, I will take a complementary view of reality, embracing empirical observation for the objective physical aspect and empirical experience for the subjectively conscious volitional aspect. This means that empiricism carries direct evidential weight over logical discourse while preserving the empirical and theoretical basis of scientific inquiry and the veridical nature of existential experience.

In regard to the above, support 1, 4 and 3 (for other reasons), but remain unconvinced about 2. This is because "logically possible" is a philosophical conclusion that lacks an empirical basis in nature. Given a broad acceptance of 1 on the basis that the subjective phenomena are categorically different from any possible explanation in objective terms it remains unclear that a universe without conscious experience can become manifest as all our knowledge of the physical universe is gained through conscious experience of it. Nor is it empirically evident that such a "zombie" universe could display identical properties with living ecosystems if it did, since such a condition is unachievable.

David then takes a very cautious view, retreating to the very brink of materialism by asserting that consciousness is naturally supervenient to the physical, although not logically so, noting that this does not invoke Cartesian dualism:

So it remains plausible that consciousness supervenes naturally on the physical. It is this view — natural supervenience without logical supervenience — that I will develop. ... The arguments do not lead us to a dualism such as that of Descartes, with a separate realm of mental substance that exerts its own influence on physical processes.

David then effectively asserts, and later explicitly assumes causal closure of the physical universe as a justification, on grounds of personal opinion rather than empirical evidence:

The best evidence of contemporary science tells us that the physical world is more or less causally closed: for every physical event, there is a physical sufficient cause. If so, there is no room for a mental "ghost in the machine" to do any extra causal work. A small

loophole may be opened by the existence of quantum indeterminacy, but I argue later that this probably cannot be exploited to yield a causal role for a nonphysical mind.

I reject this point of view, based on the fact that: (1) quantum reality consists of causal process punctuated by quantum uncertainty and entanglement. (2) This is exacerbated by open system quantum chaos, inducing further entanglements because the kind of edge of chaos phase-coherence processing used by the brain becomes subject to butterfly effect sensitivity at tipping points in conscious processing where critical insights and decisions over uncertain outcomes are resolved. This has also invoked a reappraisal of the exclusiveness of sufficient, rather than final causes, because resolving quantum field problems, e.g. in the Feynman formalism involves implicit information from the future absorbers. Therefore the classical view of efficient causality central to the notion of classical causal closure remains unproven. To wager such a position in advance of scientific verification is a belief not a description of nature.

Chalmers describes his position as a form of property dualism:

The dualism implied here is instead a kind of property dualism: conscious experience involves properties of an individual that are not entailed by the physical properties of that individual, although they may depend lawfully on those properties. Consciousness is a feature of the world over and above the physical features of the world.

The position I am advancing, involving a complementarity between the subjective mind at large and the physical universe could also be described as a form of property dualism, but working in the scientific-existential paradigm, I describe it as asymmetric complementarity, following wave-particle, boson-fermion, and other biological complementarities, such as sperm and ovum. These are not considered to be “property dualistic”, as the complementarity is integral to the natural condition, or cosmological “design” as a whole in the case of cosmological symmetry-breaking.

For a design example, the four core quantum forces of nature display a particular type of broken symmetry ([fig 71](#) lower left), which introduces a fractal design into the universe resulting in biological tissues and brains as climax structural outcomes, without assuming any form of teleology – theistic or anthropic.

Chalmers then advances the “plausibility” of consciousness nevertheless having an [entirely] physical basis, generated by contingent laws of nature such as the biological functionality of brain processing:

It remains plausible, however, that consciousness arises from a physical basis, even though it is not entailed by that basis. The position we are left with is that consciousness arises from a physical substrate in virtue of certain contingent laws of nature, which are not themselves implied by physical laws. This position is implicitly held by many people who think of themselves as materialists. ... Some people will think that the view should count as a version of materialism rather than dualism, because it posits such a strong lawful dependence of the phenomenal facts on the physical facts, and because the physical domain remains autonomous.

I shall reject this view both on multiple grounds: (1) It remains unestablished that quantum cosmology is physically autonomous as a whole or that the universe can become manifest without conscious observers. (2) Volitional autonomy is evidential to the conscious subject but no causal physical process such as a machine displays autonomy as such. (3) It results in a contradictory treatment of the subjective realm where Chalmers asserts that consciousness is irreducible but later, as we shall see, claims the phenomenal can be subtracted from volitional causality over the physical, when volition is manifest consciously as well as in behaviour and Chalmers’ arguments fractures the two, rendering the conscious awareness of volition to be a delusion and the physical manifestation in consciously motivated behaviour to have no causal basis. This is the classical materialist trap!

On the one hand we have the zombie establishing consciousness phenomena are categorically independent of the physical and on the other we have a similar argument making them subtractable from the causal, thus invoking a philosophical Catch 22.

Chalmers then indicates he will explore new fundamental properties and laws of consciousness, detailed in a major section of his work. Symbiotic existential cosmology solves this problem differently by associating subjective phenomena as complementary manifestations of physically dynamic properties of brain processing rather than parallel laws in their own right. I reserve my position on this claim because it invokes a type of analysis successful in the exploration of the physical world, because fermionic matter is granular because of the Pauli exclusion principle, leading to the fractal material complexity of matter and hence biology. It is unclear such a “subjectively reductionistic”

approach can be successful in the subjective realm, as subjectivity is not clearly subdividable in the same way, as is expressed as a noted feature of Eastern philosophy:

To bring consciousness within the scope of a fundamental theory, we need to introduce new fundamental properties and laws.

Chalmers cites physicist Steven Weinberg looking towards an explanatory chain from fundamental laws:

*In his book *Dreams of a Final Theory* (1992), physicist Steven Weinberg notes that what makes a fundamental theory in physics special is that it leads to an explanatory chain all the way up, ultimately explaining everything. But he is forced to concede that such a theory may not explain consciousness. At best, he says, we can explain the "objective correlates" of consciousness. "That may not be an explanation of consciousness, but it will be pretty close"*

Chalmers then cites two possible outcomes, citing proto-phenomenal properties in passing as a possible option:

There are two ways this might go. Perhaps we might take experience itself as a fundamental feature of the world, alongside space-time, spin, charge, and the like. That is, certain phenomenal properties will have to be taken as basic properties. Alternatively, perhaps there is some other class of novel fundamental properties from which phenomenal properties are derived. Previous arguments have shown that these cannot be physical properties, but perhaps they are nonphysical properties of a new variety, on which phenomenal properties are logically supervenient. We could call these properties protophenomenal. Most of the time, however, I will speak as if the fundamental properties are themselves phenomenal.

This leads to seeking a parallel with the elegance of physical laws. I would question this approach, as the subjective is so fundamentally different from the objective that modelling subjective phenomena on the success of physical laws invokes a subjective reductionism even if not through proto-phenomenal or proto-panpsychic means:

The case of physics tells us that fundamental laws are typically simple and elegant; we should expect the same of the fundamental laws in a theory of consciousness. ... To capture the spirit of the view I advocate, I call it naturalistic dualism. It is naturalistic because it posits that everything is a consequence of a network of basic properties and laws, and because it is compatible with all the results of contemporary science.

He notes that this could rather be what one might rather call dual-aspect monism, citing matter and energy as alternatives, but not the complementary wave-particle aspects of quanta. This is problematic because matter and energy are not complementary but functionally equivalent, for example in terms of $E = mc^2$:

I should also note that although I call the view a variety of dualism, it is possible that it could turn out to be a kind of monism. Perhaps the physical and the phenomenal will turn out to be two different aspects of a single encompassing kind, in something like the way that matter and energy turn out to be two aspects of a single kind.

In dealing with possible objections to his approach, Chalmers cites emergence as a foil while still involving materialism, noting however that it has to exceed the usual limits, for example on biologically emergent properties. I agree with Chalmers on this:

Sometimes it is argued that consciousness might be an emergent property, in a sense that is still compatible with materialism. In recent work on complex systems and artificial life, it is often held that emergent properties are unpredictable from low-level properties, but that they are physical all the same. ... If consciousness is an emergent property, it is emergent in a much stronger sense. There is a stronger notion of emergence, used by the British emergentists (e.g., Broad [1925]), according to which emergent properties are not even predictable from the entire ensemble of low-level physical facts. It is reasonable to say (as the British emergentists did) that conscious experience is emergent in this sense.

I agree with Chalmers rather than his description of Searle's position although I admire Searle's work ⁴⁵:

Like me, Searle (1992) holds that consciousness is merely naturally supervenient on the physical. He allows that a zombie replica is logically possible, holding that consciousness is merely caused by states of the brain. But he denies that this is a variety of dualism, even property dualism. This might seem to be a mere terminological issue, but Searle insists that the ontological status of consciousness is the same as that of physical features such as liquidity, so the issue is not merely terminological.

⁴⁵ Beginning with a spirited discussion of what's wrong with the philosophy of mind, Searle (1992) characterizes and refutes the philosophical tradition of materialism. But he does not embrace dualism. All these "isms" are mistaken, he insists. Once you start counting types of substance you are on the wrong track, whether you stop at one or two. In four chapters that constitute the heart of his argument, Searle elaborates a theory of consciousness and its relation to our overall scientific world view and to unconscious mental phenomena. He concludes with a criticism of cognitive science and a proposal for an approach to studying the mind that emphasizes the centrality of consciousness to any account of mental functioning.

We now come to the crux of the problem – the relationship between subjective conscious experience, volitional will and causal efficacy over the physical world:

A problem with the view I have advocated is that if consciousness is merely naturally supervenient on the physical, then it seems to lack causal efficacy. The physical world is more or less causally closed, in that for any given physical event, it seems that there is a physical explanation (modulo a small amount of quantum indeterminacy). This implies that there is no room for a nonphysical consciousness to do any independent causal work. It seems to be a mere epiphenomenon, hanging off the engine of physical causation, but making no difference in the physical world.

Chalmers notes two responses to Thomas Huxley's (1874) coining of the term epiphenomenalism, after observing frogs with cranial ablations still managing to jump out of a pool of water: *Huxley (1874) advocated such a view, but many people find it counterintuitive and repugnant.*

Chalmers' two grounds – counterintuitive and repugnant are pejorative of conscious experience and fail to invoke the full scope of the grounds for the invalidation of epiphenomenalism. The fact that something is counterintuitive or repugnant obviously doesn't mean it is not true. Newton's laws of motion were first seen to be counterintuitive, but are true nevertheless in their domain of application. Likewise disease and death are repugnant but universal realities of existence. But that's because incorrect criteria are being used. Neither of them carry the force of veridical affirmation from empirical experience of our volitional actions and decisions which are the "critical point". Epiphenomenalism is invalidated by empirical experience because it fails the mutual affirmation test of subjectively conscious volitional agents. An argument, however astute, doesn't carry the water of conviction against empirical observation, or experience.

It may seem "counterintuitive" or even "pretentiously naive" to trade off mutual affirmation between conscious biological organisms against the assumed physical causality of the entire universe, but this is a valid cosmological position, given the fact that, as far as we know, the physical manifestation of the universe can only be verified by conscious perception of its existence. The alternative to conscious volition is experiential and cosmological catatonia.

Chalmers acknowledges the mysterious nature of causation in rejecting claims of a full formal epiphenomenalism citing the possibility of a breakdown in our classical notions of causality:

In responding to this, I will pursue a two-pronged strategy. First, it is not obvious that mere natural supervenience must imply epiphenomenalism in the strongest sense. It is clear that the picture it produces looks something like epiphenomenalism. Nevertheless, the very nature of causation itself is quite mysterious, and it is possible that when causation is better understood we will be in a position to understand a subtle way in which conscious experience may be causally relevant. ... On the second prong, I will consider the reasons why epiphenomenalism might be found unpalatable, and analyze their force as arguments.

In questioning causality Chalmers first cites Humean causation, upon which all it is for A to cause B is for there to be a uniform regularity between events of type A and events of type B, or a slightly more restrictive form in which any nomic (or lawful) connection suffices. Chalmers see these as inadequate and demurs that many conscious individuals will attribute such correlations to be causes when they may not be. He also fairly rejects overdetermination – the notion that both subjective and objective causes can come to bear in parallel on the same effect or behaviour.

Chalmers acknowledges that there are two classes of facts that do not supervene logically on particular physical facts: facts about consciousness and facts about causation and that these two may be linked:

A third strategy rests with the very nature of causation itself. We saw in Chapter 2 that there are two classes of facts that do not supervene logically on particular physical facts: facts about consciousness and facts about causation. It is natural to speculate that these two failures might be intimately related, and that consciousness and causation have some deep metaphysical tie.

A proposal like this has been developed by Rosenberg (1996), who argues that many of the problems of consciousness are precisely paralleled by problems about causation. He argues that because of these parallels, it may be that experience realizes causation, or some aspects of causation, in the actual world. On this view, causation needs to be realized by something in order to support its many properties, and experience is a natural candidate. If this is so, it may be that it is the very existence of experience that allows for causal relations to exist. Of course, this proposal is extremely speculative, and faces some problems. For a start, it seems to lead to a version of panpsychism the view that everything is conscious, which many find counterintuitive.

This is an extremely important point because the only evidence we have for classical causality is through our conscious experience of the universe in the affairs of the world around us. The laws of physics, both classical and quantum, contain no arrow of time upon which sufficient causes can be based and our only theoretical evidence for it comes

from the stochastically driven second law of thermodynamics, with quantum entanglement having the spooky implications of retrodiction also imputing final causes. It is thus true (1) that the only way the physical universe actually becomes manifest is through our conscious experience of it and (2) that the laws of quantum mechanics lead to superimposed quantum states and the potential for Schrödinger cat paradox multiverses, which our conscious experience may play a key part in resolving. But as Chalmers points out this leads to panpsychism:

There is of course the threat of panpsychism. I am not sure that this is such a bad prospect — if phenomenal properties are fundamental, it is natural to suppose that they might be widespread — but it is not a necessary consequence. ... An alternative is that the relevant properties are protophenomenal properties. Either way, this sort of intimate link suggests a kind of causal role for the phenomenal.

Nevertheless he concedes that his view of natural supervenience feels epiphenomenalistic. However, he then mounts an attempt to marginalise the consequences:

Some people ... may be tempted by an interactionist variety of dualism, in which experience fills causal gaps in physical processes. Giving in to this temptation raises more problems than it solves, however. For a start, it requires a hefty bet on the future of physics, one that does not currently seem at all promising; physical events seem inexorably to be explained in terms of other physical events. It also requires a large wager on the future of cognitive science, as it suggests that the usual kinds of physical/functional models will be insufficient to explain behavior. But the deepest problem is that this view may be no better at getting around the problems with epiphenomenalism than the view with causal closure, for reasons I will discuss shortly [the assumed ability to subtract the phenomenal from the causal].

He then mounts a critique of the ability of the quantum universe to alter the classical causality of brain states, on two key fronts (1) quantum uncertainty and (2) collapse of the wave function:

- (1) *The only form of interactionist dualism that has seemed even remotely tenable in the contemporary picture is one that exploits certain properties of quantum mechanics. There are two ways this might go. First, some have appealed to the existence of quantum indeterminacy a nonphysical consciousness might be responsible for filling the resultant causal gaps, determining which values some physical magnitudes might take within an apparently "probabilistic" distribution (e.g., Eccles 1986). Although these decisions would have only a tiny proximate effect, perhaps nonlinear dynamics could amplify these tiny fluctuations into significant macroscopic effects on behavior. ... This is an audacious and interesting suggestion, but it has a number of problems. First, the theory contradicts the quantum-mechanical postulate that these microscopic "decisions" are entirely random, and in principle it implies that there should be some detectable pattern to them—a testable hypothesis. Second, in order that this theory allows that consciousness does any interesting causal work, it needs to be the case that the behavior produced by these microscopic decisions is somehow different in kind than that produced by most other sets of decisions that might have been made by a purely random process.*
- (2) *A second way in which quantum mechanics bears on the issue of causal closure lies with the fact that in some interpretations of the quantum formalism, consciousness itself plays a vital causal role, being required to bring about the so-called "collapse of the wave-function." This collapse is supposed to occur upon any act of measurement; and in one interpretation, the only way to distinguish a measurement from a non-measurement is via the presence of consciousness. This theory is certainly not universally accepted (for a start, it presupposes that consciousness is not itself physical, surely contrary to the views of most physicists), and I do not accept it myself, but in any case it seems that the kind of causal work consciousness performs here is quite different from the kind required for consciousness to play a role in directing behavior. It is unclear how a collapse in external perceived objects allows consciousness to affect physical processing within the brain; such theories are usually silent on what happens to the brain during collapse. And even if consciousness somehow manages to collapse the brain state, then all the above remarks about apparently random processes and their connection with behavior still apply.*

Both these questions are extensively addressed in this chapter of the monograph. There is no empirical evidence that brain processes are causally closed. Shepherd (2017) points out, that the neuroscientific threat to free will has not been causally established, particularly in the light of Schurger et al. (2012, 2015), also [discussed herein](#). It is illegitimate to assume that any connectedness between subjective and objective in quantum uncertainty would result in gross or even detectable variations from pseudo-randomness, particularly if the relationship is one complementary to the physical universe as a whole. We already know that, in the absence of wave function collapse third party quanta do invoke compounded entanglements.

Chalmers then begins to explore the futility of invoking spooky quantum pseudo-particle states or subjective "psychons", as these don't in themselves demonstrate experiential properties:

Imagine (with Eccles) that "psychons" in the nonphysical mind push around physical processes in the brain, and that psychons are the seat of experience. We can tell a story about the causal relations between psychons and physical processes, and a story about the causal dynamics among psychons, without ever invoking the fact that psychons have phenomenal properties.

This brings us to the nub of Chalmers' critique, with which I disagree on empirical grounds:

Any view that takes consciousness seriously will at least have to face up to a limited form of epiphenomenalism. The very fact that experience can be coherently subtracted from any causal account implies that experience is superfluous in the explanation of behavior, whether or not it has some subtle causal relevance.

I see this conclusion as the core of a dilemma all forms of philosophical causal reasoning apply to conscious volition in particular. It is evident that core physical theories defining the laws of nature, from Newton's laws of motion to cosmological TOEs, or theories of everything, are not explicitly about causality, but the description of nature through symmetries, symmetry-breaking and equational relationships that successfully define characteristics of nature we can empirically observe and confirm, such as the doubling of the bending of light around the Sun due to the Sun's gravitational field, confirming Einstein's theory of general relativity.

To make a claim on logical grounds that the subjective "phenomenal" aspect can be subtracted from the causal is not a valid comment about the status of subjective experience but the particular way the philosophical discourse is treating causality. Science is a product of theoretical predictions and confirming empirical observations. Neither is the theory a cause of the observations but a natural description of the circumstances predisposing to them. It is thus empirical observation that is the standard of validating natural science and it is the same standard of empirical experience that defines the natural investigation of the subjective domain. In this regard, the standard is and has to be veridical affirmation by empirical experience, not a logically astute argument to the contrary in defiance of subjective evidence.

Chalmers then repeats his mischaracterisation as the common objection: *The most common objection to epiphenomenalism is simply that it is counterintuitive or even "repugnant." Finding a conclusion counterintuitive or repugnant is not sufficient reason to reject the conclusion, however, especially if it is the conclusion of a strong argument.*

In my view this is an incorrect portrayal of the central existentially experienced objection, which is that our conscious existential experience is centrally and unambiguously that of being an intentional agent acting in the physical world to further our physical survival and social success. We do this by a coherent integrated experience of responding to circumstances over which we have partial control, focusing our attention and volitional will of making decisions and carrying out ensuing physical actions with purposive intent, consciously aware of our intentions and the strength of our wilful determination, in exactly the same way we process and pay attention to our sensory experience.

We are thus aware and aware that we are aware, and aware that we intend and aware that we are aware that we intend and aware that we are aware that we act wilfully, intentionally and often decisively and tenaciously resist attempts by other agents and the vagaries of the world at large to impede our autonomy as conscious volitional living beings functioning as physically causal agents. To characterise the inconsistency between this view of organismic conscious existential survival in the natural world as merely because the unverified claim of epiphenomenalism is counterintuitive on the one hand is to attribute it to a failure of astuteness and on the grounds of repugnance on the other hand to a failure of our wishful emotions to recognise the stark limitations of our sense of autonomous survival against the odds. This amounts to a philosophical misrepresentation of the realities.

Human perception is described as veridical because it evokes an experience of the world around us that is more true to reality than the incoming sensory information. Our perception of our volition is likewise veridical, to give us a truthful expression of the way our conscious attentive will is securing our survival in real time. To concede sensory perception is veridical and to deny it entirely for our perception of our volition is a contradiction – in Gilbert Ryle's stark terminology – a category error. If epiphenomenalism were actually, in any qualitative, or even quantitative respect true, our veridical perception would inform us that we are mere passengers accompanying our action without any veridical sense of our volition.

Chalmers then goes into the counter-objections in detail:

More detailed objections to epiphenomenalism fall into three classes: those concerning the relationship of experience to ordinary behavior, those concerning the relationship of experience to judgments about experience, and those concerning the overall picture of the world that it gives rise to.

The first is an attempt at finesse. Chalmers demurs on veridical volition because he attributes it to mistaken regularity or an indirect nomic (lawful) connection, ultimately attempting to dispense with it as merely an intuition which cannot have the force of an astute philosophical argument:

We are much more directly aware of experience and of behavior than we are of an underlying brain state; upon exposure to systematic regularities between experience and behavior, it is natural that a strong causal connection should be inferred. Even if the connection were only an indirect nomic connection due to relations to the underlying brain state, we would still expect the inference to be made. So this intuition can be explained away. In any case, this sort of objection cannot be fatal to the view, as it is an intuition that does not extend directly into an argument. It is an instance of the merely counterintuitive.

The second however he concedes is both worrying and potentially fatal. My position is that it is manifestly fatal, because, Chalmers concedes it is incompatible with our knowledge of experience, as I have already discussed:

The second class of objections is more worrying. It seems very strange that our experiences should be irrelevant to the explanation of why we talk about experiences, for instance, or perhaps even to our internal judgments about experiences; this seems much stranger than the mere irrelevance of my pain to the explanation of my hand's withdrawal. ... Some claim that this sort of problem is not merely counterintuitive but fatal. For example, it might be claimed that this is incompatible with our knowledge of experience, or with our ability to refer to experiences. I believe that when these arguments are spelled out they do not ultimately gain their conclusion, but these questions are certainly challenging.

As noted the basis of my objection is that Chalmers' resort to the use of astute causal argument, while dismissing veridical awareness of volition in action as intuitive by comparison with robust philosophical argument is fatal because argument is a symbolic expression of a very narrow subset of subjective experience and can't pretend to account for it as a whole. But the core objection is that this violates the principles of verification by empirical experience that are the foundation of the "scientific" exploration of the subjective.

Chalmers is ever astute and acknowledges that some people, including myself will find his position to be a fatal flaw:

I do not describe my view as epiphenomenalism. The question of the causal relevance of experience remains open, and a more detailed theory of both causation and of experience will be required before the issue can be settled. But the view implies at least a weak form of epiphenomenalism. Some will find that nevertheless the epiphenomenalist nature of this position is a fatal flaw. I have some sympathy with this position, which can be seen as an expression of the paradox of consciousness: when it comes to consciousness, it can seem that all the alternatives are bad. However, I think the problems with all other views are fatal in a much stronger way than the counterintuitiveness of this one.

Summarising his position he states his four key assumptions:

The argument for my view is an inference from roughly four premises:

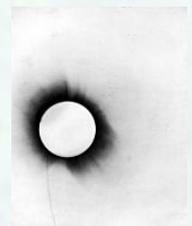
1. *Conscious experience exists.*
2. *Conscious experience is not logically supervenient on the physical.*
3. *If there are phenomena that are not logically supervenient on the physical facts, then materialism is false.*
4. *The physical domain is causally closed.*

Chalmers finally states his naturalistic dualism succinctly:

Then there is my view, which accepts premises (1), (2), (3), and (4): vii. Naturalistic dualism. Consciousness supervenes naturally on the physical, without supervening logically or "metaphysically."

My position is to deny (4) on the basis of the veridical nature of empirical experience and volition, which is both inconsistent with causal closure of the physical. This is so because verification between subjectively conscious agents depends on mutual veridical affirmation of their common status as volitional conscious agents, just as replication by empirical observation is pivotal to objective science. This is what all sane human beings, not subverted by implicit belief in materialism assert, consistent with conscious observation of the universe being necessary and integral to the ability to establish and hence manifest its existence.

Fig 101: One of Arthur Eddington's photographs of the 1919 solar eclipse experiment, confirming the time taken was double, consistent with relativity in single experienced image presented in his 1920 paper announcing its success (Dyson, Eddington & Davidson 1920, Earman & Glymour 1980, Coles 2019).



To subsume veridical experience of volition to refutation by philosophical argument, on the basis that phenomena can be subtracted from causality and hence that volition can be discounted as merely "intuition" rather than empirical experience, is as fallacious as attempting to mount a philosophical argument that the doubling of the bending of light around the Sun due to the Sun's gravitational field does not mean that we should accept relativity because the general field equation $G_{\mu\nu} = \Lambda g_{\mu\nu} + \kappa T_{\mu\nu}$ is simply a numerical expression describing a functional relationship and not a causal statement,

especially having conceded that: “*there are two classes of facts that do not supervene logically on particular physical facts: facts about consciousness and facts about causation*”.

And Chalmers has one very astute final observation:

There is also an eighth common view, which is generally underspecified: viii. Don't-have-a-clue materialism. "I don't have a clue about consciousness. It seems utterly mysterious to me. But it must be physical, as materialism must be true." Such a view is held widely, but rarely in print (although see Fodor 1992).

Ultimately we come back to his persistent, and as detailed in my view, incorrect contention that the phenomenal component can be subtracted from the causal, when the issue is that volition is both experientially phenomenal and physically efficacious as we know experientially, and thus can't validly be subtracted from the phenomenal aspect:

The deepest reason to reject options (iv) and (vi) is that they ultimately suffer from the same problem as a more standard physics: the phenomenal component can be coherently subtracted from the causal component.

It should be noted that Chalmers does seriously acknowledge the potential relevance of panpsychism as a possible solution, as I have:

Personally, I am much more confident of naturalistic dualism than I am of panpsychism. The latter issue seems to be very much open. But I hope to have said enough to show that we ought to take the possibility of some sort of panpsychism seriously; there seem to be no knockdown arguments against the view, and there are various positive reasons why one might embrace it.

In “The Meta Problem of Consciousness” Chalmers (2018) discusses the meta-problem of explaining why we think consciousness poses a hard problem, or in other terms, the problem of explaining why we think consciousness is hard to explain. In this he addresses phenomenal reports: the things we say about consciousness (that is, about phenomenal consciousness). Problem reports are a fact of human behaviour. Because of this, the meta-problem of explaining them is strictly speaking one of the easy problems of consciousness. Chalmers contrasts *illusionism*: the view that consciousness is or involves a sort of introspective illusion, while realists think conscious experiences are real direct phenomena. Chalmers notes that because illusionism is held by a minority, it makes sense to understand the problem as the meta-problem and focus on solving it.

This invokes a research program involving (i) experimental philosophy and psychology, linguistics, and anthropology studying subjects' judgments about consciousness, (ii) work in psychology and neuroscience on the mechanisms that underlie our self-models and bring about problem reports and other phenomenal reports, (iii) work in artificial intelligence and computational cognitive science on computational models of phenomenal reports, yielding computational systems that produce reports like ours, and (iv) philosophical assessment of potential mechanisms, including how well they match up with and explain philosophical judgments about consciousness.

Chalmers is principally targeting a complementary problem to the hard problem which can help elucidate these dichotomies, but it applies more generally in the sense that it concedes the role of subjective reports and poses questions of how these can be rationalised in philosophy and particularly in neuroscience, where subjective experience and subjective reports tend to take second tier to hard physical data on brain states in so far as they can unambiguously be elucidated in conscious subjects.

Chalmers uses this approach to discuss theories of consciousness such as IIT Tononi & Koch (2015) that integrated information is the basis of consciousness, noting that there is no obvious link between integration of information and these judgments. Since, according to IIT, for every system with high integrated information there will be a computationally isomorphic simulated system with zero integrated information. He applies the same challenge to global workspace theories (Baars, 1997), where the basis of consciousness is a global workspace that makes information available to other systems in the brain. How does the global workspace help to explain our judgments about consciousness? Again, it is not obvious how the workspace explains problem reports involving a sense that consciousness is puzzling.

Higher-order thought theories (Rosenthal, 2002) say that conscious states are those that are the objects of higher-order thoughts. But again it is not clear how mere higher-order thoughts explain why we report mental states as being conscious nor how higher-order thoughts explain why we report conscious states as puzzling.

He notes that it can apply to quantum theories (Hameroff and Penrose, 1996; Stapp, 1993) that say there is a strong tie between wave-function collapse and consciousness. Does wave-function collapse play a central role in explaining reports of consciousness? One might worry that the answer is no, since wave-function collapse only selects one of multiple branches of the wave function. If a subject says 'I am conscious' in the selected branch, it is arguable that the subject also says 'I am conscious' in many unselected branches. If so it looks as if there may be an explanation of the reports which is prior to wave-function collapse.

The challenge also applies to panpsychist theories which hold that human consciousness is some sort of combination of micro-consciousnesses in fundamental entities. The combination problem for panpsychism is to explain how micro-consciousnesses can combine to yield our consciousness, now extended to explain how these combination states play a central role in bringing about reports of consciousness.

In considering introspective models which attribute primitive relations to qualities and contents, Chalmers, notes that introspection is especially central to Graziano's (2013) AST model in which 'awareness is a model of attention' and doubts attention is the right choice for the complex relation that is being modelled, suggesting instead that it is more generally a model of representation.

Chalmers' own view with which I have complete agreement is best quoted for its sheer lucidity:

My own tentative view is that the most promising solution to the meta-problem lies in primitive relation attribution and the sense of acquaintance: our experiences seem to primitively acquaint us with qualities in the environment, and these experiences are themselves objects of acquaintance. I favour a realist theory of consciousness where consciousness does in fact involve acquaintance in this way. This line tends to suggest a combination of a first-order representational view of consciousness (consciousness involves immediate awareness of worldly properties) with a self-representational view of consciousness (consciousness involves immediate awareness of itself). I do not think this sort of awareness is reducible to brain mechanisms, but one might expect some sort of corresponding structure at the level of brain mechanisms.

Uziel Awret (private communication) notes the need to distinguish the ground of subjectivity from the properties:

"The intransitive properties of consciousness those common to all conscious states, systems and creatures like some rudimentary 'there is something it is like' to be such systems, or to be in such states, and are usually referred to as 'phenomenal character' (some would add privacy and intentionality). The transitive properties of consciousness are those that distinguish between different conscious states like blue and red or a square and a triangle and referred to as 'representational content'. Conscious mental states have both structural and non-structural properties including aspects of the representational content that are more structural lending themselves to scientific investigation and non-structural aspects of phenomenal character that seem less accessible to scientific investigation.

The question - What is it about consciousness that is made necessary by the way the brain is? Should be broken in two:

- 1) *What is it about the structural properties of consciousness that are necessitated by the way the brain is?*
- 2) *What is it about phenomenal character that is necessitated by the way the brain is?*

In symbiotic existential cosmology I am focusing only on phenomenal properties as intractable to the hard problem, the Darwinian panpsychism likewise refers only to primitive subjectivity in general with an evolutionary model, where consciousness as we know it, is an emergent property induced by the eucaryote endosymbiosis when the membrane became freed for informational excitability and social signalling via neurotransmitters. The transitive structural properties have to be seen in the context of how the brain operates neurodynamically.

Consistent with his view in "The Conscious Mind", Chalmers and McQueen (2021) have philosophically explored a variety of scenarios in which consciousness could collapse the wave function in realistic circumstances, dealing specifically with the paradoxes arising from superposition of the observer as a quantum system. They explore various options including super-selection rules forcing the elimination of some components of the superimposed state and super-resistance models in which a threshold causes collapse. Chalmers and McQueen adopt IIT as a basis for their analysis, but this introduces abstractions, in which consciousness is associated with a discrete Markov formulation consistent with observed features of conscious existence but not possessing subjectivity as such. This leads to a description where we are really analysing features of consciousness in objective brain dynamics rather than subjective experience to establish causality.

Summarising the difference between Chalmers & McQueen's approach and Symbiotic Existential Cosmology, we compare four philosophical objections they cited and addressed:

(a) What is a superposed state of consciousness? Chalmers & McQueen are stating a functional IIT model of "consciousness", so they state such a situation is possible, in conflict with our veridical experiences. The symbiotic cosmology concurs with the veridical conclusions of subjective conscious, and with Wigner's position that this is "absurd", although it doesn't rule out bodies and brains being quantum objects.

(b) How do quantum effects make a difference to macroscopic brain processes? Chalmers & McQueen do not assume quantum sensitivity in the "warm" brain, stating that "*we have treated brain states as superpositions of numerous decoherent eigenstates, which themselves may involve relatively classical processing in neurons*". Symbiotic cosmology accepts the need for brain states to have at least some quantum sensitivity and presents evidence for this. Critically it does not require the kind of isolation that current quantum computing methods do, by either isolating themselves from any significant decoherence, or by adiabatic quantum computing at very low temperatures following a series of zero energy configurations. All it requires in symbiotic cosmology are critically poised cellular states that become sensitive to individual quantum fluctuations in critically poised ion channels, initially in individual eucaryote single celled organisms. Later this process can become coupled in animal brains, through critically-poised whole brain states as coherent "excitons" distinguishable from one another through phase coherence discrimination being sensitive to threshold transitions in single neurons and their ion channels.

(c) What about macroscopic superpositions? Chalmers & McQueen hedge their bets, firstly suggesting machines might also be conscious: "*For a start, if a correct theory of consciousness associates these devices with some amount of consciousness (as may be the case for IIT), then the devices will collapse wave functions much as humans do.*" Then following it with a catch-all: "*Even if these devices are not conscious, it is likely that typical measuring devices will be entangled with humans and other conscious systems, so that they will typically be in a collapsed state too.*"

(d) What about the first appearance of consciousness in the universe? This is a problem for their particular models. They seek to solve this with an approximate super-resistance model: "*For eons, the universe can persist in a wholly unconscious superposed state without any collapses. At some point, a physical correlate of consciousness may emerge in some branch of the wave function, yielding a superposition of consciousness and unconsciousness (or their physical correlates) with low amplitude for consciousness*".

The symbiotic cosmological model is panpsychic so the subjective element is included from the cosmic origin. Indeed it would then be possible for the universe to be involved in collapse of its own wave functions and develop a course of history, without human observers, which is a key strength of the theory, but in the case of the experimental quantum measurements of the types we are dealing with in the cat paradox, there is a specific interaction between human organismic consciousness and the experiment, so collapse could be evoked by the human observer's consciousness. This may apply more to (a) situations in how the brain performs its own phase front coherence processing between wave voltages and discrete action potentials and (b) in unstable tipping points in prisoners' dilemma paradoxes in open environment situations, in which there are real or potential threats to survival, as in fig 91.

Penrose (2014) suggested a similar process involving gravitationally induced collapse, in which a quantum state remains in superposition until the difference of space-time curvature attains a significant level. However all quantum entanglement experiments on Earth take place successfully in an environment where gravitation is present.

Chalmers also notes that their general view might prove causal closure of consciousness: "*The same might apply to the connection between consciousness and non-conscious processes in the brain: when superposed non-conscious processes threaten to affect consciousness, there will be some sort of selection. In this way, there is a causal role for consciousness in the physical world*" (Chalmers 2003, pp.262-3). This is very close to Stapp's proposal above and the approach adopted in this cosmology, and to neuroscience notions of peripheral rather than coherent conscious processing in the brain, but it is being applied to collapse of the brain as a quantum superimposed state, not the subjective mind.

While this is provocative of an attempt to confirm a causal basis for volitional will, the difficulty here is that quantum observation depends on the subjective experience of the observer, not just integrated brain states we might accept as being the objective correlates of subjectivity, so the explanation of the theory is led into dealing with potential paradoxes of physical collapse that are tied to objective brain states rather than subjective experience, which is the veridical reality generating the unique history of the universe, rather than superimposed multiverses. In the author's view Albert's critique is pivotal – human society remains impeded from exploring the actual nature of unconstrained

conscious states and only with the full exploration of these and collecting veridical accounts of visionary states can we begin to assess the nature and cosmological status of subjectivity.

To coin an analogy from the mathematical world, integral transforms such as the Fourier transform convert localisable time-amplitude information into frequency information, creating a mapping from all states into a complementary configuration space. If the subjective basis of experience is a transform of the entire physical universe under the encapsulated constraints of the organismic brain, it may have a form of predictive power without possessing any localisable or separable features of the objective universe. Effectively it would be sampling the entire scope of quantum entanglement throughout the universe and throughout space-time, and through the consciousness of other sentient organisms, echoing Huxley's notion of organismic consciousness being a filter upon the "mind at large". Brain processing already appears to use transforms as integral to its wave processing, so the analogy is highly pertinent.

In later interviews, Chalmers (2022) has a much more positive view of the potentiality for subjective consciousness to causally interact upon the physical brain, through collapse of the wave function:

The next radical conclusion is that consciousness is separate from the physical world but it also has an effect on the physical world – a causal impact. We need to be cautious here, but science hasn't taught us that physics is a closed system – that the brain is a closed system. There's one route there that I think might be worth pursuing. A hole that's left open for where consciousness can have some impact. In quantum physics, most of the time, the wave function follows the Schrödinger wave equation, but every once in a while a strange thing happens – it collapses – why does the wave function collapse? Quantum mechanics doesn't tell us – it just says it collapses when a measurement occurs. What's a measurement? No one knows. On the face of it what looks like a measurement is a measurement by a conscious observer. If you wanted to have consciousness to effect physics, it looks like physics could not be designed more perfectly.

Moreover, in regard to the collapse of the wave function, the idiosyncrasy of single quantum instances displays unmitigated liberty, except in the context of repeated measurements of the same kind, in which the probability distribution is normalised by its asymptotic approach to the wave function real power $\phi \cdot \bar{\phi}$, in which the empirical wave function is an integral representation of entanglement at large. In the biological context no such repeated measurements occur so there is a close correspondence between quantum idiosyncrasy, the unpredictability of brain states at unstable tipping points and the uncertain and unpredictable nature of open environment survival crises. As non-IID (independent and identically distributed measurement) quantum processes do not necessarily converge to the classical, the need to prove the case for subjective interaction is no stronger than the need for materialism to prove its case for causal closure, which remains non-evident empirically.

Autopoiesis and Neurophenomenology

The term autopoiesis refers to a system capable of producing and maintaining itself by creating its own parts (Maturana & Varela 1991) to define the self-maintaining chemistry of living cells.

An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (ii) constitute it (the machine) as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network.

The aim is to give a formal meaning to biological agency as self-organising system, but applied to the cell such self-organisation is largely homeostatic, applying less to advanced organisms, where the hard problem of the explanatory gap and the creative demands of conscious intelligence require more than homeostatic prolongation of cellular life.

To address this, Francisco Varela's (1996) neurophenomenology is an attempt to marry cognitive science with a disciplined approach to experience i.e. phenomenology (Husserl 1913) and thus consists of naturalising phenomenology, as integrated into an explanatory framework admitted by the natural sciences.

Pinholt (2012) notes that Varela's article is written with David Chalmers' 'hard problem' in mind, and functions as an alternative to Chalmers' suggestions of what is needed to solve the hard problem, it is therefore also a step towards a possible solution to the 'hard problem'. Varela agrees with Chalmers that experience is not a candidate for (reductive) eliminativism. But he disagrees with Chalmers that in order for us to solve the gap between cognitive science and experience we need to find some theoretical principles that will do the job. Varela believes that there could be a "neurophenomenological" circulation i.e. a co-determination of both accounts – a joint investigation of phenomena

involving subjective experience, where the phenomenological analysis will be responsible for mapping out the structure of experience from a first-personal perspective, while cognitive science will be responsible for finding the neurological correlates for that experience, of course this approach pre-supposes that there are such things as neurological correlates.

A consequence of this approach is that both have equal status, that each constrain the other in which phenomenological analysis will provide a model or explanation of the structure of experience, while the neuroscientist will, guided by the phenomenological data, attempt to map out the neurocorrelates. According to Lutz and Thompson (2003) neurophenomenology is guided by the proposal that the best current candidate for the neurophysiological basis for consciousness is a "flexible repertoire of dynamic large-scale neural assemblies that transiently link multiple brain regions and areas."

Tim Bayne (2004) has made critiques of neurophenomenology where he remains skeptical towards claims put forward by neurophenomenologists, especially the claim that phenomenology provides a more reliable methodology than other first-person methodologies, including introspection. He reaches the conclusion that neurophenomenologists suggest that neurophenomenology involves more than just neuroscience and phenomenology but doubts the reality of this extension: "Exactly what the something more is, I think, an open question. Varela speaks of changing the "entire framework within which the [hard problem] is discussed". The idea seems to be that neurophenomenology solves the hard problem by undermining the assumptions that generate it."

The problem neurophenomenology shares with autopoiesis is that there is no clear interaction between subjective and objective realities that allows for conscious creativity, insight, innovation and intentional behaviour that characterises both the explanatory gap and the existential condition.

Minimalist Physicalism and Scale Free Consciousness

Fields, Glazebrook & Levin (2021) take a very different approach from naturalistic dualism, they call Minimalist Physicalism MP, which bypasses classical physicalism and seeks to incorporate consciousness as a type of observer-world relationship based only on principles of quantum information that is claimed on empirical grounds to be scale-free and then regards basal systems which they describe as running all the way down the evolutionary tree not just to single-celled eucaryotes and Symbiotic Existential Cosmology does of consciousness proper, but to the first prokaryote and in principal to abstract quantum systems, thus equating with the primitive subjectivity of SEC.

Here, we provide a straightforward construction of fundamental, scale-free features of consciousness and cognition within a generic description of system-environment information exchange as bipartite physical interaction. We term this description "minimal physicalism" (MP) as it makes no assumptions about classical computational architecture, in particular, no assumptions about network architecture, and no physical assumptions beyond those of quantum information theory.

A well-established literature extends the concepts of consciousness — the capability of having phenomenal experiences, however basic or minimally structured—and cognition to phylogenetically basal systems, including free-living or facultatively communal unicells, whether pro- or eukaryotic, plants, and a neural or lower (than mammals, birds, or cephalopods) complexity neural metazoa, particularly flat- worms.

Like the extension of these concepts from humans to nonhuman mammals and then to big-brained non-mammals, this extension to more basal organisms was initially motivated by observations of communication, learning, and behavioral flexibility, and by functional similarities between the mechanisms supporting information processing and learning in basal systems and in more complex systems such as mammals. Both molecular and bioelectric mechanisms of cellular information processing, memory, communication, and error correction are, in particular, evolutionarily ancient and conserved across phylogeny.

Like the Solms-Friston model of the conscious brain, this utilises Markov blankets which form a statistical thermodynamic interface across the cell membrane:

As the locus of molecular, thermodynamic, and bioelectric exchange with the environment, the cell membrane implements a Markov Blanket (MB) that renders its interior conditionally independent of its exterior; this allows the cell to be described as a Bayesian active inference system. The utility of this Bayesian approach has been demonstrated in simulation models of cell-cell communication driving morphogenesis.

The information that transits the cell membrane, and is thereby encoded on the MB implemented by the membrane, is actionable or meaningful to the cell: it "makes a difference" to what the cell does. When the cell's interaction with its environment is represented

as measurement, what renders the information meaningful becomes clear: meaning requires measurement with respect to some reference frame. Viewed abstractly, a reference frame is a value, or more generally a vector, from which deviation is detectable.

This notion of consciousness is an interactive “consciousness of” rather than subjective consciousness as a cosmological complement to the physical universe and in that sense claims to be able to pose the hard problem for example in single cellular prokaryotic systems where the feedback processes can all be identified. I have some reservations about whether this is actually testing the hard problem in its original sense or not. Prokaryote membranes are dominated by respiratory or photosynthetic free energy production, unlike eucaryote membranes which are available for perception and social signalling.

These cross-scale similarities motivate a hypothesis that consciousness and cognition are scale-free phenomena that characterize all living systems. If consciousness and cognition are scale-free phenomena, we can expect them to be supported by common, scalable mechanisms that can be investigated in whatever systems permit the most straightforward theoretical and experimental approaches. Phylogenetically basal organisms, in vitro preparations, and synthetic constructs provide obvious advantages of manipulability and environmental control. Studies of basal systems are, moreover, especially effective in overcoming the intuitions that give rise to the hard problem, as they allow the mechanisms via which single cells and relatively simple multicellular organisms navigate their environments— mechanisms that they share with most of our cells, and with us as organisms— to be investigated in detail.

I nevertheless think the approach is potentially powerful and deeply informative:

Our interest here has not been ontological, but rather empirical: to derive as much as possible from the simple assumption that consciousness involves information exchange subject to the constraints of quantum information theory. We have shown that the MP framework that follows from this assumption allows many of the key features of consciousness to be understood as simple, scale-independent consequences of thermodynamics.

It has led to a description of neurons as hierarchies of quantum reference frames (Fields, Glazebrook & Levin 2022). And has also led to intriguing conclusions on the limits of metabolic limits on classical information processing by biological cells, implying quantum processing in the cell interior (Fields & Levin 2021):

Biological information processing is generally assumed to be classical. Measured cellular energy budgets of both prokaryotes and eukaryotes, however, fall orders of magnitude short of the power required to maintain classical states of protein conformation and localization at the Å, fs scales predicted by single-molecule decoherence calculations and assumed by classical molecular dynamics models. We suggest that decoherence is limited to the immediate surroundings of the cell membrane and of inter-compartmental boundaries within the cell, and that bulk cellular biochemistry implements quantum information processing.

Defence of the real world from the Case Against Reality

I have said that while consciousness is primary, the universe is necessary. Thus we know the universe only through our conscious experiences of it, but its stability and structure is necessary for the existence of conscious life.

Don Hoffman in “The Case Against Reality” (2020) makes the evolutionary case that perception is not veridical in the sense of optimally truthful, but evolved by natural selection:

The classic argument is that those of our ancestors who saw more accurately had a competitive advantage over those who saw less accurately and thus were more likely to pass on their genes that coded for those more accurate perceptions, so after thousands of generations we can be quite confident that we’re the offspring of those who saw accurately, and so we see accurately. That sounds very plausible. But I think it is utterly false. It misunderstands the fundamental fact about evolution, which is that it’s about fitness functions—mathematical functions that describe how well a given strategy achieves the goals of survival and reproduction.

We’ve been shaped to have perceptions that keep us alive, so we have to take them seriously. If I see something that I think of as a snake, I don’t pick it up. If I see a train, I don’t step in front of it. I’ve evolved these symbols to keep me alive, so I have to take them seriously. But it’s a logical flaw to think that if we have to take it seriously, we also have to take it literally. ...Snakes and trains, like the particles of physics, have no objective, observer-independent features. The snake I see is a description created by my sensory system to inform me of the fitness consequences of my actions. Evolution shapes acceptable solutions, not optimal ones. A snake is an acceptable solution to the problem of telling me how to act in a situation. My snakes and trains are my mental representations; your snakes and trains are your mental representations.

Yes cat’s eyes are designed to hunt, with low colour specificity and reflecting retinas to hunt at night with those almond shaped pupils, and insect vision may be even more prosaic but although human perception has evolved by natural selection, human selection has been evolving towards the most generalised adaptable attributes because the human niche is strategically omnivorous of reality. Human perception has thus been consciously naturally selected to

be veridical. Visual reality out there is a chaotic jumble of photons that have no colour only wavelength and particulate energy. Human perception has evolved to give us the most socially and environmentally discerning visual theatre of 3-D, size-conserved, seamlessly integrated experience. Yes, consciousness is also a type of internal model of reality constructed by the brain through evolution, but it is a veridical masterpiece and it is not just a model, but an outstanding manifestation of the ground of conscious being in subjective cosmology. There is no better way of looking at so called “physical reality” that we can possibly imagine!

Hoffman’s perspective on existence is very confluent with this cosmology. He supports the primacy of the quantum description over the false classical description of “mainstream” neuroscience and advocates what he calls conscious realism. Here follow an excerpt from an Atlantic interview (Geferter 2016) via Quanta magazine:

My intuition was, there are conscious experiences. I have pains, tastes, smells, all my sensory experiences, moods, emotions and so forth. So I’m just going to say: One part of this consciousness structure is a set of all possible experiences. When I’m having an experience, based on that experience I may want to change what I’m doing. So I need to have a collection of possible actions I can take and a decision strategy that, given my experiences, allows me to change how I’m acting. That’s the basic idea of the whole thing. I have a space X of experiences, a space G of actions, and an algorithm D that lets me choose a new action given my experiences. Then I posited a W for a world, which is also a probability space. Somehow the world affects my perceptions, so there’s a perception map P from the world to my experiences, and when I act, I change the world, so there’s a map A from the space of actions to the world. That’s the entire structure. Six elements. The claim is: This is the structure of consciousness. I put that out there so people have something to shoot at. ... I call it conscious realism: Objective reality is just conscious agents, just points of view. Interestingly, I can take two conscious agents and have them interact, and the mathematical structure of that interaction also satisfies the definition of a conscious agent. The idea that what we’re doing is measuring publicly accessible objects, the idea that objectivity results from the fact that you and I can measure the same object in the exact same situation and get the same results — it’s very clear from quantum mechanics that that idea has to go. Physics tells us that there are no public physical objects. So what’s going on? Here’s how I think about it. I can talk to you about my headache and believe that I am communicating effectively with you, because you’ve had your own headaches.

The same thing is true as apples and the moon and the sun and the universe. Just like you have your own headache, you have your own moon. But I assume it’s relevantly similar to mine. That’s an assumption that could be false, but that’s the source of my communication, and that’s the best we can do in terms of public physical objects and objective science.

Not only are they [neuroscientists] ignoring the progress in fundamental physics, they are often explicit about it. They’ll say openly that quantum physics is not relevant to the aspects of brain function that are causally involved in consciousness. They are certain that it’s got to be classical properties of neural activity, which exist independent of any observers—spiking rates, connection strengths at synapses, perhaps dynamical properties as well. These are all very classical notions under Newtonian physics, where time is absolute and objects exist absolutely. And then [neuroscientists] are mystified as to why they don’t make progress. They don’t avail themselves of the incredible insights and breakthroughs that physics has made. Those insights are out there for us to use, and yet my field says, “We’ll stick with Newton, thank you. We’ll stay 300 years behind in our physics.”

The neuroscientists are saying, “We don’t need to invoke those kind of quantum processes, we don’t need quantum wave functions collapsing inside neurons, we can just use classical physics to describe processes in the brain.” I’m emphasizing the larger lesson of quantum mechanics: Neurons, brains, space ... these are just symbols we use, they’re not real. It’s not that there’s a classical brain that does some quantum magic. It’s that there’s no brain! Quantum mechanics says that classical objects—including brains—don’t exist. So this is a far more radical claim about the nature of reality and does not involve the brain pulling off some tricky quantum computation.

The formal theory of conscious agents I’ve been developing is computationally universal—in that sense, it’s a machine theory. And it’s because the theory is computationally universal that I can get all of cognitive science and neural networks back out of it. Nevertheless, for now I don’t think we are machines—in part because I distinguish between the mathematical representation and the thing being represented. As a conscious realist, I am postulating conscious experiences as ontological primitives, the most basic ingredients of the world. I’m claiming that experiences are the real coin of the realm. The experiences of everyday life—my real feeling of a headache, my real taste of chocolate—that really is the ultimate nature of reality.

But there is another lesson lurking here! The case is not just against veridical perception itself, but the notion of a “real world” that is independent of our perceptions of it, rather than an elusive quantum reality, in which the universe is manifest through our evolved consciousness of it (Mark et al. 2010, Hofmann et al. 2015, Fields et al. 2017, Prakash et al. 2020). The interface theory of perception (ITP) is a filter theory like Huxley’s “Doors of Perception”, of how the brain constructs our internal model of reality.

I agree with the central point that our perception is a conscious construction and we need to understand it as such, because subjective consciousness IS primary, as Don says, but if the real world doesn’t in any sense stably exist then genes aren’t real. Natural selection is not either. The whole evolutionary ball game over billions of years depends on

the stability of the real world quantum universe over these same time scales or we wouldn't even have a fitness function to select naturally towards. When we are dreaming, things do change like that, so we can have some sort of understanding of the implications and how impossible everything would be without the real world being real.

In interview, Hoffmann dismisses the materialist idea that the hard problem can be solved by physicalist versions of the easy problems, and having gained tenure as an expert in perception, sets out to try to formulate a universal theory starting from the subjective consciousness where the field is less crowded with similar unfruitful ideas:

What will happen if we start from the other direction as a purely scientific and rigorous approach. I'm not talking about mysticism or anything like that. I'm talking about can we get a mathematically precise model of consciousness on its own terms? So then we have to put down mathematical structures, not because they're right but so that we're precise. So that we can then find out why we're precisely wrong. Now you start to make predictions you get. dynamics of consciousness. The test will be can you derive quantum physics from it? Can you get quantum field theory out of it? Because at least if you can you have a mathematically precise solution of the mind-body problem starting in the other direction.

But is it really possible to deduce quantum field theory from subjective consciousness, by taking the same objective mathematical modelling that has proven to work in objective systems outside space-time.

Hoffman, Prakash & Prentner (2023) address this question, with a searing critique of theories of consciousness that incorporate assumed and often occluded physical assumptions in physicalist and phenomenistic accounts alike, targeting in particular, the notion of space-time as doomed:

Most scientific theories of consciousness posit physical systems, or functional properties of physical systems. Some propose that these give rise to consciousness; for instance, global workspace, integrated information, and orchestrated objective reduction. Others propose that these give rise to the illusion of consciousness; for instance, illusionism and attention schema. All of the above falsely assume that spacetime physics is fundamental.

But they base their alternative view of conscious agency on two assumptions:

We start with two posits about consciousness: (1) there are conscious experiences; and (2) there are probabilistic relations among conscious experiences. These posits lead us to the notion of a conscious agent.

While (1) is essential, (2) is a pre-emptive regression into Markov chains, sacrificing subjective experience to the same fate as probabilistic degeneracies of the Born interpretation and Friston's free-energy notion of homeostatic agency:

We make this precise in a mathematical theory of conscious agents, whose dynamics are described by Markov chains. We show how (1) agents combine into more complex agents, (2) agents fuse into simpler agents, and (3) qualia fuse to create new qualia.

This leads to a sterile quasi-probabilistic mathematical theory that in no way has the capacity to represent, let alone manifest, subjective experience.

Morris (2023) notes that Hoffman's ideas of the subjective are to say the least expressionist, although they do have a ring of experiential truth, and echo the ideas of Jung's archetypes and Joseph Campbell's masks of the divine:

The alternative theory Hoffman proposes is that conscious entities are fundamental entities that exist beyond spacetime. These entities are us. And we are also avatars of a single conscious entity that Hoffman calls the "conscious aleph infinity agent." We interact with each other via an interface whose format is spacetime. For Hoffman, what's really going on outside of conscious awareness is so complex, involving non-spacetime dimensions numbering in the trillions or quadrillions. Our simple human minds created an ultra-compressed version of reality stripped of details that would break our brains—if we actually thought with our brains, which Hoffman sees no convincing evidence for. Hoffman's math leads him to conclude that we are avatars of a superconscious or arch-conscious agent, that puts us avatars through the paces of an infinite number of experiences, no matter how joyous or horrific, so that the arch-conscious agent can experience everything. Hoffman also warns against overidentifying with our self, because the self is an avatar. "You are not any particular experience. You are the potential in which those experiences arise and disappear. That's what you really are in your essence. You transcend any particular experience because you are that potential."

Consciousness Cosmology and the Quantum: Putting it all Back Together

All purely materialistic descriptions of consciousness fail the manifestation test. Subjective consciousness is primary and incontrovertibly manifest, while physical reality is inferred through it. Thus for an objective description to lay claim to sweep aside the manifest nature of subjective reality is an artifice. It illustrates why attempting to form models of consciousness without addressing the root cosmological status of consciousness itself can frustrate the discovery process. By attempting to form a model which lays claim to the properties of subjective consciousness while denying

its existential status, a root fallacy is created. Yes it then does seem plausible to opt for a form of brain-mind identity over any seemingly implausible notion of externalism (cosmic consciousness interacting with the brain).

That is why I immediately in June 2021 came to the necessity of a cosmology, in which subjective and objective reality are complements within a single whole, exemplified by nature itself as a climax process and elaborate the description in full empirical detail from there. We all start from conscious experience as a universal reality and infer the physical universe and its physical descriptions from our consensus experience of it. Once we accept subjective consciousness as cosmological in 'nature', the very existence of the subjective mind IS cosmological in nature and assumes it's natural place without physical contrivance.

We know that empiricism is established, both by verifiable empirical observation and by affirmative empirical experience and the semantic notion of empiricism arose this way, because it is naturally evoked in the human mind's world view. Hence the proposition that subjective conscious volition has efficacy over the physical universe is a natural immediately verifiable statement of our existential condition, as I consciously write this passage.

The Central Thesis, makes clear that continuous brain waves, like radio waves and lasers constitute entangled quantum states and explains the interaction of subjective consciousness with the physical brain states moving in and out of wave coherence in terms of neurodynamic phase transition at the edge of chaos coupled to a quantum phase transition between entangled states and projectively reduced quantum states, minimising destructive quantum measurement to address uncertain existential crises the organism faces, leading to a unique form of quantum entangled "anticipation".

David Peat (2013) has a good description of these non-local potentialities in relation to living systems at the edge of chaos and non-local forms of entanglement:

[L]ocality has served physics well, which implies that our hypothetical underlying non-local effects must be extremely subtle. So where should we look for them? Supposing that true non-locality is present quite generally in the universe: how would it manifest itself? I suggest that the most promising place to look is in these extraordinarily sensitive non-linear systems that are termed "chaotic". Systems which suffer constant iteration and in which every tiny region is contingent upon all others are known to behave in extremely complicated ways. Their dynamics are characterized by fractal behavior--in which endless levels of detail are found at finer and finer scales. But "chaos" may be a poor term to describe such systems for it is not so much that they are "random", "anarchic", or "orderless" as that they have an extremely complex and subtle order.

These systems are so extraordinarily sensitive that the smallest perturbation has an uncontrollable and unpredictable effect upon their dynamics. These are the ideal systems in which to study non-local effects for their behavior could well be controlled by the global correlation of vanishingly small effects. Attempting to control such systems locally proves useless: on the other hand global, or non-local description and control may be entirely appropriate. The global co-ordination of boundary conditions, for example, could act to guide, in a very general way, the overall form of the system.

Information which is distributed globally as boundary conditions or very delicate non-local perturbations would be hidden within the apparent chaos of a sensitive system. Attention to individual regions of space would not be sufficient to display this non-local influence. What is required is some new, global description of these systems.

A simple image will illustrate this point. Local disturbances propagate through a system and are normally assumed to dissipate themselves, becoming lost in the random fluctuations of the medium. But in a world in which events are correlated non-locally what may appear to be a vanishingly small random fluctuation may in fact be the manifestation of a global order. Extremely small perturbations, when correlated non-locally could, for example, have the effect of initiating an inwardly moving wave of disturbance which then interferes co-operatively and gives rise to a large local disturbance. This is the reversal of what is normally assumed, in which an effect spreads out and is dissipated. I am therefore suggesting that local events in such systems can have a non-local origin. More generally I propose that sensitive dynamical systems may be guided by non-local effects and are best understood using a non-local description. The possibility of non-local control in chaotic and sensitive systems is far-reaching.

There are a wide variety of systems in nature that have the characteristics of "chaos", or rather of complex, non-local order. In such systems rather than causes producing effects of a similar magnitude it may be more a matter of very tiny, but globally coordinated causes having a wide range of global effects. The size of the cause is no longer related to the magnitude of the effect, what is important is the overall form of that cause. Moreover what appear as "random fluctuations" may be highly significant aspects of global behavior. Life forms a particularly important subset of these globally complex systems. It may be valuable to consider its processes from a non-local perspective. Life "rides the wave" and lives on a delicate knife edge between order and chaos. Some form of non-local correlation of dynamics is, I would suggest, characteristic of living systems.

This monograph provides a good understanding of the relationship between conscious and sub- or un-conscious processing that arises from brain dynamics. Conscious brain states consist of global phase angle modulated excitations

that are interacting with more diverse excitations that are phase decoherent to sufficient extent that these processes remain local and don't necessarily participate in the central "theatre" of conscious experience but remain a resource that is able to and will do so if either the global dynamic changes, or the local one becomes more coherent with the global. I see this view as productively useful, as it explains consciousness as a central arena having ready access to subconscious levels of processing. It allows edge-of-chaos dynamics to be phase tuned as well as harmonic oscillations as exemplified in the bat hippocampus (Eliav et al. 2018) and in cortical phase relationships in psychedelic studies (Muthukumaraswamy et al. 2013, Tagliazucchi et al. 2016, Toker et al. 2022).

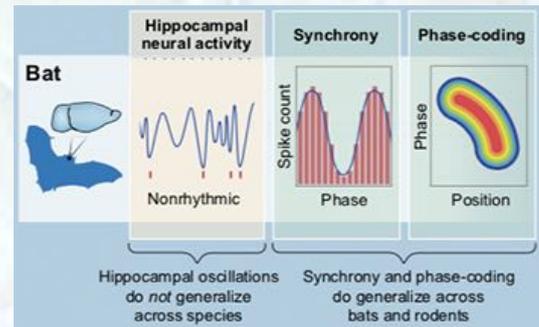


Fig 102: Hippocampal non-rhythmic synchronisation and phase precession (Eliav et al. 2018), see also (Qasim et al. 2021) fig 78(4).

We now come to the scientific description of the super-conscious state, there is obviously a physical dimension to it – if I enter a meditative or entheogenic–contemplative moksha, I can happily understand and describe this neurophysiologically in terms of quietening of the default mode network, and the relinquishing of the subject–environment polarity in favour of a unified state of ego annihilation. I can see it as a natural biophysical state that has become sensitively dependent on the brain's own inner dynamics, in a biologically natural way, by seeing the notion of the cosmic mind as a shared organismic state that emerges only in such dedicated conditions from the biota, meaning that the cosmic mind becomes manifest biologically. I don't need to articulate externalistic physical force fields to achieve this, because subjectivity is already built into the unified cosmology at the root and can fully utilise the known processes of cortical activity as a contextual boundary condition filter to realise qualia neurodynamically.

This kind of complementarity may be akin to a universal integral transform of the state of the entire quantum-entangled universe, or even the AdS/CFT correspondence, so that organismic consciousness is an encapsulated manifestation of the cosmic mind. Such a complementarity doesn't have to be conveyed by hypothetical externalistic constructs to support it, because it is cosmologically complementary to physical force fields.

We can then embark on the other half of the empirical discovery of reality with an open mind and discover for ourselves by mutual empirical experience the inner nature of cosmic reality, without placing outer restrictions upon a discovery process that we can all engage transformatively from within, because, in bringing forth what we have within us – i.e. foundational cosmic consciousness encapsulated in our mammalian biological brains – this can be experienced empirically in a discovery process without a priori theoretical or conceptual preconditions. In summary here is my tentative position about how subjective consciousness interacts with the universe and causality in detail. This is a working hypothesis, not a proven conclusion but I think it has a counter-intuitive twist that may explain everything.

Firstly in quantum mechanics, we have two apparent processes:

- (a) von Neumann type 1: the causality-violating collapse of the wave function on quantum measurement.
- (b) von Neumann type 2: the evolution of the wave function under a Schrödinger wave equation.

There are various versions of QM, from the Everett interpretation where no collapse takes place (but this creates probability multiverses that we don't experience) to Wigner type interpretations where the conscious observer collapses the wave function, to decoherence where collapse results from many interactions. In any event, conscious observers experience Schrödinger's cat either alive or dead in the real world or so it seems, although we do witness superposition in laser light. Napoleon didn't win Waterloo and we experience a line of history taking place partly as a result of our own actions, which I call historicity.

Symbiotic existential cosmology is agnostic about these QM differences, because it imputes primitive subjectivity to quanta, which could then also in principle act as 'observers', but leave this aside and back to the established physics.

When we do a simple two-slit interference experiment one photon at a time, as Feynman marvelled at, the individual photons can end up literally anywhere the wave function amplitude is non-zero throughout space-time. If we make a phase space in which the amplitude is normalised they can literally end up anywhere in this space with equal

probability, just like a random variable. This is the “free-will of the individual quantum, which Conway & Kochen (2009) used to imply conscious free will.

However, when we repeat the experiment multiple times we discover a pattern, that the photographic plate begins to have bands where the photons ended up, varying sinusoidally with the superimposed wave functions. This is an example of IID (independent and identically distributed measurements).

This is how the quantum process converges to the classical in the Born interpretation of large quantum numbers, but it is explicitly violated in both evolution, where each mutation that becomes fixed by selection induces a new context for a subsequent mutation, and in brain dynamics where any quantum event fixed by altering subsequent neuronal activity also changes the context. Again let's leave whether this is possible in the brain aside although I will claim that the butterfly effect, stochastic resonance and global tipping points at critical decisions are ideal ground for this.

Let's look at a single quantum 'instance' again. We have already seen that, in the phase space, the quantum can end up anywhere at all. This is the purest form of free-will we can possibly imagine, except that it is shaped by the wave function, so it has context just like our personal conscious decisions.

What's the flip side of this? It's that the whole process was being guided by the wave function. Now we get to entanglement. In the ideal interference experiment, we have prepared a pristine experiment in which we have defined the wave function simply and precisely by the macroscopic apparatus, but in the real world there are a multitude of third-party interactions, and in the absence of collapse, each of these introduce entanglements that modulate the wave function. In special relativistic quantum mechanics the wave function extends into the future as well as the past when a particle is emitted, as the transactional interpretation shows, so it has entangled “information” about the future which causal computation can't access through local Einsteinian causality, but entangled conscious brain states must have because evolution has conserved this edge-of-chaos consciousness from the eucaryote emergence on.

Indeed in the Everett interpretation all wave functions are part of the universal wave function forming an entangled history from alpha to Omega. So the flip side of quantum free will is the 'consciousness' the wave function possesses globally as a representation of potentially the entire history of reality encoded in the subtleties of the wave function. Thus we have a primitive model of quantum conscious free will.

Now to entanglement in detail. The results of Einstein, Rosen, Podolsky, Bell and Alain Aspect demonstrate that when two particles become entangled in a single wave function and we make independent measurements of both, we find that Bell's theorem is violated, ruling out local Einsteinian causality between the separated particles but consistent with quantum mechanics.

We can do this e.g. with an excited Calcium atom because it has two outer electrons so can transition to the ground state emitting a green and a yellow photon in opposite directions having net zero spin, thus having complementary polarisations. And Aspect did this with time varying analysers which showed that the correlations persisted over space-like intervals that appeared to require local travel between the detectors faster than the speed of light.

The conclusion of the Bell results is that: (a) The polarisation statistics of either photon appears individually random, (b) when we match them up whenever we measure one, the other instantaneously adopts complementary polarisation, but (c) this entangled relationship can't be used to send information between the separated particles.

There is another point here. Both the separate particles look like they are behaving randomly but there is a hidden process going on which is completely masked unless we sample the two together.

Now back to the supposedly causal universe. QM has two interposed processes in causal reality as we experience it: (a) The Hamiltonian progression of the wave function under the Schrödinger equation. (b) The apparently random projection of superpositions onto one of the eigenvectors in collapse.

This is what I call 'punctuated' causality after 'punctuated equilibrium' in evolution. So we now have to ask what is the cosmological source of this randomness? We already know that lots of deterministic processes can end up with pseudorandom or quasi-random distributions. Computers use these to do random simulations and classical deterministic chaotic processes have the property of ergodicity, converging to a space-filling 'thermodynamic' trajectory

characteristic of stochastic systems. So there are a huge swathe of complex processes that could underlie quantum uncertainty that could distribute in the limit to be quasi-random, masking any apparent 'hidden variable theory'.

Now let's go back to supposed causal closure of the universe in the brain context. In the quantum universe, notwithstanding the ebb and flow over Libet's claim, and its later refutations, it is not possible to make any practical empirical experimental test to confirm causal closure of the brain, so the onus on science to demonstrate it fails.

Causal closure might appear to make superficial sense because, unless it IS causally closed, we could have both mind and brain dynamics affecting future brain states, resulting in causal conflict. But if it is confined only to circumstances where the brain dynamics is critically poised in uncertainty, because it is representing an existential crisis where the causally-induced alternatives are finely balanced and the global brain state (in mutual phase coherence feedback with action potentials modulated by stochastic resonance) is at a sensitively dependent unstable tipping point, this corresponds quite closely to a quantum measurement of its own instability.

So we ask this question: "What if the only thing subjective consciousness has the capacity to do is to perform quantum measurements on its on brain's unstable brain states? Does this invoke any form of useful mind-matter interactionism or is it just futile randomness?"

Here I think that it has a huge capacity to be exactly what we are all looking for, because the universe as we know it is paradoxically 'punctuated causality' – literally only half causal and half uncertain in structural terms, so although we don't expect quantum measurement to force any outcomes to cause the cat to be alive rather than dead, it does have a profound effect on the evolution of the universe, turning it from a multiverse into one where Napoleon didn't win the battle of Waterloo, and where Nelson turned his blind eye on the Danish fleet in the Battle of Copenhagen.

Of course some of these events come down to hidden physically causal factors like the positioning of troops or the silly height of the Spanish ships in the Armada's defeat, but the key role of conscious experience, as Michael Graziano's attention schema theory points out, is split-second intuitive life or death decisions, when the shark strikes. We know the brain is also a predictive perceptual computer as shown in the "flash-lag" illusion where it sometimes makes predictive errors, but all this comes down in the end to an intensely conscious split-second real time decision which is going to alter the course of history in exactly the way a quantum measurement does.

Note also that this process emerged in pretty complete form with the founding universal eucaryote ancestor, complete with membrane action potentials, edge of chaos excitability on a global basis, the genes to enable synapse formation and the neurotransmitters as social signalling molecules, and as I noted, the brain is an intimately coupled society of such cells (King 1978, Edwards 2003) operating in essentially the same way.

Human neurons, and by extrapolation neuroglia, are extremely sophisticated human single-celled animals in their own right nurtured by their social environment. If you look at a pyramidal neuron spanning the cortical layers ([fig 122](#)), they are modulated by all the principal neurotransmitters from GABA, through serotonin, nor-adrenaline and even dopamine and the inputs of interneurons as well as fast ionopore receptor fluctuations of NMDA and AMP. Their axonal output is thus an expression of multiple dynamic forces. They are not simply additive Mcculloch-Pitts units and that is why the cerebral neurodynamics is the edge-of-chaos phase tuned dynamic it is.

This means that the brain is conscious at the cellular level and the binding problem is all about how the neuronal and glial excitations are bound together in the overall brain dynamic, which is in phase-coupled feedback between graded cortical potentials in the local EEG and individual action potentials. So we come back to meaning and this means the meaning is in the purview of conscious experience each cell has in its neurosystem context. I see this as a true conscious meaning, but it is a wildly different meaning to the meaning we experience, because neurosystems meaning is a coherently bound dynamics of cellular meaning and the cellular meaning is how the conscious excitability of individual neurons interpret their intimately bound social environment. This is a cellular version of Freeman dynamics and it's very hard for us to make meaning out of it at our coherently bound neurosystems level, but in it lies the solution to the entire dilemma of what consciousness is, the binding problem, and how meaning arises in the multi-celled conscious organism.

Taken to a rather poetic conclusion, we are walking inflated quanta exercising our free will in just the way each individual photon does, except we are doing it in a supremely entangled way that brings the conscious moment into

focus in every detail of our neurodynamic internal model of reality representing the mysterious quantum world around us and the extreme vagaries and computational intractability of the open environment problem, which is worse than the travelling salesman problem because there isn't necessarily only one outcome, but multiple threads, all or any of which may result in annihilation or ultimate survival. You could even speculate that our entire incarnation, from birth to death, is a single quantum measurement, particularly when looked at sideways on in space-time, as the Feynman representation tends to do!

Ram: In your SEC/ICAM, is primal subjectivity fully aware (eternally conscious)? Or is the primal subjectivity in potential form?

Chris: You have contradictory definitions. "Fully aware" is not the same thing as "eternally conscious". No one knows that fully aware humans are "eternally conscious". "Potential form" is completely ambiguous. What does it actually mean? Is primal subjectivity fully aware? That depends on what you mean. A single quantum has a space-time extensive wave function "experiencing" both the past and future in special relativistic quantum reality. One could say this is "aware". It also has a form of volition by projection onto one of its particle eigenfunctions. But that's not what we think of awareness, or volition as.

- (1) If we accept the irreducibility of the hard problem extended to subjective conscious volition over the physical universe, which we can affirm empirically as subjective conscious sentient beings, then subjectivity has to be an integral aspect of matter and hence has a cosmological origin with the universe.
- (2) We have evidence of cellular excitability and neurotransmitters and receptors immediately after the eucaryote endosymbiosis, so we can say the edge of chaos consciousness our neurons and neuroglia possess and hence our excitable brain dynamics arose there.
- (3) Short of that we have only our personal subjective experience as direct evidence and infer other humans and animals are conscious by their vivacious behaviour.

These are the only three observations any of us can make so any deviation from the position of [Symbiotic Existential Cosmology](#) is speculative to specious. That's why [Symbiotic Existential Cosmology](#) is empirically correct and the only possible conscious cosmology consistent with the physical universe.

Ram: Regarding individual human consciousness, my understanding is that it is comprised of conscious subjective experiences (CSEs) of self, exogenous and endogenous stimuli, and conscious components of cognitions such as conscious thoughts from 1pp.

Chris: This is a little difficult to respond to because the way you classify a framework tends to divide it into disjoint categorical objects. So you think conscious experiences are of self, stimuli, and cognitive components. This doesn't work too well for consciousness itself because it can't be subdivided categorically and remain intact and a lot of it is more like watching a movie we have some guidance and control over the outcomes of. For example neither dreams nor visionary experiences are "stimuli" which has a purely external physical connotation I am happier with the "stream of consciousness" as a holistic flow that we both perceive and modulate both emotionally and intentionally. I see cognition and thought as a culturally driven superstructural process that has taken over the conscious brain as a linguistic-based serial process. Thought is really abstractedly talking to ourselves, so it's a highly learned art where we can watch ourselves distractedly reeling out syntactical sequences with semantic meaning and guide them through to a conclusion, just as I am now typing to you, in the same way we can guide a physical sensory process, in our behaviour like hunting with an arrow, or gathering specific plants.

Ram: My first question is: where do these CSEs come from in SEC/ICAM? From what I understand, you assume that all CSEs come from primordial subjectivity, which is complementary to the physical universe. Subjectivity and the universe interact with each other, but I am still having trouble grasping exactly where CSEs originate.

Chris: CSEs in SEC come from encapsulated subjectivity. Encapsulation is a complex physical boundary condition on subjectivity that is both evocative and restrictive. It evokes specific forms of conscious experience and is restrictive in directing conscious experience to environmentally significant situations involving our survival. Our encapsulation is biologically physical. So we have a trichromatic 3D enhanced internal model of physical reality, accompanied by a spectral auditory stream connected to our awareness of elapsing time. We also have complex olfactory experiences and endogenous emotional and physiological senses and veridical perception of our subjective conscious volition over

the physical universe. So we experience and modulate the stream of consciousness while also being able to become engrossed in thought almost to the exclusion of experience itself.

This is all consistent with subjectivity being optimally compliant with these very rich physical boundary conditions to add the essential ingredient of subjective consciousness – that we subjectively experience conscious reality as it unfolds. The place where subjectivity becomes critical is in unstable transitional brain states with no foregone conclusion, where environmental (quantum) uncertainty rules, so there is no determined dynamic or heuristic so subjectivity can act out intuitive interventions on the causal process to jump out of the way of a snake in the grass, where a robot would get struck because it's too complicated to calculate the odds.

We can become entrapped on thought cycles and the ego's desperate struggle for survival so that meditators try to tell us to sit back and be here now or we will become distracted by illusion rather than veridical reality. Thus subjectivity is interacting with the physical universe through subjective conscious volition, some of which is planned and intentional and some of which is deeply intuitive, which is where root consciousness beyond experience itself comes into play.

Ram: My second query is about primordial subjectivity – does it mean a fully conscious psychophysical universe, or is it potentially conscious (i.e., it is not fully conscious, but it has the potential for consciousness)? In Sankhya, it is assumed that CC (cosmic consciousness, Purusha) is fully and eternally conscious at a cosmic level. Is Sankhya's Purusha equivalent to SEC/ICAM's primordial subjectivity at the cosmic level? Or does SEC/ICAM's subjectivity mean potential consciousness (i.e., it has the potential for consciousness, but it is not fully conscious)? For example, does it have the potential for CSE redness? Or is it eternally fully conscious, like Purusha.

Chris: Your classification into "fully" versus "potentially" doesn't capture the phenomenon. I don't accept that a fully fledged cosmic consciousness caused the universe to come into existence. It's a contradiction because consciousness has so many biological attributes and if you strip them all away there is nothing there to make the universe out of. And the cosmology is morally degenerating so its an illusory hopeful monster. Aurobindo tried to talk about conscious aggregates becoming matter but its cheese trying to become chalk or quartz. It's an illusion created by samadhi.

But that doesn't mean cosmic consciousness is just a potential that doesn't exist either. We know we are conscious experiencers and this is a cosmological process because life is the central interactive phenomenon of cosmic symmetry breaking, so cosmic consciousness is also us being conscious here and now, but it's fragmented in each of our separate encapsulations physically, like the fragmented tantric origin. But we can bring about a state of cosmic consciousness through inner states of conscious experience that open the doors of perception so the environmental filters become relaxed so our mind-brain resonates to the cosmic underlying conscious reality rather than immediate survival. Then our physical brains adopt a more cosmic dynamic, which Aurobindo called the supermind for want of a better word.

How the Mind and Brain Influence One Another

To summarise and complete, here is a short discussion with the psychophysicist Stanley Klein:

Stanley Klein: There has been a lot of evidence that mind is being done in the brain. There are indeed a number of folks that think that mind is separate from the brain. Of course the brain is getting input from neurons outside of the brain like from our eyes and ears, etc. I look forward to hearing evidence that points to mind coming from outside of our brain.

Chris: To suggest that mind is outside the brain, if you are a physicalist, means you are asking for the subjective mind to physically exist somewhere outside the brain – i.e. in the toes or round the corner somewhere. You know that's not how it works. Mind is inside and the brain is outside. Both are happening depending on how we choose the discourse i.e. to talk about our experiences, or the physical world we are perceiving.

And Stan, just what is the extensive evidence that mind is being done in the brain? There is no way of escaping that any brain research on a conscious individual mind, is happening when an experimental recording is made of brain dynamics e.g. Freeman dynamics. But this isn't mind being done by the brain – just accompanying brain states associated with conscious activities.

Stan Klein: However, I don't fully understand what you said about the mind-brain connection. Could you provide more details of what you have in mind.

Chris: The trick is in how the brain uses dynamical instability computationally. It's attempting to form a causal model, but the open environment is computationally intractable and indeterminate. The single celled eucaryote learned to use edge of chaos membrane excitation for predictive sentience, by being sensitively dependent on external quantum modes to generate a physical awareness of its environment. As the amoeba-flagellates evolved, they became genetically adapted to take advantage of this predictively, gaining perpetual survival opportunities. I see this as being non-IID at the cellular level so its a genuine quantum process at the edge of chaos that aids survival because the membrane excitation feedback process under genetic control becomes predictive in ways that involve similar situations to weak quantum measurements and expand instantaneous time into a quantum of the present.

In a complex brain, each of the neurons are carrying out an exceedingly complex social version of this, that grew out of neurotransmitters as social signalling molecules, so the social signalling has become a wired form of synaptic signalling driven at high speed through axonic and dendritic connections. The result is a Freeman dynamics brain at the edge of chaos that seamlessly uses a combination of self-organised criticality to resolve uncertainties and making quantum measurements through wave phase coherence of neuronally networked populations. Because it evolved from adaptive unstable cellular consciousness it seamlessly integrates computational and quantum predictive dynamics. We experience this as "the present". This is just a description on the fly of neurodynamics that passes far more sophistication onto the neurons themselves as highly evolved human cells with extreme delicate social connections simultaneously using all the social signalling molecules from glutamate through GABA serotonin and so on. But the key to understanding it is not brain dynamics alone but brain development and the roles the neurons of each neurotransmitter type have in mutually organising the social network of synapses.

Stan: Many thanks for your detailed discussion of many details of how the brain does its thing. You seem to be agreeing with me that the brain is where the action is for producing the mind. As I've said many times, present science doesn't yet fully understand how the brain does it. Do you agree with the above or do you think the brain isn't producing mind.?

Chris: No I don't agree Stan! The brain and mind are producing one another. The brain is not causally closed and the mind is transcausally volitional. By transcausal I mean the result is a product of a transactional process between past and future underlying quantum reality and wave function collapse.

The brain, as a developmentally and dynamically structured set of conscious neurons, is providing a partially open dynamical computational context in which the mind fills in the unstable parts of the quantum dynamic. This is being driven by tightly-coupled cellular sentience on the part of neurons and their complementary neuroglia. This means that, from the mind's point of view, the brain is a boundary condition acting as a filter on the way the mind can volitionally act. That's why we look out at the conscious experiential world we perceive as individuals. By act I do not mean causally interact in the sense of interactional dualism where we can define functional mechanisms on both sides. Nor is it simply dual aspect monism because the complementary processes are very different, with the subjective able to be experienced but neither observed objectively nor decomposed.

The nature of the mind is related to and complementary to the underlying "volitional" process that determines wave function collapse. This means again that mind is complementary to the universe as a whole. We appear to have our own mind, not because there are many minds, but because the many brains impose varying boundary constraints, as encapsulations on the subjective condition.

Stan: Chris, You said: "By transcausal I mean the result is a product of a transactional process between past and future underlying quantum reality and wave function collapse." Why did you include "future"? Present science doesn't allow information to go backwards in time or faster than light. But strangely enough some influences can go faster than light. Wonderfully crazy.

Chris: The Feynman description and transactional interpretation both involve hand-shaking between past and future through the special relativistic wave propagator and offer and confirmation waves. All quantum processes are time reversible. Weak quantum measurement is an averaged out process which involves retrodiction post-hoc. It's still partly IID because of the repeated measurements to establish the 'Bohmian' trajectories. But cellular sentience is a feedback loop at the quantum level that isn't trying to make a classical prediction, just to exert anticipatory volition, escaping the snake strike, so it's basically an inflated version of context dependent wave function collapse, including

advanced influences from absorbers. I'm not being too precise about this because SEC is agnostic as to quantum interpretations.

You are happy with entanglement involving instantaneous definition of the state of the remote particle, when the nearby one has its polarisation measured because this doesn't involve a classical signal exchanged faster than light. It simply reveals a hidden correlation that now has become determinate. But this actually occurs because the advanced waves from both detectors arrive at the source of the entangled photons and the changed result is referred back in the retarded wave to instantaneously define the remote particle's orientation. So that is the way it all works.

Real positive energy determines the arrow of time and the direction of classical causality, but collapse of the wave function punctuates this. So if you are talking about real positive energy particles, forward causality is true, but if you are talking about collapse of the wave function it isn't. For example virtual particles don't conserve mass-energy and don't respect the arrow of time because they are not real positive energy so they interconnect past and future symmetrically in precisely determining the electromagnetic force in QED.

Because mind is complementary to quantum uncertainty, it is complementary to the transactional milieu. This doesn't mean it can send classical signals from the future to the past, but it means that its volition can and does reflect these 'virtual' influences. That's why we intuitively feel and perceive we have active agency over the universe and veridically perceive this to be the case and perceive that we are acting predictively by the conscious presence of mind, while also plotting out the next move, where possible cognitively. It may seem counter-intuitive that standing in for the apparent randomness of uncertainty is all there is to volition but that's enough to completely determine and to utterly change the course of history, as we know.

Stan: Chris you said: "As you know I also have a relationship with Psi. It's just a crazy knack that I seem to possess" If you can demonstrate your ability to do Psi, you can get a Nobel prize! Can you give an example of your Psi ability?

Chris: If we can't own our own consciousness I don't think it right to say we possess Phi but we are responsive to it and share its innate capacity. I simply said it was a knack I possessed. That knack is open mindedness to uncanny correspondences in the flow of ongoing experience.

I am happy with Radin, Bancel & Delorme (2021) producing research supporting an influence of mind on entanglement and other Psi results that may have statistical significance. But these are attempts to produce verifiable results, indicating an effect under repeated instances, which make them statistically significant. This tends to be like an IID (independent identically distributed) quantum experiment that converges to the Born probability interpretation, but it depends on the exact nature of the experimental process undergone.

I really like the simple concise treatment of Gallego & Dakić (2021) showing that, in non-IID processes, the quantum description can prevail in macroscopic situations. So let me try to explain where I see what people call Psi is coming from. I am particularly interested in causality-violating conscious experiences that involve time and implicit anticipation, particularly under shifting contexts in real life where each event changes the context, so there is no IID. This is going to strike these all out of scientific proof because we can't apply statistical analysis to non IID events as they are adventitious, as we know with evolutionary mutation, but there is a reason why this is likely to be critical.

We accept that the brain has evolved to be a predictor of environmental crises of survival and opportunities for food and reproduction. We know the perceptual brain has evolved to be a predictor of emerging situations, evidenced by anomalies such as flash-lag illusions and mainstream ideas such as Graziano's attention schema theory AST. This makes excellent evolutionary sense and explains why the brain has evolved to ensure the survival of the organism, through massively parallel computing that doesn't stall in an exponential runaway, like serial computers facing the travelling salesman problem, so like Anil Seth we can describe the brain as a kind of prediction machine, using consciousness efficiently do do its work in real time, even if this is a kind of hallucination for efficiencies sake.

Now we come to the hard part. Evolution has not only selected massively parallel real time predictive machines, but subjectively conscious ones. So the same argument has to apply to subjective consciousness. So we have to address the question of why evolution has retained subjective consciousness all the way to mammals, primates and humanity, apparently universally across metazoa if subjective consciousness in itself has no predictive power over and above objective brain function.

The hard problem exists because (1) all our experience, including all knowledge of the objective physical universe is derived subjectively, (2) subjectivity is categorically inconsistent with pure objectivity and cannot be finessed into it by any Zeno's paradox easy problem approach, and (3) edge of chaos brain dynamics, combined with phase coherence processing mean the physical brain is a self-critically unstable system, uncertainly poised in the very conscious states we are considering, making proof of causal closure impossible.

So subjective consciousness must have a critical predictive advantage for it to be universally retained as central to brain function sitting right in the centre of the cyclone of edge of chaos.

When we walk down the street, we can consider that we are highly determined by our circumstances, going to the supermarket for example 50 m down our side street from here. We may be thinking some very obvious thoughts like worrying about Ukraine, but when we turn the corner just about anything can occur, including nearly getting run over.

So about half our active lives are spent dealing with defined causal aspects and the other half are accidental things that come in from left field. This is living in the quantum uncertain conscious universe. The causal circumstances are the Schrödinger equation part and the accident waiting to happen is cat paradox collapse of the wave function. Because our brains transcend IID, both processes are playing out seamlessly together. Brain computational predictivity is there to deal with the Schrödinger part and subjective consciousness to deal with causality-violating quantum collapse part of daily existence.

To be able to be predictive, subjective consciousness needs to be reflected in the sort of interactions described in the transactional interpretation and special relativistic Feynman formulation, where tellingly, even the exactly determined values of the electron magnetic moment are found with stunning accuracy by integrating over both past and future components of the wave functions. The transactional approach which deals with real particle exchanges gives an intuitive picture of this implicit predictivity, but it all comes down to how a many-to-many transaction collapses into a single real particle exchange and whatever way we look at this it is a collapse from potential past and future states to a single set of pairs of these, so it's not moving either direction in space-time but across it transversely. As I noted above, I don't have the final answer on this and suspect that no causal description is possible although I call it transcausality, because to do so would be to commit a causality violating space-time process to be causally explained, so it may forever be hidden in the entanglement which extends to the wave function of the universe as a whole (Hartle & Hawking 1983). However in this picture, we as subjectively conscious beings are INSIDE this entangled phenomenon and are thus intuitively conscious of it in our changing circumstances.

This means that our circumstances, which the Eastern Wisdom Tradition call karma (although with a more moral tone) are a product of cosmological entanglement – in the mysterious hidden variable problem. That's all well and good, but we know about Bayes' theorem, so many people discount subjective reports of coincidence, or synchronicity as being false predictions resulting from selecting only the verifying cases and ignoring the contradicting ones. The trouble with this argument is essentially that it only works with IID processes which we know converge to the Born probability. When we are dealing with sheer idiosyncrasy, we are dealing with non-IID quantum "science fiction", but subjective conscious volition is anything BUT science fiction. If anything neuroscience is fiction denying volition. But the key point here is that we can't use Bayes' theorem estimates in singular on-IID events.

So what is the answer to your Nobel prize-winning question? Well it's this. If we allow ourselves to entertain the primacy of consciousness, we enable our minds (and brains) to enter into a heightened form of intuitive awareness, where some of our attentive, perceptual and cognitive efforts go into actually looking at, and entering into, the flux of experience. Put in a very clunky way by meditators, who are far too disciplined in their one-pointed focus to appreciate the full dimensions, unless they completely abandon themselves to the abyss, this is called mindfulness. That is allowing our mind to simply resonate with nature in its vast space-time ramifications arounds us, as animals do, to make sure they can actually hear the hiss of the snake strike over the swishing of the long grasses and the chirping cicadas.

So what about my Psi? Sometimes I have really striking qualitative experiences which have the character not just of everyday coincidence, but something else at the bottom of the billabong as the Australians say. Precognitive dreams that are registered and come veridically true are examples. I hated writing a song that later proved to have tragic precognitive echoes of specific details of 9-11 that can also be explained to some degree given the subject matter, but

the qualitative details remain uncanny to this day although similar precognitive results are cited by Bem (2012) and Bem et al. (2016). These results have been analysed by Rabeyron (2020).

But why would we spend time speculating on this? In the same way, subjective consciousness is transformative over the physical universe, through efficacy of volition, we don't have time to save the world from a perilous fate dwelling on magic tricks. We need to do the good thing for life as a whole, while we are here and time is short. But Brahman accompanies me as I labour and the great virtue of entheogens is that the whack they give under the right circumstances can last a lifetime, or at least a seven year fast, because, when you fall outside the bubble of perception, you are never completely in the closed causality box any longer.

But there is more to this. The circumstances of the world may look like they are hugely deterministic laws of mass action, leaving us helpless. Empires rise and fall and their huge armies with them, in clashes of the titans as if everything is brute force, of tectonic fire and tsunamic flood, but consciousness and the human conscious world view are both transformative and critically unstable. When Nelson turned his blind eye to the telescope in the Battle of Copenhagen, an alternative history was created. Perceived realities are in flux. The Weltanshauung of Immortality is an infectious concept with a pandemic R0 very delicately poised at 1, just reproducing itself without extinction. One tiny shift and the entire flux of history can be transformed back to immortal Paradise. So the entire stakes are caught in a single cat paradox experiment that encompasses all of us.

Stan Klein: I'm pleased that we are in general agreement with standard science. One topic where there might be differences is on the topic of psychic phenomena. Do you think that telepathy might be possible, in violation of the presently known 18 wavicles?

Chris: My response is sheer speculation, off the cuff. If Bob tries to run a telepathy experiment and thinks a specific planned thought and 'sends' it to Alice and something enters Alice's head out of the blue, this is very hard to distinguish from a quantum uncertain 'cat paradox' event, and Alice's brain would have had to be in a highly uncertain dynamical state, because otherwise the causal circumstances of her brain function are forcing her brain to see Bob's thought. If that were the case it would take a strong wavicle interaction we could probably measure or falsify. But I don't think that's the case, even if Psi experimenters can get a sigma out of their experiments.

But that's not how I think this works. I think the possibility is that conscious brains use quantum entanglement and can sometimes share entangled states. This again is off the cuff, but I would see brain states as dynamical quasi-particles corresponding to phase coupled global excitations. Now the actual more common context is not an experiment, but two people who know one another, say it's me and my mum, because this happened a lot when she was alive. Because we know one another (except she's gone) there are certain dynamical brain states that can become 'engrammed' in memory, like my sense of my mother's presence and her sense of me, her son, that form a kind of familial collective consciousness.

So then I suddenly get the idea to call my mum because I haven't done so for a while and that's this quasi-exciton emerging in a non-IID way out of the 'engram' milieu, and I call her, and her phone rings and that sets off the other entangled part of her quasi-exciton that got entangled with mine last time we spoke, and of course a call from me is on the cards too, and times before that. So I say "Hi and she says "I was just thinking of you!" This is also the Aboriginal dream time speaking. They (and twins) suddenly notice something is amiss in their psyche and realise their uncle, or sibling, has passed away somewhere far off, although Bayes' theorem might claim she was always thinking of me!

Modern culture is very bad at this kind of thing because we either think flat stick in a mechanistic way or we meditate in a controlled mindful way and never really let the winds of uncertainty pass through our consciousness any more. So both spiritual practices and practical realities can block our sensibilities. The key point here is how are we going to disprove this using the standard model? It's just as bad as the hard problem. If quantum anticipation is possible and conscious volition is real, all these other possibilities are on the scientific "table top of reality", as Carlos Castaneda put it, at the far edge of brute certainty!

Consciousness and Wave Function Collapse

An important feature of our description of both the Schrödinger wave equation determining particle probabilities and the collapse process resolving them into eigenvalues, is how particle states are created and annihilated. For example a

Geiger counter is particle annihilation in a scintillation count and in a quantum interference experiment the photon is created in a hot filament, or from a voltage drop in a light-emitting diode, traverses the slits as a wave and is then annihilated as a particle by an atom on the photo-plate becoming excited. These are described effectively as discrete transitions in multi-particle states and quantum field theories.

If we start with the Schrödinger equation for the potential plus kinetic energy of the one-dimensional time-independent quantum harmonic oscillator:

$$\hat{H}(\psi(x)) = \left(-\frac{\hbar^2}{2m} \frac{d^2}{dx^2} + \frac{1}{2} m \omega^2 x^2 \right) \psi(x) = E \psi(x)$$

and change variables, by letting $x = \sqrt{\frac{\hbar}{m\omega}} q$, we have $\hat{H}(\psi(q)) = \frac{\hbar\omega}{2} \left(-\frac{d^2}{dq^2} + q^2 \right) \psi(q) = E \psi(q)$.

But we can confirm that $-\frac{d^2}{dq^2} + q^2 = \left(-\frac{d}{dq} + q \right) \left(\frac{d}{dq} + q \right) + 1$, so if we let

$$a^\dagger = \frac{1}{\sqrt{2}} \left(-\frac{d}{dq} + q \right) \text{ and } a = \frac{1}{\sqrt{2}} \left(\frac{d}{dq} + q \right)$$

We have $\hbar\omega \left(a^\dagger a + \frac{1}{2} \right) \psi(q) = E \psi(q)$. So $\hat{H} = \hbar\omega \left(a a^\dagger - \frac{1}{2} \right) = \hbar\omega \left(a^\dagger a + \frac{1}{2} \right)$.

In quantum field theories and many-body problems, one works with a_i^\dagger and a_i as creation and annihilation operators of quantum states for both bosons and fermions. In second quantisation, with occupation numbers for indistinguishable states, the occupation number for fermions can only be 0 or 1, due to the Pauli exclusion principle, while for bosons it can be any non-negative integer. This gives rise to the bosonic photon fields of quantum electrodynamics and the fermionic Dirac fields of electrons and other fermions.

These operators become:

Bosonic: $[a_i, a_j^\dagger] \equiv a_i a_j^\dagger - a_j^\dagger a_i = \delta_{ij}$, $[a_i^\dagger, a_j^\dagger] = [a_i, a_j] = 0$,

Fermionic: $\{a_i, a_j^\dagger\} \equiv a_i a_j^\dagger + a_j^\dagger a_i = \delta_{ij}$, $\{a_i^\dagger, a_j^\dagger\} = \{a_i, a_j\} = 0$.

Where $\delta_{ij} = \begin{cases} 0 & \text{if } i \neq j, \\ 1 & \text{if } i = j. \end{cases}$, $[g, h] = gh - hg$ is the commutator and $\{g, h\} = gh + hg$ is the anti-commutator.

In quantum electrodynamics, fig 71(e) the field is described as a fluctuating sequence of virtual particle states bounded by the incident and emergent real particles. Applying energy to the field can result in some of these virtual particles becoming real, as in radio emissions from transmission towers. In this description the field and its network of real and virtual particles is clear, but the wave functions are hidden in the Green's function propagators which determine the probabilities governing the virtual particle interactions. One way to do quantum mechanics is to calculate a wave function and operate on it with quantum operators. Another way is to directly consider amplitudes for a given process, such as 'the amplitude that my particle starts at point y at a time t_y and ends up at point x at time t_x '. This amplitude is known as a **propagator**. Propagators represent an alternative to wave functions that enables us to extract all of the same information and more.

The time-dependent equation that governs the change of a wave function $\phi(x, t)$ is the Schrödinger equation

$\hat{H}(\phi(x, t)) = i \frac{\partial \phi(x, t)}{\partial t}$. Each Green's function takes a wave function at some time and place (y, t_y) and evolves it to another time and place (x, t_x) . We integrate as follows to take into account the superimposed path integral effects of the Green's functions: $\phi((x, t_x)) = \int dy G^+(x, t_x, y, t_y) \phi(y, t_y)$. This means that the wave functions are still in the process, but being used to calculate the ongoing particle amplitudes at all space-time points.

Interactions, such as the absorption of a photon, by an atom on the photographic plate, are described as discrete transformations and the linear Schrödinger wave equations are just rules for calculating probabilities of particle interactions. Thus there is no actual wave function description of the entire quantum interaction in the field description, as in the transactional collapse in fig 73 where the offer wave is linear and spreading with respect to the emitter and the confirmation wave is linear with respect to the absorber but the transaction is more like a phonon.

A central question in the universe is just how much collapse takes place independent of conscious observation of it. The standard way of dealing with collapse, without requiring consciousness, is to cite decoherence through interaction with third-party quanta. Zurek (1991) initially proposed a simple exponential collapse of the off-diagonal elements as a quasi-explanation for the loss of coherence into classical eigenfunctions and has elaborated this since into quantum Darwinism by the effective survival of more robust states (Zurek 2009) .

The trouble with this is that, as described in quantum computing scenarios, and in the Feynman notation (via the Green's function propagator), third party interactions are still treated as effective wave function entanglements, which can deepen rather than solve the problem. In Feynman notation for example particle scattering is the same diagram as electron positron creation and annihilation and annihilation IS treated as wave function collapse via the discrete operator involved. This means that any interaction with third party quanta can be interpreted as either (1) collapsing the wave function or (2) as introducing multi-particle entanglements, as in GHZ and W-states.

If we take a decoherence view of the cat experiment, a single radioactive particle quantum tunnels as a wave out of the nucleus and then triggers a Geiger counter by interacting as a particle to induce charges that can be picked up and used to classically break a flask of HCN killing the cat, so that when we open the box it is dead. This is the chain that von Neumann, is contemplating in his sweeping spread of possibilities, where "collapse" could take place anywhere, from the first particle interaction, to the consciousness of the observer opening the box and seeing the cat.

The nub of the problem is that it is only in our conscious view of the cat experiment, or any other quantum measurement experiment, that we see the projection on to eigenstates occurring in our particle-dependent "classical" view of the conscious universe. We can imagine that the photons in the Sun's light come from collapsed wave functions, and we can imagine that cat paradox collapse happens the moment the radioactive particle causes a charge shower in the geiger chamber but we don't actually know. Speculation is not physical science! So before intelligent life evolved, the entire universe could have remained wildly entangled without there being any contradiction. That's what the Everett interpretation and its seamless undetectable branching confirms. The same with the Geiger counter states.

Now we can get around this by asserting that decoherence is a primary source of wave function collapse OR multi entanglement, but we really can't tell the difference until we open the box. If we take Zurek's off diagonal elements decaying and examine this in terms of multi-particle entanglement, the original two particle entanglement does become degraded by further entanglements due to extraneous added correlations confounding the simplicity of the original entangled state towards classicality, so the entangled conclusions also look like collapse to an eigenstate.

Again this doesn't mean that consciousness is the only thing that can lead to collapse, because decoherence is setting it up smoothly, if in fits and starts, all the time through multi-particle "entanglements". Hence other quanta and macroscopic systems can act as "observers" too. This tallies very neatly with macroscopic instruments precipitating the process, but it leaves open an undecidable question – just how collapsed is the physical universe independent of our perceptions of it? The only thing we are certain of, is that the cat to our conscious perception looks vivaciously alive, or dead as a door nail, as well as the bushes waving in the wind as we walk down the street and the unexpected rain shower that is breaking around us. That's right where the cookie crumbles for physics.

All "Randomness" arises ultimately from Quantum Uncertainty

Randomness has been described as having two sources, one epistemic about our state of knowledge of a system and the other ontic, about the actual physics of reality, perhaps consisting of two forms, quantum uncertainty, and the supposed randomness of molecular kinetic processes, but these are actually all sourced in quantum uncertainty.

If we think of a chamber filled with helium atoms and consider one atom in the chamber, viewed classically, this is 3-D billiards and we know multi-body billiards is chaotic because small differences in the position of any ball colliding with another causes larger deviations in their positions in the outgoing trajectories. If we view this quantum mechanically, it

is a 3-D interference experiment in which the apparatus is all the other atoms and the chamber itself. Suppose we release a single helium atom through a very small aperture at time zero. As it proceeds through the chamber, its position becomes indeterminate through wave spreading in the same way a photon does.

This is interesting and requires further thought because it is a complex system with a lot of bound particles, but the experiments on large molecules show clearly that this is taking place. This means that successive collisions result in exponentiating increases in the uncertainty of position and the indeterminacy of the trajectories, so the entire concept of the atoms as “particles” having some other kind of randomness is derived from chaotic amplification of the uncertainty of position of each of the atoms in the chamber. This effectively means that all the perceived randomness in the kinetic process was derived originally from positional quantum uncertainty, also amplified by the chaotic boundary conditions of the interacting atoms.

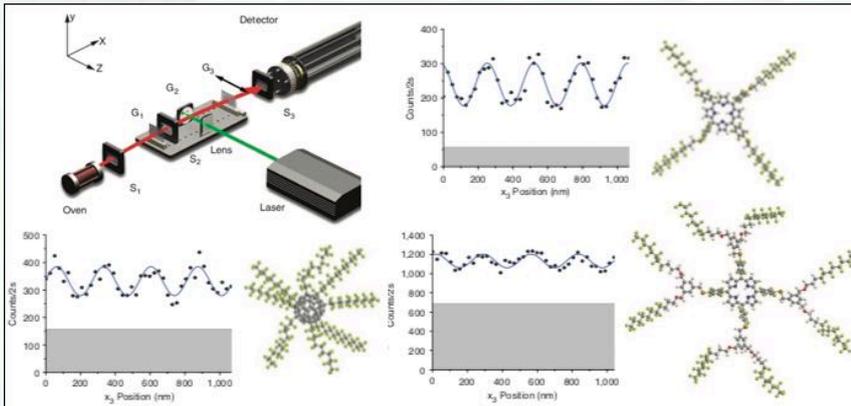


Fig 102b: Molecular interference demonstrated for three large molecules (Gerlich et al. (2011)).

As far as I can see this process extrapolates all the way into real life, where we walk around the corner and nearly get run over on the way to the supermarket, because all these uncertainties in life, although we think the universe looks “classical” are just larger more complicated instances of unmitigated amplified quantum

uncertainty, obviously including mutation, ageing, cancer and mortality itself, as well as winning the lottery! So I think we just have two sources of “randomness” the epistemic form is just partial observation through sampling subpopulations and observational uncertainty to do with the vagaries of the ontic form above and quantum uncertainty itself as the ontic form. Notice also that this means butterfly effect systems are really using quantum uncertainty to generate their ergodicity, so tornadoes are inflated quantum systems that might also be “conscious” if subjectivity also occurs at the quantum level through wave function sensitivity throughout space-time and wave function collapse.

To assume this is all random is a dangerous assumption if we don't actually know the underlying process is fundamentally random. Lots of classical processes can appear quasi- or pseudo-random and are used as random number generators. Chaotic processes and edge-of-chaos transitions frequently display ergodic behaviour due to the spreading action of the butterfly effect's positive Lyapunov exponent. Quantum measurement also has features of ergodicity that make us use the notion of randomness normalised by the wave function amplitude to explain the probability interpretation, but that's a gross simplification. Schrödinger's cat is either very much alive or stone dead when we view it. It's not an alive/dead superposition, nor is it in a random state. Entanglement gives us a hint that more is going on because the detector stats at either end show apparently random polarisations but when we do Bell theorem sampling we find they are powerfully correlated, even ‘deterministically’ complementary, when we sample at arbitrary relative orientations. Clearly uncertainty can and does handle multi-quantum entanglement which is called decoherence and it probably pervades the entire universe and its compound wave function.

Hidden variable theories assert that there is a process underlying quantum uncertainty, which is by default assumed to be “random”, but the onus on scientific proof lies as much with establishing such a source of “pure” randomness in the universe, as it does finding a succinct hidden variable theory transcending those like the pilot wave theory in a full explanation.

As previously noted, Symbiotic Existential Cosmology favours hidden variables, rather than randomness on the basis:

(1) The verification of Bell entanglement was a confirmation of the EPR claim and Einstein's quote:

God does not play dice with the universe.

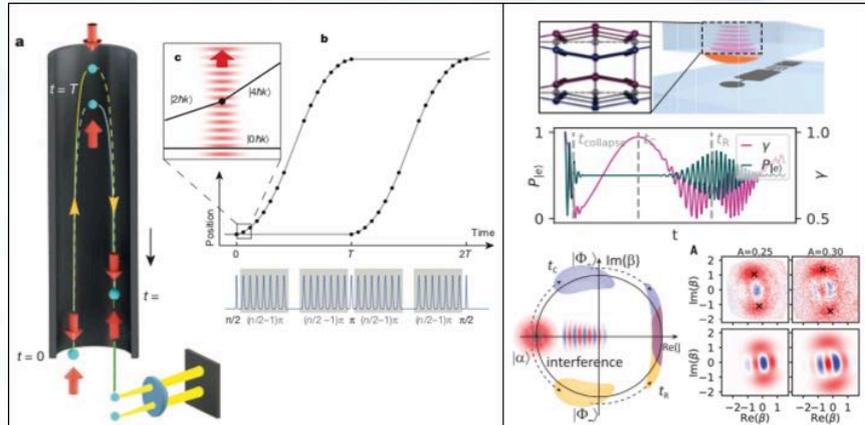
(2) The transcausal view of quantum transactions being a complex underlying hidden variable process, which is also shared by (3) superdeterminism violating statistical independence, (4) non-IID processes in biology not converging to the classical and (5) theories in which quantum measurement may contradict objective reality through process entanglements extending beyond Bell state entanglements. The transcausal aspects of transactional quantum collapse may make such a naked theory impossible to establish, meaning that both the hidden TOE and assumed randomness become undecidable propositions, which intuition can penetrate empirically, but logical proof cannot.

So then we come to karma. It's not moral, but the ultimate manifestation of quantum uncertainty in why things just happen to us. Until it is proved otherwise, I take the position as an 'avatar' that the living present is a unique karmic instance and we are treading on thin ice every step of the way. So the answer about enlightenment is not to vacate your karma, but to look very carefully long and hard into it, because the bell tolls for us.

Fig 102c: The BEC juggling and Sapphire jiggling experimental results.

We can't SEE Schrödinger Cats, but we can FEEL them!

Here is a possible denouement to the cat paradox ... this is a discovery process in the completion.



A BEC is an unlimited number of bosons (or integer spin atoms) in the same wave function, like a laser, and as we know, giving lectures by laser pointer can last as long as we push the button. But we can prepare a system in a superposition of states e.g. a quantum dot or BEC and hold it as long as we want in this entangled state until we choose measure it in some way through a particle absorption. So what IS an experiment using temporal separations falling within Heisenberg uncertainty limits? We'll see in a paragraph or two as the cat collapses and the penny drops!

Kovachy et al. (2015) throw a Bose Einstein condensate up like a juggling ball so two cusps end up in a spatially separated superimposed state:

We achieve long free-fall times by launching a Bose–Einstein condensed cloud of $\sim 10^5$ ultracold 87Rb atoms into a 10 m atomic fountain using a chirped optical lattice²⁴. After the lattice launch, we use a sequence of optical pulses to apply a beam splitter that places each atom into a superposition of two wave packets with different momenta.

The sapphire experiment (Bild et al. 2023) poses yet another situation where we have an acoustically oscillated atomic lattice that can end up superimposed between two oscillatory states with 10^{17} atoms involved.

Schrödinger's original thought experiment was not just so that two macroscopic states were superimposed but diabolically, so that the two states were biologically impossible, since live cat / dead cat is "unlawful" for the cat to exist in this superimposed state. Contrast that with the sapphire, where the two states are two very slightly different arrangements of a molecular lattice where there is no more inconsistency than in an ordinary interference experiment.

Now in a cat paradox experiment, we simply have a Geiger counter and a weak source emitting an average of 1 particle per sec and we leave the cat in the box for 0.5 secs and open it. But the cat is also a conscious organism, so what has actually happened is that the Cat starts to smell cyanide and at that point its fate is sealed, so the cat made the first conscious observation by detecting HCN molecules by smell and it has nothing to do with the experimenter opening the box.

John Kinemann suggested that a form of autopoiesis might prevent an organism becoming superimposed:

But it says, "That means a true Schrödinger's cat is still far from being realised." Meaning it has not been demonstrated for a living organism. Nor do I think it will be because life preserves quantum superposition for decision making, but also closes the causal loop to preserve life and identity. That decision has already been made by the organism. If every aspect of the organism were a real time

choice life could not be sustained. So an actual cat is much more complex than any of these lab experiments that demonstrate only one necessary principle.

I replied that consciousness has to collapse the wave function because it's the only way to affect the universe without causal conflict with brain function. It doesn't need further causal loops except as an indirect effect of this constraint.

Now, on reflection, I can effectively take John's argument and turn it inside out. We are witnessing superpositions of states all the time when our brains reach an unstable butterfly-effect-sensitive dynamical state through just the uncertainty window CN is pointing to. This is what we call making an uncertain intuitive decision, where the unconsciously competing factors interfere. Pair-splitting EPR experiments are a distraction, because they are designed to demonstrate entanglement Bell violations, but superposition is manifest in all uncertain situations. So when we have an "Aha!" moment, or when we simply make an arbitrary, idiosyncratic or creative choice, we are collapsing a superposition we have actually perceived internally through our very sense of mounting "uncertainty".

It is this transition that we are experiencing all the time, each of which IS a Schrödinger cat before during and after collapse. We can't see these Schrödinger cats because they are hiding in "plain sight" in our sense of decision making, just as I came to this conclusion, formulating to myself what the hell is going on with these goddamn cats and why we can't see them!!! So the answer is that we can't SEE a Schrödinger cat but we FEEL them all the time and that's what intuition IS! So the real world is not as classical as it appears, but as quantum uncertain as our inner feelings indicate.

Theories of Everything and their Impact on Consciousness

In the 20th century, two theoretical frameworks emerged for formulating the laws of physics. The first is Albert Einstein's general theory of relativity, that explains the force of gravity and the structure of spacetime at the macro-level. The other is quantum mechanics, which uses wave-particle complementarity a Hamiltonian wave equation and probability principles to describe physical phenomena at the micro-level.

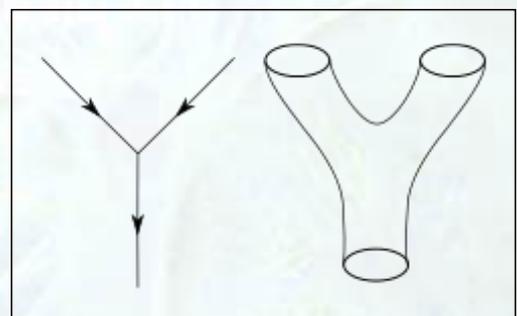
Quantum field theory is the application of quantum mechanics particles and forces such as the electromagnetic field, which are extended in space and time, modelled as excitations in the fundamental fields. One computes the probabilities of various physical events through perturbative quantum field theory using Feynman diagrams (fig 71(e)) depicting the paths of point-like particles and their interactions.

Einstein's general theory of relativity treats time as a dimension on par with the three spatial dimensions; in general relativity, space and time are not modelled as separate entities but are instead unified to four-dimensional spacetime. In this framework, the phenomenon of gravity is viewed as a consequence of the geometry of spacetime.

Canonical quantum gravity is the attempt to quantise the canonical formulation of general relativity (or canonical gravity) as a Hamiltonian formulation of Einstein's general theory of relativity. All canonical theories of general relativity have to deal with the problem of time. In quantum gravity, the problem of time is a conceptual conflict between general relativity and quantum mechanics. In canonical general relativity, time is just another coordinate as a result of general covariance. In quantum field theories, especially in the Hamiltonian formulation, the formulation is split between three dimensions of space, and one dimension of time.

Fig 103: Feynman diagram vertices become 2D string surfaces.

Roughly speaking, the problem of time is that there is none in general relativity. This is because in general relativity the Hamiltonian is a constraint that must vanish. However, in any canonical theory, the Hamiltonian generates time translations. Therefore, we arrive at the conclusion that "nothing moves" ("there is no time") in general relativity. Since "there is no time", the usual interpretation of quantum mechanics measurements at given moments of time breaks down. This problem of time is the broad basis for all interpretational problems of the formalism.



String theory is the idea that the point-like particles of quantum field theory can also be modelled as one-dimensional strings. The interaction of strings is defined by generalising the perturbation theory used in ordinary quantum field theory. At the level of Feynman diagrams, this means replacing the one-dimensional diagram representing the path of a point particle by a 2D-surface. Unlike in quantum field theory, string theory does not have a full non-perturbative definition, so many of the theoretical questions remain out of reach.

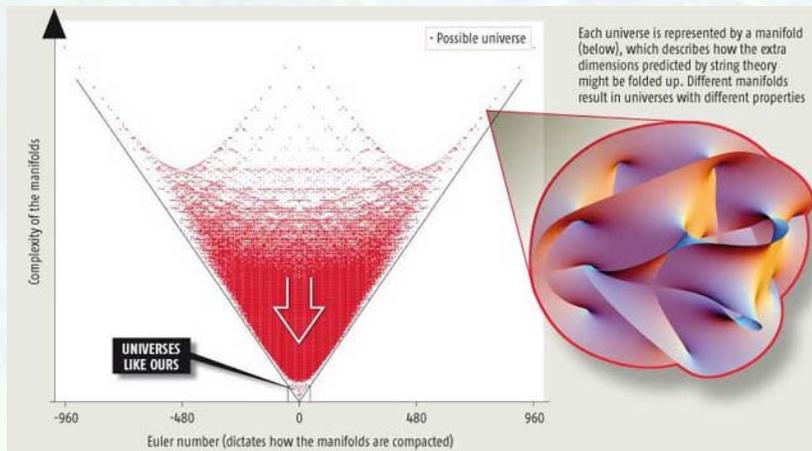


Fig 104: Two papers (arXiv:1806.08362, 1806.09718) suggest the overwhelming majority of multiverses in this landscape are assigned to the swampland of unviable universes, where dark energy is unstable, also reviving the popularity of time-varying dark energy models such as quintessence. The Calabi-Yau manifold illustrated is just one compactification, which shows a local 2D cross-section of the real 6D manifold known in string theory as the Calabi-Yau quintic.

The original version of string theory was bosonic string theory, but this version described only bosons, a class of particles that transmit forces between

the matter particles, or fermions. Bosonic string theory was eventually superseded by superstring theories which describe both bosons and fermions, using supersymmetry in which each boson has a counterpart fermion, and vice versa, but a symmetry-broken asymmetric complementarity may be required. A heterotic string is a closed string (or loop) which is a hybrid ('heterotic') of a superstring and a bosonic string. String theories require extra dimensions of spacetime for their mathematical consistency. In bosonic string theory, spacetime is 26-dimensional, while in superstring theory it is 10-dimensional, and in M-theory it's 11-dimensional. In compactification, some of the extra dimensions are assumed to "close up" on themselves to form circles. In the limit where these curled up dimensions become very small, one obtains a theory in which spacetime has effectively a lower number of dimensions and the compactified dimensions represent internal states such as colour, flavour and charge exemplified in the 10 dimensions of $U(1) \times SU(2) \times SU(3) \times (3+1)D$ space-time.

A brane generalises the notion of a point particle to higher dimensions. For instance, a point particle is a brane of dimension zero, while a string is a brane of dimension one. In string theory, D-branes are an important class of branes that arise when one considers open strings. As an open string propagates through spacetime, its endpoints are required to lie on a D-brane. The study of D-branes in string theory has led to important results such as the AdS/CFT correspondence (fig 106), which has shed light on many problems in quantum field theory.

One popular way of deriving realistic physics from string theory is to start with the heterotic theory in ten dimensions and assume that the six extra dimensions of spacetime are shaped like a six-dimensional Calabi–Yau manifold. Such compactifications offer many ways of extracting realistic physics from string theory. Each of these different shapes corresponds to a different possible universe, or "vacuum state", with a different collection of particles and forces. String theory thus has an enormous number of vacuum states, typically estimated to be around 10^{500} , sufficiently diverse to accommodate almost any phenomenon that might be observed at low energies.

Laura Mersini-Houghton (Holman, Mersini-Houghton & Takahashi 2008, Hooper 2022) notes how she discovered her multiverse theory that resolves this problem:

I began thinking about all this in the early 2000s, around the time that string theory was the leading candidate for a "theory of everything" that unifies gravity with the other three quantum forces to explain our universe. String theory is the idea that nature at a fundamental level is 11 dimensional and particles are actually just the bit we can see of tiny loops of vibrating strings. With string theory, after curling up the extra spatial dimensions to make them sufficiently small to be invisible, you end up with a whole landscape of possible initial energy states, or potential big bang energies, that could start a whole family of different universes. At the time, string theorists thought this was really bad because they were looking to end up with only one universe – one that looked like ours – described by one theory, and they were ending up with a nearly infinite number of universes. But to me it was great news because I needed a fundamental theory to provide that pool of energies that would allow me to ask the question, "why did I start with this one rather than something else?"

I had realised something that seems obvious in hindsight. We know for sure that our universe was very small in its first moments of existence. Therefore, it obeys the laws of quantum physics. What dawned on me specifically was that, based on the wave-particle duality of quantum mechanics, I could think of the universe as a wave function instead of as an object. The wave function is the mathematical entity that encodes quantum probabilities. But you can imagine it as a tree made up of many branches, each of which can produce a universe, and it spreads through the energy valleys of the string theory landscape, from where it takes its big bang energy.

You get these branches, these many worlds, but you need to decouple them from each other – you need to break that quantum entanglement. In my hypothesis, the string theory landscape broke the entanglement and separated out the many worlds. Somehow, early on, our universe went through a quantum-to-classical transition. It became a classical object where each event is determined with certainty. This could not have been the case unless the branches of the wave function of the universe completely decoupled. All the branches decouple as they are going through cosmic inflation. This is the phase, shortly after the big bang, when the universe went through a period of exponential expansion in size. My proposal was that, if this decoupling did happen, we would be able to see the remnants of it in the cosmic microwave background [or CMB], the radiation left over from those first moments of our infant universe. The idea was that, as the branches decoupled, traces of the entanglement would have been left behind.

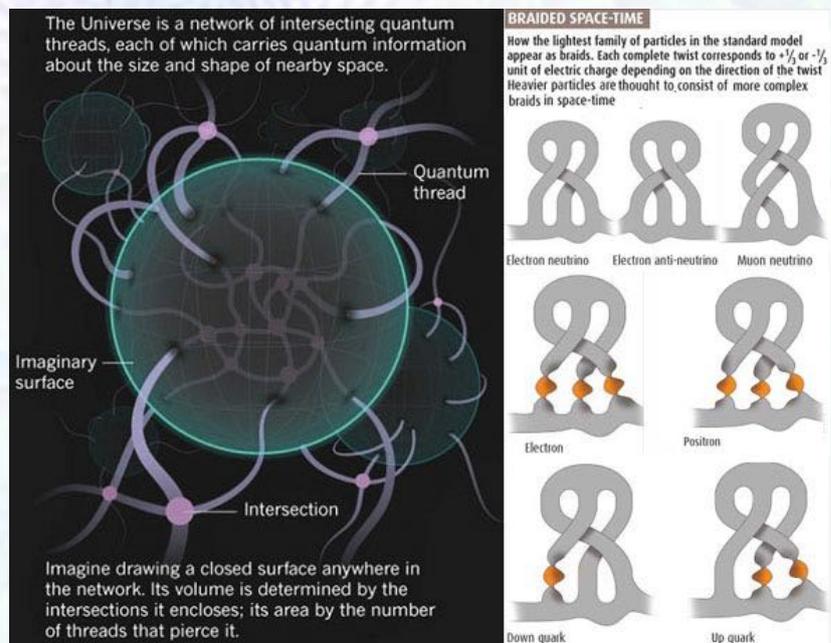
I made a series of predictions with Richard Holman and Tomo Takahashi in 2005 and 2006. We said we would be able to see signatures of this early entanglement. Our present universe is just a rescaled version of its infant self, with all its "birthmarks" still there. If you think of all these quantum universes as tiny quantum particles, they were all interacting with each other – gravitationally they were pulling on each other, and that left scars in our sky. One prediction was the existence of a giant void or cold spot in the CMB. And such a void [about 900 million light years wide] was found in the observations of the Wilkinson Microwave Anisotropy Probe, a space-based observatory. It was confirmed by the Planck satellite, which also observed the CMB. We were the first to show how you can actually test the multiverse and that you don't need to go beyond the universe's observable horizon – you can just see it in our sky.

Loop quantum gravity (LQG) aims to merge quantum mechanics and general relativity, incorporating the Standard Model into the framework established for the pure quantum gravity case. It is an attempt to develop a quantum theory of gravity based directly on Einstein's geometric formulation rather than the treatment of gravity as a force.

The quantum states in the theory do not live inside the space-time. Rather they themselves define spacetime. As a theory LQG postulates that the structure of space and time is composed of finite loops woven into an extremely fine fabric called spin networks. The evolution of a spin network, or spin foam, has a scale above the order of a Planck length, approximately 10^{-35} meters, and smaller scales are meaningless. Consequently, not just matter, but space-time itself, adopts an atomic structure. A spin network represents a "quantum state" of the gravitational field on a 3-dimensional hyper-surface. A spin foam is a topological structure made out of two-dimensional faces that represent one of the configurations that must be summed to obtain a Feynman description of quantum gravity.

Fig 105: Loop quantum gravity is an alternative to superstring theory. Right: Braided space-time gives an underlying basis for unifying the fundamental particles.

When the spin network is tied in a braid, it forms representation of a particle, which can have electric charge and handedness. Some of the different braids match known particles, where a complete twist corresponds to $+1/3$ or $-1/3$ unit of electric charge depending on the direction of the twist.



Heavier particles are conceived as more complex braids in space-time. The configuration can be stabilised from space-time quantum fluctuations by considering each quantum of space as a bit of quantum information resulting in a kind of quantum computation. There are fundamental issues reconciling LQG with special relativity.

Each of these theories lead to serious questions and contradictions about the nature of time itself. String theory finesses space and time into a higher dimensional manifold which is then compactified, Canonical quantum gravity demonstrates that there is no time in general relativity, just stillness. Loop quantum gravity fragments space-time into a spin foam. Even special relativity by the Lorenz transformations, gives both advanced and retarded solutions leading to the hand-shaking between past and future of the transactional interpretation (fig 72).

We thus have to come to terms with the way our conscious experience interacts with the physical universe and whether agency can still have meaning in a timeless cosmos. To break time down philosophically into more fundamental constituents as a single series we can think of three stages of abstraction. An A-series ordering orders times in terms of whether they are objectively past, present or future. It is a dynamic ordering constantly updating with the passage of time. A B-series ordering orders times or events in terms of the relations of earlier-than, later-than, and simultaneous-with, so is unchanging. C-series events by contrast, are temporally ordered, but there is no temporal direction within the series i.e. as a betweenness ordering. In a C-series ordering, by contrast, we say only that b is between a and c.

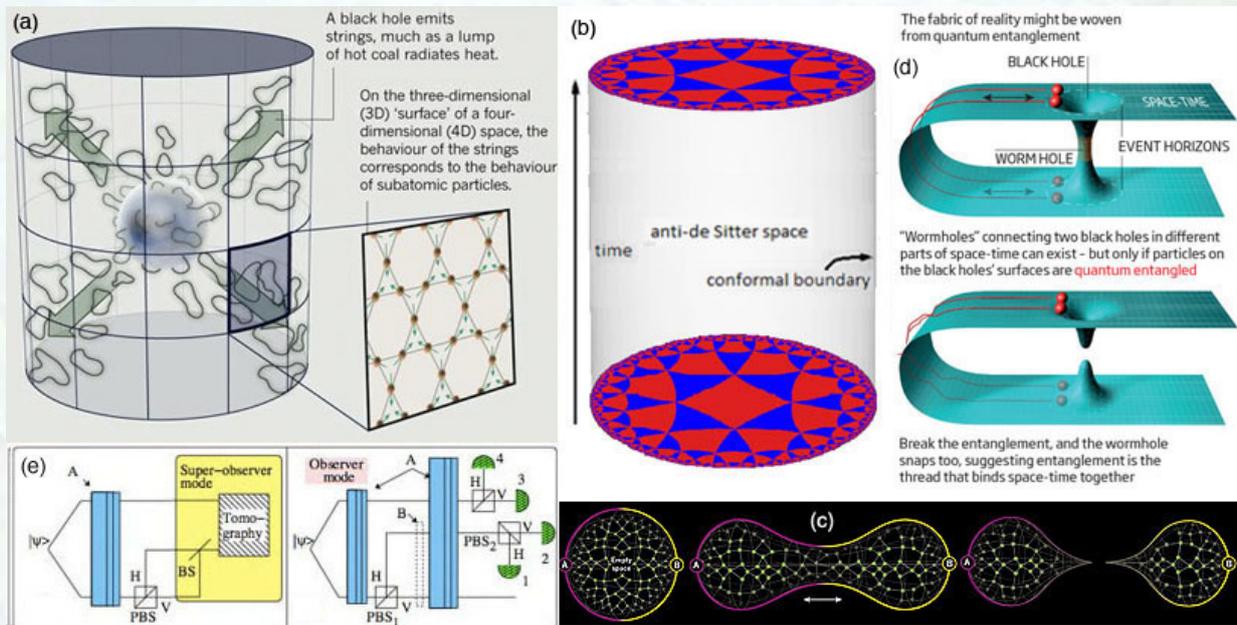


Fig 106: (a) An illustration of the holographic principle in which physics on the 3D interior of a region, involving gravitational forces represented as strings, is determined by a 2D holographic representation on the boundary in terms of QFT physics of particle interactions. (b) Einstein's field equations can be represented on anti-de Sitter space, a space similar to hyperbolic geometry, where there is an infinite distance from any point to the boundary. Maldacena (1998) discovered a 1-1 correspondence between the gravitational tensor geometry in this space with a conformal quantum field theory like standard particle field theories on the boundary. (c) Entanglement plays a pivotal role because when the entanglement between two regions on the boundary is reduced to zero, the bulk space pinches off and separates into two regions. (d) In an application to cosmology, entanglement on the horizon of black holes may occur if and only if a wormhole in space-time connects their interiors. Einstein and Rosen addressed both wormholes and the pair-splitting EPR experiment. Juan Maldacena sent colleague Leonard Susskind the cryptic message ER=EPR outlining the root idea that entanglement and worm-holes were different views of the same phenomenon (Maldacena and Susskind 2013). (e) Time may itself be an emergent property of quantum entanglement (Moreva et al. 2013). An external observer (1) sees a fixed correlated state, while an internal observer using one particle of a correlated pair as a clock (2) sees the quantum state evolving through two time measurements using polarization-rotating quartz plates and two beam splitters PBS1 and PBS2.

Many complex interactions, particularly integral transforms, involving a convolution integral of multiple components are likely to induce pseudo-random statistics. Indeed two entangled particles are able to display correlations violating Bell's inequality while the statistics of each appears random to an observer only measuring one. An example of a many-to-many correspondence suggested by Uziel Awret (2022), as shown in fig 106, is the holographic principle in M-theory or AdS/CFT Correspondence (Maldacena 1998) which gives rise to a duality between a quantum field theory on the "boundary" surface enclosing a region of spacetime, and spacetime geometry in the interior "bulk" anti-deSitter space, corresponding to a general relativity their with a negative cosmological constant. When the CFT has intractably strong interactions the dual AdS has weaker more tractable solutions and vice versa.

This is an abstraction of the duality we see in optical holograms, between the interference fringes on the 2-D hologram and the reconstitutable 3-D image it was derived from, by additive coherent light ray tracing, encoded by the wave phase, forming a tantalising bijective integral transform. Attention has been drawn to this duality as an oracle to discuss the assumed “binding problem” of how brain processes generate the coherence of subjective experience (Elliot 2019), the panpsychism structural mismatch problem (Chalmers 2016) – why macrophysical structure, e.g. in the brain seems entirely different from the macrophenomenal structure we experience, and Chalmers’ meta problem of consciousness. However, like any strict 2-component dual aspect theory, Awret’s is implicitly epiphenomenalistic and passes off the mismatch from the quantum field theory of the standard model to a dual higher dimensional abstract gravitational theory, no more like the phenomenal subjective experience than the quantum physics we know. In effect it is coopting a purely physical theory invoking an abstract duality to solve intractable string theory problems without explaining why such a dual displays any manifest subjective existence.

In the author’s view the underlying complementarity supporting conscious subjectivity in the physical universe is not such a bijective duality, as it provides complementary interactive roles for subjective consciousness to seamlessly resolve uncertainties in the unstable dynamics of edge-of-chaos processes in brain dynamics. These complementary inputs to the ongoing physical state through volition interleaving with brain states in the neural correlate of consciousness are not possible in a bijective duality.

Other research also brings this correspondence into focus. When an ice cube melts and attains equilibrium with the liquid, physicists usually say the evolution of the system has ended. But it hasn’t — there is life after heat death. Weird and wonderful things continue to happen at the quantum level. A quantum circuit acts on its basic units of information, qubits, using a standardised repertoire of gates. Some gates perform familiar operations such as addition, while others are quintessentially quantum. A “controlled NOT” gate, for example, can bind together two or more qubits into an indivisible whole, known as an entangled state. Any system composed of discrete units can be recast as a circuit, even a system that looks nothing like a computer. Leonard Susskind and co-workers (Brown & Susskind 2018, Bouland et al. 2019) applied this concept to the hot plasmas that, through the AdS/CFT duality, are equivalent to black holes. He suggested that, even after the plasma reaches a condition of thermal equilibrium, its quantum state does not stop evolving (Musser 2023). It becomes ever more complex.

Dark matter, evidenced only in the clumping and fast rotation rates of galaxies, and Dark energy, associated with the increasing rate of expansion of the universe, are likewise poorly understood. There are four basic Dark matter candidates, axions, machos (non-luminous, small stars, black holes etc), wimps (weakly interacting massive particles which might emerge from extensions of the standard model), and complex dark matter experiencing strong self-interactions, while interacting with normal matter only through gravity. Axions have become particularly interesting as candidates as other types become eliminated by limits on detection (Chadha-Day, Ellis & Marsh 2022, Semertzidis & Youn 2022, Blinov et al. 2022). Interaction with gravitational forces is deemed to be essential to explain the some 10^{120} -fold discrepancy between the cosmological constant and the standard model vacuum energy contribution.

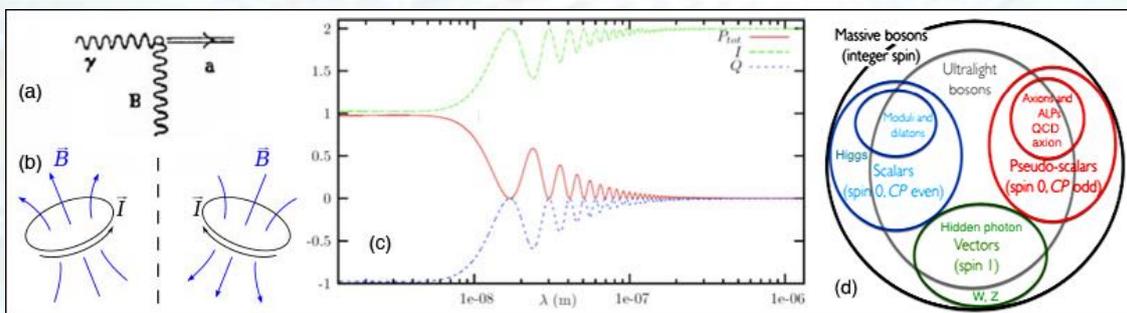


Fig 106b: (a) A photon may undergo mixing to a pseudoscalar particle - an axion - in an external magnetic field. (b) The magnetic field is a pseudovector field because, when one axis is reflected, as shown, reversing parity, the magnetic field is not reflected, but reversed, because the currents are reversed. The position of the wire and its current are vectors, but the magnetic field B is a pseudovector, as is any vector cross product $p=a \times b$. Any scalar product between a pseudovector and an ordinary vector is a pseudoscalar. A pseudoscalar particle corresponds to a scalar field which is likewise inverted under a change of parity. (d) Many extensions of the Standard Model predict additional massive bosons, beyond the W , Z , and Higgs bosons of the Standard Model. These arise naturally from the CP (charge-parity) violations seen for example in the weak force. They might be scalar (even under both P and CP transformations), pseudo-scalar (odd under both P and CP), or vector particles. The prototype for a pseudo-scalar boson is the axion, which is “ultralight” with mass $m \ll 1$ eV.

Ovchinnikov (2012) has also shown that dynamical systems in path integral formulation can be represented as topological field theories. As a result, all (equilibrium) dynamical models are divided into three major categories: Markovian models with unbroken Q-symmetry, chaotic models with Q-symmetry spontaneously broken on the mean-field level by, e.g., fractal invariant sets (e.g., strange attractors), and intermittent or self-organized critical (SOC) models with Q-symmetry dynamically broken by the condensation of instanton – anti-instanton configurations (earthquakes, avalanches etc.). Hal Cox has speculated this could help explain field theories of brain dynamics.

In philosophy, to say that a statement is truth-apt is to say that it could be uttered in some context and would then express a true or false proposition. Truth-apt sentences are capable of being true or false, unlike questions or commands. Whether paradoxical sentences, prescriptions (especially moral claims), or attitudes are truth-apt is debated. Temporal error theory is a view that is analogous to moral error theories, which deny the objective reality of moral facts, and, on the basis of this, deny that any moral claims are true. Temporal error theory, then, is the view that temporal thought and discourse is truth apt, and is false (or at least, is not true).

Can Cosmic Consciousness, or God Consciousness, Generate the Entire Physical Universe?

By contrast with abstract TOEs, or theories of everything, from superstrings to quantum loop gravity, the Vedantic tradition asserts that consciousness itself, in a transcendent cosmic form, is at the very source, generating the physical universe. Similarly, theism asserts that God created the universe. Is this a realisable perspective, or does it introduce even more inconsistency and counterfactuality into the cosmic conundrum, inconsistent with Occam's razor?

An example is Aurobindo's viewpoint, where he accepts the scientific view of biological evolution but claims a complementary process of conscious involution creating the physical substance of the universe:

According to Sri Aurobindo, in conformity with the oldest Indian scriptures, matter was created by the ultimate or supreme consciousness seeking manifestation. In order to manifest, supreme or absolute consciousness, starting from the full fluidity of the spirit, created graded planes of being, till it reached the state of manifesting the solid density of matter. Sri Aurobindo calls this the process of Involution. The involution of consciousness is the process in which the Supreme or Absolute conceals itself more and more by creating planes of consciousness of increased density, in order to create the density needed for physical manifestation. In each of the planes that were created during the involution, (called typical planes or graded worlds) the absolute or divine consciousness veiled itself increasingly till it was able to produce and manifest the various forms of solid matter.

Fig 106c: Both God and Brahman, the Vedantic cosmic mind as ultimate reality, carry aspects of the human persona and psyche in their tacit assumptions, meaning they are projections of human organismic experience onto the cosmos, not absolute cosmic realities.



We have arrived at this question by facing up to the hard problem of consciousness, that no objective arrangement of material waves or particles, no matter how complex, or integrated can, of themselves generate subjective experience, which accounts for 100% of our knowledge of reality, nor explain how we have efficacy of conscious volition over the universe in our survival-oriented and creative behaviour. But can we reverse the explanatory gap and explain the universe, as some woven or over-laid form of a consciousness, which has no underlying physical process at all? Just as particulate interaction, no matter how complex cannot give rise to the holistic nature of subjective experience, how can consciousness that we conceive of as the "observer" of holistic experience, contort this holistic realm into the particulate universe we perceive and know from detailed experiments is governed by physical laws of nature, as specific and critical to life as the standard model, without introducing even more intractable paradoxes? Neither is posing a neural monistic entity, with neither subjective nor objective manifestation, any form of solution to these profound differences which have to be interactive for subjectively aware organisms to have efficacy of physical volition.

For all the seemingly impenetrable difficulties of the explanatory gap, we at least have a good idea of how conscious life emerges in the physical universe, long after the cosmic origin, in a process that requires generation of the chemical elements of life in supernovae and then biogenesis and the evolution of life, reentry of the archaea and bacteria in the

eucaryote endosymbiosis, generating full subjective consciousness and then the rise of multicellular animals with biological brains. The very notion of consciousness arises from the alert waking state of a human or animal organism, in notions from “conscious of” our surroundings, consciousness, as opposed to sleep and coma, and self-consciousness as self-aware organismic agency. Many aspects of our subjective experience, including colour vision and spectral sound are derived from brain processing via biological receptor organs for physical modes, rather than the universe itself and hence are evolutionarily adapted and organismic. Even our ideas of self and other are processed in regions like the precuneus and temporo-parietal junction, so that in meditation and psychedelic states, we can experience union with ultimate reality and hold an ongoing notion of God consciousness. But we have no direct experience of the consciousness in others except by their vivacious behaviour and no validly meaningful knowledge of consciousness, as an absolute actuality generating the physical universe, except perhaps through our first person visionary experience.

The peak experience on psychedelic mushrooms that was the source of this cosmology, was astounding in the way it conveyed disembodied cosmic consciousness in the persona that the Vedantic tradition likens to Brahman, in the merging of individual atman or conscious self with universal cosmic consciousness, in a near-death type experience. But at the same time, it was warning me that Brahman was as vulnerable as I and the biosphere, because without the survival of life, this state of cosmic reunion, outside our biological incarnations, was as vulnerable as life itself, without surviving climax living beings to experience this transcendent reality.

This brings us to a new and different world view, or weltanschauung, via a consciousness filter theory, in which moksha is a living biological state, asymptotic to a form of cosmic consciousness, when the doors of perception are opened wide, so that the constraining filters of perception cease to be confined to the physical awareness of the world and descend deeper into the abyss of what unconditioned climax consciousness can be and become in the unfolding of life. But it doesn't assert primal transcendence of this state of reunion over the physical universe, from which it has arisen as a climax phenomenon. Both the notions of theistic deity in God, founded in intentional conscious agency and of Vedantic doctrine in Brahman, as the ultimate cosmic reality founded in consciousness itself, are thus projections of human organismic agency and conscious existence onto the entire universe and its very origin.

While God is seen as transcendent, in being both omniscient and omnipotent, the very notion carries incontrovertible archetypes of anthropomorphic agency. God has all the attributes of human emotions, from compassion, to jealousy, and genocidal anger and violence, as well as all the notions of intentionality we associate with human manufacture, in which living beings are created de novo by God's shaping in clay, or breathing the breath of life we possess into life as a whole, “*And the LORD God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul*” or in rational thought as the doctrinal logos “*In the beginning was the Word, and the Word was with God, and the Word was God*”, all imbued with the reinforcement of moral cosmologies characteristic of urban societies in the pursuit of ultimate order, construed as in obedience to God's divine will. This leads in turn to false notions of creationism, and intelligent design, where life is construed to be merely a clockwork theistic technology of “creatures” created de novo by God, in which *Homo sapiens* rules over life as a whole:

And God said, Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth.

But we have also discovered that the conscious complexity and sentience of life arises, not from a rule of ultimate order, but through critical phase transitions at the edge of chaos, giving rise to the evolution of increasing complexity and diversity and the very dynamical brain states characterising organismic consciousness.

When we turn to the Vedantic tradition, we can see the same process occurring, in which the rishis, in a state of deep samadhi conceived that the entire universe was made out of aggregations of divine consciousness, to make the material universe as the demi-God Brahma emerging from the dream of Vishnu out of his navel, overlooked by faithful Lakshmi. This was then made more abstract in Upanishadic notions of Brahman as ultimate reality in the abstract, standing outside life, as a cosmological absolute form of consciousness, generating the entire universe. This consciousness is also set apart from experience, as the illusory world of subjective form, or maya, particularly when confined to our organismic perception of the physical world and our egotistical survival in the mortal coil of the round of birth and death. Is it reasonable to separate pure “transcendent” consciousness from all immanent experience, when consciousness is the very ability to have subjective experience and even the most basic physical experiences, let alone dreams, memories and reflections, are essential to the continuity of life as a whole, and are thus NOT illusion?

This is where Symbiotic Existential Cosmology remains counterposed to the original Vedantic tradition, as a remedy just as it is a remedy to theism by returning cosmic agency back to us all as subjects, because it sees cosmic consciousness just as it manifests biologically, as a nascent emergent property of the eucaryote endosymbiosis becoming organismic and human consciousness realised for example in deep meditation, and the mystical visionary state, that is a climax manifestation of the living universe, whose very existence and ability to manifest is dependent on the existence of life as a whole.

Symbiotic Existential Cosmology thus postulates only primal subjectivity, as a complementary aspect to quantum reality at the cosmic origin, in a process that remains entirely consistent with physical cosmology and the likely inflationary scenario, in which both the universe and subjectivity emerge as a quantum fluctuation, rather than the Vedantic view of a transcendent super cosmic consciousness that generates the entire universe, that like all theistic cosmologies run down into chaos because of defection against the presumed ultimate order of moral good.

Primal subjectivity is conceived of as optimally compliant with the environmental boundary conditions of the filters the biological brain imposes, while giving subjective consciousness a privileged active agency, during quantum uncertain phases in neurodynamic phase transitions, central to the survival of the organism and in turn our ability to experience ultimate reality as conscious agents. This transforms from a physicalist view that conscious experience is just a shadow manifestation, a mere internal model of reality generated by physical brain processes, into a filter theory of conscious experience, as being essential to organismic life, as a holistic manifestation of subjective efficacy of volition over the physical universe, to aid and ensure survival of the sentient being, not as maya or illusion, but the biological focus that consciousness must be compliant with, for the organism to survive and reproduce and for life to flower as a whole.

We see in later Indian thought a complementarity between Shiva as the timeless cosmic conscious witness of Shakti as the dynamic force of physicality begetting both life and death in creation and destruction, then leading to universal maya or illusion, as the primal pair retreat from intimate coitus, leading to all of us sentient beings lost in the egotism of organismic consciousness, ending ultimately in the conflagration of the Kali Yuga, due to moral and spiritual decline.

By contrast, Symbiotic Existential Cosmology doesn't seek transcendence over nature, in spiritual supremacy, but immanent symbiotic integration with life as a whole, at the edge of chaos, in the natural consummation of the conscious universe, in self-becoming that IS transcendence, realised in the unfolding of life.

The Reality of Time and the Notion of Agency

In "Out of Time", Baron et al. (2022) explore both the potentially non-existent status of time in current physical cosmology and the folk notions of time that human cultures consciously and socially invoke:

The idea that time does not exist is, for many, unthinkable: time must exist. Our goal is to make the absence of time thinkable. Time might not exist. This chapter lays the groundwork for our investigation. We begin by clarifying the central target of our investigation, the folk concept of time and then motivating the idea that it is this folk concept whose investigation matters. ... Our primary focus in this book is on the folk concept, or concepts, of time. ... For now, we can think of the folk concept of time as something like the naïve view of time – the unreflective notion of time that individuals use in their everyday lives. ... When we talk of the folk concept of time we don't simply mean the way the folk think about, or conceive of time. We don't simply mean what the folk think time is like. We mean something like what the folk think (almost certainly implicitly) it would take for there to be time in a world. ... Why should we care about the folk concept of time? The short answer is that we should care about time in the folk sense, because it appears to be implicated in normative concepts and practices in which we are deeply invested; concepts and practices like moral and practical responsibility.

They note a number of versions of TOEs attempting to unify gravity and the standard model of physics:

A number of approaches to quantum gravity (QG) have been proposed. The best-known approach to QG is string theory, according to which the fundamental components of reality are tiny one-dimensional strings that vibrate in up to eleven dimensions. The chief alternative to string theory is Loop Quantum Gravity (LQG), according to which reality is fundamentally a lattice-like structure, constituted by discrete 'chunks' that are 'woven' together. Another approach to QG is the Canonical Quantum Gravity program (CQG), which applies standard quantisation techniques from quantum field theory to the gravitational field, in order to produce a quantum account of gravity (roughly in the mould of the standard model of particle physics). Other approaches include causal set theory, the asymptotic safety approach, the causal triangulation approach and the emergent gravity program.

They then consider how our philosophical notion of agency can survive the sacrifice of time itself by using causality in a local sense to create the framework for reasoning agency:

In what follows we cannot hope to spell out a full-blown realist account of agency without time. That would be a massive undertaking. Instead, we will focus on showing how the realist can respond to the two arguments we mounted earlier: the conceptual and cognitive arguments.

Let us start with the conceptual argument. ... The concept of agency at issue is one that focuses on deliberation. As already discussed, we believe it is plausible that for one to be an agent, one must be able to impose a deliberative structure. We are also inclined to accept that in order to do that, one must believe that there is some supportive structure. We nonetheless think the conceptual argument fails. It's not the case that there must be a C-series for there to be a supportive structure. Thus, one can reasonably believe that there is a supportive structure even if one accepts temporal error theory. There is thus no bar to the imposition of the kind of deliberative structure needed for agency.

Consider the idea that we need to take some things to be fixed, and unchangeable, and to be the things on the basis of which we deliberate. Consider also the idea that we take other things to be open, and malleable, and to be things about which we deliberate. Causal structure seems well suited to support both aspects of deliberative structure. There being a causal structure allows us to take as fixed, and unchangeable, those things that are causally prior to our location, and as open and malleable, only those things that are causally downstream from us. We cannot causally intervene on events that are causally prior to us, so they are excellent candidates to be held fixed and unchangeable. This brings us to the cognitive argument. Recall the basic argument: some if not all of our agentive thoughts involve temporal thoughts. Those thoughts are therefore true only if the relevant temporal thoughts are true as well. If temporal error theory is true, then our temporal thoughts are false and so at least some agentive thoughts are false too. Our response to this argument is just to concede the conclusion: yes, some of our agentive thoughts are false. Be that as it may, the falsity of the relevant agentive thoughts does not undermine agency. The reason for this is that there are other nearby agentive thoughts that are true; thoughts that invoke only causal notions.

By contrast, and at least in principle, we can causally intervene in events that are causally downstream from us, so these are also excellent candidates to be held open and malleable. Indeed, with respect to those things that are causally downstream from us we can distinguish between those that we take ourselves to be able to causally affect, and those we take ourselves not to be able to causally affect. Only those in the former category are those about which we can deliberate. Those events that are causally prior to us, in the causal ordering, or those that are causally downstream from us, but which we take ourselves to be unable to causally affect, are those things about which we cannot deliberate. So, the presence of causal structure provides a supportive structure for at least these aspects of deliberative structure.

However, we have come to see that conscious experience has depths and heights that take it far beyond the confines of rational thought and mental cognition, including emotional states, transcendent mystical states and real world states of acute anticipation as a key feature of consciously surviving immediate existential threats. Baron et al. (2022) thus also make an attempt to discuss temporal non-cognitivism in this context:

Temporal non-cognitivism is the view according to which our temporal thought and talk does not involve truth-apt beliefs, but rather, involves some other kind of attitude. So, even if our folk concepts of time are not satisfied, it does not follow that such talk is false because a fortiori it is neither true nor false. ... We find temporal non-cognitivism tantalising. We confess, though, that we are not sure how to spell out the view in a plausible manner. Given this, what we say about temporal non-cognitivism will be brief. Our aim is not to argue that there is no way to develop a version of temporal non-cognitivism. Rather, we will gesture towards what we take to be some powerful problems that the non-cognitivist must face if she is to develop such a view.

The central problem we see for temporal non-cognitivism is that it is difficult to see what our temporal thoughts might be, if not beliefs, and hence which mental states temporal talk might express, if they are not reporting beliefs. Indeed, we can only really see one way to develop this idea, and that is to take temporal thought and talk to express non-cognitive attitudes of some kind. Call such a view: temporal expressivism. The question then becomes which non-cognitive states the expressivist might identify with our temporal thoughts.

There are roughly two kinds of attitudes that one might appeal to: emotive attitudes such as regret, anticipation, nostalgia, fear, anxiety; or evaluative attitudes such as desire or preference. These are natural options to pursue, because they all display a 'temporal' asymmetry and so bear some connection to time already. ... Any plausible temporal non-cognitivism will need to provide felicity conditions for temporal thoughts such as 'it rained yesterday' and 'it rained 5 minutes ago'. After all, even the non-cognitivist about temporal thought presumably doesn't want to say that any temporal thought is as apt as any other. ... Even if felicity conditions for some temporal attitudes can be provided along these lines, there is a deeper problem for temporal expressivism. The problem is a paucity of attitudes. Whichever attitudes one chooses—emotive or evaluative—there do not appear to be sufficiently many, or sufficiently fine-grained, non-cognitive attitudes to capture all of the different temporal thoughts we have.

In principle, one can have temporal thoughts that are extremely fine-grained, down to the scale of seconds, or nanoseconds. It is implausible, however, that we can place each such fine-grained temporal thought into a one-to-one correspondence with some similarly fine-grained attitude. The main problem is that we can't differentiate degrees of anticipation to the same extent. Can one really have a greater degree of anticipation for an event in a second, as opposed to one in two seconds? What about nanoseconds? It seems doubtful. Attitudes are just not that finely structured.

This position states clear roles for both emotion and anticipation as non-cognitive modes of subjective conscious experience, but the conclusion that anticipation can only exist by degree and that it is too coarse grained to function is inconsistent with the exceedingly fine-grained role of anticipation in existential threats to survival which occur in the conscious moment without any assumptions of the overall nature of time as a global or cosmological entity having any relevance to the immediate survival threat.

In this sense, the conscious moment, in both acute existential crisis and in deep mystical states IS timeless and consciousness is itself more generally an ongoing quantum of the present, which does not itself change but rather local conditions change as they pass in and out of our experience. This leads potentially to a deep correspondence between conscious timelessness and cosmological timelessness as complements of one another.

Other theories of agency treat it rather as a systems theoretic complementation to the physical universe.

Karen Barad (2007) in "Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning", describes agential realism as a theory in which the universe comprises phenomena which are "the ontological inseparability of intra-acting agencies". "Intra-action", coined by Barad expresses an important challenge to individualist metaphysics. Phenomena or objects do not precede their interaction, rather, 'objects' emerge through particular intra-actions. Thus, apparatuses, which produce phenomena, are not assemblages of humans and nonhumans (as in actor-network theory). Rather, they are the condition of possibility of 'humans' and 'non-humans', not merely as ideational concepts, but in their materiality.

Her publication brief expresses it thus:

Intra-activity is an inexhaustible dynamism that configures and reconfigures relations of space-time-matter. In explaining intra-activity, Barad reveals questions about how nature and culture interact and change over time to be fundamentally misguided. And she reframes understanding of the nature of scientific and political practices and their "interrelationship." Thus she pays particular attention to the responsible practice of science, and she emphasizes changes in the understanding of political practices, critically reworking Judith Butler's influential theory of performativity.

I am concerned that this is a philosophical/metaphysical argument which poses a complementarity between quantum physics as an interactive process and human social and political discourse, marginalising the individual subject as a systems cipher. What meaning is there to subjective consciousness as a complement to the objective universe, individual insight, enlightenment, moksha or the cosmic mind, if the complement is based on political discourse, rather than empirical experience? On the other hand this is precisely what Symbiotic Existential Cosmology does in invoking an 'animistic' process of mutual affirmation socially to empirically establish subjective consciousness volition has efficacy over the physical universe, before investigating the role fo the physical brain in this process.

A second work by Scott Kelso and David Engström (2006) "The Complementary Nature" provides a complementary account of what they describe as "coordination dynamics" (Kelso 2013), within which complementarity is rooted:

The division of our world (natural and social) into distinct contraries or opposites has become almost universal practice in most fields of human endeavor and inquiry, including science. Undeniably, imposing such divisions on space and time, wave and particle, order and chaos, action and perception, or organism and environment have enabled significant progress in our scientific understanding of these separate domains. However, understanding based on separation or contraries is fundamentally limited, as is powerfully demonstrated by modern physics, biology and neuroscience. Coordination dynamics describes how coordinated patterns form and transform within and between parts of a given system. Core concepts, developed at length in the book, include self-organization, pattern dynamics, multifunctionality and functional equivalence, and information flow.

In the 1960's, general systems theory sought the goal of a common pattern and process, consonant with Ilya Prigogine's non-equilibrium thermodynamics of living systems, Hermann Haken's synergetics about self-organized coherence, Francisco Varela's (1972) autopoiesis, and Stuart Kauffman's (1986, 1993) autocatalysis. This means that coordination dynamics is attempting to treat physical, biological and even social systems on the same systems footing invoking a transformative continuity between processes which are isolated from one another and those in which coordinated interaction is derived from more generalised laws. However, in doing so, coordination dynamics remains an objective description of reality that does not seek to explain the hard problem of the fundamental nature of subjective consciousness, just the interactive properties of neuronal self-organisation as functional information:

Neuronal connections in the brain are an effective medium that nature has provided through the mechanisms of self-organization and natural selection. But the important concept here, as these simple experiments on people reveal, is biologically relevant

information. Such functional information can be conveyed by local connections and between distant areas, both by two-way interactions. In this capacity, local~global and integration~segregation are two of the key complementary pairs of coordination dynamics.

So how does coordination dynamics explain all these phenomena? And what are the implications of this different view of the brain for the complementary nature? The empirical data suggest that integration (pure coordination) and segregation (no coordination) in both brain and behavior may be viewed as polar, idealized extremes and that the key to understanding lies in the dynamical interplay of integration~segregation tendencies. As a candidate science of the complementary nature, coordination dynamics must minimally be able to explain both polarized complementary aspects and all that falls in between them.

The book cites a series of complements and a general relation:

Heterogeneity~Homogeneity, Oscillation~Rhythm and Coupling~Uncoupling and summarises them in a General process equation $\dot{c}v = f(cv, cp, f)$, where the rate of change of the coordination variable, cv , is a function f of three basic factors: the momentary value of the coordination variable cv itself; one or more control parameters cp ; and noisy fluctuations, F . Recall that coordination variables capture the functional nature of behavioral patterns. Such coordination variables can be quite abstract in that they can characterize coordination among the same and different kinds of elements and processes (homogeneous~heterogeneous).

Key here is the fact that these capture only the functional nature of behavioural patterns, not subjective consciousness. This approach is similar to that of autopoiesis (Maturana & Varela 1972) in that it provides a complementary objective description of physical and mental phenomena as complementary views of reality described by systems analysis without explaining the hard problem of subjective conscious experience.

Scott Kelso's work has also become the basis of more wide ranging explorations. Brian Josephson (2019) in "The Physics of Mind and Thought" utilises biosemiotics to provide a possible explanation of quantum measurement:

Regular physics is unsatisfactory in that it fails to take into consideration phenomena relating to mind and meaning, whereas on the other side of the cultural divide such constructs have been studied in detail. ... On the other side of the cultural divide, there is the fundamental idea of a sign, the study of which originated in the semiotic concepts developed in the nineteenth century by Charles Sanders Peirce, more recently taken up by biologists, thereby founding the subject of biosemiotics (Hoffmeyer 2008 a, b). Semiotics emphasises the role of interpretation, a process connecting signs with corresponding objects, or more generally mediation, a process involving situations where a third entity influences the relationship between two others. Such mechanisms play a key role in biology, and one that is essential for effective biological function.

Sign use, as originally argued by Peirce and subsequently developed by Deacon (1998) and by Favareau (2015), is of three types, iconic, indexical, and symbolic. The first two types of sign involve entities in the immediate environment, but symbolic use, which now appears to be confined to human beings, can involve manipulations concerning entities absent from the immediate environment, which faculty is attributed by Deacon to a human ability to avoid being too involved in the current situation during mental activity. This can be understood in terms of memory mechanisms that can, as it were, hold on to signs so as to be able to act systematically with them, and thereby develop 'games' such as mathematics.

The basic problem with quantum mechanics is that a person's decision as to what aspect of nature to observe can have real consequences, and it is unclear how such mental activity can be integrated with traditional physics; we cannot simply leave out the observer. A thesis in the above has been that semiotics (sign theory) will play a central role in such a future integrated physics, a basic task for such a future physics being that of bridging the gap between signs and the phenomena addressed by current physics, thereby arriving at an integrated point of view. A similar situation arises in conventional science, where a gap of this kind exists between fundamental physics and biology, one that can be bridged taking due account of a succession of levels, utilising a range of specialised approaches to deal with these.

Josephson (2019) in "The Physics of Mind and Thought" explores using biosemiotics to integrate physical cosmology with mind and meaning:

Regular physics is unsatisfactory in that it fails to take into consideration phenomena relating to mind and meaning, whereas on the other side of the cultural divide such constructs have been studied in detail. This paper discusses a possible synthesis of the two perspectives. Crucial is the way systems realising mental function can develop step by step on the basis of the scaffolding mechanisms of Hoffmeyer (2008 a, b), in a way that can be clarified by consideration of the phenomenon of language. Taking into account such constructs, aspects of which are apparent even with simple systems such as acoustically excited water, as with cymatics, potentially opens up a window into a world of mentality excluded from conventional physics as a result of the primary focus of the latter on the matter-like aspect of reality.

Josephson (2021) seeks to extend the complementation of quantum physics with socio-political systems of Barad, to invert the usual "theory of everything" approach to particle cosmology by treating it as an expression of goal seeking agents. He notes that both Bohm's notion of the implicate order and mind-like processes have been invoked:

In the following a more explicit picture is proposed, based on the existence of parallels between spontaneously fluctuating equilibrium states and life processes. Focus on the processes of natural language suggests a picture involving an evolving ensemble of experts, each with its own goals but nevertheless acting in harmony with each other. The details of how such an ensemble might function and evolve can translate into aspects of the world of fundamental physics such as symmetry and symmetry breaking, and can be expected to be the source of explicit models. This picture differs from that of regular physics in that goal-directedness has an important role to play, contrasting with that of the conventional view which implies a meaningless universe.

Josephson & Majumdar (2021) extend this, invoking Wheeler's notion that physical reality may be manifest through participating conscious observers through quantum measurement to use nonlinear dynamics, taking into account biological factors:

The constraint that structures that develop should have biological value is shown to be able to account naturally for many features of the quantum domain, thus providing an alternative paradigm to the conventional 'theory of everything' one, which has over time become problematic. For the future, detailed investigation of nonlinear dynamics along the lines discussed here is likely to be more fruitful in regard to the problem of understanding nature than continuing current attempts to tweak 'theories of everything' to fit.

Majumdar & Josephson (2020) formulate physics using system dynamics of self-selected fluctuations and correlations in a fundamental \odot field:

Instead of the traditional reductionist method of looking at phenomena in nature, we look at how the interplay of symmetry breaking and entanglement of subsystems within this unified field leads to entropic complexification – which appears as the fundamental interactions and particles. This complexification optimizes system configurations to facilitate energy dissipation. The fluctuations in the background field encode laws for phenomena based on the stability, recurrence and patterns of these fluctuations.

Chris Nunn: Go down the 'timelessness' route and you end up with some picture like Julian Barbour's path. The answer to this paradox could perhaps be that temporal extension *is* (proto)consciousness,

Chris King: I have two complementary views of conscious experience that overlap, just like the relativistic and quantum descriptions.

One is temporal and is our reckless journey through the multiverse, looking through our blind eye, as Nelson did at the signal to retreat in the Battle of Copenhagen, creating history for good or ill as we speak. That's the "quantum consciousness IS uncertainty" vision.

The other is eternal relativistic timelessness, in which everything that we have been and will be is laid out, looking from sideways on in space-time from alpha to Omega, as "a thing already achieved" as Maria Sabina said of her mushroom experiences. This doesn't mean everything is determined or teleological, but it's the view after all the transactional handshaking has taken place, of the great trip we and everyone took, so we can look on it from far off, perceiving as the compassionate, eternal consciousness we actually are. But Omega, as I have said is not the end point. The consummation of existence is not Omega but the interactive Sigma – Paradise on the cosmic equator in space time.

Chris Nunn: But isn't 'consciousness' a correlate at least of what *removes* uncertainty. The two concepts seem to lie at opposite poles of the *same* truth and it looks like we need some happy mean. And an idea of temporo-spatial evolution can provide one – 'threads' of consciousness-associated time getting woven into ever more elaborate forms.

Chris King: Consciousness is here to mitigate, mediate, or utilise uncertainty as the need may be. However uncertainty is not the opposite of consciousness, but an inside out view of the same thing.

It also depends on our frame of reference. If we are looking at brain states, if there is no uncertainty in our brain state then we are a zombie, or a robot. There is no role for subjective consciousness at all. So from the physical perspective the brain state needs to enter an uncertain state for subjective consciousness to be able to intervene and affect outcomes. From the subjective perspective this is the opposite, because we cease being zombies and become conscious agents, removing uncertainty from the world as we act by creating real history.

But again centrally the uncertain states that are seriously going to threaten our survival in the wild are things like a snake strike. This is all caught up in the uncertainty of the way circumstances play out. We can try to do "good

hunting” and take the path we think the snake is less likely to be on, but the snake is going to play likewise to hunt me and take the path that I would least expect. These environmental problems are (a) computationally intractable and (b) quantum idiosyncratic, motivated by live volition and sheer coincidence. The same is true in modern society with other humans and traffic and hurricanes and diseases all playing wildcard elements. So there is a deep correspondence between quantum uncertainty on all scales and conscious anticipation. Nelson knew he was looking through his blind eye and that it would change the course of history. It did. But the terrible acid test is that this looks like consciousness is staring right into the entanglement and fishing for a collapse state by some kind of transactional hand-shaking between past and future to anticipate the cat remaining alive.

Yes there are situations where we execute a well designed plan and things go like clockwork, but even in these situations there are multiple sequential non-IID situations about just how we handle a process and the uncertainties that inevitably lead to uncertainty. The brain has worked out how to do this seamlessly because operating at the edge of chaos allows the uncertain regime and the determinate boundary conditions of consciousness to coexist in the dynamical system and for bifurcations into and out of uncertainty.

The real evolutionary victory of the conscious brain happened at the eucaryote endosymbiosis when the excitable membrane became a sensory and social communication dynamic in self-feedback. This is where we can look for the secret of this existential anticipation dynamic because the brain is just a very advanced society of social amoeboid flagellates locked in “psychic” symbiosis through brain resonances, so to speak. The result is that we do not understand uncertainty or what its deep link to us is. We think of it as randomness but all randomness ultimately is a secondary product of quantum uncertainty and it's obvious that a multiplicity of entanglements lead to a vast network of correlations. The randomness only appears as we approach the classical Born rule situation by travelling down an IID sequence. So the paradox becomes uncertainty = free will.

Chris Nunn: There are two separate, albeit inter-related, issues here. One is neural deterministic chaos with its pseudo-random outcomes and unpredictability in anything other than the very short term, plus its capacity for harbouring strange attractors (‘memories’). The other is the huge question, albeit one that's often ignored, as to whether the entire ‘quanglement’ realm is similarly constituted. There are major empirical problems with supposing that quantum EM fields don't embody pseudo-randomness and associated universal structure, though ones constrained by the Higgs field may be more localised (the relevant experiments haven't been done yet).

Chris King: This is the nub. Tuneable chaotic neurodynamics as Freeman emphasised, is not classical deterministic chaos because it's the dynamics of quantum structures from the molecule up, so the use of edge-of-chaos in neurodynamics is not deterministic dynamical chaos, as in a mathematical system like the logistic iteration or the Lorenz flow. These are classical ideals and are not realistic in relation to the conscious brain.

The key is the point you are making about whether, for example phase coherence in distinguishing conscious states from subconscious, that Pribram emphasised, is more than just an analogy with quantum measurement and is something fundamental about quantum measurement and entanglement. I think it is and it is because the superficial evidence is that the brain is deriving an anticipatory advantage in environmental uncertainty from using phase angle coherence sampling at the edge-of-dynamical chaos. The only way this makes sense is that its advantageous to survival as a form of quantum anticipation, despite trading off potentially noisy disruption of classical causality.

Neurodynamics is a non IID-quantum process whose contexts are continually changing, so no approach to the Born interpretation occurs, so the whole thing needs to be treated quantum theoretically, which is beyond the scope of current science. The neuroscience area is still stuck in the classical paradigm, so you refer to deterministic chaos but it isn't classical. We just simply haven't caught up conceptually with the entangled quantum universe we are consciously existing in. The fallacy lies in looking for isolated phenomena like the ion channel where we can be convinced we are at the quantum level and accepting only those as quantum effects and treating all other aspects of neurodynamics as classical by default.

My take is that Pribram's analogy is an actuality. This idea of quantum coherence measurement is reinforced by the fact that individual action potentials are phase correlated with the local continuous field potentials in a hand-shaking resonance, so the EEG is not just an artefact of action potential averages, but a genuine wave function. Thus the brain can seriously be looked at as a massively parallel quantum measurement process, where EEG modes are analogous to, or actually are, quantum “excitons”.

Chris Nunn: I like to think that the conversion process can be viewed as the endowment of abstractions with temporal extension. You might object that one could equally well say 'spatial extension' but I don't think that would be correct because spatial extension (i.e. 'position') is already present in the 'abstraction' (i.e. the wave function), whereas temporal position isn't.

Chris King: I agree about temporal extension, but I would add that the wave function, if you are referring to the quantum wave function, is both spatially and temporally extended, as in the Feynman and transactional descriptions, and vastly temporally extended into both the past and future to put it mildly.

Chris Nunn: There's much confusion about 'free will'. It may best be regarded as the capacity of volitional consciousness to influence behaviour and its own future content, leaving out questions about the determinants of volitional consciousness. I agree that it is not fully determined by purely neural constraints, though social constraints on it are very significant. To a large extent true 'freedom' may depend on an interplay between neural and social constraints, perhaps with some input from both (pseudo) randomness and universal 'quanglement' structure.

Chris King: Absolutely!

Chris Nunn: I think of Freeman neurodynamics in terms of 'landscapes' in classical dynamic state space. True Freeman (and Vitiello) tried to apply the maths of QFT to these but, so far as I know, this was mainly because of the need to cope with almost infinite dimensionality. The advantage of staying classical is that it provides a ready explanation of a wide range of properties, especially sleep which is all about smoothing out excessive landscape 'rutting' along with fitting new attractors into existing landscapes.

Chris King: You are absolutely right here. This is the way he did it in great detail using differential equations modelling excitatory and inhibitory feedback, generating phenomena of classical chaos and it is beautifully informative of transitions from high energy chaos into existing, or even new attractors from learning.

The complications starts to set in when we go from the classical model to actual EEG potentials, where we are measuring a classical signal of discretely sampled voltages in a time series, which we conceive of as continuous potential variations in the scalp, or more deeply on the cortical surface. Qasim et al. (2021) have shown that action potentials are phase responsive to the local continuous field potential which people in turn believe is a tissue average of the effects of the same action potentials, so we have a particular kind of discrete-continuous feedback here which has the complementary characteristics we see in wave function reduction to the particle. I'm not saying they are the same, but that they both have a discrete continuous complementarity based on phase which is exactly what the uncertainty principle says in terms of counting wave beats to determine time uncertainty of the energy.

And without saying ion channels are the only quantum process, individual action potentials are only a step of scale away from the ion channel because threshold tuning in the neuron is a form of self-organised criticality that in threshold can make the action potential sensitive to the ion channel.

Chris Nunn: Any influence of quantum coherence on these landscape features is likely to depend on structured modification of classical dynamic timings, according to this picture.

Chris King: So this is where I think the classical description you are advancing starts to break down. We don't actually have a classical picture, we have a classical model and a biological picture and the biological picture is a fractal process with scale handshaking. Moreover isolating the ion channel as the only plausible quantum level is wrong because the whole picture is one fractal reverberating process which is as far from IID-convergence to the classical (by independent identically-distributed quantum measurements) as living thermodynamics is from equilibrium.

So the answer to the above is that it is wrong to think of the process on one level as classical in a way we can conceive of e.g. thinking of the neuron in terms of classical differential equations and then assume its classical and say any quantum effects are going to have to prove themselves and possibly complicate the classical process. The reality is the whole thing evolved as a reverberating quantum system and things on a larger scale that we think of as classical are actually "inflated" quantum processes throughout, particularly given the butterfly effect, because the failure to converge to the classical means everything is not causally localised in the way we are anticipating.

This is a very hard call for experimental and theoretical science because, if non-IID processes do formally fail to converge to the classical overall, we haven't even started to embark on the scientific journey of how to make sense of this. This is why I think proving classical causal brain closure is scientifically impossible, so that the simple affirmation of subjective conscious physical volition carries far more analytical power and evidential weight and overturns physical materialism at the outset.

Chris Nunn: The way I'd see this is that phase coherence, whether classical or quantum, mediates attachment of memory-dependent meaning to information. The meaning is represented in terms of ever evolving topological structures, ones that can usefully be thought of as woven tapestries, which become conscious if temporal looping allows memories of the occurrence of the meanings. Any 'anticipation' ('Bayesian brain' manifestations) would usually be a function of indirect, long term classical loopings usually referred to as 'learning'. 'Quantum anticipations' would have a secondary role, dependent on effects of entanglement 'structure' on classical neural coherence timings, that could be responsible for a range of 'psi' phenomena.

Chris King: All these things may be true as well, but the difference with edge-of-chaos quantum dynamics is that all these processes you are describing are now boundary condition filters on root uncertainty, rather than classical causalities, so depending on how robust they are in a given context they can dominate overall in some situations and are manifestly incomplete influences in others.

Chris Nunn: Agreed, though we do need to retain conceptual distinctions for many purposes. Like the weather out there, lots of neural dynamics are mainly classical. They may be a lot more sensitive than the weather to any influences of quanglement structure, but it's still a limited influence.

Chris King: I think we need to replace "mainly classical" with "formative classical boundary conditions on uncertainty".

Chris Nunn: Agreed there's a lot to be said for musical analogies, but it's a music that we experience synaesthetically - as Scriabin, for instance, saw shapes in sounds. Your view of EEG modes has a lot in common with Johnjoe McFadden's 'cemi-field' theory (McFadden 2020). I prefer to think of them as creating form in the structure of time - and time, of course, is a constraint on quantum particles - not itself a wave function derivable 'particle'.

Chris King: That's very complicated. The way I enter the nierika on mushrooms is a synaesthetic resonance between rushing chirping sounds and the visual patterns before me and then as I'm "listening" to it all, it expands into vistas that I can see in the corner of my eye with exquisite observational detail, and then if I let go, I fall into the synaesthesia and then that's down the moksha rabbit hole until I come catapulting out at some later point and realise "what the hell just happened to me?" and recollect the full impact of the journey I have taken. While this IS a musical analogy it's also a cosmological reality, just like the particle trails in the LHC are. Whatever time is in this picture is still in the process of being elucidated, as the paradoxes of quantum gravity intimate.

Chris Nunn: Wouldn't it be more correct to say that wave functions don't own inherent spatio-temporal 'extension', except universally, and via incorporation of a potentiality for defining spatial localisations?

Chris King: I really wanted to finish with the transactional interpretation, so here it is. Both the Feynman description of virtual particle exchanges in QED and the transactional interpretation of real particle exchanges involve special relativistic hand-shaking between past emitters and future absorbers. Looked at from the transactional viewpoint, before we open the cat's box there is a web of past-future handshaking transactions. Somehow, as we open the box, this web is decomposed in some kind of non-linear interaction and as we look inside, there is one emitter and one absorber and if the latter was in the geiger counter, the cat is no more. But this process doesn't go from past to present to future. It's transversal to elapsing time, which is why I called it "trans-causality" in 1985 when I wrote "Dual-time Supercausality".

This is the jewel in the lotus that is yet to teach us where quasi/pseudo-randomness and randomness both meet their match in the partially collapsing entanglement. The key point is it spans space-time as we know it and the process has paradoxical constraints. It has to look quasi-random in terms of the Born interpretation at one end, but it has to manifest precise correlations between each of the entangled components at the other. That is the second lesson after we sing the musical hymns to reality and take another long journey into the unknown!

Chris Nunn: Looks like a very nice concept resonance! The only additional point I'd like to make is that Qasim et al's finding probably relates to the largest scale of a (pseudo) fractal structure of brain dynamics in which the smallest scales relate to neuronal contributions to dendritic plexi, intermediate scales to astrocytic 'domains' and largest scales to EEG fields generally. Anyhow, I suppose next step is how to test all this in a way that has some chance of convincing neuropsychologists generally. The fate of Daryl Bem (2012, 2016) and others 'pre-sponse' ('pre-sentiment') findings shows this isn't easy. An example of something that might work better is that our ideas (along with John Jay Kineman's 'holonic' concept) would seem to predict something very like Rupert Sheldrake's (1981) formative causation, at least in relation to learning by brains and possibly generally. Shouldn't be too hard to convincingly test that if someone would provide the resources. What do you think? Any other suggestions?

Chris King: I have an issue with Sheldrake's morphic resonance (formative causation). This to me is causally what RNA would be like if the polymerisation were exothermic – i.e. it would become an irreversible clunker. I had a conversation with Rupert in the 1980s and tried to point out that the leading edge issue is creative insight, not morphic resonance. It's a space-time problem to which anticipation is key not just spatial replication. It's getting the first instance of an idea that is formative, not replication ad nauseam. The idea that this replicates afterwards is not explaining the creative source and it leads to a teleological fait accompli. Thus I think the notion is a hopeful evolutionary monster.

Chris Nunn: That's one way of looking at it. I'd see 'formative causation' as analogous to neural learning but embodied in a quanglement landscape, not a neural dynamic state space one. Just as with neural learning, the relevant quanglement feature can be expected to 'deepen' with repetition. The assumption here is that there is feedback from classical dynamics to quantum field 'structure' but this is implicit in all our models.

Chris King: That's a good insight! I agree basically. I spent the day going over Penrose and Hameroff which I do think is off the beam, so that's how I stated my summary, but it made me think again about Penrose's space-time blistering idea and yes he is also saying uncertainty is not random at least in his confined context to the microtubules so it does fit with a kind of quanglement learning process, in particular the idea that at least some forms of entanglement are non-random and might be connected to mind states.

The Diverse States of Subjective Consciousness

A key issue in this discussion, particularly in regard to the materialist emphasis of neuroscience, is the fact that there are diverse states of conscious experience that extend far beyond and deeper into our awareness than the states of everyday experience of the world around us. Those who spend virtually all their living existence only relating to the everyday waking state can easily slip into identifying subjective consciousness with merely being an internal model of physical reality around them and then succumb to mind-brain identity, or exclusively materialistic conceptions of subjective consciousness as a brain mechanism.

These include:

- (a) **Dreams** particularly the richer end of the REM spectrum of states, including lucid and prescient dreams.
- (b) **Psychedelic experiences**, which 'reveal' internal realities, from kaleidoscopic geometric visions to whole scenes and encounters, generally of a radically different nature to those of dreams, meditation on its own and ordinary consciousness. These constitute the traditional sacramental routes to entheogenic realisation, or moksha.
- (c) **Dissociative experiences** such as induced in different ways by salvinorin-A and the anaesthetic ketamine, which differ from psychedelics in both their mechanism and their experiential character.
- (d) **Meditative and contemplative** states of sensory withdrawal and ego loss. These are the traditional non-sacramental routes to mystical union, moksha and satori, which complement the sacramental routes in (b).
- (e) **Psychic and parapsychological** experiences, including (1) precognition, (2) prescience & déjà vu, (3) uncanny unexplained coincidences, (4) telepathy, and (5) psychokinesis.
- (f) **Near death experiences NDEs** (Grayson & Flynn 1984, Groff 1988, Borjigin et al 2013, Parnia et al. 2023), which may accompany cardiac arrest, anaesthesia and non-life-threatening states; and **out of body experiences OBEs** (Monroe 1989), where a person on the border of sleep, an NDE, or in a non-ordinary conscious state observes their own body from without, in a disembodied state.

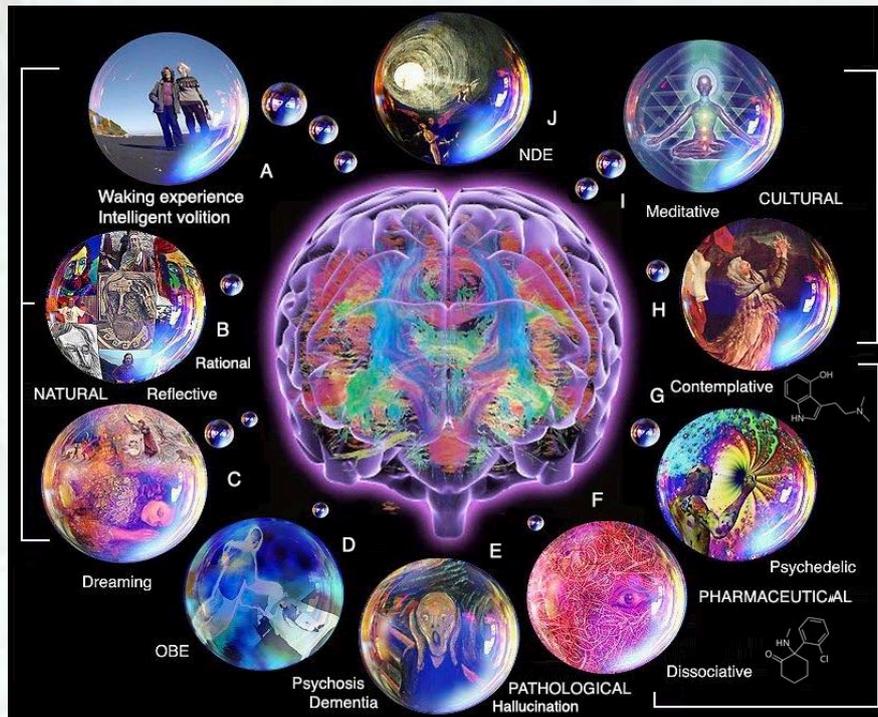


Fig 107: The sheer diversity of conscious mental states need exploration in their own right without a priori assumptions.

This belies the complexity and depth of the problem of consciousness because there are a variety of states of non-ordinary consciousness, which are neither imaginary, nor simply hallucinatory, nor are they just random uncoordinated phenomena, but are perceived as veridical experiences having the same, or qualitatively similar reality value, to our experiences of the world around us.

Moksha⁴⁶ means release from the cycle of birth and death in this life in the sense of experiencing and realising the conscious cosmic unity that transcends the physically mortal condition.

Dreaming states tend to be the most fully fledged experiences of non-ordinary reality human being experience although ephemeral in that they can only be recalled during waking. They are also veridical sentient experiences that are highly unpredictable, creative, and although they may reflect recent experiences may also hint at future experiences that come true later, hinting a deep time-spanning reality underlying existential consciousness. This appears to go far beyond the cited functional roles of REM and deep sleep in memory. Lucid dreaming states, although difficult to initiate and unstable either to immediate awakening by activating the reticular activating system or subject to a false awakening and reversion to the normal REM state, can enable the conscious observer to experience an often very exotic mental state in real time by recognising they are dreaming during the dream state.

Psychedelic and **dissociative** experiences are non-ordinary waking states that, by contrast with dreaming sleep, can be experienced and interrogated consciously. We have already discussed psychedelic experiences extensively throughout this work. Psychedelic states have particularly striking attributes, especially when combined with meditative withdrawal, characterised by “ultimate reality” and types of abstract perceptual experience having intense reality value radically different from any other kinds of experience. These are not hallucinations and their nature needs a great deal of further subjective exploration to begin to fully fathom.

Meditative experiences, although more controlled and tending more to mindfulness and compassion likewise stand in the Eastern tradition as a central route to union with cosmic reality exemplified in the union of Brahman and atman.

Parapsychological experiences, which are the orphans of materialistic science, are perceived as common place by many individuals and surveys indicate a degree of statistical support (Cardena 2018, Wardell 2019, Giroladini 1991). Some of these may be associated with deep properties of the quantum universe, hinted at in the Feynman formalism, weak quantum measurement and the transactional interpretation. These diverse forms of subjective experience

⁴⁶ *moksha* – derived from the Sanskrit word muc (“to free”), the term moksha literally means freedom from samsara (existential illusion). This concept of liberation or release is shared by a wide spectrum of religious traditions, including Hinduism, Buddhism, and Jainism.

present a deep and complex domain of subjective discovery, which has barely been tapped and emphasises the inadequacy of assuming a physically materialistic view, which diminishes the authenticity of everyday experience to be merely an epiphenomenal internal brain model and assigns all forms of non-ordinary conscious experience to delusory, imaginary, confabulated, stochastic, or hallucinatory status.

The psychedelic psychotherapist Stanislav Groff (1988) gives an insight into this wider “geography” of non-ordinary conscious states surrounding the realms of traditional perennial philosophy, in his notion of the territories of holotropy surrounding those of traditional religious cosmologies:

The hylotropic, or matter-oriented, mode of consciousness is the term I am using for the normal, everyday experience of consensus reality. The holotropic mode of consciousness, or consciousness aiming toward wholeness and totality of existence, characterizes certain nonordinary psychological states, such as meditative, mystical, or psychedelic experiences. It can also be observed in many spontaneously occurring episodes referred to as psychotic by contemporary psychiatry.

In the hylotropic mode of consciousness, we experience only a limited and specific segment of the phenomenal world or consensus reality from one moment to another. The nature and scope of this experiential fragment of reality is quite unambiguously defined by our spatial and temporal coordinates in the phenomenal world, the anatomical and physiological limitations of our sensory organs, and the physical characteristics of the environment.

In the holotropic mode of consciousness, it is possible to reach, in addition, all the remaining aspects of existence. These include not only access to one's biological, psychological, social, racial, and spiritual history and the past, present, and future of the entire phenomenal world, but access to many other levels and domains of reality described by the great mystical traditions of the world. Comparative study of mystical literature shows that most of these systems seem to agree on a complex, layered, and hierarchical model of reality that includes phenomenal as well as transphenomenal aspects of existence.

The gross experiential realm reflects the world of ordinary waking consciousness and consensus reality based on the evidence of the sensory organs. The corresponding worldview and way of being in the world is limited to information derived from the physical body and the material world, to linear causality as the only connecting principle, and to Newtonian understanding of space and time. Many systems of perennial philosophy have identified and explored, in addition, several transphenomenal levels or realms of existence, usually referred to as subtle, causal, and ultimate or absolute.

Both the subtle and the causal levels can be further subdivided into lower and higher. The lower subtle, or astral-psychic, level contains traditionally out-of-body experiences, astral travel, occult and psychic phenomena (precognition, clairvoyance, psychokinesis), auras, and similar experiences. The higher subtle level comprises archetypal forms of deities, supreme presences and spiritual guides, experiences of divine inspiration, visions of light, and audible illuminations. ... The lower causal level is the realm of savikalpa samadhi, the final God, creator of all the realms, the audible light of bija mantra the source of all individual deities. The higher causal realm is characterized by ultimate transcendence and release into boundless radiance, or nirvikalpa samadhi. On this level, there is no subject or object, no self or god, only formless consciousness as such. On the level of the Absolute, consciousness awakens to its original condition and suchness, which is also suchness of all of existence gross, subtle, and causal.

Savikalpa samadhi is sometimes described as the state in which the yogi's consciousness temporarily dissolves into Brahman. Depending on the yogic tradition, savikalpa is either the second or third highest level of samadhi.

*The observations from modern consciousness research with or without psychedelic drugs bring, in general, strong supportive evidence for this understanding of reality. However, in specific details, **the cartography of consciousness found in perennial philosophy would have to be extended and modified to fit the findings of experimental psychiatry and the new experiential psychotherapies.** In the following text, I will attempt to outline a classification of transpersonal experiences that is based on the scheme of perennial philosophy, but incorporates, at the same time, the findings of modern scientific research.*

*To create a transpersonal taxonomy that would reflect in an accurate and comprehensive way the introspective data and objective observations from modern consciousness research is not an easy task. **The spectrum of transpersonal experiences is not only extremely rich, ramified, and variegated, but includes levels of reality governed by laws and principles that are different from those that rule ordinary reality. Many transpersonal experiences, being ineffable, elude adequate verbal description and occur on levels of reality where those very aspects that could ordinarily serve as principia divisionis, such as time, space, duality, and polarity, or linear causality, are transcended. The problem is further complicated by the holographic nature of consciousness and mutual interpenetration of its different levels and domains.***

This realm extends to both a unification with all life and with the ultimate reality of the Cosmos:

Transpersonal experiences which involve transcendence of spatial barriers suggest that the boundaries between the individual and the rest of the universe are not fixed and absolute. Under special circumstances, it is possible to identify experientially with anything in the universe, including the entire cosmos itself. Here belong the experiences of merging with another person into a state of dual unity or assuming another person's identity, of tuning into the consciousness of a specific group of people, or of expansion of one's consciousness to such an extent that it seems to encompass all of humanity. In a similar way, one can transcend the limits of the

specifically human experience and identify with the consciousness of animals, plants, or even inorganic objects and processes. In the extremes, it is possible to experience the consciousness of the entire biosphere, of our planet, or of the entire material universe.

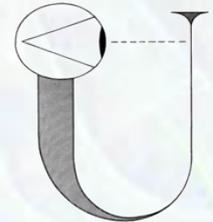
In some rare instances, an individual in the holotropic mode can have the experience of consciousness expanding to such an extent that it encompasses the totality of life on this planet, including all of humanity and the entire fauna and flora, from viruses and unicellular organisms to highly differentiated species. Instead of the ordinary identification with one living organism, this experience represents identification with life as a cosmic phenomenon.

Individuals experiencing identification with Cosmic Consciousness have the feeling of encompassing the totality of existence and reaching the Reality underlying all realities. They sense beyond any doubt that they are in connection with the supreme and ultimate principle of Being. This principle is the only real mystery; once its existence is accepted, everything else can be explained from it and understood. The illusions of matter, space, and time, as well as an infinite number of other forms and levels of reality, have been completely transcended and reduced to this one mysterious principle as their common source and denominator.

This experience is boundless, unfathomable, and ineffable. Verbal communication and the very symbolic structure of our language appear to be a ridiculously inadequate means to capture it and convey its qualities. Our phenomenal world and everything that we experience in the ordinary states of consciousness fades away in the light of this supreme awareness as limited, illusory, and idiosyncratic aspects of this one Reality. This principle is clearly beyond any rational comprehension, and yet even a short experiential exposure to it satisfies all the subjects intellectual and philosophical craving. All the questions that have ever been asked seem to be answered, or there is no need to ask any questions at all.

This emphasises the position already expressed in the introduction that, while brain states may be a necessary condition for human conscious experiences, they are not a sufficient condition and the primacy of the conscious condition introduces a cosmological paradox. All our experience of the world is exclusively through our conscious perception of it and yet we are bound to accept the reality of the external universe for our own conscious survival as biological organisms and to negotiate the affairs of the world, but we simply don't know the existential status of the universe is actually able to manifest in the absence of our conscious experience of it and the fact that we don't is critical to good cosmological design. So experiential reality including the source of our scientific description of it starts with consciousness and ends up with the universe, while biogenesis starts with cosmic symmetry-breaking and ends up with conscious organisms. That's the existential paradox.

Fig 108: Wheeler's universe as a self-excited circuit. The universe starts out right as the thin black line, then it grows and in time and gives rise to 'observer-participancy', which in turn imparts 'tangible reality' to even the earliest days of the universe.



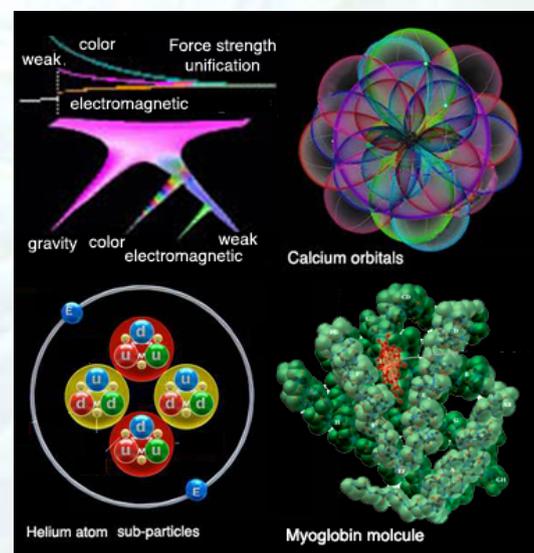
John Archibald Wheeler (1983) quotes as follows:

"An old legend describes a dialog between Abraham and Jehovah. Jehovah chides Abraham "You would not even exist if it were not for me!", who replies "Yes Lord that I know, but also You would not be known if it were not for me. In our time the participants in the dialog have changed. They are the universe and man". "How does quantum mechanics differ from what Bishop George Berkeley told us two centuries ago?:" "Esse est percipi" to be is to be perceived.

Insight, Agency, Uncertainty, Creativity, Karma, and Volition: Subjective Consciousness as a Quantum Climax

The following is an exploratory description based only on circumstantial evidence, to elucidate how subjective consciousness, through the environmental boundary conditions imposed by the neurodynamically active brain, may bring about the climax conscious cosmology of the sentient universe as we know and experience it. It is purely speculative, but is a test, if not a proof of principle about what we as subjectively conscious sentient beings, with autonomy of volitional will over our decision-making behaviour in the physical universe, are actually here doing.

Notwithstanding the apparent contradiction between quantum reality, occurring within space-time, and gravity, which is not renormalisable like the other forces, where, in general relativity, the curvature of space-time is functionally coupled to gravitation, quantum reality nevertheless appears to be a fundamental transition in cosmology that is not just confined to the vector boson



– colour, weak and electromagnetic forces. For example superstring theory is couched in terms of supersymmetry, in which each integral spin boson is paired to a half integral spin fermion and vice versa, balancing the negative vacuum contribution of the fermions against the positive contribution of the bosons, accompanied by string quantum excitations at the Planck scale. It thus becomes critical to understand the role of quantum reality in biological and particularly neurodynamic processes associated with subjective consciousness.

Fig 108a1: Cosmic symmetry-breaking and molecular fractality. Cosmic symmetry-breaking results in the four forces of nature, in which quarks bond in colour triplets to form protons and neutrons, to form atomic nuclei, with orbital electrons, forming atoms, which then bond in a succession of strong covalent and ionic and then cooperative weaker H-bonds and polarity bifurcations to form fractal molecular structures extending from individual molecules to tissues and organs.

Biogenesis and the evolution of complex life is clearly a consequence of the symmetry-breaking of the forces of nature. The generation of molecular matter and particularly organics in supernovae is generated by the tiered interaction of the strong and weak nuclear forces and electromagnetism under the collective influence of gravity to form some 100 atomic nuclei, atoms with orbital electrons and molecules.

This interaction supplied by free energy of solar radiation on the negentropic planetary surface, results in far from equilibrium thermodynamics giving rise to a complex edge-of-chaos dynamic molecular landscape in a phase transition, where cycles of anabolic polymerisation and catabolic denaturing become highly sensitive to varying “initial” conditions determined by the particular molecular concentrations of organic molecules forming prebiotic precursors of proteins and nucleic acids, as discussed in the [fractal biocosmology](#) section. The sheer diversity of organics in the Murchison chondrite, fig 53, illustrates this. This also requires polynucleotides to be marginally unstable thermodynamically, to avoid irreversible polymerisation, just as RNA is, thus requiring a sustained phase transition state to achieve replication.

These are not just structurally fractal as shown in the biocosmology section, but have fully fractal dynamics, as manifested in biological organisms. The unlimited emergent potential of such regimes has been vastly underestimated by the exclusive focus on attempting to find the “magic formula” that will immediately generate working polynucleotide and polypeptide systems as a mechanically defined system, rather than understanding the ecologically emergent potential of such systems as a whole.

Molecular systems, as experimentally explored and detected in experiments and in carbonaceous chondrites and our knowledge of molecular processes, quantum tunnelling in enzymes and superposition in protein folding indicate that such molecular systems involve quantum processes and constitute vastly more complex forms of three dimensional quantum spatio-temporal computing automata than the classical discrete examples of 1D and 2D [cellular automata](#) (CAs) familiar to mathematics. As I wrote this, q-bits for quantum computing have been generated on single molecules (Castelvecchi 2023).

Such CAs can be analysed in terms of chaos and order based on the proportion of live and dead cells and some of those at the edge of chaos such as the 1D system 110 and John Horton Conway’s 2D game of life take the form of universal computers where any Turing compatible process can be represented as a set of initial conditions which can then be computed by the CA’s universal rules. In a similar but vastly more complex quantum computing phenomenon free molecular interaction in molecular populations can give rise to living organisms in which genetically coded proteins can in turn generate excitable cells, and brains which are not only the most complex computational objects in the known universe, but are also subjectively conscious. CAs such as the game of life can generate both a computer CPU as a computational illustration, but also form free-living digital ecologies, in which initial conditions give rise systems of potentially unbounded digital complexity.

Molecular systems the early Earth, exceed the classical dynamics of the game of life in three ways: (1) They are three dimensional not two. (2) They are quantum systems exploiting both superposition and entanglement. (3) They are continuously redefining the rules of engagement because the molecules themselves are defining the “field” dynamics through their autocatalytic interactions on the early Earth, rich with organics in a variety of far-from equilibrium contexts, from lost city undersea vents to ponds and shorelines with heightened magnetic interactions prone to chiral selectivity provide a wide variety of geological contexts to form an “open set” of initial conditions generating a continuously evolving ecology of arbitrarily complex molecular progenotes as cooperatively interactive, far-from-equilibrium edge-of-chaos systems, under sustained phase-transition.

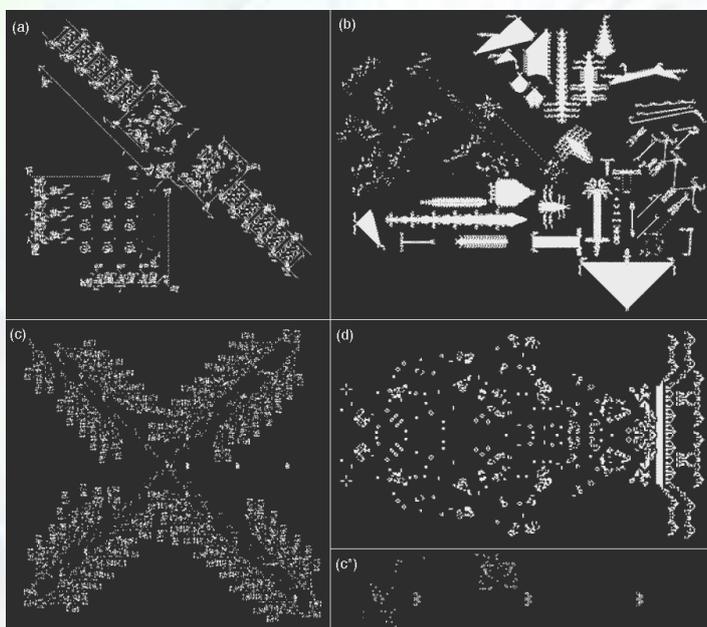
What is needed is a dedicated experimental program like the LHC, in the form of an organic molecular reactor that can generate phase transition systems with a variety of controllable molecular inputs, accompanied by free energy sources e.g. of simulated stellar radiation, spark discharge, lost city vent type chemical interfaces and magneto-chiral evaporating shorelines that can be sampled on a real time basis by automated gas chromatography and mass spectrometry as a tuned evolving system.

The laser, superconductivity and superfluidity are examples of highly coherent quantum systems, whose effects are evident at the macroscopic scale. The laser also demonstrates macroscopic multi-particle entanglement at ambient temperatures. The classical electromagnetic field also exhibits macroscopic quantum coherence. The most obvious example is the carrier signals for radio and TV, which satisfy Glauber's (1963) quantum description of coherence.

Quantum coherence has been shown to be equivalent to quantum entanglement in the sense that coherence can be faithfully described as entanglement, and conversely that each entanglement measure corresponds to a coherence measure (Tan & Jeong 2018). A common misconception of biological processes is that they are fundamentally classical in nature and that the law of mass action will prohibit quantum phenomena which will become thermodynamically

overwhelmed by interactions which will destroy any quantum coherence at the warm wet ambient biological temperatures of 25°C, but this is an unjustified conclusion, as we shall see.

Fig 108a2: The game of life consists of a 2-D rectangular field of cells updated by the rule that any cell with 2 or 3 live neighbours remains alive while one surrounded by 3 live cells also becomes alive. This results in a critical dynamic at the edge of discrete chaos where any grid of cells has the capacity to form a universal computer and/or reach unlimited scales of complexity. These are illustrated (a) in a simulation of a computational CPU, (b) in terms of a series of self-propagating organismoids, (c) by a disordered partially symmetric assembly generating a series of gliders, with fractal details inset in (c2) and (d) by a large glider acting as a generator for an ensuing slip-stream of clouds of persistently active cells.



Biology is rich with phenomena at the quantum level, which are essential to biological function.

Protein folding is a manifestation of quantum

computation. The protein folding problem is solved biologically through each molecule being effectively in a superposition of states which can use wave tunnelling to reach an optimal active conformation. Enzymes likewise invoke quantum tunnelling to enable transitions through their substrate's activation energy barrier to form the products, thus accelerating the reaction rate by orders of magnitude. Research confirms that the conscious brain can detect single photons and is able to amplify sensitivity given previous threshold input (Tinsley et al. 2016, Takeshita et al. 2017).

Quantum entanglement has been claimed to be behind the way migrating birds navigate in the magnetic field (Giachello et al. 2016, Paul et al. 2017, Hiscock et al. 2016, Gunther et al. 2018). When a spinach photosynthetic active centre absorbs a photon, it has also been suggested that the excitation's wave function performs a spatially parallel quantum computation, which enables the excitation to travel down the most efficient route to reach the chemical reaction site (Hildner et al. 2013, Romero et al. 2014), however photon absorption in photosynthetic bacteria involves pairs of excited proteins which enter into a superimposed vibrational state, in which one or the other becomes activated (Maiuri et al. 2018, Thyryhaug et al 2018, Duan et al. 2022) with excitons having ultra short time scales.

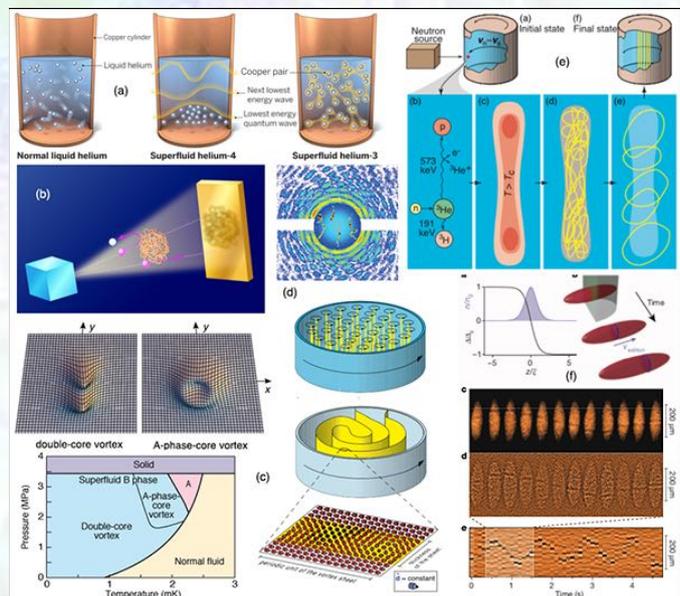
Danah Zohar (1990) in "The Quantum Self" has also drawn attention to ways in which quantum phenomena could arise in the brain, including the coherence states proposed by Herbert Frölich (1968, 1977, 1983, 1988) which have received some experimental support (Katona et al. 2015), particularly in systems driven far from equilibrium (Zhang et al. 2019). Catecholaminergic Neuron Electron Transport (CNET) is a hypothesised neural signalling mechanism in

catecholaminergic neurons that would use quantum mechanical electron transport. Electron tunnelling occurs in ferritin, an iron storage protein that is prevalent in those neurons. The hypothesised function of this mechanism is to assist in action selection. The mechanism itself would be capable of integrating millions of cognitive and sensory neural signals using a physical mechanism associated with strong electron-electron interactions (Rourke 2019, 2020). Fisher (2015) has also speculated that phosphorus and in particular $\text{Ca}_9(\text{PO}_4)_6$ calcium phosphate Posner's clusters might play an integral role in neural processing using quantum coherence. Estimates of coherence time vary from 105 seconds (ibid) down to 60 sec (Player & Hore 2018), but may be inconsistent with evidence from Ca^{++} dynamics not correlating with consciousness (Chen et al. 2020). We have also seen specific quantum theories of consciousness such as those of Hameroff & Penrose (2014) and Freeman and Vitiello's (2016) dissipative quantum model of brain dynamics, based on attractor dynamics and the interaction of quantum fields with water and the cytosol.

Symbiotic Existential Cosmology's approach focuses on edge of chaos dynamics as a transition to quantum sensitivity, through "excitons" distinguished from one another by tuneable wave phase coherence between continuous field voltages and neuronal action potentials, complemented by neuronal thresholds and ion channel activations as a process driven by self-organised criticality, leading to quantum sensitivity. None of these need to operate in an atmosphere of complete isolation from quantum decoherence in the "warm wet brain". They derive their basis from corresponding excitations in single celled eucaryotes, so the key step is the sensitivity of edge of chaos excitation in the single cell to quantum level changes e.g. in the ion channel, associated with sensing external quantum phenomena, from light (photons), sound and vibration (phonons), orbital interactions (olfaction) and electromagnetic disturbances.

The emergence of organismic consciousness is an evolutionary process. The brain inherited the dynamics to make our form of subjective consciousness possible long before multi-celled organisms evolved. LECA, the founding single-celled eucaryote already possessed the G-protein linked receptors found in the brain, and going even deeper -- LUCA the last common ancestor of all life, possessed a chemiosmotic excitable membrane, enabling chaotic sensitivity in the butterfly effect during bursting and beating. In the context of animal brains, these in turn, lead to phase-front processing, which forms a representation of the same dynamics involved in quantum measurement, bringing quantum entanglement into the dynamics, driven by self-organised criticality at tipping points, running from individual ion channels to whole brain dynamics, in a coherent system reaching a complexity unique in the universe.

Fig 108b: Diverse properties of superfluidity and quasi-particles in liquid helium. (a) Helium becomes liquid at 3-4 K and at much lower temperatures enable the coherent waves of superfluidity due to Bose-Einstein condensation. Superfluid phases in ^4He (2.17 K) and ^3He (1mK), once Cooper-pairs have been formed. (b) The quasi-particle experiment showing both reflected "holes" and the shadow of transmitted particles on permitted orbits (Noble et al. 2022, Eltsov 2022). (c) Quantum turbulence in rotated superfluid He consists of lattice of quantised vortices linked in vortical sheets (centre), turning with the cylinder walls (Lounasmaa & Thuneberg 1999). (d) X-rays reveal tornado-like vortices swirling in a droplet of ^4He (Cho 2015) (e) Mini-bang experiment modelling the origin of the universe in superfluid ^3He (Ruutu et al. 1996). (f) High-mass solitons generated in superfluid ^3He (Yefsah et al. 2013).



To gain a view of the potential for emergent quantum phenomena, even in apparently simple monoatomic environments, we now turn to liquid helium 3 as an oracle for the possibilities that arise in an ultra-cold environment where there are a few interfering thermodynamic interactions. ^3He has a fermionic nucleus of two protons and a neutron, and two orbital electrons, thus becomes a fermionic superfluid, that displays a variety of unstable quantum phenomena illustrated in fig 108b, including quasi-particle states, quantum turbulence, high mass solitons and cosmic string like defects. Superfluid ^3He consists of Cooper-pairs of atoms entangled in the same wave function, just as are the electrons in solid-state superconductivity, with residual unpaired complexes of atoms forming quasiparticles. This, unlike ^4He which becomes a bosonic superfluid, generating Bose-Einstein condensates, results in a situation akin to spin glasses (Oppermann & Rosenow 1996) possessing devil's staircase fractality (Çağlar & Berker 2017), in which some quasi-particle states in the medium can be forbidden to enter, if they come too close to an

obstructing superfluid tangle resulting in reflection of a quasi-particle “hole”. This phenomenon was clearly demonstrated by immersing a micro-experiment in which a source of quasi-particles generated by disturbing the medium can be either reflected off a superfluid tangle caused by a wire loop if they pass too close, otherwise passing on to the photographic plate, showing the shadow of the particles that didn't become deflected (Noble et al. 2022, Eltsov 2022).

We now transfer our focus to the biological realm of ambient thermodynamic temperatures around 25°C and the unique properties of liquid water, in relation to biological and neurodynamic processes. It is clear that these temperatures do not support the relative entropic isolation of ultra cold-state physics, but may nevertheless invoke unique quantum properties of their own. It should be noted that the fact that the most utilised high temperature superconductor $\text{Bi}_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_{10}$ (BSCCO), becomes superconducting at 110°K, well above the 77°K of liquid nitrogen and far above the 4.15°K for mercury, and that significantly higher temperatures have been claimed, demonstrates that entangled pairs can remain robust at much higher temperatures than absolute zero, showing that nascent possibilities may also exist for quantum processes in neurodynamics at biological temperatures.

Differential electronegativity in the first row elements CNO induces a symmetry-breaking between the non-polar C-H bond and the increasingly polar N-H and O-H (fig 108c(j)). This results in phase bifurcation, dividing the environmental medium into polar (aqueous) and non-polar (oily) phases in association with low-entropy water bonding structures induced around non-polar molecules. This is directly responsible for the development a variety of structures, from the membrane in the context of lipid molecules, to globular protein enzymes and nucleic acid base-stacking.

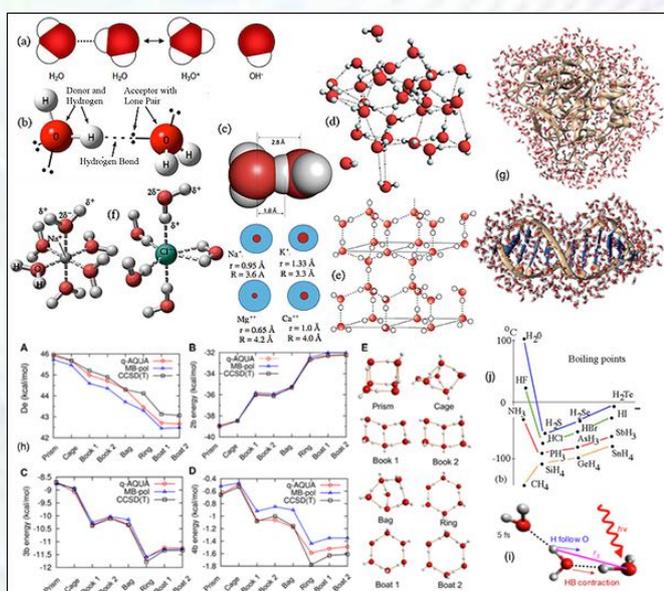


Fig 108c: Optimality of H_2O demonstrated in its varieties of interaction: (a) Dissociation into acidic and basic ions. (b) Hydrogen bonding into the oxygen lone pair. (c) Geometry of the H-bond, (d) Water's high boiling point is a function of H-bonding in which 85% of molecules at room temperature are caught in a bonding lattice. (e) The H-bonded crystal structure of ice, which is both less dense and more ordered than liquid water, as reflected in liquid water extreme specific heat (right). (f) Polar bonding of water molecules with positive and negative ions results in larger hydrated ionic radii, with naked and hydrated ionic radii shown centre. (g) Water structures surrounding the proteins, nucleic acids and phospholipids is pivotal in their biological structures, involving an interplay between polar properties of water and non-polar moieties of amino acids and nucleotide bases to form protein micelles, nucleic acid helices and the membrane structures of the living cell. (h) Many-body representation up to the four-body interaction, benchmarked for the isomers of the water hexamer of the Prism, Book, and Cage isomers (Yu et al. 2022). (i) Many anomalous properties of liquid water originate from

its well-connected hydrogen bond network, including unusually efficient vibrational energy redistribution and relaxation. Shown is a transient hydrogen bond contraction of roughly 0.04 \AA , followed by a thermalisation (Yang et al. 2020). (j) Water's unique bonding structure is also reflected in its high boiling point.

Water is one of the most important, yet least understood, liquids in nature (Yang et al. 2021). It has the highest heat capacity of all liquids, with a specific heat capacity of $4.186 \text{ Kj/g}^\circ\text{C}$ at 20°C , with ice at -1°C , 2.093 compared with kerosene 2.01 , copper 0.385 , mercury 0.140 and proteins (lysozyme 1.483). This reflects the very large number of H_2O quantum modes that can become thermally excited. Liquid water consists of a dynamic weak bonding structure, in which around 82% of the molecules at any time are bonded in locally solid configurations (Yu et al. 2022). It also contains holes and multiple liquid phases (Huang et al. 2009, Nilsson & Pettersson 2015).

Critical in this process are the optimal properties of H_2O among all molecules, as a polar H-bonding and ionising medium, making possible in turn polarity interactions, aqueous acid-base bifurcation, ionic solubility and hydrogen bonding. The optimal nature of water as a hydride is illustrated in boiling points (fig 108c(j)). Water provides several other secondary bifurcations besides polarity. The dissociation $2\text{H}_2\text{O} \leftrightarrow \text{H}_3\text{O}^+ + \text{OH}^-$ lays the foundation for the acid-base bifurcation, while ionic solubility generates anion-cation. Many key properties of proteins and nucleic acids, are

derived from water bonding structures, in which a counterpoint of H-bonding and phase bifurcation effects occur, determining the form of the alpha helix and nucleotide base pairing.

Hydrophilic-non-polar bifurcation is central to the tertiary structures of globular proteins as 'micelles' and helices and hairpins of RNAs and DNA. The solubility, or otherwise, of a variety of molecules and ions is derived from the energies and entropies of their induced water-bonding structures. Polymerisation of nucleotides, amino-acids and sugars all involve dehydration elimination of H₂O, giving water a central role in polymer formation. It has also been suggested water contains quantum-coherent domains, in association with boundaries such as macromolecules and membranes.

Complementing this is the fact that membrane excitability and neurodynamics involves movement of ions and ion transport, both generating and responding to electromagnetic fields. The dominant isotopes of H⁺, Na⁺, K⁺ and Cl⁻ are all fermionic ions, since they have even numbers of neutrons and orbital electrons (once one electron escapes or is caught to form the ion) and an odd number of protons, enabling both bosonic excitations and fermionic effects.

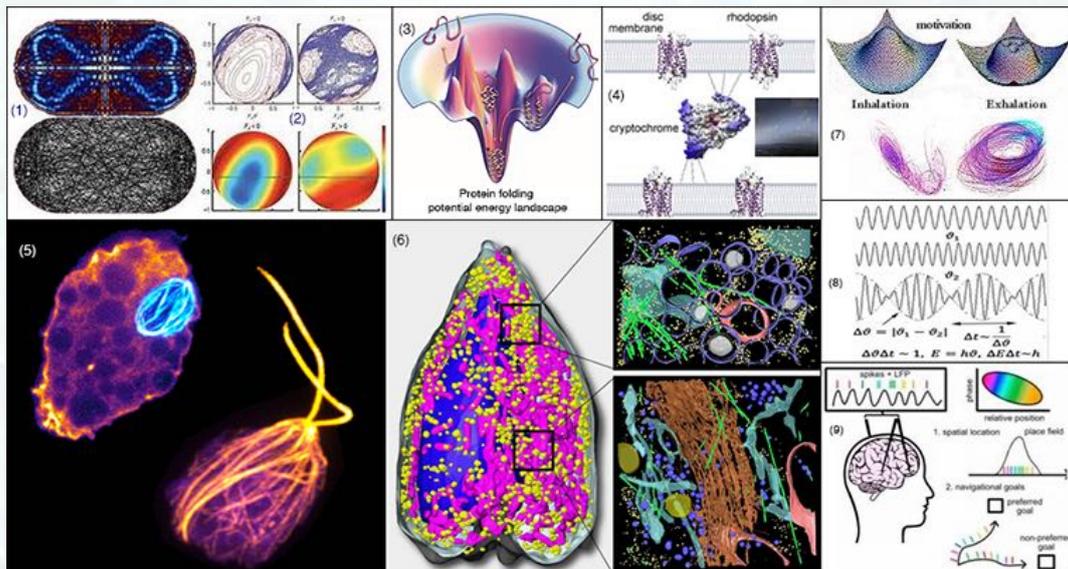


Fig 108d: (1) Quantum suppression of chaos in wave function scarring by a classical repelling orbit. (2) Quantum kicked top has a chaotic regime resulting in entanglement between orbital activation and nuclear spin. (3) Proteins have a funnel-shaped energy landscape with many high-energy, unfolded structures and only a few low-energy, folded structures. Folding occurs via parallel microscopic trajectories via quantum tunnelling. (4) Bird magnetic navigation is mediated by quantum mechanical, long-lived spin coherences in realistic models of cryptochrome, providing the necessary precision (Hiscock et al. 2016). (5) The close-to-founding eucaryote excavate *Naegleria gruberi*, which diverged from metazoa over a billion years ago, has both amoeboid and flagellated modes, and already contains actin and microtubule cytoskeletons, mitotic and meiotic machinery, suggesting cryptic sex, several transcription factors and a rich repertoire of signalling molecules, including G-protein coupled receptors, histidine kinases and second messengers including cAMP – many features essential for neuronal activity. Mitotic microtubules in blue and flagellar in yellow (Velle et al. 2022). (6) A 3D volumetric view of a pancreatic beta cell obtained using soft x-ray tomography, with the distribution of insulin granules (yellow), mitochondria (pink) and the nucleus (blue) highlighted. The boxed regions point to structural details of these regions obtained using cryo-electron tomography illustrating the fractal complexity of eucaryote cell organelles (White et al. 2020). (7) Transitions in an out of chaos in brain dynamics. (8, 9) Phase coupling between action potentials and tissue continuous potential waves realised in the EEG have homology to quantum measurement through wave beats.

If we now turn to tissues such as the cerebral cortex, [fig 51](#) shows that biological tissues are the most complex form of matter known in the universe, with diverse electrochemical and biochemical properties and hand-shaking interaction on all fractal scales, from the molecular level, through molecular complexes such as proteins, nucleic acids and ribosome, to cell organelles from the ribosome to the membrane, endoplasmic reticulum and nucleus to organs and organisms. These structures are complemented in nervous systems by patterns and pathways of electromagnetic excitation from individual action potential to tissue spanning waveforms in electrical potential in a state of mutual interaction. Pivotal to these are phase tuning between action potentials and tissue potential wave phase noted in [fig 78\(4\)](#), and transitions in and out of chaos in edge-of-chaos dynamics, noted in [fig 78\(1\)](#) and [fig 35\(right\)](#).

Phase tuning represents a potential form of quantum measurement of the brain's own excitations noted in [fig 71\(c\)](#), where the uncertainties of time and energy are related through frequency of wave beats against a reference wave.

Cerebral neurodynamics has access to this, in view of action potential emission primed by the continuous tissue potential wave phase in a way which is not available to physicists who lack a quantum reference wave. We have already seen that classical radio waves emitted by transmitter towers satisfy the conditions of quantum coherence so this relationship is potentially not just an analogy. Pivotal here is the relationship between decoherent excitations regarded as local processing and the more coherent global excitations associated with conscious brain states. This is in turn coupled to edge of chaos brain dynamics, which in self-organised critical states leads to whole excitable neurosystems becoming potentially sensitive to quantum instabilities, which due to the fractal architecture and dynamics of neurosystems, result in hand-shaking from the level of the ion channel through individual neurons to whole brain states during phase transitions from chaos to order, in decision-making, insight and perception. In this process the conscious state is linkable to the greatest complex of coherent oscillation in the brain dynamic, interacting through tuned degrees of entanglement with other partially decoherent dynamics, which may become part of the central conscious flow through phase modulation. This quantum dynamics at the edge of chaos may have anticipatory properties essential for survival, by forming a wave function surrounding the present, incorporating the immediate past and future in the emergent flow of conscious experience, avoiding the snake's strike in the immediate moment.

When we look back at quantum chaos in fig 57(1), we can see that the quantum suppression of chaos in closed systems is breached in the quantum kicked top when two quantum systems (orbital energetics and nuclear spin) have mutual coupling and become entangled. This leads to complex interactive processes in neural tissues, which have climax fractal complexity in that the systems concerned consist of overlapping coherent waveforms, that like Cooper-pairs can display resistance to simple thermally based decoherence and may rather couple to specific interactive modes defined by the precise context of a given excitation, limiting the ways decoherence can intervene and resulting in more structured forms of quantum interaction, akin to the properties of helium 3 quasi-particles, solitons and cosmic string phenomena. This combined with the fact that brain processes do not involve ID (independent identically-distributed) measurements convergent to the Born probability interpretation, due to their continually

changing contexts, means that, even at 25°C, the conventional neurodynamics in the conscious brain may well be fully quantum in nature as it stands, and not require special quantum avenues, such as Hameroff and Penrose (2014).

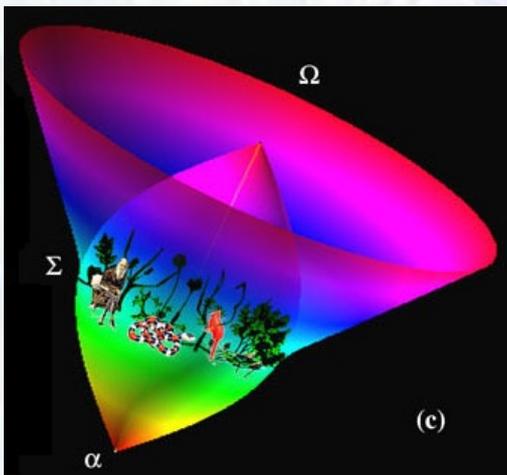


Fig 109: Paradise on the cosmic equator. According to the anthropic principle, existence of conscious observers is a boundary condition. Life can exist only once cosmic evolution has generated the elements of life and evolution has then a chance to reach an organismic climax.

The universe is thus a sentient cosmos, crowned by quantum consciousness evolving in such a way as to make possible a fully intimate connection between subjective and objective aspects of reality, in which existential "isness" and objective behaviour reach a consummation in the sentient brain in conscious perception and volitional will. Subjective consciousness can then intentionally affect the physical universe, just as we experience it to do, by collapsing the

wave function of the "multiverse" of quantum probabilities into the line, or course, of cosmic history we experience, through Schrödinger's cat paradox. This is what we experience as conscious decision-making, affecting the world around us, for better, or worse. This in turn means that, as a consummating manifestation of cosmic sentience, we have a personal and collective responsibility to fulfil this emergent quest and to preserve and unfold the diversity of life in the universe and this is what the meaning and purpose of life is all about. It is we ourselves, the universe's sentient beings, who form the consummating manifestation of the interactive catastrophe set off by symmetry-breaking in the cosmic origin and it is we who must needs protect and unfold the diversity of life and consciousness, so that the process can reach ultimate fulfilment. The buck stops with us and the fate of life within the universe becomes our personal responsibility to protect.

This cosmology, by its structural design presents a unique form of anthropic cosmology. The anthropic cosmological principle states that our location in the universe is necessarily privileged to the extent of being compatible with our existence as observers, given that we could only exist in a type of universe capable of developing and sustaining sentient life. The strong form says the universe (and hence the fundamental parameters on which it depends) must be such as to admit the creation of observers within it at some stage. Proponents of the anthropic principle argue that it

explains why this universe has the age and the fundamental physical constants necessary to accommodate conscious life, since if either had been different, we would not have been around to make observations. Anthropic reasoning is often used to deal with the notion that the universe seems to be fine tuned in terms of the relative strengths and interactions of the four forces, in such a way as to make conscious observers possible.

The phrase "anthropic principle" first appeared in Brandon Carter's (1973) contribution to a symposium honouring Copernicus's 500th birthday. He articulated the Anthropic Principle in reaction to the Copernican Principle, which states that humans do not occupy a privileged position in the Universe. "*Although our situation is not necessarily central, it is inevitably privileged to some extent.*" He defined two forms of the anthropic principle, a "weak" one which referred only to anthropic selection of privileged spacetime locations in the universe, and a more controversial "strong" form that addressed the values of the fundamental constants of physics. In effect the symbiotic cosmology "inverts" the Copernican principle by stating climax consciousness provides the ultimate privilege, by enabling the universe as a whole to become conscious.

The weak anthropic principle (WAP) states that the universe's ostensible fine tuning is the result of selection bias (specifically survivorship bias). Most often such arguments draw upon some notion of the multiverse for there to be a statistical population of universes to select from. However, a single vast universe is sufficient for most forms of the WAP that do not specifically deal with fine tuning. The strong anthropic principle (SAP), as proposed by Barrow & Tipler (1988), states that the universe is in some sense compelled to eventually have conscious and sapient life emerge within it. The Wheeler participatory anthropic principle (PAP) states that only universes with a capacity for consciousness can exist. Wheeler states: "*We are participators in bringing into being not only the near and here but the far away and long ago.*"

On Qualia

Symbiotic Existential Cosmology avoids attempting to describe subjective qualia as an analytical issue because, although it proposes primal subjectivity, it avoids any kind of formal descriptive protopsychism as any kind of structured description, as a cosmological misconception.

The physicalist viewpoint says we have trichromatic colour vision because there are three photoreceptors and the qualia form a three dimensional colour space as part of the neurodynamic analysis of photons of a single spectrum of frequencies which we don't see, but only, like a cat paradox experiment, sample as particles through rhodopsins. This means that the neurosystems have evolved to construct a 3D colour space to represent the incoming excitations. A few people have tetra-chromatic colour vision and some, particularly women who have two X-chromosomes and so can have two alleles for say the green receptor, claim to have scintillating colour vision and become artists, but they have no means to give expression to a four-dimensional colour space. Like the whisker barrels of the mouse and our dependence on orchestration of major neurotransmitter types like serotonin, GABA and glutamate to organise embryonic cortical connectivity, three colour vision space may be genetically based.

Symbiotic Existential Cosmology changes this picture, so that intentional subjectivity plays a central role in the subjective conscious volitional responses of subjective conscious intentionality changing the physical universe through our behaviour to support our survival. The brain then acts as an environmental boundary condition filter on this interactive process, so that when we hear a hiss in the dappled forest canopy, our subjective consciousness integrates all this incoming sensory "information" into the flow of experience, partly from memory, but also from the "anticipatory quantum of the conscious present". We anticipate a snake strike and maybe look to see the source but anyway jump out of the way and survive. So the Symbiotic Existential Cosmology view is subtly different from physicalism because intentionality is subjective but the palette of qualia is still driven by the filters of neurodynamic environmentally adapted processes, rather than pan proto-psychic entities in their own right, which are like a form of pseudo-physicalist mentalism.

When we take psychedelics, this all begins to make more sense because consciousness becomes synaesthetic, so sounds and colours intermingle in a single consciously perceivable mode, in which visual and auditory senses make an interplay of sonorous kaleidoscopic visions that can open out into whole dream-like visions accompanied by vast vistas and exotic scents. I remember tripping and smelling the overwhelming aroma of fried chicken, because the candle in the room was smoking, so we turn all these into something that is recognisable.

Memory is not the defining determinant of conscious experience. The stream of consciousness just uses brain-derived memories to form a contextual backdrop for actively anticipating environmental uncertainties through subjective experience and applying volition over the physical universe to make hay while the sun shines.

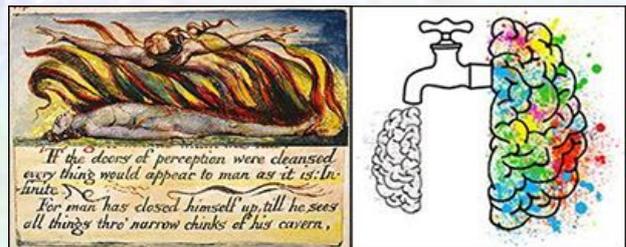
Sound is a time-evolving one dimensional frequency space taking the form of a wavelet transform that can become symphonic. Sight is a three dimensional spatial plus three dimensional colour space with other attributes like 3D edge detection and object reification thrown into the mix. All of these look and feel like the adaptive components of an internal model of reality constructed by our neurosystem. But then enters olfaction, where we have around 150 receptors and dogs have hundreds to 1000, forming the diffuse multidimensional experience we experience intuitively as delicate scents to overpowering odours. Benedictine liqueur is a good example, with about 22 different intensely olfactory molecules, each with their own receptor binding, so the neurosystems that analyse this are impossible to classify as red or blue in any structured way, yet we have a clear capacity to sense odours and scents.

Symbiotic Existential Cosmology says that subjectivity has to be optimally compliant to determined physical boundary conditions imposed by the quantum physics of the environment in terms of orbital bonding, phononic resonances in the cochlea and photon sampling in the retina, otherwise would begin to impose its own “psychic” constraints, which would inhibit biospheric adaption and organismic survival and cause potential causal conflict with brain processing. On the other hand it is able to effect brain dynamics when it is in an unstable ceritical phase transition in which outcomes are not pre-defined and may reflect root quantum uncertainty. Symbiotic Existential Cosmology’s approach to this is that physical boundary filters induce a complex adaptive subjective response, which we envision as the flow of subjective experience of reality, as a flow of environmentally adapted “hallucinations” that we all depend on, but are part of a much larger conceivable universe of which William Blake said:

“If the doors of perception were cleansed, everything would appear to man as it is infinite”.

Again when Blake says:

“We are led to believe a lie when we see with and not through the eye that was born in a night to perish in a night while the soul slept in beams of light”



He is not saying "Reality is not what you see but that which sees" as Deepak Chopra put it – that consciousness IS reality, or makes reality on its own, although it IS primary, but that it's a lie when we restrict ourselves to perceiving only the physical world, ignoring the visionary state. Seeing with is perception, seeing through is vision. The “soul” i.e consciousness can also see the light from within. The key is to look within, through our visionary “vision” not just assume consciousness is reality. We need to actually make the visionary journey across the Styx, not just stare at the ferry boat. So I see qualia as the residue of what we get when the infinity of the unconstrained “mind at large” is anchored down by the constraints of neurosystem adaption, not determined by the brain's neurosystems, but constrained by the boundary conditions of the reducing valve of physical perception. We have to deal with qualia as part of the vision quest and go right into it all, not try to analyse how it happens, but just go into the Nierika and see what the journey unfolds.

Multiple Minds and One World: Why SEC is ICAM

In the veridical way existential reality is generated, subjective experience is primary – 100% of our knowledge of the world around us, and of our visionary inner landscapes of awareness, are derived through our subjective conscious experiences of reality. The world around us is then realised as a sensory subcategory of these experiences, through the consensual overlap of our subjective perceptions of external realty, through which we gain a common experience of the physical world. We then interpret these as “physical existence” in a universe containing biological brains, which, like ourselves, appear also to be able to have private inner subjective experiences although we can’t directly perceive them. We may also, in meditative and entheogenic states, converge to an inner reality which we experience in the stream of consciousness, unbound by sensory constraints, in what appears to be a unified ‘cosmic consciousness’.

By contrast, the attempted construction of reality from the physical universe and its brains remains incomplete because there is no means of any explanation, or even any idea of what such an explanation would be like, concerning how the brains can also have private, integrated, wholistic subjective conscious experiences – the hard problem of consciousness research. Pure materialism thus completely fails to explain, let alone manifest, how or why we have an

inner conscious life at all, and worse still, completely denies our volitional ability to mentally affect the physical world around us, when we are intentional conscious agents having to have intentionality to ensure our survival in real time.

Notwithstanding the notion of a probability multiverse in some quantum interpretations, we experience only one world at large, in which matter is subdividable and decomposable, but we are a multitude of integrated wholistic subjective conscious minds, that can't see or communicate with one another's consciousness directly, but only through our vivacious volitional behaviour in the physical world, although telepathy may be an adventitious, if ephemeral, potentiality. Our minds, rather than experiencing physical reality, in and of itself, which consists of colourless, odourless quanta possessing no sensory features but only energy, wavelength position and inertia, perceive reality subjectively only through an internally generated model of reality providing the idealised 'hallucinatory' interior mental view we call "being conscious of our subjective experience", which extends beyond physicality, although filtered through neurobiological sensory processes such as three colour retinal vision, Fourier frequency representations of sound, multidimensional receptor olfaction and internal somatosensory 'feelings', of love and lust and longing, in a sentient 'world' of colour, sound and other subjective qualia which we cannot subdivide, but which flow through us continually in an unbroken whole. The key to all this is volition over the physical world around us – that we are subjective conscious beings possessing intentional will to act and survive as biological organisms in the physical universe.

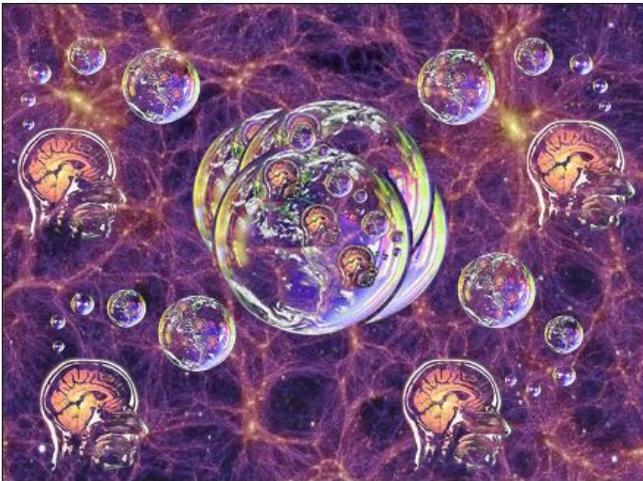


Fig 109b: Multiple subjective holistic conscious volitional minds converge to a consensus mental view (centre), of the physical world around us, involving a single divisible engulfing universe (background). In the physical view there are multiple objective brains, but each invokes a unique private conscious experience, evident only to the subject.

The relationship is not, and cannot be, a bijective duality between a single world and multiple minds, unifying the 'inner' conscious and 'outer' physical views, because there is not a simple bijective duality as a whole between the subjective and objective aspects. Strict 2-component dual aspect monism frameworks, such as Awret (2022) and Vimal (2022), cannot describe veridical reality as it is, even when they involve asymmetric dualities such as the AdS/CFT holographic

principle, or a strict bijection between individual conscious experiences and their neural physical bases. They freeze the subject-world relationship in a non-interactive bijective correspondence that doesn't adequately explain why multiple minds exist in a single universe, or how subjective conscious volition occurs veridically over physical reality, because the subjective is confined to a ghost in the machine of the brain, forced in lock-step with physical processes, making them existentially equivalent to identity theory, little different from the unconscious zombie that manifests no subjectivity at all in a pure physicalist description, despite hypothetically replicating a "brain's physical processes".

Although Awret's use of the holographic principle is a potent oracle for the complementary natures of subjective and objective, there is no evidence subjective experience is more like an abstract gravitational theory than the quantum universe we know. It is then ensnared in an eliminativist denial of volition, inconsistent with subjective empiricism and with survival of the subjectively conscious organism, in a way which cannot be directly falsified as claimed: *I am an eliminativist on free will. This position is easy to defend. I know that I have the ability to change my mind and privately so but lets not exaggerate. You seem to suggest that the indeterminism associated by the collapse provides room for consciousness to 'bias' the collapse in certain instances. The good news is its falsifiable, the bad news is that it is ridiculous.*

The claim to bias is untenable because there is no evidence subjective volition violates the Born probability interpretation yet theories, from transactional super-causality to super-determinism, could provide more subtle correlations or even causal interactions below the Born-measurable level. Awret in personal correspondence contrasts his view with Sean Carroll (2020), as allowing for a more versatile relationship, enlarging isomorphism to an asymmetric bijective duality, but at the cost of an explicit rejection of free-will:

Consciousness exists. It's real. I talk about it all the time. I asked this question to people like Sam Harris, who don't believe in free will. Have you never tried to make a difficult decision? Do you really just say, well, let the laws of physics do what they're going to do? Of course. At the level where we talk about people, we attribute choices and volition to them like we attribute conscious

experiences to them. And I'm all in favor of that. I think that they exist. They're real. They should be treated as such. That doesn't provide any evidence at all that they are not isomorphic to physical things going on in the universe.

However, the more versatile dual aspect framework of the Pauli-Jung conjecture (Atmanspacher 2012) may do so because it suggests induced, occasional, evasive mind-matter correlations, in which the physical is not completely independent of the mental, and both are not independent from the assumed reality underlying them, as exemplified by Jung's notion of synchronicity. This idea stems from the *Unus Mundus* – or “one world” of existential experience of the mediaeval philosophers that goes back to the legend of Plato's Cave. In the Pauli-Jung conjecture, the physical state is holistic before measurement, and the subjective aspect involves the unconscious emergent into consciousness, together with archetypes being open to synchronicity, or “meaningful coincidence”, being made possible by the fact that both the observer and connected phenomena ultimately stem from the same source, the *unus mundus*. Pauli in particular talks about the “autonomous activity of the soul” as “something objectively psychical that cannot and should not be explained by material causes. The room left in the versatile account allows for correlations below the level of measurable events. A hidden variable theory which determines the outcome of collapse in terms of the complex interactions of the cosmic wave function could provide just such a correlation with subjectively experienced environmental uncertainties, themselves having a critical impact on organismic survival.

Symbiotic Existential Cosmology, which likewise accepts as axiomatic primal subjectivity, in which subjective conscious volition has efficacy over the physical universe, is thus classified as ICAM – interactive complementary aspect monism because there is a single extant reality comprising the universe and all our conscious experiences, both of the physical world and of our own inner realities, which are complementary, and as Pauli has commented, like quantum complementarity, subjectivity and objectivity are mutually exclusive, although both are essential complements to sentient existence, which are not bijectively dual, but are interactively coupled, either by underlying correlations, or interactive causes, in our both possessing subjective consciousness of the world around us and executing our conscious intentional agency, in subjective conscious volition over the physical universe.

Psychedelics and the Fermi Paradox

The relationship between [psychedelics](#) and the [Fermi paradox](#), [detailed in the introduction](#), is the most controversial part of Symbiotic Existential Cosmology, so an explanation is in order. The Fermi paradox is the question: Why is there no evidence of life out there in the universe, given that from what we already know, it is a [very probable](#) occurrence? Is it because it's hiding, or because dominant cultural civilisations become unstable in evolutionary time scales and self-destruct in a [Fermi extinction](#)? Even if life is extremely unlikely in the universe as some measures suggest (Sandberg, Drexler & Ord 2018), the primary importance of protecting life on Earth is commensurately increased. Brian Cox on the BBC ahead of COP26 warned that [Earth's demise could rid galaxy of meaning](#) Brian notes on the BBC that ‘Unique events that led to civilisation mean its demise could ‘eliminate meaning in the galaxy for ever’.

Fig 110: An artist's portrait of a psychedelic experience.

The word *psychedelic* means “psyche revealing”, where *psyche* means the human mind, soul, or spirit and *dēlos* means ‘clear, manifest’. The classic 5HT_{2a} psychedelics are paradoxical serotonin receptor super-agonists that appear to induce a distinct second signalling pathway that sets off different processes from simply a surfeit of serotonin, putatively involving serotonin-glutamate receptor dimers that metabotropically modify glutamate excitation across the cortex. By contrast, both SSRI anti-depressants and entactogens affect the serotonin transporter to increase serotonin levels at the receptor, but the entactogen MDMA is not a psychedelic. It gives a strong serotonergic high amid touchy feely ‘love drug’ sensations, possibly because of secondary oxytocin effects, but not a psychedelic ‘trip’.



[Psychedelic](#) species and substances set off a flood of incoming sensory stimulation, combined with a tendency for the default mode network to go silent, resulting in the experience of ego loss, and in combination with meditative repose, can become full blown [quantum change](#) experiences, in which religious people may experience God or “divinity”

alternatively described as “ultimate reality” by the non-religious. Hence the name *enthogen* is applied to their ritual use in spiritual and shamanic contexts. Of course, in negative contexts, this can become Heaven and Hell as Aldous Huxley pointed out, so good conducive contexts are critical. But the fact that psychedelics are being used to treat terminal illness and severe depression successfully shows that, even in dire contexts, they can be very beneficial.

Psychedelics effectively induce a situation where subjective consciousness begins to derive an internal model of the reality of its own internal dynamics, invoking kaleidoscopic geometric figures and synesthesia – resonant mixed sense-mode experiences, in which accentuated daydreaming evolves into veridical visions – actual perception of observational realities ‘out there’, and finally the existential experience of union with the ‘other’ – the signature of Brahman-atman and peak accounts of near death experiences.

So while meditation alone can result in states of peaceful mindfulness and compassion and in some people mystical experience, brain studies of meditation reveal a more controlled state of oscillatory synchrony amid a sparser spiritual or mystical experience. This explains why moksha is so rare and why the Eastern tradition resorts to reincarnation to seek enlightenment in a future life cycle, although some people with conducive genetic biochemistry enter these states more often naturally and can become mystic visionaries, leading both to new religions and cultic misadventures.

Psychedelics can reveal, in far greater first-person depth and illumination, the dimensions of the visionary experience shared by religious mysticism and meditative repose, and do it in a way which is characteristic of those aspects of near death experience that take us to the very edge of existence. The psychedelic experience gained from ingesting a psychoactive species is not a false vision, or inferior to a pure spiritual experience and is modulated as part of the attentive experience of the subjectively conscious observer, who remains able to distinguish reality from fiction. Bringing all these together, we have a research recipe for the subjective equivalent of the LHC in cosmological physics. We can tie this phenomenon to edge-of-chaos modulations disrupting the perceptual filters in our neurodynamics that our evolution as a species has selected for, to confine the observed plethora of internal and external information to a vastly reduced core subset, tuned down for organismic survival.

The key markers of human selection have been Machiavellian social intelligence on the one hand and the “mating mind” (Miller 2000) on the other, where astute female reproductive choice has led to an XY-chromosomal peacock’s tail runaway of super-intelligence (Fielder & King 2017) amid the softer, kinder aspects of perpetual human sexual receptivity amid human sensual love and longing, but nevertheless, with the loss of innocence of our original virtues of verifiable trust in good character over time during our gatherer-hunter phase in small bands of people, human evolution since has clearly been towards an increasingly urban patriarchal culture of human dominance over other humans, the female sex and the diversity of nature, enshrined in the growth of the egotistical mind as an overblown survival tool turned into the pursuit of dominance and power.

Human cultures have reacted to this dilemma by altruistic punishment, asserting prescriptive highly incorrect moral cosmologies, while extolling the ideals of virtuosity and compassion. In recent form, this has led to utopian notions of humanity, combined with artificial intelligence, and technology, becoming dominant forces in the mechanistic universe, violating our symbiotic relationship with nature and woman alike, leading to the mass extinction of biodiversity and our own attrition or extinction.

In the pursuit of longevity, amid human cloning and genetic modification, those seeking human immortality are trying to turn themselves back into parthenogenetic organisms whose life span is indeterminate, but this is ultimate selfishness. No parthenogenetic species can survive long term without sexual recombination and the biosphere to support it so this is a cul de sac and evolutionary suicide, as is any form of species dominance that violates the fundamental principle of biospheric symbiosis of all species within it.

So the question remains: Why are there psychedelics and do they have a meaningful role in the evolutionary process? If we go back to biogenesis itself, we have a partially solved problem of far-from equilibrium fractal molecular chemistry breaking through to the RNA era. Nevertheless, given the organic gas clouds of Orion, the lost city vents littering the primordial olivine ocean floor and other catalytic processes, all except the hard end of intelligent designers accept that this is a natural process. Likewise for the eucaryote emergence, which after all is a symbiosis of the two complementary foundational life forms, archaea and bacteria. We also have the tendency of adventitious mutation within the biosphere’s diversity to produce a plethora of organic molecules, so it’s hardly surprising if some of these are psychedelic, in our case on Earth the classic psychedelics – psilocin, DMT, and mescaline.

But there is another side to this story. The human brain is actually an intimately coupled society of some 10^{10} neurons communicating and modulating their activity through the same core types of neurotransmitter amoeboid-flagellates evolved as single-celled organisms for social signalling. We think of the brain as predominantly electrodynamic, but it is a profusely sappy biochemical organ in which electrodynamic excitation is punctuated and mediated by biochemical synaptic transmission. The metabotropic receptors modulate key dynamical modes from direct excitation and inhibition (glutamate, GABA and acetyl-choline) through waking activity vigilance, mood and drive (nor-epinephrine, serotonin and dopamine) to the stages of light and dreaming sleep involving several of these.

An evolutionary key here is that these neurotransmitters are also formative developmental morphogens. Serotonin for example retains a similar role in human brain development to that as the fruiting tip organiser in *Dictyostellium*, extending from maternal serotonin inducing the neural crest all the way through to the ascending 5HT1a pathways fanning out across the cortex (later modulating wake and sleep modes) acting in development as primers for the cells which organise the layered structure of the cortex. This means that modulating neurotransmission can alter primal evolutionary survival modes evolved through the deep developmental roles conserved since our single celled ancestors by the same neurotransmitters

So the hypothesis connecting psychedelics and the Fermi paradox is that evolution climaxing to the emergence of a dominant cultural species like Homo involves a narrowing of the experiential filters to promote species dominance which then becomes a critical flaw, in species dominance and exploitation precipitating a mass extinction of the diversity of life through habitat destruction and the depletion of resources, in a non-renewable energy consumption and population burst, causing severe climatic change and disrupting planetary habitats on a global scale. This is the Fermi apocalypse catastrophe we are witnessing.

The natural antidote to the destructive Fermi apocalypse is that the kind of climax driven by a dominant cultural species also occurs at peak biodiversity, after a long period of fecund prosperity, in our case since the Tertiary-Cretaceous extinction, and this results in a 'salting' of the biosphere with biomolecules which modulate the neuronal activity of a dominant species in such a way as to carry its conscious neurodynamics closer to the climax edge of experiential chaos than its own evolutionary species selection became adapted for. This is then a way the fullness of evolutionary climax comes to reestablish the symbiotic biosphere, because changing the consciousness of the dominant species liberates it from its evolutionary constraints. Because any dominant cultural species seeks to understand what the hell it is doing in the universe, this becomes a catalyst for its own self-discovery.

This is not a magic process of divine psychedelic intervention, but might come to explain the other good half of the Fermi paradox. A dominant species which discovers its psychedelic species and learns to use their paradoxically disturbing properties, then begins to protect and even cherish its biosphere as sacred and integral to the evolving cosmic "design", for the lack of a better word, and thus, instead of proudly announcing its dominant existence to all comers, or failing one of the many triple witching hours of its own cultural, political, economic and environmental instabilities, instead settles into discovering the abyss of its own conscious experience as a convergent symbiosis with the conscious universe as a whole.

This is what I term cosmological symbiosis, thereby settling into a much more cerebral perennially immortal existence, complemented by the use of renewable technology and adroit strategies to protect the biosphere from astronomical crises, such as massive impacts and nearby supernovae, by careful use of its solar system habitats to avoid putting all its eggs in one basket and to remain concealed in the universe at large, to avoid predatory exploitation from without. This is the Fermi paradise on the cosmic equator in space-time.

In this sense, the notion of union with the cosmic mind is also not a magical process, although it is magical to experience and spiritual to the core. It is simply allowing our own subjective consciousness to reach edge of chaos climax while running egoless in neutral, thus enabling a rapprochement between the organismic brain and the foundational dynamics that invoke the mind at large, as an archetypal dynamical system, expressing in the fullest and most resonant way, the consciousness of the universe, expressed through its climax biota. The differences from traditional spiritual realisation can also be seen in its reverence of nature as sacred consistent with the Weltanschauung of Immortality, rather than the mind-sky view of cosmic transcendence over nature, all too anthropomorphically seeking only human transfiguration in enlightenment in the Eastern traditions, where nature is just degenerate sentient beings and the biological and genetic basis as nature's embodied sacredness is set aside. So the healing is this.

Evolution of the biosphere has a safety valve for the human egoistical destruction of Gaia. It's just a product of the sheer adventitious fecundity of evolution, not a magical phenomenon. But it has the capacity to bridge the gap between humanity as unnatural evil and humanity as "we are nature". This is proven by the fact that the very substances suppressed by Western culture in the 1960s, in an echo of the Inquisition and witch hunts, have now become a cutting edge treatment for severe depression and the existential nightmare of terminal illness.

Now here is the deep paradox. The Western religious tradition, sourcing from Yeshua, is a sacramental tradition. The synoptic gospels claim Jesus instituted the carnivorous sacrificial sacrament of his own flesh and blood in the last supper. *"And he took the cup, and when he had given thanks, he gave it to them: and they all drank of it. And he said unto them, This is my blood of the new testament, which is shed for many."* But where did this historical disjunct, so un-Hebrew arise? We have to look further to his all too Dionysian miraculous behaviour supported by the women of Galilee "out of their very substance". The entire mission is an apocalyptic presentation of Dionysian tragic theatre, inherited from the sweeping victory of Alexander the Great, leaving in his wake a Greek culture that extended across Syria and Jordan to the Nabatean cultural climax in Yeshua's time, where Dhushara became his manifestation. Dionysus is the god of wine and altered states supported by the maenads whose pupils were dilated with belladonna.

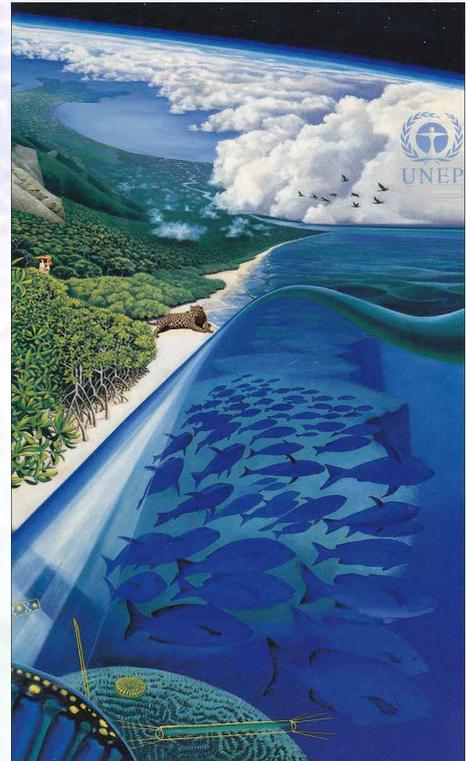
I didn't invent psilocybe mushrooms, the evolutionary biosphere did. I concealed my use of them for 50 years and went to Jerusalem in the millennium to pronounce the epoch of the Tree of Life because they "told me so" a decade and a half before, but now they have been researched scientifically and found to have genuine transformative value.

We all have to accept the fact that the founding religion of Western culture is sacramental and it is no coincidence that I now stand here as the spokesperson for the Tree of Life holding the sacraments of the biosphere. That is the healing because it is the scientific way for egotistical human nature to become liberated in time to save life as a whole. This doesn't mean everyone should be taking psychedelics. It just means that they are part of the solution and when they are accepted as such, a new horizon beckons. Enough of a good part, given their newly recognised status to make a real transformation of human culture for the better.

My experience of Brahman in the moksha epiphany that triggered this cosmology was not a false vision. I stand by the Upanishads as an empirical account! I stand likewise by the Gospel of Thomas as a personal statement of Yeshua's visionary nature. I stand also by Maria Sabina and Gordon Wasson.

Fig 110b: A picture of symbiotic climax in the biosphere. The cover of UNEP's Global Biodiversity Assessment 1995, for which I was a reviewer, with mushroom and jaguar added to represent land animals and fungi.

My June 2021 experience was all the more genuine because I am an extremely level-headed scientist, fully aware that I have intentionally taken my conscious neurodynamics to the edge of chaos to liberate it from the filters of my own evolutionary confinement. I can then return to the fold and set to work to discover what kind of universe can actually make this all possible in scientific terms. Instead of a raft of religious edicts and doctrine, and a lifeless mechanistic physical account. Humanity gets the living cosmology of quantum reality and conscious existence that is empirically verifiable and detailed across a wide spectrum of disciplines.

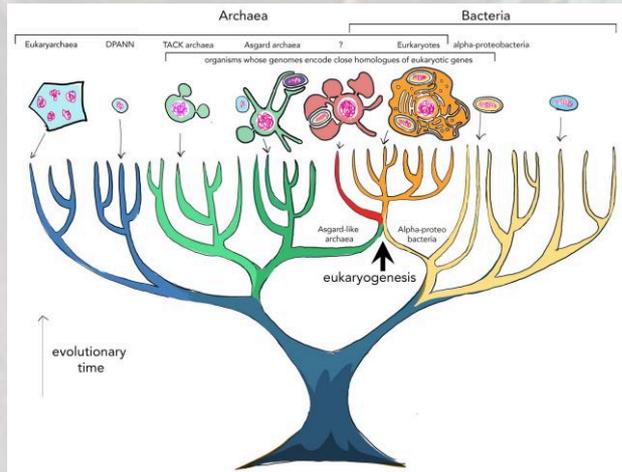


The Evolutionary Landscape of Symbiotic Existential Cosmology

Symbiotic Existential Cosmology is fundamentally a **profoundly evolutionary cosmology**, in which the integrative nature of both genotype and phenotype, modified only by small mutational changes, ensures the biosphere as a whole retains unfolding climax stability over evolutionary and cosmological time scales. In a sense it is **an account of a voyage**, just like Darwin’s voyage on the Beagle, leading to “The Origin of the Species”, except that this written work is an account of a vision quest into all the subjective, physical, cultural and religious aspects of the existential reality of conscious existence in the natural universe. It is an innovative evolutionary quantum cosmology in which:

- (1) **Mutations** are viewed as **quantum uncertain transformations** following a non IID sequence which fails to converge to the probability interpretation, modulated by natural and sexual selection, rather than simple randomness (Santiago-Alarcon et al. 2020, Monroe et al. 2022).
- (2) **Major evolutionary transitions**, including **abiogenesis**, the **great oxygenation**, the **eucaryote endo-symbiosis** the **Cambrian radiation** and our **cultural emergence**.

Fig 111: The Tree of Life merger that made us in the eucaryote endo-symbiosis (Baum & Baum 2020).



- (3) **Natural and sexual selection** of metazoa is mediated by an animal’s **subjective conscious volition over the natural world**. Sexual selection and its mutual runaway effects in a Red Queen race (Ridley 1993) have also had profound creative influences on evolution pivotal to human intelligence and cultural emergence.
- (4) **Modular regulatory evolution**. See figs 127, 130 & 100, show that transposable elements and endogenous retroviruses which occupy nearly half the human genome, are both capable of mutational insertion of new elements as well as having been utilised in essential symbiotic roles, complemented by supergenes (Arnold 2022).
- (5) **The organismic development process** is also coupled to genetic evolution (evo-devo). Fig 120 shows this in homeotic gene evolution underlying segmental development across the metazoa, fig 112 shows it in non-coding DNA and fig 122 also shows the approach in the evolution of the human brain as a social neuronal organism.
- (6) **Biospheric symbiosis**: Natural and sexual selection results in the fittest biospheric symbionts, not the most competitive dominant species, exemplified by the eucaryote endo-symbiosis and multiple predator-prey and parasite-host relationships rising to climax diversity.
- (7) **The mutual coupling of genetic evolution to cultural evolution**, with the emergence of culture and language, has resulted in a multilevel selection paradigm in which cultural elements reinforced across generations, also influence genotype and organismic phenotype, and vice versa.
- (8) **Cosmological symbiosis** in which **gene-culture-biosphere co-evolution** ensures biospheric and human survival.

Gregory Bateson (1972) viewed all three systems of the individual, society and ecosystem as together a part of one supreme cybernetic system that controls everything instead of just interacting systems. This supreme cybernetic system is beyond the self of the individual and could be equated to what many people refer to as God, though Bateson referred to it as Mind.

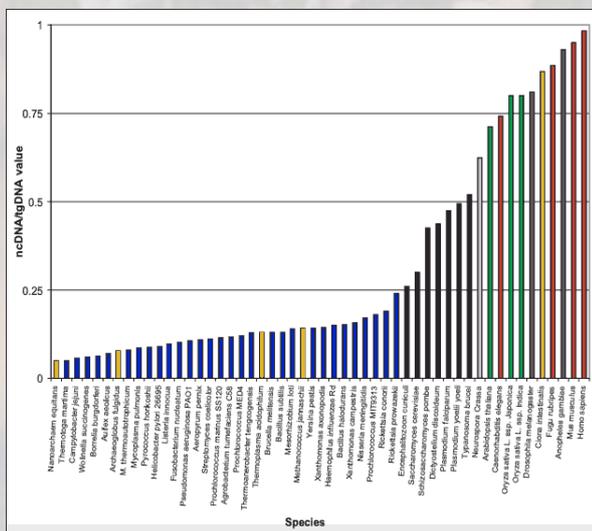
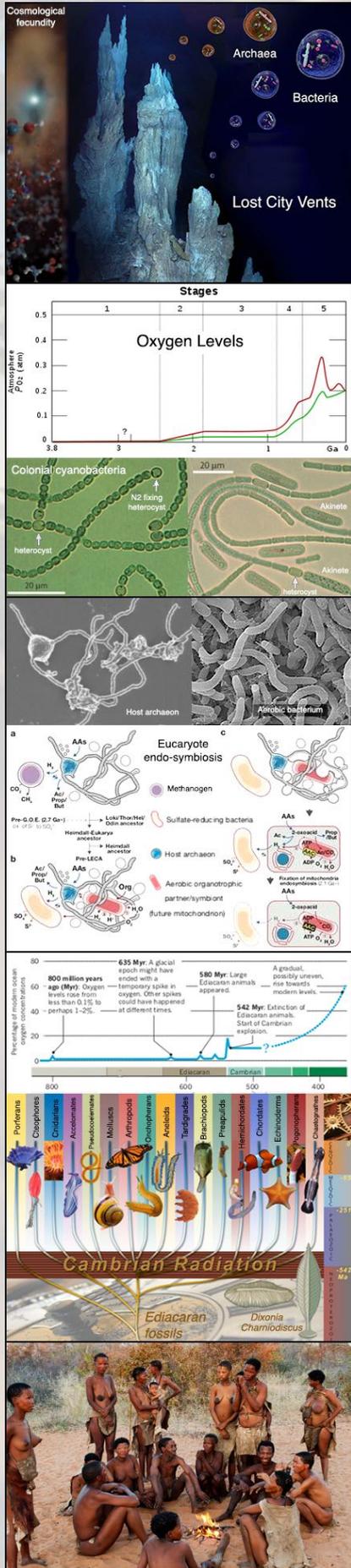


Fig 112: Increase in the ratio of noncoding DNA to total genomic DNA correlates with increasing biological complexity from 0.05 in *Nanoarchaeum* to 0.983 in *Homo*. Archaea in yellow, bacteria in blue, unicellular eukaryotes in black, the fungus *Neurospora crassa* in light grey, plants in green, non-chordate invertebrates in red, the urochordate *Ciona intestinalis* in yellow, and vertebrates in dark grey. It is key to understanding how higher organisms, through to ourselves, were able to evolve, because single base pair mutations of non-coding DNA are less disruptive, as they don’t have to be translated and make only a differential change to RNA and promoter binding. Complementing this, natural and particularly sexual selection is both phenotypic and conscious (Taft & Mattick 2003). This means that humans have only 2.82 times the coding genome of the amoeboid slime mould *Dictyostellium discoideum* and 2.7 times as many genes, with only 2.0 and 1.57 as many compared with the simple roundworm *Caenorhabditis elegans*. Evolution has thus become a symphony on largely the same genes, as is also made clear in the great gene diversification 3 bya ago in fig 128 .

Five Major Evolutionary Transitions



The Origin of Life – Abiogenesis to LUCA (4.4 – 3.5 Bya)

Fractal biocosmology has already been extensively explored in the cosmology section, in which the evolving universe is highly fecund for biogenesis and leads through a transitional phase of establishing the genetic code and protein translation eventually to arrive at LUCA, our last universal common ancestor, which may have been a progenote, a loosely interacting RNA-based system before the independent emergence of archaea and bacteria as free living cells, fig 99, whose cell membrane components are distinct, with complementary strategies, consistent with the overall time interval above (Grimm & Marchi 2018, Schopf et al. 2018).

The Great Oxygenation Event (GOE) (2.4 Bya)

Although the first life forms depended on a variety of energy sources, including chemical gradients, all ongoing life depends ultimately on photosynthesis. The first evidence for the existence of molecular O₂ in the atmosphere and ocean dates to 3.1-3.5 Bya, consistent with cyanobacterial emergence (Cardona et al. 2018, Jabłońska & Tawfik 2021). The origin of the Great Oxygenation circa 2.45–2.32 Bya coincides with the evolution of colonial multicellular forms of cyanobacteria (Schirrmeister et al. 2011, 2013), in which specialised heterocysts (Flores & Herrero 2009, Kumar et al. 2010) enable fixation of nitrogen at higher oxygen levels, by disabling photosystem II (Cardona et al. 2018). The earliest known akinetes – dormant multicellular cyanobacterial cells (Sukenik et al. 2019), are preserved in 2.1 Bya chert from West Africa (Tomitani et al. 2006). The final rise in O₂ at 0.8 Bya corresponds to emergence of eucaryote algae and higher plants. Red algae have been dated as far back as 1.6 Bya (Bengtson et al. 2017).

The Eucaryote Endo-Symbiosis – LECA (2.1 – 1.5 Bya)

The eucaryote endo-symbiosis (Imachi et al. 2019) has already been discussed extensively in the cosmology section and forms the greatest evolutionary transition since the origin of life, giving rise to all complex life forms. What is pivotal about this is that it is an evolutionary biological co-adaption to one or more symbiotic interactions between complementary species, but does closely follow the O₂ increase set off by the great oxidation as a precursor, consistent with the overall time interval above (French et al. 2015, El Albani et al. 2010, Bengtson et al. 2017). The sheer scope of this transformation can be seen from fig 112 where there is a jump of 25x in total genome, 17x in protein coding genome and 8x in coding genes from the bacterium *Rickettsia conorii* to the amoeboid slime mould *Dictyostellium discoideum*, contrasting with the small coding genome expansion since of ~2.8x.

The Cambrian Radiation (541– 521 Mya)

The Cambrian radiation corresponds to the greatest burst of animal complexity and diversity in the evolution of life. Central to this transition is a tipping point in developmental complexity governed by homeotic genes which evolved in single-celled eucaryotes (Derelle, et al. 2007), but reached a critical transition in the Cambrian radiation, giving rise to all the extant higher animal phyla through developmental evolution. By comparison, the previous Ediacaran fossils show very limited complexity. It has been suggested (Fox 2016, Evans et al. 2022) that a transient rise and then fall in oxygen levels, probably due to emergence of new algae and plants, was associated with a mass extinction of Ediacaran fauna and the rapid rise of animals with active predatory behaviour and intelligence, spreading to the resulting vacant niches. This is consistent with a modern-style marine biosphere rapidly emerging during the Ediacaran and early Cambrian, followed by broad evolutionary stasis (Paterson et al. 2019). The rise of land plants has been dated back to 500 Mya (Morris et al. 2018).

Human Emergence and Cultural Evolution (300 – 200 Kya)

The emergence of *Homo sapiens*, and the rise of human culture and technology, beginning with tool-making and then extending to agriculture and animal husbandry has both transformed the face of the Earth, and with it brought about a new paradigm of cultural evolution, driven by spoken and written language, cultural memes and the advent of social, scientific and political discourse spanning the generations. This is now running a huge risk of causing a mass extinction of the diversity of life, precipitating a potential Fermi self-extinction – the Medea hypothesis (Ward 2009), unless our species can regain biospheric symbiosis.

The Extended Evolutionary Synthesis

This places the evolutionary view of Symbiotic Existential Cosmology as lying within the extended evolutionary synthesis (Pennisi 2008, Laland et. al. 2014, Buranyi 2022), which includes multilevel selection, transgenerational epigenetic inheritance (Felsenfeld 2014, Benetti et al. 2022, Kabacik et al. 2022), which can affect macro-evolution (Jablonka 2017), niche construction, evolvability, and evolutionary developmental biology (evo-devo) comparing the regulatory and developmental processes of different organisms to infer how developmental processes evolved (Gerhart & Kirschner 2007). The inclusion of gene-culture coevolution augments this view, to encompass cultural reproductive processes involving *memes* – a concept, social process or institution that spreads from person to person within a culture and often carries symbolic meaning that can self-replicate, mutate, and respond to selective pressures.

All species have evolved mechanisms of phenotypic plasticity that enable them to respond adaptively to their environments. Some mechanisms of phenotypic plasticity count as evolutionary processes in their own right. The human capacity for symbolic thought provides an inheritance system having the same kind of combinatorial diversity as does genetic recombination and antibody formation. (Wilson et al. 2014).

Culture is phenotypic plasticity that acquired its own intrinsic capacity to change and is now out of genetic control. We don't expect a flu virus to operate to our advantage, so why should we expect a 'mind virus' always to be in our interests? For meme advocates, not only is cultural evolution largely unconstrained by genetic pre-dispositions, but genetic evolution may itself be driven by cultural imperatives (Laland and Brown 2002 319) .

'Meme' is the name given to such units of culture and, as some memes are more likely to spread than others, there is a new kind of evolution generated at the cultural level. Somewhat disturbingly, the selection of one meme over another may be of no advantage to the individual human being; rather the meme makes use of us in order to replicate itself. Memeticists suggest that human beings may behave the way they do not because it is in their interests but because their minds have been infected by a cultural virus. Could consciousness be little more than a collection of memes? Are the dominant world religions neither true nor even beneficial, but merely those complexes of religious ideas that happen to be best at spreading? (Laland and Brown 2002 24).

Melkikh A (2014) proposes an extended evolutionary model of partially directed evolution, based on the learning automata theory, which includes a priori information about the fitness space. A potential repository of such prior information is the states of biologically important molecules. notes that many researchers have proposed and explored quantum properties in biology that could effect evolution and have proposed that molecular machines associated with reading DNA exhibit quantum properties.

| Type A evolution (undirected) | Type B evolution (partially directed) |
|---|---|
| There is no a priori information about future states | There is a priori information about future states |
| Sequence does not "see" the surrounding feature space | Sequence "sees" a neighborhood in the surrounding feature space |
| Robustness is not necessary and is only an unnecessary cost | Robustness is beneficial because it is known which pieces of sequence should be preserved |
| Evolvability is not profitable because it can worsen the genotype | Evolvability can be profitable if it is known how the environment will change |

Josephson & Pallikari-Viras (1991) note the differences between classical and statistical quantum science where results are classically or statistically determined and adaptive living systems where organisms may be able to exploit quantum nonlocality and entanglement through adaptive, rather than universal knowledge:

The first, the method of science, is to retain conformity with the demands of reproducibility and universality by the device of replacing the no longer possible strict determinism by statistical determinism. The outcome of this approach is quantum mechanics. The second, a method that is in general terms favoured by life, involves renouncing the demand for universal knowledge in favour of more specialised and purposeful adaptations to the more limited class of situations that the organism or organisms concerned is liable naturally to encounter in the course of its life.

Laland and Brown note Dawkins' (1976) original discovery of the term:

He coined the terms 'replicator' and 'vehicle' to distinguish between the 'immortal' genes, which are replicated each generation, and the transient, vehicular organisms that house them. The gene is the archetypal replicator, but Dawkins proposed that a new, frequently insidious kind of replicator has recently emerged on this planet, a mind virus that infects us with catchy concepts and fashionable ideas. "We need a name for the new replicator, a noun that conveys the idea of a unit of cultural transmission, or a unit of imitation. 'Mimeme' comes from a suitable Greek root, but I want a monosyllable that sounds a bit like 'gene'. I hope my classicist friends will forgive me if I abbreviate mimeme to meme."

The word **evolution** itself is plagued by a spectrum of meanings. Oxford languages defines it's scientific meaning as "the process by which different kinds of living organism are believed to have developed from earlier forms during the

history of the earth" but more generally it is the gradual development of something, quoting in example: "the forms of written languages undergo constant evolution. When we come to discuss gene culture coevolution, these two meanings will come into direct conflict. "It's etymology underlies this ambiguity arising early 17th century: from Latin *evolutio* 'unrolling', from the verb *evolvere* (evolve). Early senses related to movement, first recorded in describing a 'wheeling' manoeuvre in the realignment of troops or ships. Current senses stem from a notion of 'opening out', giving rise to the sense 'development'.

Charles Darwin used the word in print once only, in the closing paragraph of "The Origin of Species" (1859), and preferred *descent with modification*, in part because *evolution* already had been used in the discarded homunculus theory of embryological development and in part because it carried a sense of "progress" not present in Darwin's idea. But Victorian belief in progress prevailed (and the advantages of brevity), and Herbert Spencer and other biologists after Darwin popularised *evolution*.

Dawkins (1976, 1982) argued that discrete, accurately copied, long-lived "replicators" are necessary for cumulative, adaptive evolution and must have the following characteristics:

Fidelity. The copying must be sufficiently accurate that even after a long chain of copies the replicator remains almost unchanged.

Fecundity. At least some varieties of the replicator must be capable of generating more than one copy of themselves.

Longevity. Replicators must survive long enough to affect their own rate of replication.

Although these statements implicitly assume this process is cumulatively integrative over time, so that snakes do not turn into tigers, thus ensuring the stability of the biosphere over evolutionary and cosmological time scales, this is not specifically expressed and can cause problems when we are dealing with gene culture co-evolution. We know there is a deep truth to this argument because our genomes are full of transposable elements which at all opportunities seek to replicate themselves potentially at the expense of organismic mutation and/or survival. However organisms apply natural and sexual selection as whole genomes and there is more complexity to this picture. Even a simple prokaryote genome that reproduces parthenogenetically will eventually accumulate a lethal load of deleterious mutations by Muller's Ratchet. Hence recombination between genomes is a virtually universal necessary condition, via conjugation plasmids and viruses in prokaryotes and indexed sexual recombination in eucaryotes.

Dawkins argued that individual genes must be seen as the units of selection in evolutionary processes within sexual populations. This is primarily because the other possible candidates, notably whole organisms and groups, do not "replicate." Stephen J. Gould in "Caring Groups and Selfish Genes" (1977), argued that by contrast genes cannot be units of selection because natural selection is not able to "see" (operate on) single genes, only on whole organisms. Lewontin (1970) had argued that natural selection at any level requires variation, heredity and differential fitness. Hull argued that people had been packing into one concept, "unit of selection," criteria associated with two distinct and equally important roles:

Replicator: an entity that passes on its structure largely intact in successive replications.

Interactor: an entity that interacts as a cohesive whole with its environment in such a way that this interaction causes replication to be differential.

Wilson DH et al. (2014) in noting that humans possess great capacity for behavioural and cultural change, but our ability to manage change is still limited have set out to sketch a basic science of intentional change centred on evolution, introducing a further set of concepts related to cultural evolution:

The human capacity for symbolic thought provides an inheritance system having the same kind of combinatorial diversity as does genetic recombination and antibody formation. Taking these propositions seriously allows an integration of major traditions within the basic behavioral sciences, such as behaviorism, social constructivism, social psychology, cognitive psychology, and evolutionary psychology, which are often isolated and even conceptualized as opposed to one another.

In this sense, a network of symbolic relations that regulates behavior is like a genotype that produces a phenotype. We will call it a "symbotype" to stress the comparison. Like genotypes, symbotypes evolve based on what they cause the organism to do, regardless of the direct correspondence between the mental and environmental relations. As an example, religious and superstitious beliefs might not correspond directly to anything that exists in the real world, but they might still be favored by selection, based on the behaviors they motivate in the real world. ... The term symbotype refers not to a single cultural trait but rather to a given set of symbolic relations, which results in an entire suite of phenotypic traits (the phenotype). The term does not presuppose any particular proximate mechanism for the symbotype and does not assume that the phenotype can be atomized into independent traits. Obviously, a great deal of future research will be required to clarify the concept of the symbotype, but it differs importantly from the concept of a meme.

Wilson et al. then cite informational recombination as a key generator of variety, that we have seen in the context of integral genetic evolution. While this is true, it goes little or no way towards establishing the integral stability over long time scales of such processes:

Genotypes, symbotypes, and antibodies share something else – almost infinite variety, based on the recombination of their elements. Much as x genes with two alleles at each locus result in 2^x combinations, each potentially producing a different phenotype for selection to act on, a human symbolic system consisting of a few handfuls of “object→sign” relations will be able to derive thousands of combinations, each potentially resulting in a different phenotype for selection to act on (Deacon 1998).

This provides Wilson et al. with their primary thesis that humans have evolved a “quantum leap” in our elaborate capacity for open-ended behavioural and cultural change:

However our symbolic inheritance system and its combinatorial properties arose, the result was a quantum jump in our capacity for open-ended behavioral and cultural change. The best way to see this is by standing back from the “trees” of single scientific studies to see the “forest” of human evolution. A single biological species spread out of Africa to inhabit the globe, adapting to all climatic zones and occupying hundreds of ecological niches, in just tens of thousands of years. Each culture has mental and physical toolkits for survival and reproduction that no individual could possibly learn in a lifetime. Then the advent of agriculture enabled the scale of human society to increase by many orders of magnitude, resulting in mega societies unlike anything our species had previously experienced. The human cultural adaptive radiation is comparable in scope to the genetic adaptive radiations of major taxonomic groups such as mammals and dinosaurs (Pagel & Mace 2004). What else is required to conclude that humans have an elaborate capacity for open-ended behavioral and cultural change?

In this they implicitly acknowledge that not only does the cultural milieu not necessarily optimise natural evolutionary fitness in the biosphere, but that natural fitness cannot now even be defined as an entity in its own right:

It is important to stress that the cultural inheritance system does not entirely supersede the other inheritance systems. ... Moreover, the four inheritance systems – genetic, epigenetics, learning, and symbolic thought – have been interacting with one another throughout our history as a species. Genetic evolution and cultural evolution have been shaping each other for a very long time. It is therefore incorrect to say that cultural evolution serves to maximize genetic fitness, as if the latter can be defined without reference to the former.

So we come back to the central question – how does the advent of cultural evolution enhance or diminish that capacity of Homo sapiens to survive on evolutionary time scales in the closing circle of the evolving biosphere?

Because the concept of symbotype bears a superficial resemblance to the concept of meme (Dawkins 1976), a brief comparison is in order. The term meme is sometimes used broadly to refer to any cultural trait. More narrow usages suggest that cultural traits resemble physical genes in various respects, such as functioning as “replicators,” having a physical form inside the brain, or having the capacity to spread at the expense of their human hosts (Aunger 2002; Blackmore 1999). The most recent treatments of cultural evolution recognize the need for a term that describes cultural traits at the phenotypic level; but these treatments depart from other specific concepts that have been associated with the term meme. In particular, it is possible for the replication of cultural traits to be a systemic process without the need for gene-like replicators (Henrich et al. 2008; Laland & Brown 2002). The concept of “evolution without replicators” applies even to genetic evolution (Godfrey-Smith 2000).

They hint at a deep analogy between genetic and cultural evolution:

The human capacity for symbolic thought provides an inheritance system having the same kind of combinatorial diversity as does genetic recombination and antibody formation. Taking these propositions seriously allows an integration of major traditions within the basic behavioral sciences, such as behaviorism, social constructivism, social psychology, cognitive psychology, and evolutionary psychology, which are often isolated and even conceptualized as opposed to one another.

This merely highlights a deep analogy between cultural ‘inheritance’ and the recombinational complexity of genetic, antibody systems and symbolic thought, but this is not a model for evolution but simply sexual recombination, leaving aside gradual evolutionary change on cosmological time scales due to mutation and selective advantage. Only when we have informational systems which can (1) replicate, (2) be subject to incremental change that is subject to phenotypic differences and selection and (3) the capacity for recombination can we establish a sustainable evolutionary paradigm.

Their answer thus leads to a series of troubling questions regarding not only the lack of a comprehensive integral evolutionary paradigm of gene-culture co-evolution but to the emergence of forms of “evolution” with neither replicators, nor integral stability, and not only in cultural evolution alone, but in genetic evolution as well.

Henrich et al. (2008) state:

While we agree that the existence of replicators is sufficient for cumulative adaptive evolution, they are not necessary. Any process of cultural transmission that leads to accurate replication of the average characteristics of the population will work. Accurate replication at the level of the gene (or meme) will have this effect, but accurate at the population level can arise for other reasons as well. ... Highly accurate, unbiased, genetic replication allows minute selective forces to generate and preserve adaptations over millions of years. Error prone cultural replication, [of one of two mental representations], even when "corrected" by a conformist bias [a group choosing the most common option found in the group], imposes modest, but still significant forces on the cultural composition of the population. Similarly, blending inheritance [e.g. in which an average result not actually present in the set of instances] rapidly depletes the variation in a population necessary for selective processes like prestige-biased transmission to have an effect. But, because the inferential processes that underlie cultural transmission are noisy, it is likely that they can maintain lots of variation. However, this also means that they are likely to create evolutionary forces that act to change the mean, and thus compete with selective forces.

Laland & Brown (2002) take issue with the concepts of replicator versus vehicle, in the context of cultural evolution:

The approach, advocated by Hull (2000)⁴⁷, is to describe as replication all cases in which information is passed along largely unchanged regardless of whether the substrate is a brain or artefactual. Replicators are distinguished from interactors (loosely synonymous with Dawkins' 'vehicles'), which are the entities that exhibit adaptations, but are characterized by a loss of information. They also deal with the continuous interactive aspects of cultural evolution:

*A major question mark against memes, to which both Dawkins and Dennett allude, is whether they have sufficiently high copying fidelity, or accuracy of reproduction. When discussing meme fidelity Dawkins confesses 'here I must admit that I am on shaky ground' (1976, p. 209), and he acknowledges, as an example, that his ideas published in *The Selfish Gene* resulted from a blending of Trivers's and his own memes. Similarly, Dennett (1995 355) asks: 'Isn't one of the hallmarks of cultural evolution and transmission the extraordinarily high rate of mutation and recombination?'. If memes are constantly passed on in altered forms, can they be described as replicators? This looks quite unlike the particulate, virtually error-free copying of gene translation. At first sight, meme evolution appears so fluid, subject as it is to continuous mutation, blending of memes, and cross-fertilization between lineages, that it is difficult to see how it could generate complex adaptations analogous to the vertebrate eye or hand.*

There are at least two counterarguments that have been put forward. The first was expressed most clearly by Dawkins: It is possible that this appearance of non-particulate is illusory, and that the analogy with genes does not break down. After all, if we look at the inheritance of many genetic characters such as human height or skin colouring, it does not look like the work of indivisible and unblendable genes. (1976, p. 209). The second counterargument is that, while every version of a meme varies from one person to the next according to each individual's personal experiences, all memes have a core element that is shared knowledge.

Godfrey-Smith (2000) critiques the classical concept of the replicator in the light of a series of criticisms including those of developmental systems theory:

Criticism of the Dawkins/Hull replicator is found in the work of Paul Griffiths and Russell Gray (1994 298), who are among the proponents of "developmental systems theory" (DST) as a general approach to development and evolution. According to Griffiths and Gray, the replicator/interactor distinction is the product of a "dichotomous" view of evolution and development, where the "dichotomy" involves an illegitimate division between two fundamental types of developmental causes, the "genetic" and the "environmental." Griffiths and Gray claim that the standard replicator/interactor distinction is a "projection into evolution" of dichotomous views of development. ... The developmental systems theorists argue that the only thing which actively replicates or reproduces itself is the entire life cycle. They also argue that the life cycle is the relevant unit for evolutionary theory: "the prime unit of evolution (unit of self-replication) is the developmental process, or life cycle." We should conceive evolution as the "differential replication of developmental processes/life cycles".

He then applies Lewontin's formulation for Darwinian evolution which does not specifically cite a replicator:

Let us approach this point via Lewontin's formulation of the recipe for Darwinian evolution (1970). Evolution requires a population in which there is variation in phenotype, differential reproduction on the basis of phenotype, and heredity of the traits associated with differential reproduction. Heredity is conceived as a correlation between parents and offspring. As Lewontin says, it does not matter how the correlation is achieved, so long as it exists.

In Lewontin's 1970 discussion, the term "unit of selection" has a simple and thin sense -- the units are just the entities in the population which satisfy his three conditions. These "units" need not be replicators, because in a sexual population there can be a great deal of difference between parent and offspring. Yet if parent and offspring are correlated -- if parent and offspring are more similar than randomly selected pairs of individuals in that population -- then evolution by natural selection can occur. The

⁴⁷ Organisms are commonly regarded as: (1) phenotypes that interact with their environments, that survive, reproduce, and pass on genes and (2) the entities that are 'produced' by genes. Hull (personal communication) argues that his notion of 'interactor' is significantly different from Dawkins' 'vehicle'. As in (1), Hull's regards his concept as a populational notion (the population of entities that directly interact with the external environment), while Dawkins's 'vehicle', as in (2), is regarded as more embryological (vehicles are the entity that replicators produce).

requirement of heredity in traits affecting fitness is weaker than a requirement that there exist replicators, and heredity is all that is needed for evolution.

The principle of integral evolutionary change is thus reduced to the simple root of heredity⁴⁸, much as in Gregor Mendel's (1866) work. But this studies hybridisation and is thus about indexed recombination across a single generation and thus gives no theoretical model for integral evolutionary change that ensures stability over the cosmological time scales required for avoiding a Fermi paradox extinction.

This is inadequate and symbolises the entire dilemma of memetic cultural evolution being called evolution at all, because the foundation of evolutionary viability on cosmological time scales is the gradual cumulative change of what Darwin called "descent with modification", now known to be caused by intermittent mutational changes at a low level each generation, enabling the genomes of a species to survive on a population scale combined with natural and sexual selection that is the process occurring on cosmological time scales, that has allowed the biosphere to evolve without Fermi paradox, caused by short-term instability. Recombination, as associated with cross-fertilisation of ideas is a single step process to offset Muller's ratchet and provides non of the graduated change to maintain cumulative evolutionary synchrony between evolving species.

The only way this can be resolved to ensure biospheric and human survival is gene-culture-biosphere co-evolution, in which cultural memes acknowledge the cosmological necessity of human genetic and cultural evolution maintaining overall genetic fitness of the biosphere over such cosmological time scales.

Sexual Selection is a Conscious Creative Process

Sexual selection is a conscious process driven by subjective perception and volition. In spiders, birds and humans the female, who because of a much higher parenting investment in eggs and mammalian pregnancy, frequently evolves forms of conscious choosiness that require a male to be able to fulfil diverse physical and behavioural demonstrations of ability, as a genuine indicator of fitness. These exemplify some of the most creative aspects of evolution that have also had a pivotal influence in human intelligence and cultural emergence (see [fig 131](#)), where astute female reproductive choice driven by extreme sexual polarisation of reproductive investments in humans due to the demands of human pregnancy.

This is the hand of the "Great Mother of All Living" declaring that the evolution of the entire Tree of Life is natural and partly driven by subjective conscious perception and volition. It is sealed in our genes and in the most ancient layers of the Earth's crust. She leaves her signature in the rocks, in the fossils, in the genetic sequences and in the free flowing phenotypes of organismic regulation. There is no way this founding story of our becoming, the core creation myth of our very existence, can be undone.

Here follow the essential principles:

(1) The natural conclusion of evolutionary biology is that conscious evolution began with the eucaryote endo-symbiosis freeing the cell membrane for quantum sentience and social signalling, so we have to understand how natural selection works seamlessly with consciousness in amoeba-flagellates because they conserved conscious volition for a billion years before brains evolved.

(2) One can take a materialistic view that single celled eucaryotes are just sophisticated automata but that flies in the face of the fact that the same excitation processes in them occur in our neurons and phagocytes. In particular, cellular sentience is at the quantum level sensitively detecting small electrochemical fluctuations, light, physical oscillations and chemical orbital effects corresponding to our existing senses. Moreover a transition would take such responses from procaryote genetic operons to non-linear responses to edge of chaos excitations, justifying the notion of conscious perception. Moreover organisms like Dictyostellium show distinct transitions from the free swimming

⁴⁸ **heredity** (n.) "the passing on of physical or mental characteristics genetically from one generation to another" Etym. 1530s, "inheritance, succession," from French hérité, from Old French *eredite* "inheritance, legacy" (12c.), from Latin *hereditatem* (nominative *hereditas*) "heirship, inheritance, an inheritance, condition of being an heir." Legal sense of "inheritable quality or character" first recorded 1784; the modern biological sense "transmission of qualities from parents to offspring" seems to be found first in 1863, introduced by Herbert Spencer.

cellular form of volition to resonant coordinated organismic behaviour in the worm stage of fruiting, showing collective resonant excitation and decision-making characteristic of conscious volition.

(3) Natural selection has to operate at the genetic level and the only way conscious volition can directly influence genetics is through reproductive choice, so conscious evolution becomes the province of sexual selection while environmental natural selection is a mix. This becomes clear in vertebrate and mammal behaviour where sexual selection is the climax process determining evolution of the brain.

(4) This is strongly exemplified in humans, where the female parenting strategy delivering live young via a risky pregnancy and long-term lactation and child rearing is in stark conflict with the male sowing wild oats strategy and the emergence of human intelligence appears to have resulted from neither sex having the upper hand, requiring each to run a red queen evolutionary race of genetic and social intelligence to survive, interrupted only recently by the patriarchal imperative due to male paternity uncertainty.

(5) The key implication is that it is volition and reproductive decision-making and its support in healthy survival in nature that drives what is not just conscious evolution but volitional evolution.

The fact that human culture doesn't yet recognise the huge significance of sexual selection underscores humanity's failure to appreciate conscious volitional evolution, exacerbating the error of materialistic neuroscience failing to recognise conscious volition at all.



Fig 113: Sexual selection in birds and spiders. Sexual selection is almost universally consciously engendered, while natural selection is only partially so, because some natural selection factors are inanimate, while other animate interactions with predators and prey and social interactions are consciously based. Sexual selection enables the female who has to invest much more in eggs than the male evolves to use creative conscious perceptual means to assess genuine indicators of male genetic and/or parenting fitness. This can lead to a runaway Red Queen effect (Ridley 1993), driven by female reproductive choice evolving to become more choosy, as male adaptations become more attractive resulting in beautiful bird plumages (Prum 2017, Jabr 2019). How beautiful they have become attests to the fact that the female bird perceives it and demands it in the same kind of detail we find spell-binding. Top row: the Superb Lyre bird, which in addition to having a mesmerising tail and bridal veil like the peacock (lower right), is required to literally mimic every sound from other birds to chainsaws and construction sites to a squalling baby (1, 2, 3, 4) seducing the female with every sound in the universe surrounding them. Lower left, the Satin bowerbird courtship involves complex two-stage cues in female reproductive choice (Robson et al. 2005). Male South African Weaver Birds similarly construct elaborate hanging nests which avoid predators, to attract mates (fig 141). Lower centre: Peacock spider courtship. The male has to carefully signal with his hairy mid legs from under her leaf to seduce her willingness to mate, rather than eat him, before fertilising her with his palps. These spiders are tiny and have even tinier brains as the inset on a human finger shows.

Evolutionary Origins of Neuronal Excitability, Neurotransmitters, Brains and Conscious Experience

The discussion of psychedelics in the previous chapters brings us back to a fundamental question. Why does the brain use neurotransmitters such as serotonin in such characteristic ways to do with emotion, wakefulness and sleep, vigilance and reward? This takes us back all the way to the emergence of life and potentially to the cosmological relationships defining the biomolecules, from ATP to RNA, and the various biological amino acids and their elementary amines such as tryptamine and dopamine. The elementary neurotransmitter types, many of which are fundamental amino acids (glutamate, glycine, GABA), or amines derived from amino acids (serotonin, dopamine, histamine, epinephrine) have primordial relationships with the membrane, as soluble molecules with complementary (+) charge relationships with the hydrophilic (–) ends of the phospholipids. Glutamate and GABA are prominent components of both the Tagish Lake and Murchison carbonaceous chondrites and stardust aerogels from the tail of comet Wild 2, clear evidence for a prebiotic cosmological status. As the two key excitatory and inhibitory neurotransmitters in the human brain, which are also key in myxamoeba fruiting body aggregation, demonstrating their strong conservation, this also gives human consciousness a cosmological foundation.

Tryptophan, the amino acid from which serotonin is generated, plays a key role in the transfer of electric charge in the earliest forms of photosynthesis. In *Rhodobacter sphaeroides*, there are 39 tryptophan residues surrounding the porphyrin centre. Initiation of the electron transfer reaction by excitation results in a transient change in the absorbance at UVB, near the peak of the tryptophan absorbance band. To make serotonin from tryptophan, oxygen is needed, and in the earliest geological times the Earth's atmosphere had little oxygen. Thus, serotonin is made specifically in unicellular systems capable of photosynthesis and the cellular production of oxygen. Consequently serotonin is up to 100 times more plentiful in plants and animals have ceased to synthesise tryptophan, depending on plants for their supply. This relationship with light continues to this day in human use of melatonin to define the circadian cycle and serotonin in wakefulness and sleep, with light deprivation causing depression through serotonin.

Fig 114: Murchison amino acids. Biological blue/purple. Neurotransmitters red/purple.

The fundamental components of the mammalian G-protein coupled receptor system, including the canonical GPCR itself appear to go right back to LECA the last eucaryote common ancestor, fig 115, as they are shared across all major eucaryote branches (Mendoza et al.). From the gene diversity for serotonin receptors, the 5-HT_{1a} receptor is estimated to have evolved 750 million to 1 billion years ago, before the muscarinic, dopaminergic and adrenergic receptor systems (Peroutka & Howell, Peroutka, Walker et al) and long before the Cambrian radiation defining multicellular animals. As noted by Natch (1973), "the ionic mechanisms for electrogenesis are basically identical to those in nerves, muscles, and receptors of metazoan organisms".

| Amino acid | Murchison meteorite | Electric discharge |
|--------------------------------|---------------------|--------------------|
| Glycine | 4 | 4 |
| Alanine | 4 | 4 |
| α -Amino-n-butyric acid | 3 | 4 |
| α -Aminoisobutyric acid | 4 | 2 |
| Valine | 3 | 2 |
| Norvaline | 3 | 3 |
| Isovaline | 2 | 2 |
| Proline | 3 | 1 |
| Pipecolic acid | 1 | <1 |
| Aspartic acid | 3 | 3 |
| Glutamic acid | 3 | 2 |
| β -Alanine | 2 | 2 |
| β -Amino-n-butyric acid | 1 | 1 |
| β -Aminoisobutyric acid | 1 | 1 |
| γ -Aminobutyric acid | 1 | 2 |
| Sarcosine | 2 | 3 |
| N-Ethylglycine | 2 | 3 |
| N-Methylalanine | 2 | 2 |

Wan & Jékely (2021) describe the ancestral repertoire of eukaryotic excitability and discuss five major cellular innovations that enabled its evolutionary origin, including a vastly expanded repertoire of ion channels, the emergence of cilia and pseudopodia, endomembranes as intracellular capacitors, a flexible plasma membrane and the relocation of chemiosmotic ATP synthesis to mitochondria, which liberated the plasma membrane for more complex electrical signalling involved in sensing and reacting.

This places the emergence of receptor proteins and their neurotransmitters as occurring before the multicellular nervous systems, as cell-to-cell signalling molecules essential for survival, and positive and negative responses to nutrition and danger. The need for multimodal molecular messengers thus arises from the need for cells to have a variety of signalling molecules modulating key motivational and aversive aspects of survival strategy. It explains that neurotransmitters originated from direct signalling pathways between the cell membrane and gene expression in the nucleus of single cells, highlighting why changes in gene expression such as that of *egr-2* in psychedelics may be central to psychedelic neurotransmitter action, rather than just flow-on excitation. It has been suggested that key enzymes in neurotransmitter pathways may have become ubiquitous through horizontal gene transfer from bacteria (Iyer et al).

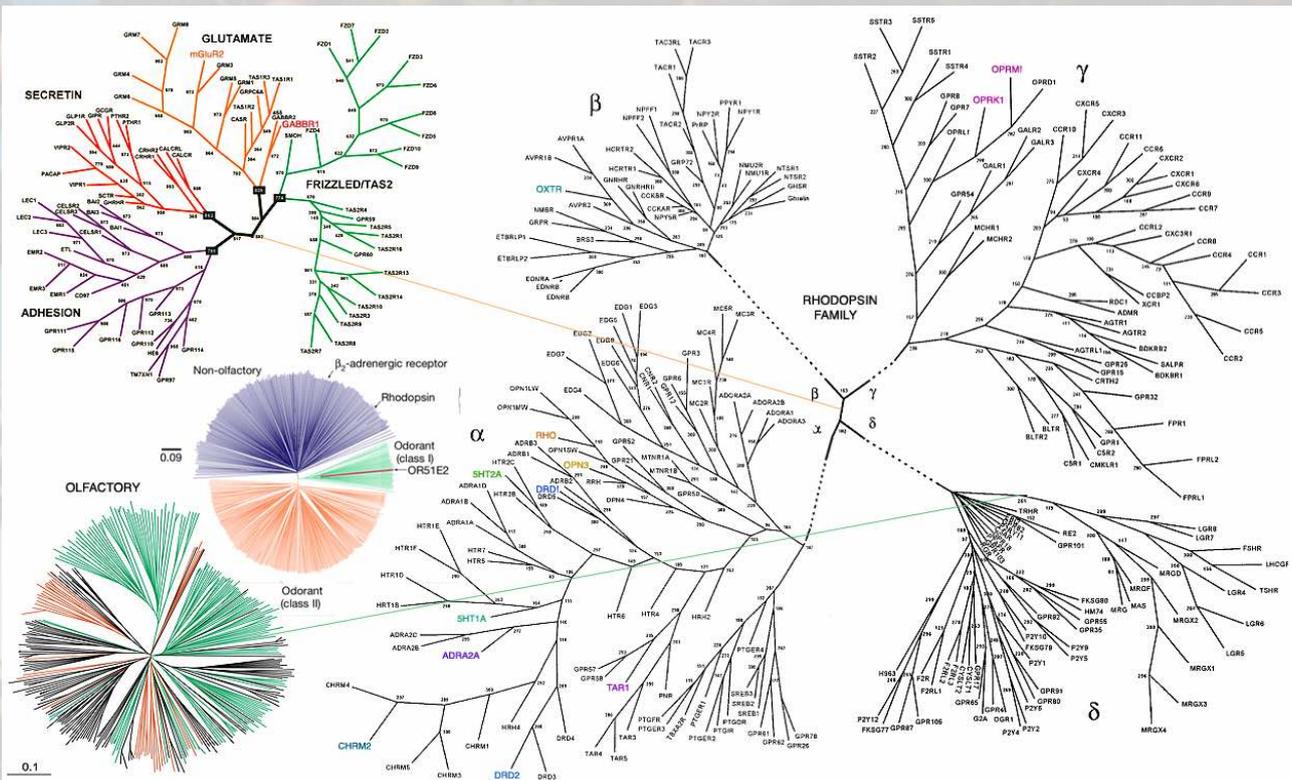


Fig 115: (Left) Evolutionary tree of the human G-protein linked receptors (Fredriksson et al. (2003), with examples highlighted in color. On the α branch are amine receptors - serotonin 5HT1A and 5HT2A, dopamine D1, and D2 (DRD1, DRD2), adrenergic α 2a (ADRA2A), muscarinic acetylcholine (CHRM2), trace amine TAR1, as well as rhodopsin (RHO) and enkephalin (OPM3). On the glutamate branch are metabotropic glutamate mGluR2 and GABA GABBR1. On the β branch is oxytocin (OXTR) surrounded by vasopressin receptors and Ghrelin. On the γ branch are opioid κ and μ (OPRK1, OPRM1). Olfactory (Zozulya et al 2001, Billesbølle et al. 2023) and the non-rhodopsin receptors are linked to their respective points on the rhodopsin family tree.

This ancient origin is confirmed by the fact that receptor proteins, second signalling pathways and key neurotransmitters are known to occur widely in single-celled protists. Both *Crithidia* and *Tetrahymena* contain norepinephrine, epinephrine, and serotonin (Blum 1969). The ciliated protozoan *Tetrahymena pyriformis* (Brizzi & Blum, Essman) and flagellated *Crithidia fasciculata* (Janakidevi et al) utilise serotonin, and the former also metabolises dopamine and epinephrine (Takeda & Sugiyama, Nomura et al). *Tetrahymena pyriformis* also has circadian light-related melatonin expression (Kohidai et al). In *Tetrahymena*, intracellular concentrations of serotonin and dopamine vary inversely during logarithmic and stationary phases of growth. These substances are released into the extracellular milieu, probably in response to elevated intracellular Ca^{2+} , where they can increase intracellular levels of cAMP. Evidence that GABA could play a similar role comes from the finding that treatment with diazepam, a GABA receptor ligand, elevates the growth rate of *Tetrahymena* (Lauder 1993). *Tetrahymena* utilises histamine, serotonin, epinephrine, melatonin, and triiodothyronine can be found in it, as well as peptide hormones, such as insulin, adrenocorticotrophic hormone, epidermal growth factor, endocannabinoids, endorphins and c-AMP and GMP. Thus signalling molecules in single celled eucaryotes appear to further long-term adaption through cross-generational epigenetic changes (Csaba 2014).

Trypanosoma cruzi could be induced to differentiate by increased cAMP levels that resulted from addition of epinephrine (González-Perdomo et al). Species of *Entamoeba* secrete serotonin and the neuropeptides neurotensin and substance P (McGowan et al) and release and respond to catecholamine compounds during differentiation from the trophozoite stage into the dormant or transmissible cyst stage (Eichinger et al) and *Plasmodium falciparum* malaria replication can be blocked by 5HT1a agonists (Locher et al). Acetylcholine and its G-protein coupled receptor have been found in acanthamoeba (Baig & Ahmad 2017, Baig et al. 2018) and acetylcholine, vasopressin and opioid systems coordinate contractile vacuoles in *Amoeba proteus* (Bagrov & Manusova 2011). This heightens the dual role of such molecules in both intra- and inter-cellular signalling, just as acetylcholine is both a neurotransmitter and induces the secretion of insulin in humans. Elements of the protein signalling pathways, such as protein kinase C, essential to neuronal synaptic contact originated close to the eucaryote origin (Emes et al. 2008, Ryan & Grant 2009). Likewise the Dlg family of postsynaptic scaffold proteins, which bind neurotransmitter receptors and enzymes into signalling complexes originated before the divergence of the vertebrates and arthropods (Nithianantharajah et al. 2012).

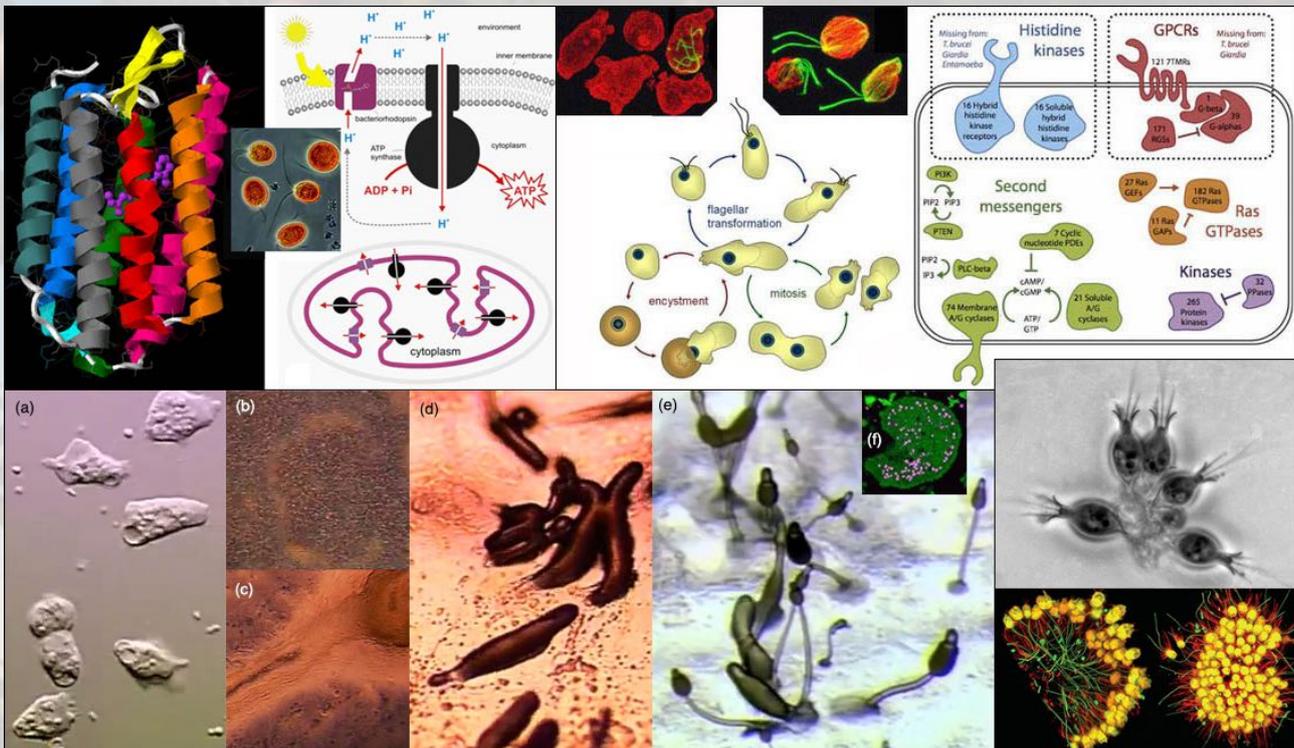


Fig 116: Left: Heptahelical rhodopsin receptor in the G-protein coupled family creates a photosynthetic H^+ ion gradient in *Halobacteria* provides voltage gradient excitability and ATP to power the cell. Centre: Complement of signalling systems found in *Naegleria gruberi* (Fritz-Laylin et al. 2010), a free-living single celled bikont amoeba-flagellate, belonging to the excavate group *Heterolobosea* that diverged from other eukaryotic lineages over a billion years ago, which include some of the most primitive eucaryotes such as *Giardia* and *Trichomonads*. Nevertheless it is capable of both oxidative respiration and anaerobic metabolism and can switch between amoeboid and flagellated modes of behaviour, regenerating complete centrioles and flagellae de novo (Fritz-Laylin & Cande 2010). The *Naegleria* genome sequence contains actin and microtubule cytoskeletons, mitotic and meiotic machinery, suggesting cryptic sex, several transcription factors and a rich repertoire of signalling molecules, including G-protein coupled receptors, histidine kinases and second messengers including cAMP. Apoptotic cell death essential for maintaining multicellular integrity also arose with mitochondrial endosymbiosis (Kaushal et al. 2023), is promoted via the mitochondria, occurs also in single celled eucaryotes (Madeo et al. 1997) and originated in bacterial protection against phages (Koonin & Aravind 2002, Kibby et al. 2023). Lower left *Dictyostelium discoideum* (a) individual cells eating bacteria, (b) aggregation wave front of cAMP, (c) aggregating to form slugs, (d) slugs, each containing 1000 or so individual amoeba, swimming purposefully and making individual chemotactic decisions coordinated through coherent membrane excitability also showing they can merge and separate, (e) fruiting body and (f) sexual syntrium with multiple nuclei, pink (Bloomfield et al. 2019). Lower right: Choanoflagellate cells forming an ancestor of animals, at the transition from single celled organisms to colonies have conserved the amoeboid-flagellate switch (Brunet et al. 2021). Below: The colonial form *Choanoecca flexa* can invert the colonies in a similar way to tissue layer folding in early animal embryogenesis (Brunet et al. 2019).

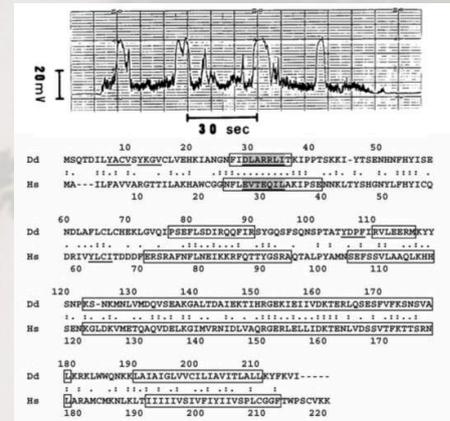
Consequently the major neuroreceptor classes have a very ancient origin, with the 5HT1 and 5HT2 families diverging before the molluscs, arthropods and vertebrates diverged, close to the level of the founding metazoa. Sponges, with only two cell types, express serotonin (Wayrer et al) and have been shown to have the critical gene networks to generate synapses, in a pre-coordinated form (Conaco et al). Coelenterates already have all the key components of serotonin pathways, involved in signalling by sensory cells and neurons, despite having only a primitive nerve network (McCauley, Umbriaco et al).

Aggregation of social myxamoeba such as the slime mould *Dictyostelium discoideum* (video), under exhaustion of food supply, is mediated by cyclic-AMP, also utilising glutamate and GABA_B receptors (Taniura et al. 2006, Anjard & Loomis), forming first a motile slug and then forming a fruiting body via reciprocal serotonin and monoamine oxidase A (maoA) activity (Halloy et al, Goldbeter, Taniura et al, Baskar, Mani & Hyde). MaoA, which degrades serotonin, confers the fate of an organiser to the *Dictyostelium* tip. Once a tip has formed, serotonin contributes to tip dominance. It inhibits further tip formation, and thus ensures the mound retains the size determined during the earlier developmental stage. This relationship between serotonin and MAOa is precisely retained in humans, as exemplified in MAO inhibitor anti-depressants. The slug motions, including phototaxis, follow a distinct dynamical process from individual amoeba responses (Schlenkrich et al. 1995), indicating a separate collective organismic excitation protocol.

And this collective organism can be sexually diverse. *D. discoideum* has three different mating types which can mate with any two different sexes. Heterothallic mating occurs when two or more amoebae of different mating types fuse during aggregation to form a multinuclear syncytium, which then breaks apart forming binucleate cells leading to one or more giant zygotes, which then release cAMP to attract other cells, engulfing them cannibalistically which serve to encase the whole aggregate in a thick, cellulose wall to protect it. Inside the macrocyst, the giant cell divides first through meiosis, then through mitosis to produce many haploid amoebae that will be released to feed as normal amoebae would. This means that the collective organism is sexually diverse, just as we are. It also means that a sexually diverse but significantly related population engages in sacrificial behaviour for the benefit of the species because the individuals forming the stalk die and do not get to produce spores. In related *D. purpureum* the slug stage in genetically mixed colonies separates into slugs containing a majority of closely related individuals to avoid cheating (Mehdiabadi et al. 2009). The fact that syncytium formation leads to cells having up to three mitochondrial genotypes, when three sexual strains fuse, suggests sexual fusion could have evolved by the endosymbionts to ensure their survival, controlled later by sperm-ovum fertilisation to avoid cytoplasmic genetic warfare. Serotonin thus plays a key role in enabling developmental organisation of reproduction conducive to the survival of the collective sexual organism, rather than individual amoebae.

Both serotonin and external cAMP as well as glutamate and GABA are thus involved in social signalling, mediated by external G-protein linked receptors, despite the fact that in mammals cAMP is an intracellular second-signalling molecule. GABA promotes the release of the peptide SDF-2 which induces spore formation. Glutamate acts via the metabotropic glutamate receptor DdmGluPR as a competitive inhibitor of GABA functions mediated by a GABAb-like receptor and is also able to inhibit induction of sporulation by SDF-2. Lack of glutamate expression delayed aggregate formation and impaired chemotaxis toward cAMP. Phylogenetic analysis suggests that DdmGluPR diverged after the mGluR family-GABAb receptors split but before mGluR family divergence (Anjard & Loomis 2006, Milne & Devreotes 1993, Tanura et al. 2006).

Fig 117: Above: Changes in extracellular electric potential of *D. discoideum* pseudoplasmodial slug (fig 116) moving on the substratum (Kitami 1988). Below: VAMP homology between *Dictyostellium* and humans (Bennett et al. 2008).



About a third of wild-collected *D. discoideum* also engage in the symbiotic "husbandry" of bacteria, allowing the "seeding" of the food source at the location of the spore dispersal, which is particularly valuable if the new location is low in food resources. Colonies produced from the "farming" spores also show the same behaviour when sporulating. Some bacteria are sequestered in double membrane bound phagosomes where they are protectively isolated but not consumed. The amoebae preserve their individuality and each amoeba has its own bacterium. Symbiotic farming has a cost benefit trade-off: Those colonies that do not consume all of the prey bacteria produce smaller spores that cannot disperse as widely. In addition, much less benefit exists for bacteria-containing spores that land in a food-rich region, explaining why an ongoing minority of colonies do this (Brock et al. 2011).

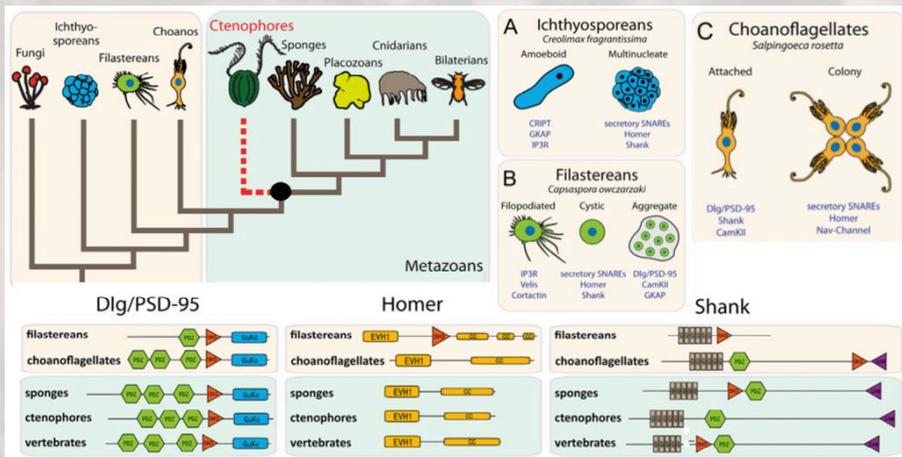


Fig 118: Ichthyosporeans Filasterians and Chonaoflagellates have genes for proto-synaptic proteins having extensive evolutionary homology with metazoan and vertebrate (human) synaptic proteins Dlg/PSD-95, Homer and Shank. In single-celled species they are associated with aggregation processes, just as human synaptic protein Dlg/PSD-95 is also active in septate junctions in skin cells (Burkhardt & Sprecher 2017).

Just as humans and slime moulds share the same basic

neurotransmitter pathways, human phagocytes and *Dictyostelium* share the same pathways for bacterial assimilation and defensive protection (Dunn et al. 2017). This is reflected in the homology of human and myxamoebic SNARE protein VAMP7, or SYBL1 (Bennett et al. 2008), involved in both endosomal vesicle transport and target cell killing by natural killer cells. Syntaxin 7, syntaxin 8, Vti1 and VAMP7 form an active SNARE complex for early macropinocytic compartment fusion in *Dictyostelium* (Bogdanovic et al. 2008). Syntaxins drive fusion of synaptic vesicles containing v-SNAREs. and interact with voltage dependent calcium and potassium channels. The myxamoebic versions likewise have sequence homologies with human versions.

Studies of protists that are close relatives of metazoans, like the ichthyosporean *Creolimax fragrantissima*, the filasterean *Capsaspora owczarzaki* and the two choanoflagellate species *Monosiga brevicollis* and *Salpingoeca rosetta* possess proto-synaptic proteins – synaptic protein homologs although they never developed synapses and neurons that may interact with other proto-synaptic proteins in organisms with no synapses and neurons, in a very similar manner as observed in neurons. Their genomes encode for Dlg/PSD-95, Homer and Shank. Vesicle membrane proteins (e.g. Synaptophysin and Synaptogyrin), proteins involved in exocytosis (e.g. Complexin), and signaling (e.g. CaMKII) are also present in the genomes *C. owczarzaki* and choanoflagellates. Moreover, voltage-gated sodium and calcium channels were identified in the genomes of choanoflagellates (Liebeskind et al. 2011, Burkhardt & Sprecher 2017).

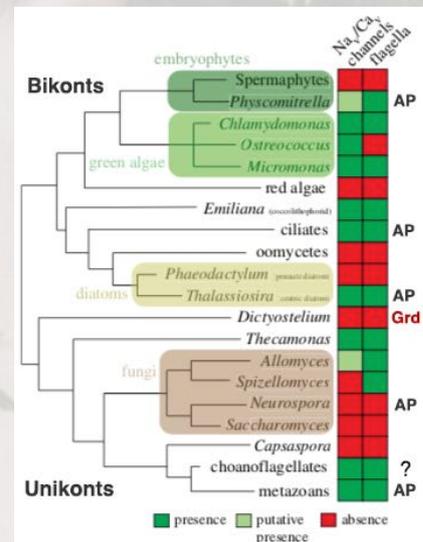
In metazoans with synapses and neurons, synaptic proteins are functionally diverse and fulfil different roles in other cell types. This seems to be the case for nearly every synaptic protein found in vertebrates. For instance, Dlg/PSD-95 functions as a scaffolding protein and clusters iGluRs to the plasma membrane of postsynapses, but the same protein is an important component of septate junctions in epithelial cells. The protein Homer, which is expressed in the nucleus and binds both to flotillins in choano-flagellates and to astrocytes in vertebrates highlighting that many proto-synaptic genes may be pleiotropic.

Fig 119: Both action potentials (AP) and Na/Ca ion channels capable of delivering them are widely spread across the eucaryote tree, leading to the notion that the founding ciliated eucaryote possessed action potentials. Notably *Dictyostelium* lacks flagella and has graded membrane potentials (Brunet & Arendt 2016).

Brunet & Arendt (2016) have explored the incidence of action potentials and Na/Ca ion channels and associated the incidence of action potentials in single celled eucaryotes as stemming from the activation of the eucaryote flagellum. The eucaryote kingdom is divided at or close to the base by the unikont/ bikont division of one or two flagella, with animals and plants on opposing branches. Both of these broad groups bear flagella and have action potentials. Close to the root excavata such as *Naegleria* are known to possess flagella (fig 116). From this point of view excitability including that leading to action potentials is an ancestral feature of flagellated energetic protists. The amoeboid-flagellate switch is also conserved across the choanoflagellates, leading to metazoa (Brunet et al 2021).

Wan and Jékely (2020) note that fast reaction escape responses of ciliated eucaryote cells such as *Paramecium* (Schlaepfer & Wessel 2015) to potential threats from illumination changes or mechanical disturbance are usually induced by action potentials – unidirectional electrical pulses involving fast, regenerative changes in membrane potential. They state that while all cells display some electrical activity, phylogenetic evidence suggests that the capacity to propagate action potentials may have been an ancestral eukaryotic trait supported by LECA.

Brunet & Arendt (2016) advance an evolutionary hypothesis for the origin of the depolarization–contraction–secretion (DCS) coupling, the functional core of animal neuromuscular circuits. They argue that such fast reactions may have emerged in response to accidental membrane damage and sudden calcium influx. Based on calcium-triggered membrane depolarization, they infer that the first action potentials evolved alongside the membrane of sensory-motile cilia, with the first voltage-sensitive sodium/calcium channels enabling a fast and coordinated response of the entire cilium to mechanosensory stimuli. From the cilium, action potentials then spread across the entire cell, enabling global cellular responses such as concerted contraction in several independent eucaryote lineages. In animals, this process led to the invention of mechano-sensory contractile cells. These gave rise to mechano-sensory receptor cells, neurons and muscle cells by division of labour and can be regarded as the founder cell type of the nervous system.



A precursor of synaptic transmission occurs in choanoflagellates, where the cells of some species aggregate to form colonies. In these colonies, the cells move water past the colony by beating their flagella. Each of these cells can release transmitters that act on receptors in nearby cells to produce movements of the whole colony (Kristan 2016). At the transition to multicellularity, the fresh water sponge *Spongilla lacustris* has 18 distinct cell types. Synaptic genes were active in a few of these types, which were clustered around the sponges' digestive chambers called secretory neuroid cells. X-ray scans revealed that neuroids send out long arms to modulate the activity of choanocytes holding the flagella that drive the sponges high-flow filter feeding currents. They do not have actual synapses but illustrate the evolution of cells specialising in modulating the activity of others (Musser et al. 2021).

Also originating with LECA are key transcription factors responsible for initiating transcription and hence gene expression. Fig 120(1) shows the full spread of these factors across eucaryote diversity, with a large paneucaryotic core complemented by further evolution of TF's in unikonta, holozoa (animals and amoebas), metazoa (higher animals), fungi, algae and higher plants. Likewise, the homeodomains (Bürglin & Affolter 2016) originate at or close to the LECA root (Derelle et al. 2007), occurring for example in trichomonads and more diversely in amoebzoa and establishing separate new branches in metazoa, fungi and plants. These provide a genetic skeleton for developmental adaption of higher organisms through regulatory changes of morphogenesis leading to evolution of organismic phenotype of major phylla in constrained forms of regulatory evolution leading to among other branches to the brains of vertebrates, mammals, primates, apes and humans in the processes outlined in fig 120.

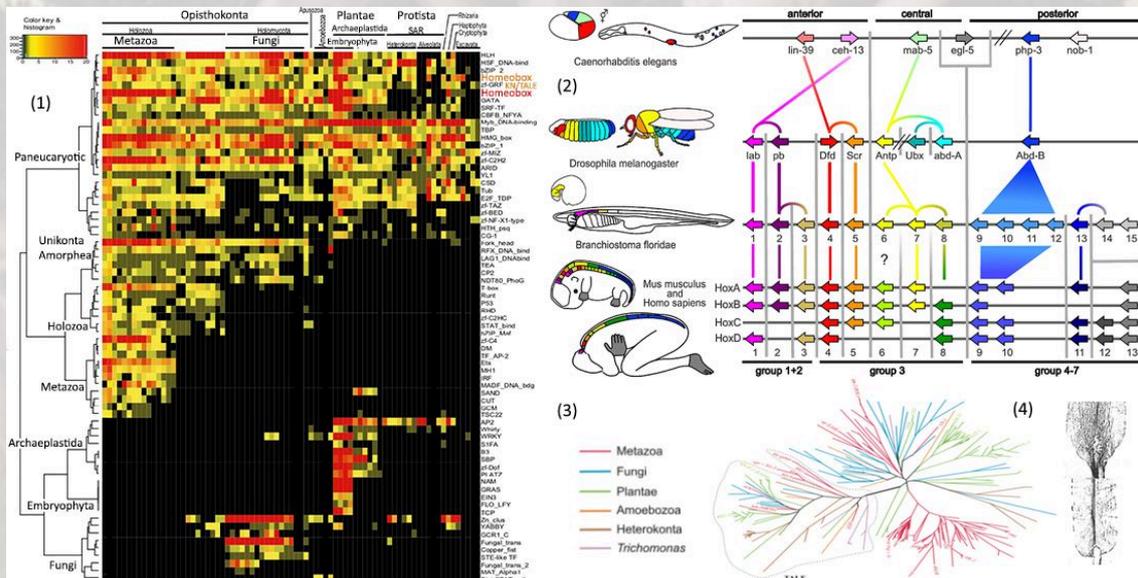


Fig 120: (1) Transcription factors, including homeobox motifs in homeotic genes are widely distributed across the eucaryotes, indicating an origin with LECA (de Mendoza et al. 2013). Separate groups have also evolved in plants animals and fungi. Short terminal repeats representing about 5% of human DNA appear to act as mutable transcription factor "wells" flanking core regulatory sequences that allow a population of transcription factors to collect TFs to effect modulated gene control (Horton et al. (2023). (2) Related homeotic genes are involved in segmentation of both arthropods and vertebrates and also occur in plants (4). (3) Evolutionary tree of homeodomains shows these arose in single celled eucaryotes and diversified in metazoa, fungi and plants (Derele et al. 2007). Evolutionary developmental biology (evo-devo) compares the developmental processes of different organisms to infer how these evolved. It is composed of multiple core evolutionary concepts. (a) Deep homology is the finding that dissimilar organs such as the eyes of insects, vertebrates and cephalopod molluscs, long thought to have evolved separately, are controlled by similar genes such as pax-6 (see fig 154). These genes are ancient, and highly conserved among phyla; they generate the patterns in time and space which shape the embryo, and ultimately form the body plan of the organism. (b) Species do not differ much in their structural genes, such as those coding for enzymes; what does differ is the way that gene expression is regulated by the toolkit genes. These genes are reused, unchanged, many times in different parts of the embryo and at different stages of development, forming a complex cascade of control, switching other regulatory genes as well as structural genes on and off in a precise pattern. This multiple pleiotropic reuse explains why these genes are highly conserved, as any change would have many adverse consequences which natural selection would oppose. New morphological features and ultimately new species are produced by variations in the toolkit, either when genes are expressed in a new pattern, or when toolkit genes acquire additional functions. Transposable elements facilitate this through modular regulatory changes in how the toolkit is expressed.

A multicellular transition point occurs in Cnidaria such as hydra, where the nervous system is an undifferentiated neural net, yet hydra displays innovative and intuitive multiple modes of locomotion, as shown in fig 256, and cnidaria are fully-capable of associative learning (Botton-Amiot, et al. 2023, Bielecki et al. 2023). This attests to the idea that the neural net is self-organising society of sentient amoeboid-flagellates, rather than the neurons being relatively trivial

integrators, and the neural net / brain design is the causative definer of intelligent consciousness. The emphasis thus remains on cellular rather than network intelligence alone (Ford 2009, 2010, 2017).

We thus now turn to higher organism and particularly human brain development. Late in the fourth week, the neural tube develops three distinct bulges that correspond to the areas that will become the three major divisions of the brain: forebrain, midbrain, and hindbrain. Not until the end of week 5 and into week 6 (usually around forty to forty-three days) does the first (chaotically) excitable electrical brain activity begin to occur. During weeks 8 to 10, the cerebrum begins its development in earnest. Neurons proliferate and begin their migration throughout the brain. The frontal and temporal poles of the brain are apparent during weeks 12 to 16, and the frontal pole (which becomes the neocortex) grows disproportionately fast when compared with the rest of the cortex.

Fig 121: Fetal brain development (Konkel 2018).
Emergence of resting state activity by fMRI
(Schöpf et al. 2012).



The very early leading role in brain development of serotonin expression is laid bare by its sequential expression and elaboration from very early stages and is consistent across vertebrate species. In early mouse embryos, 5-HT derived from the maternal-embryonic circulation activates different 5-HT receptors to control the proliferation, migration, gene expression, and morphogenesis of neural-crest and neural crest-derived cells (Buznikov et al. 2001). 5-HT signalling molecules such as enzymes responsible for 5-HT synthesis and breakdown, 5-HT receptors and the 5-HT transporter (5-HTT) are already expressed in the brain before 5-HT neurons are born (Witteveen et al. 2013).

“The development of serotonin-containing neurons has been extensively studied in a number of animal species, including rat, chick, nonhuman primate, and human. In all species studied the highest functional status of the serotonin system is reached early in development, and adult levels of the system are actually much lower than in the younger animal. Serotonergic neurons are first evident by 5 weeks of gestation and increase rapidly through the 10th week of gestation. By 15 weeks of gestation, the typical organization of serotonin cell bodies into the raphe nuclei can be seen. Serotonin levels increase more slowly throughout the first 2 years of life and then decline to adult levels by 5 years of age. The early arrival of serotonin into target regions, ahead of other monoamines, may regulate the ingrowth and terminal development of other monoamines, in particular dopamine. Because serotonin regulates the maturation of target areas, the amount of serotonin that grows into an area becomes key for further development” (Whitaker-Azmitia 2001).

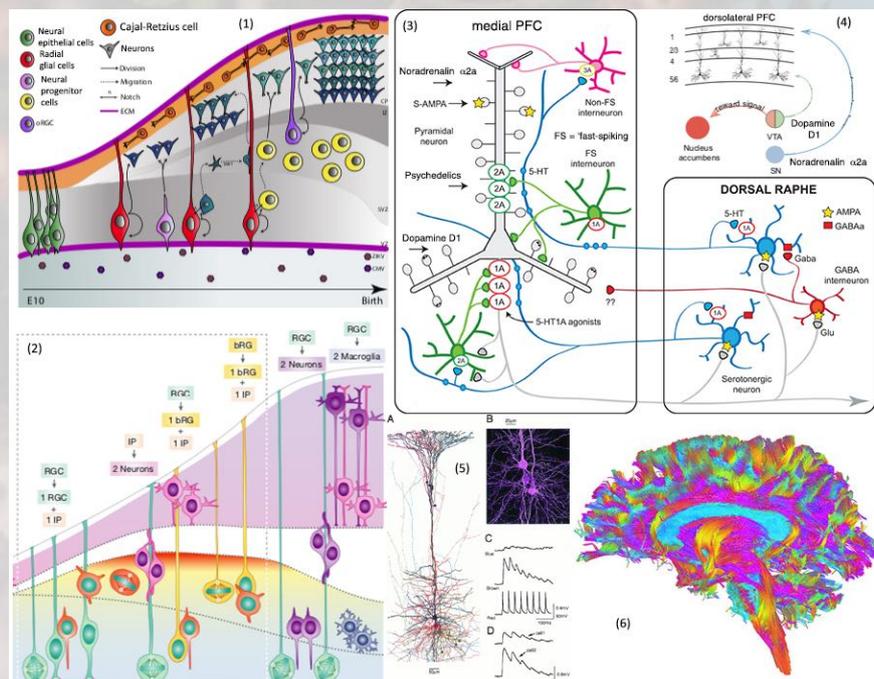
GABAergic neurons likewise appear early in the development of embryonic brain and spinal cord. GABAergic fibers, apparently ascending from the spinal cord, project through regions of brainstem, midbrain and forebrain where serotonergic, dopaminergic and peptidergic neurons are being generated. An example of trophic signalling between neurons and glia also occurs in the serotonergic regulation of the calcium-binding protein S100 β , which functions as a serotonergic and GABAergic growth factor in the embryonic brain stem (Lauder 1993).

“Cells of the serotonergic raphe nuclei are generated early in the embryonic rat brain, prior to most of their target cells. As soon as they are formed, these neurons begin to send axons rostrally, where they soon encounter their earliest targets (e.g., dopamine neurons of the substantia nigra). The ability of 5-HT to regulate development of its target cells may be mediated by specific 5-HT receptor subtypes. It has been demonstrated that prenatal exposure to pCPA, or the general agonist 5-methoxytryptamine (5-MT), alters the postnatal expression of 5-HT receptors in rat brain. A recent in situ hybridization study has revealed that embryonic monoamine neurons and other neuronal populations affected by in utero exposure to pCPA express mRNA transcripts encoding 5-HT1c and 5-HT2 receptors. Moreover, the [psychedelic] 5-HT1c/2 agonist DOI promotes growth of cultured embryonic brainstem 5-HT neurons and mesencephalic dopamine neurons”.

5-HT neurons located in the rostral raphe cluster extend profuse axon tracts into the fore- and midbrain. A distant target of the ascending 5-HT projection system within the forebrain is the medial prefrontal cortex (mPFC). The mPFC is the seat of our highest cognitive abilities and known to be involved in attentional processes, working memory and behavioural flexibility. In rodents, the developing 5-HT-positive fibers reach the mPFC, where they initially innervate the marginal zone and the subplate, before massively innervating the cortical plate proper. The 5-HT fibers, found within the marginal zone of the mPFC, are thought to contact Cajal-Retzius (CR) cells, cortical layer I cells secreting the

glycoprotein reelin crucial for the correct layering of the cortex (Witteveen et al. 2013). Serotonin's key function as an organiser of brain development in humans, may thus explain why foetal alcohol syndrome may be precipitated by embryonic serotonin depletion (Whitaker-Azmitia et al. 1996).

Fig 122: (1, 2) Neurogenesis and cellular migration up the glial scaffold to form the cortical layers (Agirman et al. 2017, Paridaen & Huttner 2014, Liu et al. 2023). (3) Serotonin interactions in the mature brain between the Dorsal Raphe and mPFC (Celada, Puig & Artigas 2013). These are also activated in embryogenesis and mediate the organisation of the layered cortex through the Cajal-Retzius cells. Inset: Dopamine and Noradrenalin inputs to dlPFC (Thiele & Bellgrove 2018). (5) Pyramidal cells are complex oscillating cells which have receptors for multiple neurotransmitters in diverse locations from dendrites to the cell body and axon. (6) Connectome of axonal pathways in the brain emphasises its integrated embryonic development as an adaptive cellular process.



The 5-HT_{2a} receptor develops more slowly than the 5HT_{1a}. The peak of the 5-HT_{2A} receptor is earlier than the 5-HT_{2C} receptor and the receptor is functional by postnatal day 7 in the rat hippocampus. This time period is too late to influence differentiation, however the receptor may play a role in branching, terminal sprouting, synaptogenesis, and mitogenesis. The role of both the 5-HT_{1A} and 5-HT_{2A} receptors during development suggest that the 5-HT_{2A} receptor acts to release glucose from glial cells and to increase Ca²⁺ levels in neurons. These actions destabilise the internal cytoskeleton, promoting fluidity and result in cell proliferation and apoptosis, resulting in structural instability. By contrast, the 5-HT_{1A} receptor increases the release of S100-β from astrocytes and reduces the levels of cAMP in neurons, promoting an acceleration of differentiation produced by enhancement and stabilisation of cytoskeletal formation, neuronal rest and stability. The 5-HT₂ receptor can be referred to as a programmable receptor. Events during development may affect the number, affinity, or function of these receptors in the adult brain. Both prenatal and postnatal stress to the mother significantly increases the number of 5-HT₂ receptors in the offspring, even after they have become adults (Azmitia 2001).

Serotonin neuronal autoregulation spans major metazoan phyla from molluscs, through arthropods to vertebrates as well as the human brain: "Serotonin appears to autoregulate development of cultured 5-HT neurons, and can initiate and autoamplify its own synthesis in hypothalamic cultures. Evidence for an autoregulatory role of 5-HT in vivo comes from the observations that *Drosophila* mutants incapable of 5-HT synthesis, and adult snails depleted of 5-HT, exhibit aberrant growth of serotonergic axons. Similar effects are seen in rats treated prenatally with the 5-HT receptor agonist 5-MT. Taken together, these studies indicate that altered levels of 5-HT may affect development of the serotonergic system in developing brain. Serotonin also inhibits its own growth through the presence of serotonergic receptors on serotonin terminals possibly 5-HT_{1b}. Thus, serotonin regulates not only the development of target fields, but also its own development" (Whitaker-Azmitia et al. 1996).

This picture confirms that the role of serotonin in nervous system development is strongly conserved from amoebozoia to humans and signals the existence of an ancient conserved regulatory system that evolved in single celled eucaryotes to secure survival of the collective organism, still similarly expressed in us to regulate development. This provides an evolutionary basis for neurodynamic networks to have retained these developmental characteristics, enabling entheogenic serotonin receptor agonists to alter the emotional dynamics of the networks of the ego attuned for organismic and kin survival to promote collective survival, experienced as union the with mind at large. It is also consistent with consciousness emerging at the level of the eucaryote cell.

The developmental paradigm outlined in fig 122 also underlines the fact that the entire network architecture of the brain is the result of a developmental social interaction between specific cell types of neural epithelial cells differentiating into glial and neuronal cell types, which then, in a coordinated sequence, undergo a dynamic state of

cell migration where differentiating cells use the glial scaffold to locate their cell bodies in the appropriate places in the cortical layers before sending out dendrites and axons to make contact with the cell types with which they will eventually form the functional brain's global network.

Cell migration to achieve this has to occur on multiple fronts. In **radial migration**, Neural stem cells proliferate in the ventricular zone lower in fig 122 (1, 2). The first postmitotic cells to migrate from the preplate become Cajal-Retzius cells and subplate neurons, migrating by somal translocation. The cells are bipolar and attach the leading edge of the process and the soma is then transported by nucleokinesis, via a microtubule "cage" around the nucleus elongating and contracting in association with the centrosome to guide the nucleus to its final destination. Radial fibres (radial glia) can translocate to the cortical plate and differentiate either into astrocytes or neurons. Somal translocation can occur at any time during development. Subsequent waves of neurons split the preplate by migrating along radial glial fibres to form the cortical plate. Each wave of migrating cells travel past their predecessors forming layers in an inside-out manner, meaning that the youngest neurons are the closest to the surface. It is estimated that glial guided migration represents 80-90% of migrating neurons. Most interneurons and Cajal-Retzius cells migrate **tangentially** through multiple modes of migration to reach their appropriate lateral location in the cortex. Many neurons migrating along the anterior-posterior axis of the body use existing axon tracts to migrate along in a process called **axophilic migration**. An example is GnRH- expressing neurons, which make a long journey from their birthplace in the nose, through the forebrain, and into the hypothalamus. **Neurophilic migration** involves the migration of neurons along an axon belonging to a different cell type. **Gliophilic migration** is the migration of glia along glial fibres.

The resulting picture is that the entire global network structure of the mature nervous system has arisen through the intelligent strategic activity of individual glial and neuronal cells responding to morphogenic, cell identifying and neurotransmitter clues. There is obviously a genetically based adaptive program in play to achieve this, but the resulting complexity is vastly higher than the complexity of the human genome, so it has to take place through individual cells responding intelligently to the cellular signals in their immediate environment. The conscious biological brain remains the most ecosystemically complex diverse "computational" system in the universe and the only one capable of subjective conscious awareness, recent studies of the mouse brain (Yao et al. 2023) and human synaptic proteome (van Oostrum et al. 2023) show vast diversity with no less than 5,300 types of neuron and neuroglia in the with 10^{15} synapses over 10^{10} very complex non-linear neurons with up to 10^5 different synapses involving multiple receptor types on each. This is general natural intelligence at the molecular level, at cosmological climax.

As the nervous system matures and active excitable network communication arises, edge of chaos excitability forms a dynamic inducer of network connectivity and synaptic adaption, working through the sensory systems from the outside in, with the retina, modulating the input nuclei such as the lateral and medial geniculate in the thalamus and finally the cortex. This means that the notion of the mature brain as simply a synaptic network where the cells are simple functional modules summing up synaptic inputs and encoding these inputs in an action potential firing rate are gross trivialisations of the neurons and glial cells, whose interactive intelligence has been responsible, not just for ongoing adaptive brain states, but the entire structure and function of the nervous system. There is no evolutionary sense in their regressing to a McCulloch-Pitts zombie state having intelligently generated the entire brain.

The idea of the brain as simply a biological neural network of summative synaptic units with thresholds and long term weighting adjustments is thus a highly incorrect simplification, while the idea of the brain as a social network of participating highly intelligent cells both causing the entire fabric and its collective activity in conscious mental states is

the correct one and the one that remains informative about all forms of adaption, learning and memory in which the human brain is involved. Likewise the idea that the neurons are just "cellular" automata while the networked brain somehow has emergent conscious from its network complexity is a Zeno's paradox fallacy. Nuclear functions, including genetic and epigenetic modification have been cited as a basis of long term memory whose basis lies in existing cellular memory processes (Miller et al. 2010, Yu et al. 2011, Bernstein 2022).

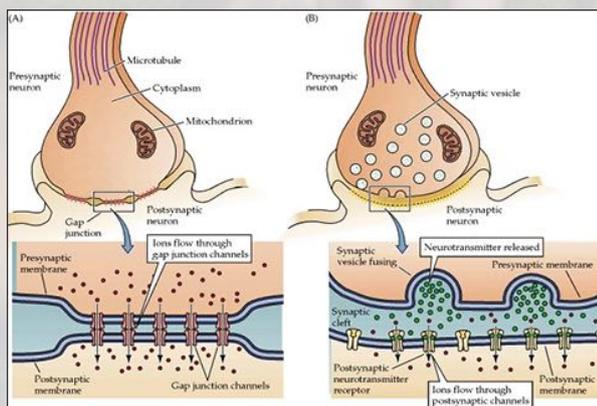


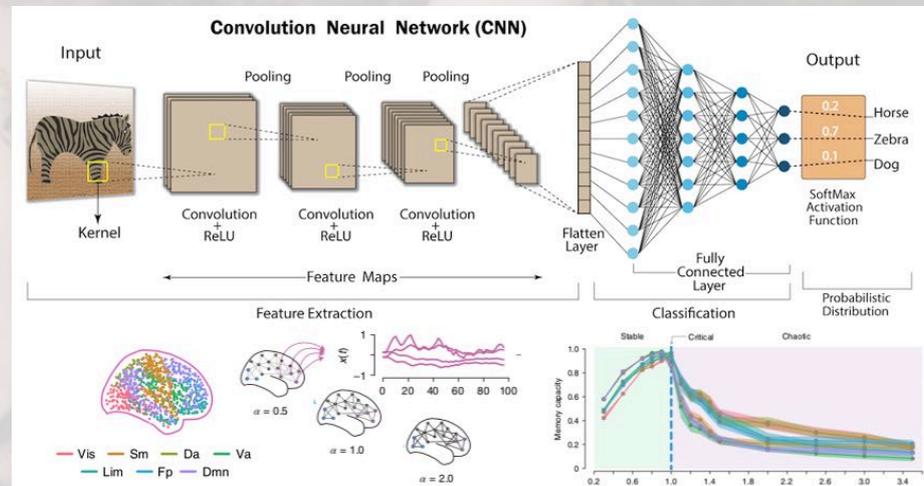
Fig 123: Electrical and biochemical synapses.

Critical to this is the fact that even the brains of humans consist of an intimately coupled society of intelligent amoeboid cells communicating via the same neurotransmitter molecules that single-celled eucaryotes use to engage social signalling to ensure the survival of the collective organism. While both ionotropic and metabotropic neuro-receptors and modulators, based on chemical neurotransmitters, form the principal interactive longitudinal network pathways, electrical synapses using gap junctions have also evolved in metazoa (Söhl et al. 2005, Purpura 2014, Martin et al. 2020). But these have not replaced the dependence on biochemical synapses, showing the latter have, throughout multicellular evolution remained essential to organismic survival. The brain has thus, even given the genetic where-with-all to do so, never evolved to become a purely electrochemical neural net that could be adequately modelled by artificial electrical neural net processes. Electrical synapses do have complementary roles to biochemical synapses, enabling fast resonant activity maintaining synchrony, especially in lateral connections, e.g. in the retina (Trenholm & Awatramani 2022), enabling volume transmission (diffusion through the extracellular space of neurotransmitters that reach remote target cells) and generating electrical fields that are capable of influencing the excitability of nearby neurons. Gap junctions can also pass smaller molecules such as ATP and second messengers, so they are not exclusively electro-chemical. They are also bi-directional, while biochemical synapses are unidirectional. Mixed function chemical and electrical synapses also occur.

The final aspect of this is that the process is not just cellular but is a dynamic fractal from the quantum level to the global brain state. It is operating using wave phase coherence in feedback between continuous and discrete signalling and it is operating at the edge of chaos (King 2014, Teuscher 2022), so its dynamical properties are in a state of self-organised criticality at the quantum level. It is thus in a state of sustained causal uncertainty.

There can be no comparison between the conscious mammalian brain and any externally designed artificial neural net, because the biological one is intelligently designed from the cell up, through the development process, rather than having an externally imposed serial structure, as in a convolutional neural networks, or even random neural nets approximating cerebral circuits, which lack the fractal functionality, thus making machines with subjectively conscious volition, improbable to untenable (Ricci, Cadéne & Serre 2021, Schaeffer, Khona & Fiete 2022, Feather et al. 2023). Artificial neural nets do not have the edge of chaos phase coherence sampling dynamics of the neurodynamic brain.

Fig 124: Upper a convolutional neural net is an externally designed serial causal chain where convolutions of the image are first formed and then a multilayer neural net is entrained on the data to produce a pattern discriminator. The neural nets are simple Hebbian nets connected in series. Lower: An experiment to measure net memory capacity in simple neural nets by iterative synaptic modification designed to have rough quasi-random connections modelled on brain neural networks, tested on active field overlap α (Suárez et al. 2021).



Deep and Dreaming Sleep Across the Animal Evolutionary Tree.

Human sleep runs in cycles descending into deep non-REM States characterised by deep slow waves and periodically rising with increasing frequency during the night to shorter phases of REM (paid eye movement) sleep, where the brain activity closely resembles the waking state but the body is largely paralysed. This is when the rich phases of dreaming occur.

A collection of theories of REM and non-REM sleep have attempted to associate dreaming phases with memory consolidation processes – through specific patterns of neuromodulatory activity and electric field potential oscillations, slow-wave sleep (SWS) and rapid eye movement (REM) sleep support system consolidation and synaptic consolidation, respectively. During deep sleep, slow oscillations, spindles and ripples - at minimum cholinergic activity - coordinate the re-activation and redistribution of hippocampus-dependent memories to neocortical sites, whereas during REM

sleep, local increases in plasticity-related immediate-early gene activity - at high cholinergic and theta activity — may favour the subsequent synaptic consolidation of memories in the cortex (Diekelmann & Born 2010, Stickgold & Walker 2007). Studies show that people perform better at memorisation tasks when they have had a good episode of REM sleep. The direction and amplitude of rapid eye movements during REM sleep disclose gaze shifts in the virtual world of REM sleep, thereby providing a window into the cognitive processes of the sleeping brain (Senzai & Scanziani 2022). Researchers studying mice have found a causal relationship between REM sleep and memory consolidation (Boyce et al. 2016). The memory enhancements of sleep also appear to be specifically targeted at memories the individual perceive to have future relevance. The mere expectancy that a memory will be used in a future test determines whether or not sleep significantly benefits consolidation of this memory. (Wilhelm, et al. 2011). However, although we often forget our dreams consistent with memory reprocessing taking place, if we are awakened immediately from REM sleep, or our sleep is disturbed, we can often remember complex dreams in their entirety, or even become aware enough to realise we are dreaming and enter a lucid dreaming state.

Deep non-REM sleep has also been associated with consolidation of synaptic connections. Sleep after motor learning promotes the formation of postsynaptic dendritic spines on a subset of branches of individual layer V pyramidal neurons. Such neurons activated during learning of a motor task are reactivated during subsequent non-rapid eye movement sleep, and disrupting this neuronal reactivation prevents branch-specific spine formation (Yang et al. 2014). More generally sleep appears to consolidate motor learning at the burst levels attained immediately after training (Nettersheim 2015). It has also been found that sleep re-calibrates homeostatic and associative synaptic plasticity, believed to be the neural basis for adaptive behaviour, in humans (Kuhn et al. 2016). It has been found that in young people sleep spindles remain in synch with large slow waves, which may enable the prefrontal cortex to encode memories being transferred from the hippocampus, leading to consolidation. In older people disruption of this synchrony appears to lead to loss of memory consolidation during sleep (Helfrich et al. 2017).

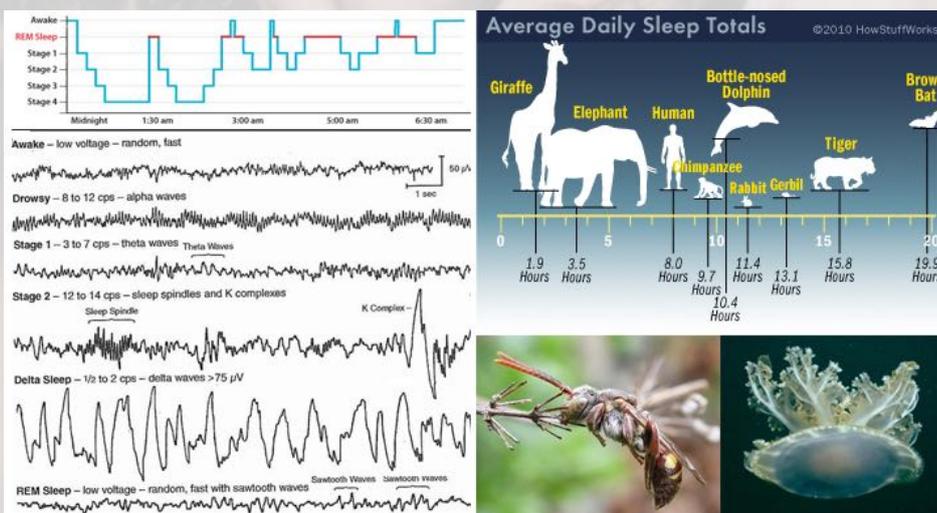


Fig 125: Left stages in the human sleep cycle. Top right: Variations in mammalian daily length of sleep. Lower right: Sleep like torpor in Panurginus and inverted Cnidarian.

There is wide variation in the sleep between mammal species. For example a giraffe only sleeps an average of 1.9 hours, both chimps and orangutans sleep longer than humans 9.67 and 9.11, while a tiger slumbers for 15.5 and an armadillo 20.4. As well as

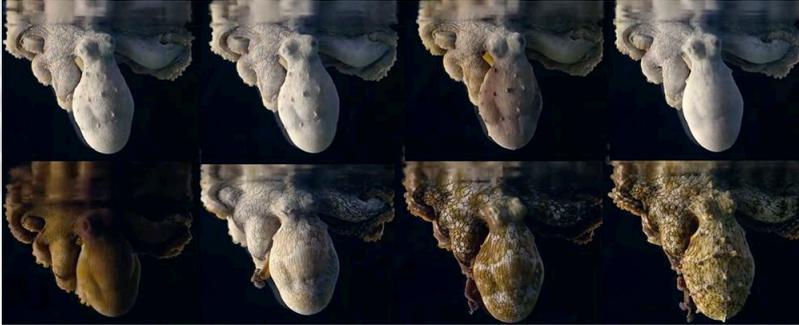
depending on metabolic rates, sleep periods, which extend to both the vertebrates and arthropods, can provide a protective role, keeping animals, which are either nocturnal or diurnal, out of the sight of predators during their inactive hours. The extent of the REM phase also varies widely between mammal species. Animals with big brains for their body size need a significantly higher percentage of REM sleep, supporting a role in intelligence and cognitive function (Lesku et al. 2008). Humans have atypically short sleep compared with closely related primates and pack an unexpectedly higher proportion of REM sleep within a shorter overall sleep duration, and do so by reducing NREM sleep, rather than increasing REM. (Nunn & Samson 2018). Notably cetaceans sleep a single cortex at a time, rather than the whole brain to enable swimming.

Fig 126: REM sleep in kittens, and baby jumping spiderlets.

Recent research has highlighted REM



phases of sleep running far down the evolutionary tree. They are noted in zebra fish (Leung et al. 2019). Jumping spiderlets have been filmed going through periods of quiescent sleep hanging on a thread, interspersed with short periods of eye movement and leg twitching characteristic of mammalian REM sleep (Rößler et al. (2022). Furthermore, cephalopods, including octopi and squids have been shown to likewise have periods of active sleep in which rapid changes in skin colouration appear to coincide with an active dreaming state (Iglesias et al. 2019, Medeiros et al. 2021) coinciding with a perceived series of encounters as shown in the figure. Jumping spiders have excellent camera eyes, unlike the compound eyes of insects.



This raises intriguing questions about the fundamental role of dreaming consciousness throughout the animal tree despite highly divergent brains of molluscs, arthropods and vertebrates, hinting at a universal form of consciousness in all animal life forms.

Fig 127: Changes in skin colouration in an octopus indicate a dream involving rising from the ocean floor (dark transition) and hunting and eating camouflage.

The Evolving Human Genotype: Developmental Evolution and Viral Symbiosis

To gain an empirical view of how these various evolutionary factors play out in practice, we now turn to examining in detail the evolutionary processes of replication and selection as they apply to our own species.

The double stranded human genome consists of some 3×10^9 base pairs, including only ~21,000 protein-coding genes making up around 1% of the genome. More than 80% of the human genome has some active biochemical activity. Although it is currently unknown whether all of this DNA contributes to cellular function, the majority can be transcribed into RNA. Nearly 20 percent of the genome is associated with DNase hypersensitivity or transcription factor binding, identifiable with regulatory regions, of which more than 4 million have been identified (Zhao 2012).

Many of these protein coding genes, including the nuclear core metabolic genes arising from the endosymbiotic α -proteobacteria that became our mitochondria, first evolved in the great archaean expansion 3.2 billion years ago (David & Alm 2010), so that the phenotypic evolution of higher organisms has become a regulatory symphony orchestrating the expression of these genes and later homeotic morphogenetic genes that arose with the first metaphyta in ever more evolved regulatory relationships, through natural and sexual selection based on animal survival and reproduction.

As Gerhart & Kirschner (2007) note:

Regulatory change acts on the repertoire of unchanging core processes to select subsets, which are then externally selected upon. The burden of creativity in evolution, down to minute details, does not rest on selection alone. Through its ancient repertoire of core processes, the current phenotype of the animal determines the kind, amount, and viability of phenotypic variation the animal can produce in response to regulatory change. Thanks to the nature of the processes, the range of possible anatomical and physiological variations is enormous, and many are likely nonlethal, in part simply because the processes have been providing "useful" function since pre-Cambrian times. Phenotypic plasticities, both those evokable by environmental change and those developmental adaptabilities not evocable, are rich sources and favored paths of variation requiring little regulatory change.

This brings us to the selfish gene part, which invokes an extraordinary symbiotic evolutionary story over very long time scales. Around 46% of the human genome consists of transposable genetic elements (TEs) and endogenous retroviruses, which can take on a selfish life of their own. The evolutionary distribution of these elements in the human genome is illustrated in fig 100. TEs can be separated into two major classes: DNA transposons and retrotransposons. DNA transposons, making up ~3% of the human genome, can excise themselves from the genome, move as DNA and paste themselves into new genomic sites. Although they are currently not mobilising in the human genome, they were active during early primate evolution, until ~37 million years ago. Retrotransposons duplicate via transcribed RNA intermediates that are reverse-transcribed and inserted at new genomic locations. They consist of two groups, with and without long terminal repeats (LTRs). Human LTR elements are endogenous retroviruses which

account for ~8% of the genome, most inserted in the human genome >25 My ago, and their activity is presently very limited in humans. Nevertheless, HERV-derived transcripts and proteins have been detected in healthy and diseased human tissues, and HERV-K, the youngest, most conserved family, is able to form virus-like particles (Bannert & Kurth 2004). By contrast, the vast majority of human TEs result from the present and past activity of non-LTR retrotransposons, typified by LINE-1 (or L1), Alu and SVA elements, that collectively account for about one third of the human genome. These are the only TEs unequivocally shown to be currently active in humans, as demonstrated by de novo insertions causing genetic disorders (Cordaux & Batzer 2009), including loss of the tail in apes (Xia et al. 2024).

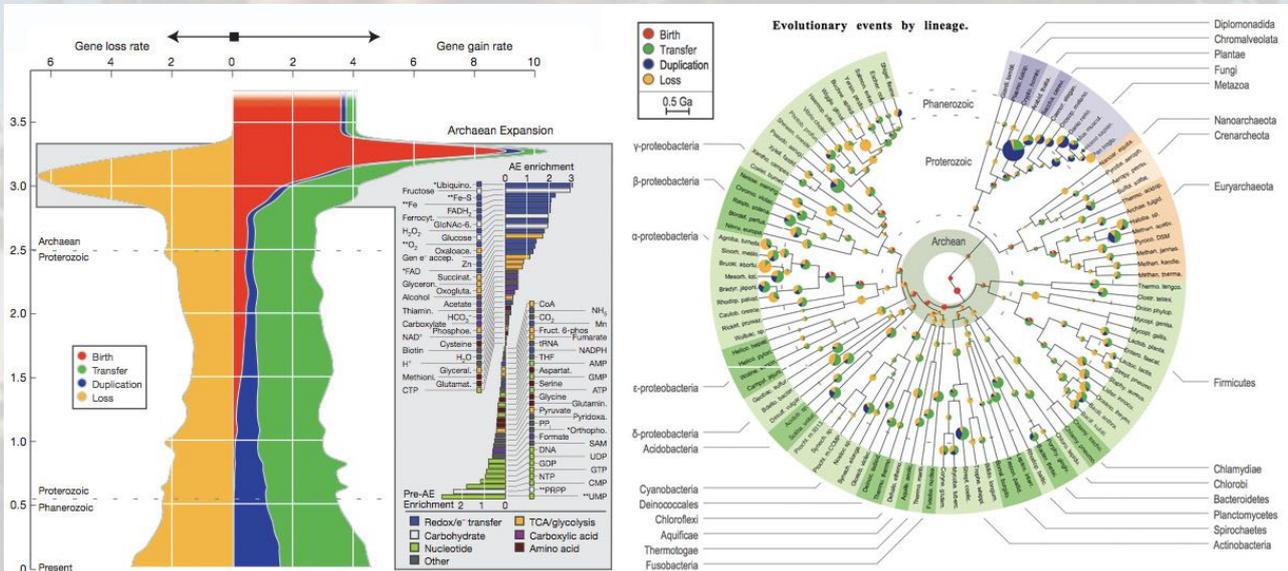


Fig 128: Tree diagram of the birth, transfer, duplication and loss of key genes in the redox and electron transport pathways, in a founding burst of gene evolution between 3.3 and 2.7 billion years ago (David & Alm 2010).

There are >500,000 L1 copies in the human genome, resulting from their continued mobilisation for the past 150 My. L1 elements constitute ~17% of the human genome. There are >1 million Alu copies in the human genome, resulting from their continued activity throughout the past ~65 My. Alu elements have no coding capacity and are, therefore, non-autonomous TEs – “a parasite’s parasite”. Instead, they borrow the processes encoded by L1 elements. There are ~3,000 SVA copies in the human genome, resulting from continued activity throughout the ~25 My of hominid evolution. SVA elements are non-autonomous TEs mobilised by the L1 machinery. Before the autonomous L1 element and its Alu parasite expansions, the genome experienced the autonomous L2 element and its MIR parasite. The current rate of Alu and L1 retrotransposition has been estimated as one insertion every 20-200 births in humans.

We now investigate the ecology, parasitism and symbiotic implications of transposable elements. TEs are not randomly distributed. The genome may be viewed as an ecosystem inhabited by diverse communities of TEs, which seek to propagate and multiply through parasitism, cooperation, and competition. Many elements have evolved mechanisms to target specific loci where their insertions are less detrimental to the host but favourable for their propagation. The success and diversity of TEs in a genome are shaped both by properties intrinsic to the elements as well as evolutionary forces acting at the level of the host species (Bourque et al. 2018 and ensuing paragraphs).

To survive in evolution, TE expression needs to strike a balance – sufficient to promote amplification, but not so vigorous as to lead to a fitness disadvantage for the host offsetting the benefit to the TE. TE-encoded enzymes are naturally suboptimal for transposition and why some TEs have evolved self-regulatory mechanisms controlling their own copy numbers. A variety of host factors are also employed to control TE expression, which includes a variety of small RNA, chromatin, and DNA modification pathways, and sequence-specific repressors such as KRAB zinc-finger proteins. However, many of these silencing mechanisms must be at least partially released to permit developmental regulation of host gene expression programs, particularly during early embryonic development. For example, genome-wide loss of DNA methylation is necessary to reset imprinted genes in primordial germ cells. This affords TEs an opportunity, as reduced DNA methylation often promotes TE expression. There is also a large body of evidence supporting the idea that horizontal transposon transfer is a common phenomenon that affects virtually every major type of TE and all branches of the tree of life, in addition to endogenous vertical transfer in organismic reproduction.

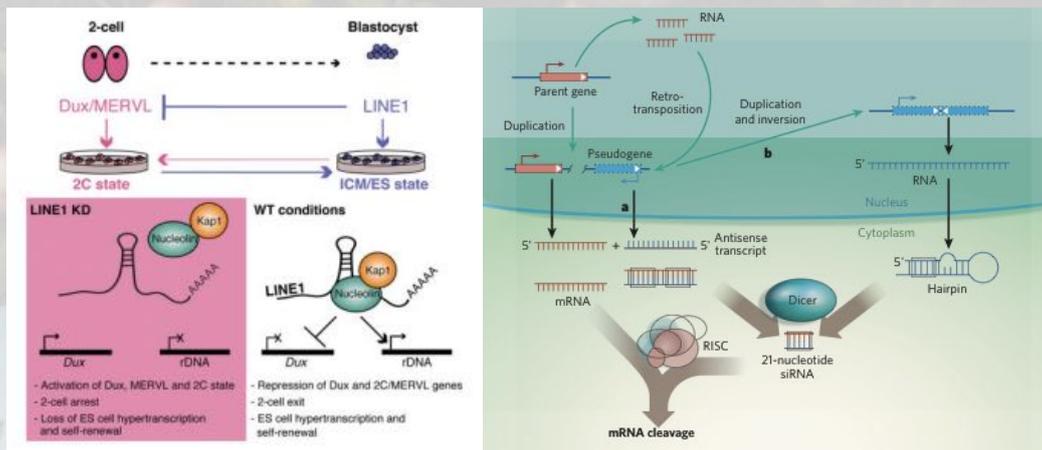


Fig 129: (Left) LINE-1 RNA mediates binding of Nucleolin and Kap1 to rDNA, promoting rRNA synthesis and ESC self-renewal. (Right) Pseudogene-mediated production of endogenous small interfering RNAs (endo-siRNAs). Pseudogenes can arise through the copying of a parent gene (by duplication or by retrotransposition). (a) An antisense transcript of the pseudogene and an mRNA transcript of its parent gene can then form a double-stranded RNA. (b) Pseudogenic endo-siRNAs can also arise through copying of the parent gene as in a and then nearby duplication and inversion of this copy. The subsequent transcription of both copies results in a long RNA, which folds into a hairpin, as one half of it is complementary to its other half. In both a and b, the double-stranded RNA is cut by Dicer into 21-nucleotide endo-siRNAs, which are guided by the RISC complex to interact with, and degrade, the parent gene's remaining mRNA transcripts. The mRNA from genes is in red and that from pseudogenes is in blue. Green arrows indicate DNA rearrangements (Sasidharan R, Gerstein M 2008 *Protein fossils live on as RNA* Nature 453/5 729-32).

TEs are an extensive source of mutations and genetic polymorphisms. More than 99.9% of the ~500,000 L1 copies are no longer mobile due to various forms of mutations and truncations. It is estimated that each person carries a set of ~100 active L1 elements, mostly young insertions still segregating within the human population. TEs are associated with genome rearrangements and unique chromosome features. Transposition represents a potent mechanism of genome expansion that over time is counteracted by the removal of DNA via deletion. The rate at which TEs transpose, which is in part under host control, is an important driver of genome evolution.

To replicate down the germ line L1 elements are preferentially expressed in both germ-line tissues and spermatogenic mice (Branciforte and Martin 1994, Trelogan and Martin 1995). L1 RNA transcripts are generated in several stages of spermatogenesis including leptotene, and in the primary oocytes of females poised at prophase 1 and predominantly become expressed after fertilisation in embryogenesis (Lyon et al. 2010). Most insertions are in somatic cells leading to somatic mosaicism and only a small subset in germ line cells. This could enable somatic stress to have a potential effect on translocation in the germ-line which might enable forms of genetic adaption in long-lived species such as humans (King 1985, 1992). Conversely the SRY-group male determining gene SOX has been found to regulate LINE retrotransposition (Tchénio et. al. 2000).

L1 is highly expressed during early development and plays essential roles in mouse embryonic stem cells and pre-implantation embryos. RNA transcribed from LINE1 elements acts as a nuclear scaffold that recruits Nucleolin and Kap1/Trim28 to repress Dux, the master activator of a transcriptional program specific to the 2-cell embryo, directing gene expression programs essential for embryonic stem cell self-renewal, pre-implantation embryo development, and exit from the 2-cell stage to the blastocyst (Percharde M et al. 2018).

L1 elements have also been found to replicate in neural progenitor cells in both the mouse and human and copy numbers have been found to increase in the hippocampus, and in several regions of adult human brains, when compared to the copy number of endogenous L1s in heart or liver genomic DNAs from the same donor. The authors comment that these data suggest that de novo L1 retrotransposition events may occur in the human brain and, in principle, have the potential to contribute to individual somatic mosaicism (Coufal et. al. 2009). L1s were found to be able to mobilise in mammalian neural progenitor cells (NPCs) isolated from adult rat hippocampus (Muotri et al 2005). During development, neurons migrate from the proliferative zones as hippocampus and subventricular zone toward the surface of the brain to form six distinct histological layers and establish new neuronal networks. Thus, L1-associated mutations occurring in progenitor cells could potentially change the cellular phenotypes in the nascent neurons. L1 retrotransposition was found in the striatum, cortex, hypothalamus, hilus, cerebellum, ventricles, amygdala, and hippocampus. Estimates from human hippocampus, were respectively 13.7 and 6.5 somatic L1 insertions per neuron and glia, respectively. More recently the L1 insertion rate in both neurons and glia from

hippocampus and frontal cortex of three healthy individuals was 0.58–1 events per cell. What seems to be certainly clear is that neuronal cells are more permissive for L1 retrotransposition than other cell types in the human body (Macia & Muotri 2017).

Although L1 elements do not have viral infectivity, lacking the envelope genes of retroviruses, there are recorded cases of horizontal gene transfer of L1 elements between species (Ivancevic et al. 2018). The line related bovine B element which also helps replicate a population of alu-like elements, has made multiple interspecies transfers from predators (snakes) to their prey (frogs) through a variety of parasites (Adelson et al. 2009, Kambayashi et al. 2022).

The use of next generation sequencing has provided additional insights into the L1 role in the mammalian brain, which demonstrate that is indeed made of a mosaic of genomes. Mice in running wheels had threefold more L1 retrotransposition than mice in sedentary environments. In human, the expression of L1 retroelements has been linked to several psychopathological conditions such as post-traumatic stress disorder and major depressive disorder (MDD). MECP2, a protein involved in global DNA methylation, along with the transcriptional factors Sox2 and HDAC1, is known to form a repressor complex on the L1 promoter region, controlling L1 neuronal transcription and thus retrotransposition. Mutation of MECP2 in humans causes Rett syndrome (RTT), a progressive neurological disorder being considered part of the autism spectrum disorders (ASD). Terry & Devine (2020) note aberrantly high levels of L1 expression and retrotransposition in Human Neurological Disorders. The activated L1s act as alternative promoters for many protein-coding genes involved in neuronal functions, revealing a hominoid-specific L1-based transcriptional network controlled by DNA methylation that influences neuronal protein-coding genes (Jönsson M et al. 2019).

Ivancevic et al. (2016) have traced the evolutionary tree of L1 back to the founding eucaryotes as L1 elements occur in both plants and animal phyla spanning vertebrates, arthropods, and molluscs such as octopi where L1 transposition has specifically been associated with high-intelligence where transcription and translation measured for one of these elements resulted in specific signals in neurons belonging to areas associated with behavioural plasticity (Petrosino et al. 2022). L1, along with DNA transposons and LTR retroelements are ubiquitous across the arthropod kingdom (Petersen et al. 2019).

Similarly inactive L1 elements have been found to be 'boosters' of one X chromosome in collapse of one of the two X chromosomes in somatic lines that happens in female embryogenesis (Lyon 2000). A subset of young LINE-1 elements, however, is expressed during X inactivation, rather than being silenced. Such LINE expression requires the specific heterochromatic state induced by Xist. These L1s often lie within escape-prone regions of the X chromosome, but close to genes that are subject to X inactivation, and are associated with putative endo-siRNAs small interfering RNAs that silence transposable elements. L1s may thus facilitate X inactivation at different levels (Chow et al. 2010).

A number of key coding and non-coding RNAs are derived from TEs. Although usually detrimental, there is growing evidence that TE insertions can provide raw material for the emergence of protein-coding genes and non-coding RNAs, which can take on important and, in some cases essential, cellular function. A spectacular example of deeply conserved TE-derived genes are Rag1 and Rag2, that catalyse V(D)J somatic recombination in the vertebrate immune system. Both genes, and probably the DNA signals they recognise, were derived from an ancestral DNA transposon around 500 million years ago.

One of the most intriguing examples of TE domestication is the repeated, independent capture of ERV env genes, termed syncytins, which are involved in placentation by facilitating cell–cell fusion and syncytiotrophoblast formation. These multinucleated cells originate from fetal trophoblasts and constitute the boundary layer between maternal and fetal tissue. The major functions of this layer include maternal–fetal exchange and the maintenance of immunologic tolerance toward the developing fetus (Bannert & Kurth 2004). Notably, one or more such syncytin genes have been found in virtually every placental mammalian lineage where they have been sought, as well as some placental lizards, strongly suggesting that ERVs have played essential roles in the evolution and extreme phenotypic variability of the mammalian placenta (Lavialle et al. 2013, Cornelis G et al. (2017). Another is RNA expression of retroviral RNLTR12-int (Retro-myelin) crucial for myelination, by binding to SOX10 to regulate myelin basic protein expression. It occurs in all jawed vertebrates through multiple convergent evolution events after initial speciation (Ghosh et al. 2024).

Another example of a viral-sourced activity re-purposed for host cell function is provided by the neuronal Arc gene, which arose from the gag gene from a LTR retrotransposon domesticated in the common ancestor of tetrapod vertebrates. Genetic and biochemical studies of murine Arc show that it is involved in memory and synaptic plasticity

and has preserved most of the ancestral activities of Gag, including the packaging and intercellular trafficking of its own RNA (Pastuzyn et al. 2018, Nikolaienko et al. 2018).

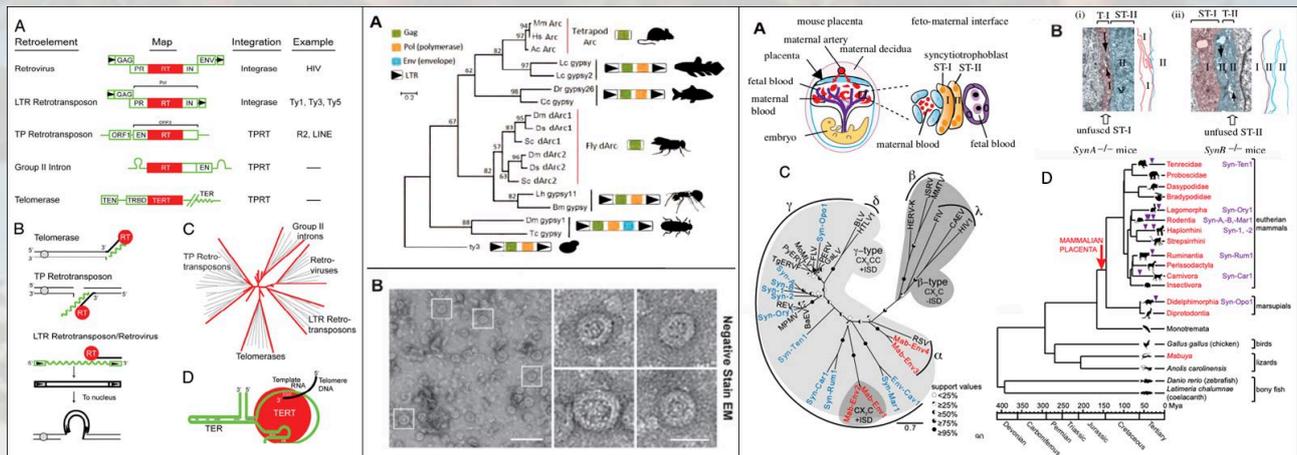
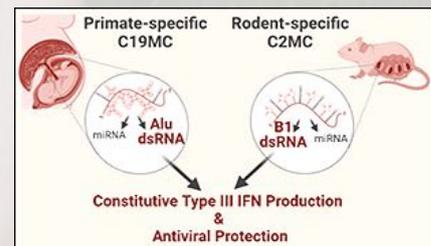


Fig 130: Left: Telomerase containing an ancient relative of TE reverse transcriptase shows a deep evolutionary link with all retroelements. Centre: The arc gene involved in retrovirus like particles in neural plasticity arose independently from gypsy elements in both mammals and *Drosophila*. Right: Syncytin essential for the placental membrane has been incorporated across mammals, some marsupials and a placental lizard from retroviral Env genes.

Unlike prokaryotes, eucaryote protein-coding genes are interspersed with non-coding introns between the exons that constitute functional pieces of the coded protein which have to be excised before translation. Introns allow for alternative splicing to produce different proteins and enable evolution to be modular and to recombine exons into new proteins, so they are a crucial part of eukaryotic genomes, but their origins are poorly understood. Some lineages exhibit large-scale gains in introns extremely rapidly. This is consistent with a type of element, introners, that create copies of themselves that insert into many genes across the genome, leaving behind introns, which can be removed by spliceosomes. These appear to have evolved convergently from many distinct genetic elements, most are consistent with DNA-based transposable elements, and they are disproportionately common in the genomes of aquatic organisms where horizontal genetic transfer is more common (Roy et al. 2020, 2023, Gozashti et al. 2022).

TEs can donate their own genes to the host, and they can also add exons and rearrange and duplicate existing host genes. In humans, intronic Alu elements are particularly prone to be captured as alternative exons through cryptic splice sites residing within their sequences. L1 and SVA (SINE/VNTR/Alu) elements also contribute to exon shuffling through transduction events of adjacent host sequences during their mobilisation. In both mice and humans, the placenta utilises SINE elements (Alu and B1) to form ds-RNA to modulate the immune system in pregnancy to induce type III interferon to avoid viral disease while not inducing rejection of the embryo(s). By pretending it's under viral attack, it keeps the immune system running at a gentle, steady pace to protect the enclosed foetus from viruses that slip past the mother's immune defences (Wickramage et al. 2023). The reverse transcriptase activity of retroelements is also responsible for the trans-duplication of cellular mRNAs to create 'processed' retrogenes in a wide range of organisms. The L1 enzymatic machinery is thought to be involved in the generation of tens of thousands of retrogene copies in mammalian genomes, many of which remain transcribed and some of which have acquired new cellular functions. This is a process still actively shaping our genomes; it has been estimated that 1 in every 6000 humans carries a novel retrogene insertion.



TEs also make substantial contributions to non-protein coding functions of the cell. They are major components of thousands of long non-coding RNAs in human and mouse genomes, often transcriptionally driven by retroviral LTRs. Some of these TE-driven lncRNAs appear to play important roles in the maintenance of stem cell pluripotency and other developmental processes. Many studies have demonstrated that TE sequences embedded within lncRNAs and mRNAs can directly modulate RNA stability, processing, or localisation with important regulatory consequences. Furthermore, TE-derived microRNAs and other small RNAs processed from TEs can also adopt regulatory roles serving host cell functions. The myriad of mechanisms by which TEs contribute to coding and non-coding RNAs illustrate the multi-faceted interactions between these elements and their host.

TEs contribute cis-regulatory DNA elements and modify transcriptional networks. Cis-regulatory networks coordinate the transcription of multiple genes that function in concert to orchestrate entire pathways and complex biological processes. There is now mounting evidence that TEs have been a rich source of material for the modulation of eukaryotic gene expression. TEs can disperse vast amounts of promoters and enhancers transcription factor binding sites, insulator sequences, and repressive elements. As TE families typically populate a genome as a multitude of related copies, it has long been postulated that they have the potential to donate the same cis-regulatory module to ‘wire’ batteries of genes dispersed throughout the genome. An increasing number of studies support this model and suggest that TEs have provided the building blocks for the assembly and remodelling of cis-regulatory networks during evolution, including pathways underlying processes as diverse as pregnancy, stem cell pluripotency, neocortex development and innate immunity.

We now turn to the overall mutational load of all these processes. Xue Y et al. (2009) set an even lower limit examining the Y chromosome of 3.0×10^{-8} mutations/nucleotide/generation, giving 90 per haploid genome. Harris & Pritchard (2017) note that due to the combined action error correcting genes, mutation rates are extremely low in humans – about one point mutation per 100 MB or about 60 genome-wide per generation. Given only 1% coding this would imply only around 0.6 coding mutations per generation consistent with the raw assumption of around 0.5.

Feusier J et al. (2019) have provided the following retrotransposition rate estimates for Alu elements, one in 40 births, is roughly half the rate estimated using phylogenetic analyses of one in 20, a difference in magnitude similar to that observed for single-nucleotide variants. The L1 retrotransposition rate is one in 63 births and is within range of previous estimates (1:20–1:200 births). The SVA retrotransposition rate, one in 63 births. While these are more disruptive or retrogene TE insertions, the rates of both are broadly consistent with a viable mutational load under integrative mutational change accompanied by sexual recombination.

This picture has shown us a comprehensive view of how the organismic human genome succeeds in maintaining a balance with its “selfish” TEs, in which feedback between TE transposition, host repression and a wide array of symbiotic evolutionary manifestations have resulted in a co-evolutionary scenario in which the TEs have become (or have always been) essential complements of the host nuclear genome, providing us with the capacity for passing the two cell embryo stage, enabling placental development, contributing to neural plasticity and learning and the very basis of our antibody immunity.

The Evolving Human Phenotype 1: Sexual Evolution, the Heritage of Sexual Love and Patriarchal Dominion

In “The Woman that never Evolved”, Sarah Hrdy (1981) conveyed a previously unrecognised view of the primate female in the span of her transition to humanity: *we are introduced to our nearest female relatives: competitive, independent, sexually assertive primates who have every bit as much at stake in the evolutionary game as their male counterparts do. These females compete among themselves for rank and resources, but will bond together for mutual defense. They risk their lives to protect their young, yet consort with the very male who murdered their offspring when successful reproduction depends upon it. They tolerate other breeding females if food is plentiful, but chase them away when monogamy is the optimal strategy. When “promiscuity” is an advantage, female primates—like their human cousins—exhibit a sexual appetite that ensures a range of breeding partners. From case after case we are led to the conclusion that the sexually passive, noncompetitive, all-nurturing woman of prevailing myth never could have evolved within the primate order.*

Human evolution and cultural emergence has thus been marked by a strong influence of female reproductive choice, amid mutual mate choice, accompanying a long slowly developing childhood. This is consistent with our closest sister species, chimps and bonobos having a mix of female exogamy and male clan dominance in chimps, and powerful alpha females in bonobos, where sexual evolution of the clitoris has led to frequent female-female socio-sexual bonding (Fielder & King 2004 A). The eschewing of overt estrus in favour of menstruation in humans, combined with a degree of lunar and menstrual synchrony also leads to female reproductive choice operating strategically to offset male reproductive domination and threats of male infanticide.

Indeed human sexual evolution, perpetual socio-sexual receptivity accompanied by ecstatic female arousal, the foregoing⁴⁹ of overt oestrus in favour of menstruation, the need for human males to demonstrate genuine indicators

⁴⁹ It has been claimed that concealed estrus is not an evolved trait but an underlying primate condition and that overt estrus is an evolved trait due to sexual and social selection e.g. in chimps and bonobos (Laland & Brown 2002 13), as the majority of primate species, including most apes, do not reveal their time of ovulation.

of genetic fitness, both in a large penis lacking the penile bone of the great apes, and in hunting and social prowess, consistent with XY sex chromosome inheritance, complemented by lunar phasing and menstrual synchrony, attest to an evolutionary emergence of *Homo sapiens* strongly influenced by female reproductive choice (Fielder & King 2004).

Evidence for such archaic patterns is evident in the practices of founding human cultures, from 19th century accounts of ‘Hottentot’ women refusing sex unless meat is provided, through the Hadza to the Sandawe “twerking” rites by the light of the full moon (King & Fielder 2004 B), sometimes referred to as the “sex strike” (Knight 1991, Power & Watts 1996, King & Fielder 2004). Intense female clitoral orgasm, perpetual sexual receptiveness outside menstruation, the growth of female fatty breasts and neotinous features indicating fecundity and youthfulness and the loss of penis spines and bones, with growth of a large erectile penis in males, also attests to mutual sexual selection in humans enhancing both female sexual attractiveness and males having to give a genuine indicator of genetic fitness during sex.



Fig 131: Above Left: Chimp, bonobo and human penises compared. Both chimp and bonobo penises have penis bones and neuro-sensitive penile spines (one shown inset top left) with a very short copulatory period. The human penis is notably larger and testes smaller than chimps. Below Left: Bonobo and human clitoris. Bonobos have a large clitoris enabling female-female erotic contact but like chimps have an overt estrus (below centre). The human clitoris is smaller but highly sensitive with more nerve endings than the human penis. Centre and Right: Human pregnancy is a very significant risk and investment to the human female, involving risks of giving birth to a large head, travail vulnerability in late pregnancy, followed by years of breast feeding and early child rearing of a dependent infant. Male and female reproductive strategies are thus examples of sexually antagonistic co-evolution (Fielder & King 2004 D) in which males try to avoid paternity uncertainty by controlling female sexual choice leading to the sex wars and patriarchally driven sexual dominance. Female reproductive choice is thus essential to human evolution to counterbalance this effect. Centre: Infrared imaging of female sexual arousal is accompanied by blood flow to the labia and clitoris just as it is to the penis. This is central to the nature of human courtship and bonding between the sexes.

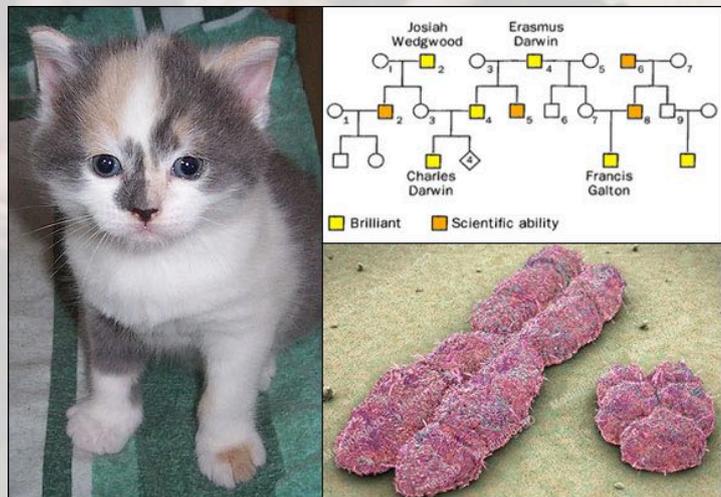
The emergence of super-intelligence in humans has also been associated with the “mating mind” (Miller 2000), in which men display their genetic prowess in hunting and their social skills in music, story-telling and social humour, while the women make astute social choices of who to get pregnant with, given a mix of good genes and resourcing required to bring up a human infant. Machiavellian social intelligence for strategic bluffing, is also evident in intelligent species, from capuchins to humans. Female sexual selection is consistent with XY sex chromosome inheritance, where the large X chromosome is unique in males but chimeric in females due to double X being toxic, except in the germ line (Turner 1996). This provides a context for males to demonstrate intellectual and social prowess due to their unique X whose genes may also serve reproductive choice in females. The X chromosome contains multiple genes linked to brain function and development, some of which are rapidly evolving, giving support to this idea.

My joint work with Christine (Fielder & King 2004) “Sexual Paradox: Complementarity, Reproductive Conflict and Human Emergence” set out the thesis that the emergence of human culture and super-intelligence arose from a reproductive prisoners’ dilemma of sexual selection game theory where neither sex had the upper hand in terms of their own highly asymmetric reproductive strategies, causing a peacock’s tail Red Queen race of mutual sexual selection for culture and intelligence, centrally mediated by astute female reproductive choice, in a context of mutual mate choice to enhance family stability. Because of the very high costs to mammal females due to having to invest in live birth, the female reproductive strategy is highly skewed towards careful parenting investment. By contrast mammalian male strategies are strongly skewed to fertilising as many females as possible. Hence only 3% of mammalian species are socially monogamous, although not genetically so, due to covert ‘cheating’ by both sexes. Humans are at an extreme for mammals, because of the high risks of delivering a large-headed baby, often as a single offspring, long periods of lactation and child care in a slowly-growing infant, requiring increasing cultural education put

these asymmetries at an extreme, leading to sexually-antagonistic co-evolution, manifest in existential conflicts of personal interest. This then becomes the process of sexual selection that is fixing the intellectual benefits of the emergence of language and culture we will see in the next section. It is a view confluent with evolutionary psychology, which we support, as giving expression to evolutionary sexual selection conducive both to human emergence and intelligence, and also to strongly pro-social influences of love consistent with long-term emergent stability.

This is partly underpinned by some beautiful aspects of mammalian sexual chromosome evolution. Mammals have an ingenious sexual genetic scheme to align sexual selection with the effects of the honest egg and the cheating sperm. The female XX and male XY means that the male is haploid X and the female diploid XX. The haploid state provides for maximal selective advantage, because there is just one 'pure' copy of each gene on this entire chromosome, not two interacting copies. When the female embryo begins to divide about the 10 to 20 cell stage, in each somatic cell i.e. apart from the germ-line sex cells, one or other X randomly collapses. So a female brain is single X, like the male, but with a difference - it is a mosaic of cells of two genetic X-identities, those of her father and mother, as in the picture of the tortoise-shelled cat. The male by contrast is endowed with one pure maternal X-dose. When he is good he is very very good - but when he is bad he is singularly retarded. There are at least 8 forms of X-linked male mental retardation because the X chromosome, the hemizygous 'haploid' X is carrying several key genes for brain development at the spearhead of human evolution (Turner 1996).

Fig 132: (Left) X-linked tortoise-shell gene variation demonstrates X-mosacism in a female cat on a scale where the brain would also be chimeaic. The confinement of this phenomenon to female felines combined with an elusive contracted genetic element in female somatic cells, the Baar body, was the trigger for Mary Lyon (2000), the discoverer of mosaic X-inactivation to make the discovery (Jegalian and Lahn 2001). (Top right) Darwin Family tree (Turner 1996). His grandfather was the founder of Wedgwood Pottery and his cousin, Galton, was a prolific writer and the founder of the Eugenic movement. The pedigree shown in the figure was said, at the beginning of the century, to indicate that genius is a Y-linked dominant, but it could equally well be explained by X linkage. Charles Darwin received Joshua Wedgwood's X chromosome and therefore his intelligence through his mother (11-3), and Erasmus Darwin's brilliance having reappeared in Francis Galton via his mother (11-7), rather than his father. Mary Howard (1-3), was also related to the Galtons. (lower right) Human X and Y chromosomes.



There are 221 known human genetic defects that can cause mental impairment, some 10% of which reside on the X chromosome, even though it carries less than 4% of known human genes and the complete sequence of the X chromosome (Ross et al. 2005), confirms that an unusually large number of its genes code for proteins important to brain function. Estimates of the increased likelihood of a deleterious mental impairment gene being on the X-chromosome range from 1.9 times through 4.3 times (Inlow & Restifo 2004) to 7.2 times (Zechner et al. 2001) giving it a pivotal role in the evolution of human intelligence. Researchers have also found that in some traits linked to intelligence, such as verbal skills and good social behaviour, male twins were more alike than female twins indicating X-linked genes in which the females are chimeric (Loatet et al. 2004).

In our species, where intelligence and social skills are central to success, genes on the X chromosome seem to have evolved rapidly to provide us with the necessary brain power (Check 2005). An explanation goes as follows. As the X and Y diverged from a common autosome pair they each began to accumulate autosomal genes. Ultimately the X and Y diverged to the point where most X genes cannot recombine with Y and become recombined only in female oogenesis. This makes the X one of the most stable in the mammalian genome, for two reasons. Firstly because the genes are expressed in almost exclusively haploid form in males, who have lost the corresponding Y genes, they need to be more strongly conserved according to Muller's ratchet theory. Secondly, mutation rates are much lower in females who produce a relatively small number of primordial eggs early in embryogenesis, as opposed to males, who produce vast numbers of sperm throughout life.

The stability and inheritance of the X may have paradoxically exposed X genes to more intense pressure to evolve. As genes became transferred between chromosomes, those involving intelligence that became transferred to the X

become exposed to acute sexual selection by females because in males, the X chromosome genes get a chance to shine, or to fail miserably, each time they pass through the male line. Because a male carries only one copy, any new mutations are revealed in all their glory.

Many of the genes on the X chromosome associated with human brain function seem to have distant relatives with different functions in other vertebrates, such as chickens and fish (Kohn et al. 2004). So in boosting our cognitive abilities, the X chromosome seems to have co-opted a diverse range of existing genes, rather than evolving a new set of genetic sequences for the purpose, posing a paradox of conservatism amid rapid change. In some instances, geneticists have pinpointed genes on the X chromosome that still seem to be in the process of adopting new roles in the brain. For instance, a gene called JARID1C seems to be evolving from a similar gene called JARID1D, which is found on the Y chromosome. If men inherit a damaged version of the JARID1C gene on their single X chromosome, they develop mental disabilities. The fact that the healthy Y chromosome version cannot compensate for its defective cousin hints that JARID1C is becoming more crucial to the brain as it evolves (Jensen et al. 2005).

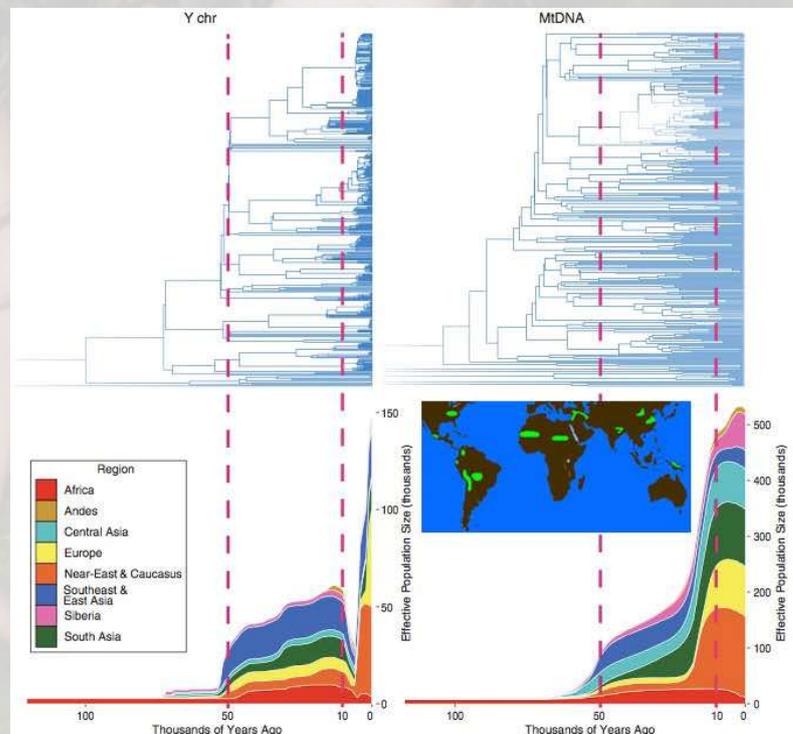
When the occasional man gets the pure benefit of a fortuitous X complementing his other good brain genes on the diploid chromosomes he may thus become a genius. The irony is that the male never can transmit this heritage to his sons. It is always the maternal X that goes to the son, because to be a son he must have got the paternal Y. Females are thus the progenitors of male prodigies, but the prodigies are doomed ducks. This is the sacrificial saga of the sex gene. The only hope for a male genius is to have daughters! By contrast, females can fortuitously give direct birth to male geniuses. This doesn't mean only males display creative genius. Neither does it deny the capacity of culture and education to mediate natural differences.

A revolutionary idea is that female genes encouraging female sexual selection for intelligence are strongly linked to genes for high intelligence selected for in the male. Early in human evolution, researchers suggest (Zechner et al. 2001), females developed a preference for intelligent males. According to the theory, the genes for super-intelligence and for the preference of intelligent males were closely linked, and so were inherited together. And because superior intelligence also aided survival, the process wasn't kept in check by natural selection — unlike other sexually selected characteristics such as the peacock's tail, which makes its bearers more vulnerable to predators. These X-linked genes then ran away together without any limitation by natural selection, because of the adaptive advantage of intelligence.

Fig 133: A human reproductive bottleneck in Y-chromosome diversity began about 10,000 years ago and continued for several millennia (Karmin et al. 2015). Inset shows 11 independent areas of primal agriculture discovered.

Laland's treatment of sexual selection is a glaring omission in terms of its pivotal role, all the more anomalous, given Darwin's own founding (1871) title on human emergence — "The Descent of Man, and Selection in Relation to Sex". When Laland does briefly touch on sexual selection in passing, it is only a brief reference with no implications articulated either for our emergence as a super-intelligent species, or for the effects of our epoch of 'civilised' culture for better or worse:

Even if human mating preferences are learned, socially transmitted, and culture specific, sexual selection will still result. Indeed, culturally generated sexual selection was found to be faster and more potent than its gene-based counterpart. ... experimental data shows that humans copy the mate choice decisions of others, which can lead to the social transmission of preferences for particular characteristics in the opposite sex. ... Given the pervasiveness of cultural influences on human mating preferences, social transmission may exert a powerful influence on the selection of secondary sexual characteristics and other physical and personality traits.



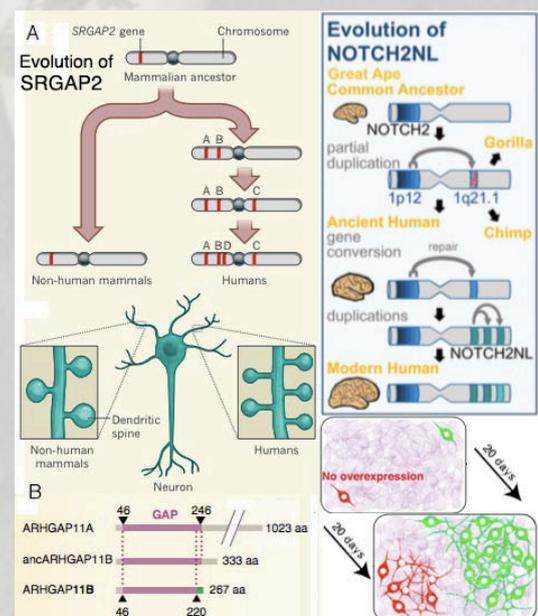
The Evolving Human Phenotype 2: Past and Future Evolution of the Brain and Human Intelligence

There is clear evidence for increasing brain size and intelligence, as primate evolution has proceeded from monkeys to apes, and finally humans. Genetic studies have found a number of intriguing improvements in neuronal brain structure in the evolution of *Homo sapiens* from higher apes. An outstanding example has been the *FoxP2* transcription factor gene (Enard et al. 2002), whose mutations can give rise to severe selective language impairment and appears to be associated with fine motor coordination of the larynx. Mutations in this gene are rare, but there has been a double mutation in this gene and the paucity of 'silent' neutral mutations which don't change the protein suggested it was a very recent change, later than 200,000 years ago, which has swept through the population by conferring a major selective advantage. However the evidence for a selective sweep involving *FoxP2* is no longer supported by a more extensive study by the original team (Atkinson et al. 2018) and is now known to be shared by Denisovans and Neanderthals, taking it back to at least 600,000 years ago before *Homo sapiens* and these lines diverged.

An indication of a key genetic switch which may have led to the increasing brain size of the *Homo* line has come from investigation of the gene family *SRGAP2a,b,c*, (Dennis 2012) involved in neocortex maturation, which is present in only one copy in chimps as well as other mammals, but has undergone three duplications in humans, the first daughter copy 3.4 million years ago around the time evidence of *Australopithecus* tool use seems to have occurred, and the second 2.4 million years ago around the time *Homo* is believed to have split off from *Australopithecus* and the third about 1 million years ago. The effect of the duplications of truncated copies appears to be that the duplications form a more complex regulatory system, which partially inhibits the action of the original, leading to a slower growing, larger brain with more complex ramified neurons, which can also migrate more rapidly during embryogenesis, leading to design features consistent with a larger more complex brain (Charrier et al. 2012). Several other brain genes may also prove to be duplicated in humans complementing this discovery.

A human-specific gene may be responsible for human neocortex expansion due to a single nucleotide change, which introduces a new splice variant. Neocortical neurogenesis involves two main classes of neural progenitor cells, apical progenitors (APs) and basal progenitors which are better suited for maximising neuron production. Accordingly, the evolutionary expansion of the neocortex is associated with an increase in the generation of BPs. The gene *ARHGAP11B*, which promotes basal progenitor amplification and is implicated in neocortex expansion, arose on the human evolutionary lineage by partial duplication of *ARHGAP11A*, which encodes RhoGAP. However, the lack of 55 nucleotides in the mRNA, which leads to loss of RhoGAP activity by GAP domain truncation also results in addition of a human-specific amino acid sequence. The 55 nucleotides are deleted by mRNA splicing. Hence, a single nucleotide substitution underlies the specific properties of *ARHGAP11B* that likely contributed to the evolutionary expansion of the human neocortex (Florio et al. 2016).

Fig 135: (Left) A The evolution of *SRGAP2*, showing the four human genes and the counterposed effects one maturing dendritic spines and another encouraging the formation of more immature spines resulting in a more complex expression. B: Splice variant duplication *ARHGAP11B* with unique tail enhancing basal progenitor mitosis and neocortical expansion (green). (Right) Evolution of *NOTCH2NL* and its affect on neurogenesis.



A set of three nearly identical genes found only in humans, *NOTCH2NL*, appears to play a critical role in the development of our large brains (Fiddes et al. 2018). These are found exclusively in humans and appeared between 3 and 4 million years ago, just before the period when fossils show a dramatic increase in the brain sizes of human ancestors. These genes belong to an ancient family of *NOTCH* genes, discovered in fruit flies and named causing notched wings. The human-specific genes were derived from *NOTCH2*, one of four mammalian *NOTCH* genes, through a duplication event that inserted an extra partial copy of *NOTCH2* into the genome in an ancient ape species that was a common ancestor of humans, chimpanzees, and gorillas. The partial duplicate was a nonfunctional pseudogene, versions of which are still found in chimp and gorilla genomes. In the human lineage, this pseudogene was revived when additional *NOTCH2* DNA was copied into its place, creating a functional gene. Gene conversion was likely

responsible for repairing a non-functional version of NOTCH2NL. After it was repaired, but before we diverged from our common ancestor with Neanderthals, NOTCH2NL was duplicated several times, resulting in four genes. Three of the four are active genes that direct the production of truncated versions of the original NOTCH2 protein. A complementary team (Suzuki et al. 2018) also focused on NOTCH2NL because of the importance of its ancestral gene, NOTCH2, in signalling processes that control whether cortical stem cells produce neurons or regenerate more stem cells. And they found that artificially expressing NOTCH2NL in mouse embryos increased the number of progenitor stem cells in the mouse cortex and can substantially expand the population of cortical stem cells, which in turn generate more neurons, a feature expected to distinguish between human and non-human cortical neurogenesis.

The role of micro RNAs which bind to mRNAs and thus are able to initiate a coordinated array of regulatory changes have been implicated in the differences in evolutionary rates of change between humans and chimps. Constitutive gene expression divergence is comparable between humans and chimpanzees. However, humans display a 3–5 times faster evolutionary rate in divergence of developmental patterns. Such accelerated evolution of human brain developmental patterns is twice as pronounced in the prefrontal cortex than the cerebellum, preferentially affects neuron-related genes, and does not depend on cis-regulatory changes, but might be driven by human-specific changes in expression of trans-acting regulators. Developmental profiles of miRNAs, as well as their target genes, show the fastest rates of human-specific evolutionary change. miR-92a, miR-454, and miR-320b are possible regulators of human-specific neural development (Somel et al. 2011).

Schroeder & Rogers Ackermann (2017, 2023) have shown that genetic drift, and, likely, small population sizes were important factors shaping the evolution of Homo and many of its novel traits, particularly those involving regulatory changes of many genes, for which neutral variation is prominent, although selection has played an essential role in driving adaptation to new contexts.

Brain size has swelled from the 500cc of Australopithecus. Homo erectus and his alter-ego Homo ergaster, went from a 750cc brain to 1250cc. The emergence of modern Homo sapiens, is accompanied by a slight decrease in brain size from an average of about 1500cc to 1400. Although this is well within the range of human variation between 1100 and 2000cc, it does suggest that some form of compactification has taken place. One view of this is that the development of culture and language has made it cognitively easier for the brain to assimilate the world around us. Another suggested (Ridley 2003 34) is that a reduction of aggression may be accompanied by a more neotonic physiology (tending towards embryonic form), as is noted comparing womens slightly smaller brain sizes than men, made up for by a higher proportion of grey matter neurons.

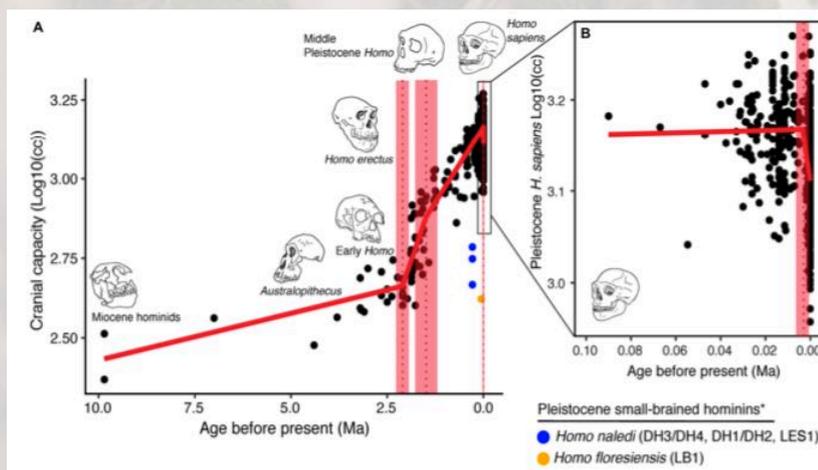


Fig 136: Variations in brain size, with a focus on a recent decrease DeSilva et al. (2021).

However, brain size is only an overall measure of brain complexity and intelligence and the size of the brain has both grown and shrunk in the lead up to the present. An important measure is the relative contributions of grey matter consisting of cell nuclei and white matter consisting of connecting axons. Zhang & Sejnowski (2000) have established a universal scaling law between grey matter and white matter of the cerebral cortex consistently

spanning several orders of magnitude in brain sizes across the mammalian kingdom, arising from an evolutionary requirement for compact arrangement of long axonal fibres.

Lüders, Steinmetz & Jäncke (2002) show that among people today, brain size correlates negatively with proportion of grey matter. Women have smaller brains with proportionately more grey matter so their white matter is relatively more efficient. Larger brains have a lower proportion of grey matter so their white matter was bulkier and relatively less efficient and their grey matter wasn't much larger as might appear from brain size.

*As expected, we found a significant sex difference for the absolute volumes of total brain, grey matter, white matter and CSF, with greater volumes for men. Relating these compartmental volume measures to brain volume resulting in proportional volume measures revealed **a higher proportion of grey matter in women**. No significant sex differences were found for white matter and CSF proportions. However, when the influence of sex was partialized out by regression analyses, brain volume explained 40-81% of the variance of the absolute grey matter, white matter and CSF volumes. Performing these regression analyses for the proportional volume measures revealed that brain volume explained ~16% of the variance in grey matter proportion. **Interestingly, the correlation between brain volume and grey matter proportion was negative, with larger brains exhibiting relatively smaller proportions of grey matter.** ... We suggest that brain size is the main variable determining the proportion of grey matter.*

This finding lends moderate support to the idea that some of the recent reduction in brain size could be due to evolving changes to improve the efficiency of axonal circuitry because (a) a larger brain is slower because the axonal routing takes longer, (b) there is a continuing selective pressure against unnecessary brain size, because of the metabolic load of a larger brain which already consumes 40% of the glucose metabolism and (c) because of a large brain size causing greater risks to the baby and mother during delivery.

There are many possible causes to explain such a reduction, changes in body size, diet, domestication reducing aggression. However, there is another major factor that may contribute and that is the negative effect of culture on brain size due to collective intelligence reducing the need for individual intelligence. DeSilva et al. (2021) note:

Reduction in brain size may not compromise cognitive performance if intelligence is an attribute of the society rather than the individual. Galton first described that the accuracy of decision making by human groups could exceed that of any individual group member. This concept of collective intelligence has since been elaborated in studies ranging from insects to humans. If brain production, maintenance, and operation costs are metabolically significant, then collective intelligence may reduce demands for neural tissue to support individual cognitive capabilities.

We suggest that group cognition lowered the demands for neural architectures required to support some aspects of individual intelligence and decision making. This effect may have become even more pronounced with the advent of writing ca. 5000 years ago, which falls within the estimated 95% CI for the pronounced reduction in Holocene human brain size (Fig 136). During human history, social groups became larger, social interactions more frequent, social networks more complex, and tracking relationships more demanding. A rise in sociocultural complexity was not due to particular individuals becoming more intelligent and culturally skilled, but because of the emergence of collective intelligence resulting from a growing population of interconnected humans and interacting human groups. As group size increases, interactions with a dynamic and exceedingly complex social landscapes result in increased demands on the brain. However, because of the metabolic demands of the brain, there may be limits to feedback loops between social network size and brain structure. If group decision-making generated adaptive group responses exceeding the cognitive accuracy and speed of individual decisions and had a fitness consequence, then human brain size may have decreased as a consequence of metabolic cost savings.

Population size expanded dramatically with the advent of agriculture, beginning ~10 kyr and grew exponentially from an estimated five million to over 100 million by 3000 years ago. This increase in population coincided with deterioration in individual health and increases in infection rate, pathogenic load, and virulence. It remains possible, then, that the high energetic cost of a heightened immune response, might have been a factor in Holocene brain reduction. In fact, Crabtree (2013a, b) proposed this immunity-for-intelligence trade-off in his controversial "Idiocracy Hypothesis," though this idea has been criticized on the basis of flawed assumptions (Kalinka et al., 2013; Mitchell, 2013). Gowdy and Krall (2013) draw parallels between the ultrasocial human superorganism, complete with division of labor and "economic organization around surplus" that arose in the Holocene and the sociobiology of agricultural eusocial insects, including some ants and termites.

Crabtree (2013a, b) cites the large number of X-chromosome genes, each of which results in clinical intellectual disability (ID) as an unstable chain of genes, rather than a robust self-compensating network, making the human genome vulnerable to the loss of any of them:

Perhaps the most effective way to estimate the number of genes in humans that are needed for full intellectual function is to rely on studies of X-linked intellectual deficiency (XLID). Because males have only one X chromosome, the effects of X-chromosome mutations cannot be rescued or compensated for by the second copy, in contrast to mutations on other chromosomes. Present studies indicate that mutation of about 215 intellectual deficiency (ID) genes on the X chromosome give rise to XLID and/or emotional disability [1,2]; this represents about 25% of the genes on the X chromosome. Of these, 86 have been characterized and do not seem to be neomorphs (a gain of inappropriate function). This gives a conservative estimate that about 10% of all human genes are implicated in intellectual function. Because mutation of any one of these genes can give rise to intellectual disability, it can be concluded that they do not operate as a robust network, but rather as links in a chain, failure of any one of which leads to intellectual disability. The X chromosome does not appear to be enriched for genes required for intellectual development, and therefore we can extrapolate that between 2000 and 5000 genes are needed for intellectual and emotional function.

Crabtree (2013c, d) has responded vigorously to his critics (Kalinka et al., 2013; Mitchell, 2013). His extension to 2000-5000 ID genes in the whole genome is likely a moderate overestimate because he assumed the X-chromosome was representative of the entire genome, however there are still a very large number of genes involved, so the concern

remains real. In fact the X-chromosome does have between 1.9 and 4.3 times as many ID or MR (mental retardation) genes, which in turn attests to a pivotal role for astute female reproductive choice in selecting for super-intelligence cited in the previous section. Hence the repression of this, under patriarchal culture, is very likely to be having a deleterious effect on human intelligence.

A novel test, in which Inlow J & Restifo L (2004), distributed unmapped MR disorders proportionately across the autosomes, failed to eliminate the well-known X-chromosome overrepresentation of MR genes and candidate genes:

It has been proposed that the human X chromosome contains a disproportionately high density of genes for cognitive ability. This proposal generated controversy as well as speculation concerning possible underlying evolutionary mechanisms, including the intriguing suggestion that female mate selection for high male intelligence helped accelerate the rapid rise of human cognitive abilities (Turner 1996; Zechner et al. 2001). Opponents, however, argued that all X-linked recessive mutations are simply easier to map and identify because their phenotypes are revealed in hemizygous males. Countering this view is an analysis (Zechner et al. 2001) showing a 7.2-fold X-chromosome bias for MR genes, whereas genes causing common morphological phenotypes have, on average, only a 2.4-fold X-chromosome bias.

To take this question one step further, we asked whether the apparent X-chromosome overrepresentation among the molecularly identified human MR genes [of around 4.3 times] would disappear if we accounted for the plausible possibility that numerous autosomal loci are “hiding” among the unmapped MR genes. We attempted to overcome the ascertainment bias that favors identification of X-linked genes by making simplifying assumptions that maximize the estimate of autosomal MR genes and minimize the estimate of X-linked MR genes. Even when these very conservative (i.e., biased toward autosomal) assumptions are used to estimate the chromosomal distribution of the unknown MR genes, a 1.9-fold overrepresentation of MR genes on the X chromosome remains. This result supports the hypothesis that the X chromosome contains a disproportionately high density of genes influencing cognitive ability.

Crabtree cites the cultural hive mind we have created, in which selection for individual intelligence is blunted in favour of collective intelligence, as well as demands of urban living in terms of immune competition as a result of epidemic diseases as contributing to intellectual decline:

When might we have begun to lose these abilities? Most likely we started our slide with high-density living, which was enabled by the transformative invention of agriculture. Selection may have begun operating on resistance to the diseases that naturally grow out of high-density living, switching the pressure from intelligence to immunity. It is also likely that the need for intelligence was reduced as we began to live in supportive societies that made up for lapses of judgment or failures of comprehension. Community life would, I believe, tend to reduce the selective pressure placed on every individual, every day of their life. Indeed that is why I prefer to live in such a society.

Several considerations could mitigate the validity of the argument that intellectual and emotional fitness are slowly decaying. For example, genes required for intellectual and emotional function could be needed for early development or even fertility, and would thus be maintained through selection. ... Another common counter-argument is that we are under constant selection for our intellectual traits. Intellectual capacity and emotional stability have mating advantages that would reduce the rate at which mutations affecting these traits become fixed in our genome. This is true, but I fear does not take into account the extreme selection required to maintain traits dependent upon thousands of genes with reduced heritability. A hunter-gatherer who did not correctly conceive a solution to providing food or shelter probably died, along with his/her progeny, whereas a modern Wall Street executive that made a similar conceptual mistake would receive a substantial bonus and be a more attractive mate. Clearly, extreme selection is a thing of the past.

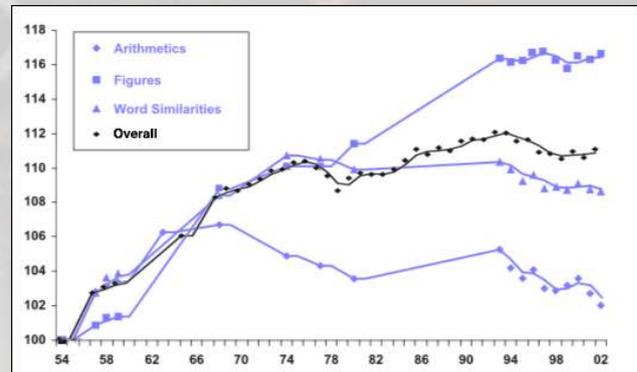
Gawdy & Krall's (2013) thesis is particularly stark, invoking a “hive mind” superorganism status for a human culture heading towards self-extinction:

The current geological epoch has been dubbed the Anthropocene—the age of humans. We argue that the roots of the Anthropocene lie in the agricultural revolution that began some 8000 years ago. Unique human psychological and cultural characteristics were present in our distant hunter-gatherer past, but in terms of the biophysical impact of our species, agriculture represented an unequivocal and decisive evolutionary break. With the transition to agriculture human society began to function as a superorganism functioning as a single unit designed by social natural selection to produce economic surplus. Where environmental conditions were permitted, early human agricultural societies followed the same pattern as a few social insects and exhibited explosive population growth, complex and detailed division of labor, intensive resource exploitation, territorial expansion, and a social organization favoring the survival and growth of the supergroup over the well-being of individuals within the group. Similar economic forces lie behind ultrasociality in social insects and humans—increased productivity from the division of labor, increasing returns to scale, and the exploitation of stocks of productive resources. Exploring the evolutionary mechanisms behind ultrasociality offers insights into the growth imperative that threatens the stability of the earth's life support systems.

Does this currently mean we have already incurred a significant loss of intelligence? Possibly not but probably a loss of some forms of intelligence related to individual survival. The Flynn effect (Sundet, Barlaug & Torjussen 2004) is the substantial and long-sustained increase in both fluid and crystallised intelligence test scores that were measured in

many parts of the world over the 20th century. Test score increases have been continuous and approximately linear from the earliest years of testing to the present. For example, a study published in the year 2009 found that British children's average scores on the Raven's Progressive Matrices test rose by 14 IQ points from 1942 to 2008. There are numerous proposed explanations of the Flynn effect, such as the rise in efficiency of education and better diet, along with skepticism concerning its implications. Some research suggests that there may be an ongoing reversed Flynn effect (i.e., a decline in IQ scores) in Norway, Denmark, Australia, Britain, the Netherlands, Sweden, Finland, and German-speaking countries, a development which appears to have started in the 1990s.

Fig 137: Overall Flynn effect begins to decline with marked falls in word and arithmetic scores (Sundet et al. 2004)



Bratsberg & Rogeberg (2018), analysing the effect in Norway, state that the Flynn effect and its reversal are both environmentally caused and that the trends are not due to a changing composition of families, and that there is at most a minor role for explanations involving genes (e.g., immigration and dysgenic fertility) and environmental factors largely fixed within families and that their influence is negligible compared with other environmental factors. Therefore the Flynn effect provides no reassurance that the underlying genetic basis of human intelligence is not under atrophy.

The outstanding difference between humans and all other species is the emergence of human culture. This introduces new kinds of challenges. Humans are a highly social species, so survival in the jungle has been overtaken by survival in the concrete jungle of human affairs. In many ways this is just as challenging, because Machiavellian intelligence, both creates many social niches and also creates chains of prisoner's dilemma paradoxes of survival. But it is also clear that human culture is providing services that are significantly blunting strong selection for individual intelligence on a wide demographic footing. Previously to survive in gatherer-hunter society while cooperating in small bands, the inability to survive in the wild and fend for a family would result in demise. In technological society the diverse intelligence skills required for all aspects of individual survival have been reduced to a much simpler set of options of being trained for a specific and sometimes menial action set, e.g. in an industrial process or routine office role. Human mate selection is no longer driven by astute females seeking brainier males, but macho brawn in the patriarchal mould, with female reproductive choice actively and violently repressed by the religious patriarchy as well.

We are thus fooling ourselves to think we are biologically more intelligent purely on the basis of the culture that we have co-evolved with. We have been overtaken by our own culture. All the products of culture we see, from the pinnacles of scientific discovery, to the elaborate technological processes that have enabled the digital age and a landing on the moon, have not arisen from an increase in individual intelligence, but chain reactions of discovery and manufacture in which a series of small insights create a technological process which then becomes automatically replicated to produce items, from heart-lung machines to cell phones, which we now depend on and can barely comprehend how to use, let alone understand how they are made, or how they work.

Climax Mammalian and Avian Intelligence

We are keenly aware that we are more intelligent than apes but when we examine the brains of elephants and dolphins and whales, which form the climax of intelligence of the Proboscidea and Cetaceans, their brain structure and complexity looks anatomically and physiologically very similar to, or even surpassing that of human brains.

While the large brains of elephants are dominated by cell numbers in the cerebellum so that, while their CNS numbers are much higher than humans, their cortical numbers are lower, the same is not true for cetaceans. Mortensen H et al. (2014) note:

*Possessing large brains and complex behavioral patterns, cetaceans are believed to be highly intelligent. Their brains, which are the largest in the Animal Kingdom and have enormous gyrification compared with terrestrial mammals ... we estimated the total number of cells in the neocortex of the long-finned pilot whale (*Globicephala melas*) brain. For the first time, we show that a species of dolphin has more neocortical neurons than any mammal studied to date including humans. We found that the long-finned pilot whale neocortex has approximately 37.2×10^9 neurons, which is almost twice as many as humans, and 127×10^9 glial cells.*

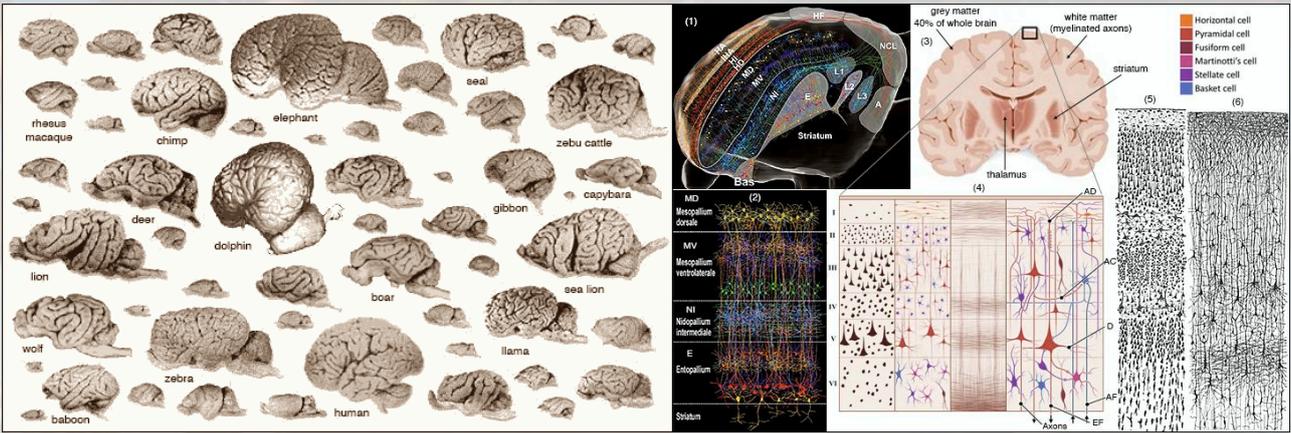


Fig 137b: (Left) Spread of mammal brains . The mammalian cortex folds more extensively with the volume of thalamo-cortical axons requiring increasing folding to compensate for the basal brain network volume, although primates have a superior ratio of cortical neurons to brain volume (inset fig138b). This is partially compensated for by smaller mammals also having smaller pyramidal neurons by a packing factor close to the square root of the linear size. E.g. a human is about 25 times as tall as a mouse is long and its pyramidal neurons are 1/2 the width, packing 4 times as many into the same cortical area. Hence the mouse actually has more cortical neurons for its relative brain volume than humans (fig 138b) although its cortex is smooth. (Right) Avian (1, 2) and human brains (3-6) compared for pallium/cortical neuronal structure (Güntürkün et al. 2021). Both have a layered structure but in birds this extends all the way to the striatum, while in mammals it occupies only the superficial cortex (1-4 mm mean 2.5 mm), overlaying massive white matter axons. (5) shows Nissl staining to show cell bodies in the visual cortex and (6) Golgi staining to show axons.

There is no basis to the notion that the spread of other mammals have inferior biological intelligence to *Homo sapiens*. The cerebral cortex is an evolutionary adaption shared by stem and all crown mammal species, with larger brains commensurately more folded to maintain proportionality between the area of the cortex and the increasing volume of basal brain connections. There are no dumb and smart mammals, but simply mammals displaying conscious intelligence, adapted to their ecological roles. What distinguishes humanity is the intervention of language and culture, as externally derived memetic processes, ultimately from the possession of fingers and opposable thumbs, enabling niche manipulation shared by founding primates. Smaller mammals have smoother cortices but similar relative numbers of cortical to basal brain neurons.

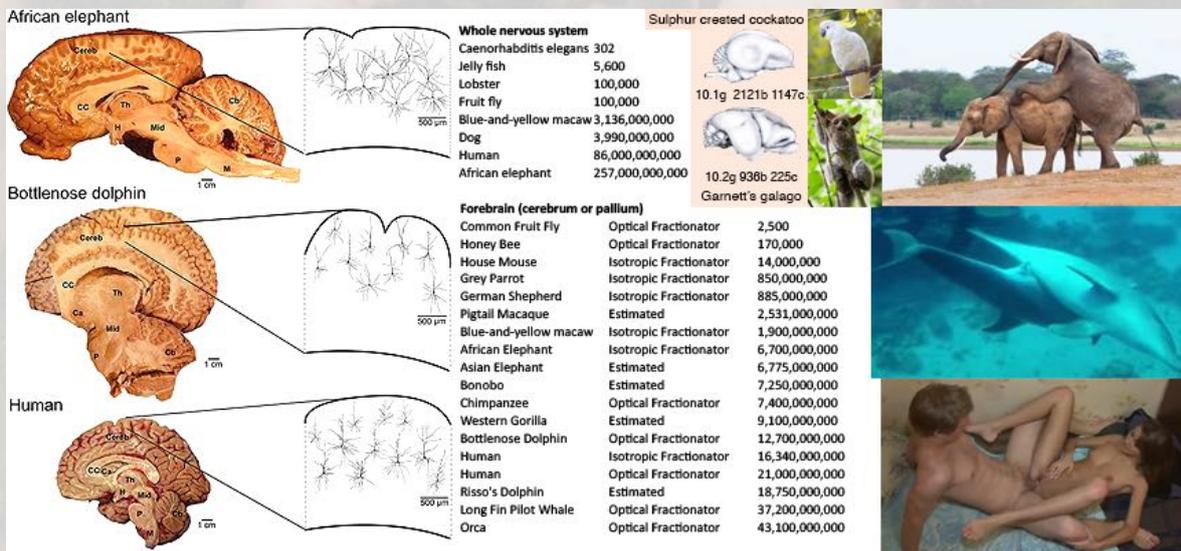


Fig 138: Left: Biological intelligence is not revealed or reliably measured by cultural complexity. Brains and cortical neurons of African elephant, Bottlenose dolphin and Human. Centre: Diverse whole brain and cortical neuronal numbers. The blue and yellow macaw forebrain neuronal density 1.9bn is comparable with the pigtail macaque 2.5bn, despite its brain weight being only 20.7g compared with 106g. Inset: The cockatoo and galago each have a brain weighing 10g but the cockatoo has 1.147bn cortical neurons, 54% of the whole brain, compared with 0.226bn in the galago representing 24% of the whole brain in both galago and human.

The key difference between humans on the one hand and elephants and dolphins on the other is human culture, both as language, which I contend in the next section has a strong cultural component as a memetic virus conferring rapidly evolving semantic efficiency; and niche and tool construction, which results in the civilisation that makes us think we are far more intelligent than the rest of life. This is a form of human exceptionalism that is deleterious to our survival.

Elephants have no fingers and no toes and can't use tools, except with their highly evolved trunks for plant foraging and drinking, so it's hard for them to make any kind of records. All cetaceans have the same problem – no limbs but fins and no way of making traceable records, so dolphins spend all their time playing sex games, of love and war and have very high intelligence but that's the limit of their culture and memes are really difficult to come by. Studies of the linguistic basis of cetacean clicks and songs remain uncertain how far these differ from other kinds of animal communication (Eskelinen et al. 2016, Janik 2013, King et al. 2021, Ryabov 2016).

We aren't necessarily more biologically intelligent than elephants and dolphins, except that our line of evolution resulted in fingers, tools and niche construction, and a tear away process of memetic cultural evolution, in which grunts and mothers crooning to their babies resulted, through finely tuned human vocal articulation, just as our use of fingers, resulted in complex language taking over our brains from the outside, as conceptual cultural memetic “viruses” and produced the kind of world we now live in, complemented by our tools and the trappings of village and then urban culture, which is now reducing us to troglodytes of our own making, unless we protect the biosphere.

In fact we can see as parents just how easy it is for language to become established because *Homo* has another unique physiological “invention” that is as significant as fingers and thumbs were to the first primates – the absurdly expressive human voice box. There is evidence from *Homo erectus* and *ergaster* of this evolving long before human culture (Fielder & King 2004). Recordings of ape calls show just how different we are in terms of vocal semantics, although semantics is obvious in primate expressive behaviour eg. Capuchins in fig 150b. Monkeys, such as Vervets have functionally referential alarm calls (Price et al. 2015), but only marginally in apes such as chimps (Slocombe & Zuberbühler 2005). These abilities go back to the lemurs (Walton & Kershenbaum 2019), suggesting humans may have retained this underlying conserved vocal trait socially, as well as opposable fingers and thumbs.

We are NOT “hard-wired” for semantic language. It is a rapidly evolving cultural “virus” we communicate, as Kirby and Christiansen (2003, Christiansen & Chater 2008) make clear next section. When we first taught our kids, we said “no” and stopped them and then we said “mama” and “papa” and pointed to each of us just as mother pumas do, to teach their cubs to hunt by example. That is where our kids immediately grasped the elusive concept of “semantic” meaning and it was all over, from there, bar the endless chatting since. Neither are ape kids so different from human kids in terms of family dynamics. Just as the fingers made technology, so the voice box made linguistic culture and rational thought, by reverse cultural viral memetic takeover – par excellence! Thus the combination of fingers and accurate referential alarm, calls rather than humanity being a super-intelligent elite, seem to be key to the birth of culture.

What is the Future Spearhead of Conscious Evolution?

Comparing humans, dolphins and elephants, we have seen that what distinguishes humans is not just their large brains but their phenotypic ability to give expression to tool use and to thus design new ecological niches exploiting the natural habitat and the species it contains, through processes such as gathering and hunting, and the generation of social cultures associated with language, particularly between mothers and their babies and young children as the key to developmental intelligence, then used widely in the social group to establish and maintain trusting relationships.

This would justify the focus on *Homo sapiens* itself as the key dominant species in whose evolution the future of biospheric evolution has become entwined, except for the crippling and potentially fatal flaw that human exploitation of the biosphere has become not only a threat to the biosphere as a whole through habitat exploitation, wilderness degradation, wild species destruction, climate crisis, and pollution, not to mention the risks of nuclear warfare, but has also become an ever more brittle instability for humanity itself, due to increasing dependence on technology to drive our ever longer and more tenuous food distribution chains, and our energy demands to keep an increasingly complex global society, prone to multiple tipping points of urban food supply break down, international conflicts arising from increasing scarcity of resources, epidemic disease due to a single large fluid mass society, and the debilitating effects of climate and biodiversity crisis itself. This is now becoming compounded by increasing dependence on unsustainable forms of artificial intelligence, prone to even more brittle break down in the event of any disruption to the social system. This leaves our species completely vulnerable to any major disruption, from an asteroid or cometary strike, through a large magma eruption like that that gave rise to the Deccan traps, severe climate overheating tipping points with loss of the polar albedo and others. It raises the question of whether *Homo sapiens* has a viable evolutionary future, or whether the biosphere may need to depend on simpler more prolific species, with faster genetic turnover and adaption and shorter reproduction times, from rodents, to cockroaches, or even single-celled eucaryotes, as an ultimate future option for biospheric survival.

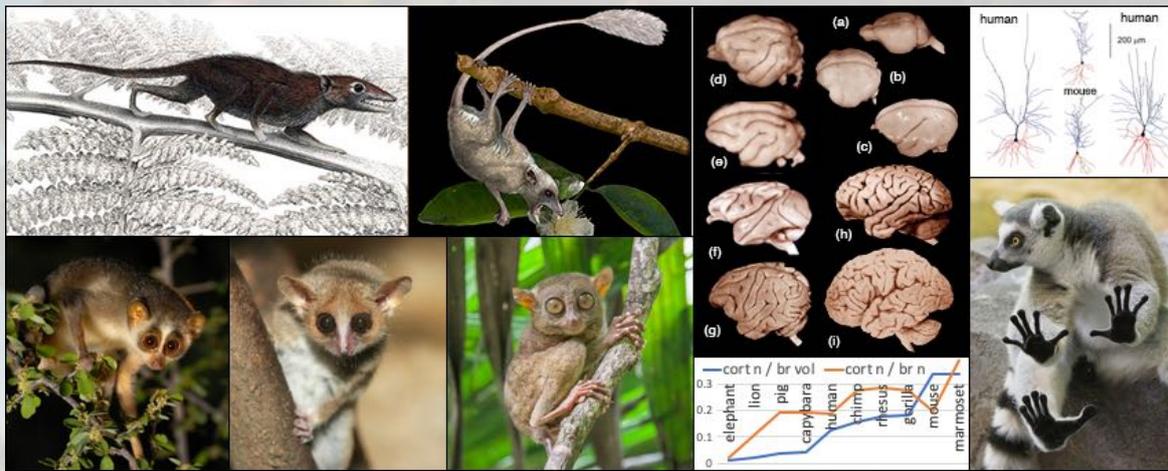


Fig 138b: Top left: *Juramaia* a eutherian placental fossil from 160 mya ago (Luo et al. 2011) followed by *Eomaia* 125 mya (Ji et al. 2002). Top right: *Dryomomys*, 55 mya after the Cretaceous-Tertiary extinction, the most primitive primate known from good fossil material. The first known primate fossil, *Purgatorius*, dating from 65 mya, known only from isolated teeth and jaw. The earliest primate from molecular clocks dates at 90 mya but adapted to take into account fossil evidence it dates to 81.5 mya, well before the Cretaceous-Tertiary extinction (Tavare et al. 2002). Lower row: slender loris, mouse lemur and tarsier. Right: Brains of (a) mouse, (b) tarsier, (c) marmoset, prosimian (d) ring-tailed lemur and (e) slow loris. Anthropoid (f) rhesus monkey, (g) lar gibbon (h) chimp and (i) human. Primates display cortical folding homology. Larger mammals, from rodents (capybara) to primates (humans) have greater folding in larger brained species to preserve cortical surface to brain volume ratios (Brain Museum). Lower right: Comparison of the ratios of cortical neurons to brain volume and total neuron count in elephant, lion, pig, capybara, human, chimp, rhesus, gorilla, mouse and marmoset. These show mice and marmosets, despite their smooth brains and small size, share optimal cortical n/brain vol ratios, even compared with humans. In addition mouse CA1 pyramidal cells are only half the dimensions of human ones (top-right) so neuronal densities in small animals are higher (Benavides-Piccione et al. 2020). Small primates are thus ideally placed to evolve compact highly intelligent brains by comparison with other mammalian families. Opposable thumbs for grasping objects are widespread in primates, with strepsirrhine pro-simians having pseudo-opposable thumbs (lower far right). *Darwinius masillae*, an Eocene primate fossil between prosimian and simian, had hands and feet with highly flexible digits featuring opposable thumbs and halluces (Franzen et al. 2009). The brain to body ratio is high in primates, with rhesus macaques having a similar figure to humans.

In New Zealand Aotearoa, because of its evolutionary isolation the region had no apex mammal predators and only small reptiles, some bats and flightless birds, such as the iconic kiwi, which are now ravaged by rodents, mustelids and possums, meaning that humans have had to take on the burden of becoming apex predators of feral introduced invasive species. One can then ask the question is it worth saving such exceptional species, because species extinction is after all a natural consequence of evolutionary change, as well as new species emergence. But this isn't about any fundamentalistic naturalist agenda of protecting dumb wild animals, but the entire future of conscious existence on our beloved blue-green planetary paradise we are putting a stake.

However any form of intervention to allow species extinctions involves a tortured and complex decision because survival of the biosphere depends not just on an individual species' reproductive success but on how a climax ecosystem generates robustness to sometimes apocalyptic planetary environmental crisis through the sheer diversity of its interacting niches. It becomes a perilous game to cast lots on evolution itself to try to sustain it from the consequences of human devastation. But are there some species, however threatened, that are really essential?

Traditional fossil records suggest the mammalian radiation of the dominant placental species occurred only after the dinosaur extinction, implying it took an astronomical intervention to result in the mammalian dominance, primate emergence and hence human evolution, rendering any notion of humanity as a hot evolutionary target capricious. However it is clear the earliest mammal ancestors arose long before this, some 225 mya ago, as small shrew-like species living off small organisms, such as insects (Novacek 1997). There has been continuing debate between molecular clock evidence suggesting an early diversification and fossil evidence existing only since the demise of the dinosaurs. The current picture remains controversial but a picture is emerging of an early genetic origin with little phenotypic diversification in the Jurassic-Cretaceous epoch of the dinosaurs, although the stem and crown placental groups had become established, followed by rapid phenotypic diversification after the dinosaur extinction, as diverse new niches became available (Tavare et al. 2002, Ji et al. 2002, O'Leary et al. 2013, Luo et al. 2011, Halliday et al. 2019, King & Beck 2020), thus explaining the discrepancy. Primates become key for their fingers complementing their brains that became key in human tool use, and cultural emergence, so primates remain key future evolutionary targets.

The most “primitive” primates are the wet-nosed strepsirrhines, consisting of the lemurs of Madagascar, galagos (bushbabies), pottos from Africa, and lorises from India and southeast Asia. Many of the species living today are endangered due to habitat destruction, hunting for bushmeat, and live capture for the exotic pet trade. Strepsirrhines are behaviourally diverse, although all are primarily arboreal (tree-dwelling). In the warmer Eocene there were many species which have become extinct, in our cooler climates, so they could diversify in a warmer world heading back toward Eocene temperatures provided we protect them now. The sister dry-nosed group of haplorhines, including Tarsiers are also targets. Otherwise, in a cataclysmic planetary crisis, we are back to rats and mice.

Implications for the human future, Where could this end up for humanity?

1. Going down the Hive-Mind Rabbit Hole

How far do we want to go down the road of becoming a smaller-brained hive-minded species dependent on our brittle unstable, implicitly unsustainable, machine technology to survive? Given that we are extremely maladapted to the survival of the biosphere in a form that is likely to sustain us long term, this seems to be a terminal Fermi demise.

2. Violating our Evolutionary Paradigm

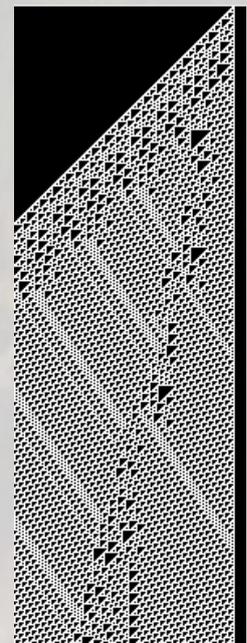
Human super-intelligence and cultural emergence appears to have occurred in a context of astute female reproductive choice complemented by mutual mate choice. The patriarchal epoch exemplified by Eden asserts an overthrow of this to achieve male paternity certainty. This has resulted in all sorts of negative selective pressures. The current situation is girls of reproductive age not making astute reproductive choices because the media and the group culture preaches a doctrine of macho males and awed females getting laid, that is mindless patriarchal fantasy and intelligence suicide. The history of the last 10,000 years already described in the previous section shows diverse manifestations of this. It is deleterious for an XY chromosomal species with a massive polarisation of reproductive risk and investment to culturally repress astute female reproductive choice. Religions are the prime offender and need to be exorcised for their sins, but also the notion of males driving culture reinforced by militarisation and the dominance of men in strategic decision making. This is also a recipe for a downhill slide into oblivion.

3. Biological Intelligence vs Cultural Chain Reaction: Will we split into two species?

This discussion has hinged on two issues (a) Human brain size changes and (b) Are humans the most intelligent species? Most people who claim humans are the most intelligent species, are doing so on the basis of products of cultural chain reaction, but they are denying the influence of culture and claiming it is based on our biological intelligence. These comments are simply reinforcing the fact that we are becoming more and more dependent on cultural chain reaction processes, in which many humans contribute a small amount of intelligence to accumulative manufacturing processes as a hive mind and the results look stunning but don't in any way represent the ongoing demographic level of biological intelligence across the human population as a whole.

Fig 139: The edge-of-chaos 1-D CA rule 110 is a universal computer (Chen et al. 2012, Cook 2004).

If you glance at the cellular automation on the right, you will see a system having no intrinsic intelligence, simply a rule. The 1-D cellular automaton with decimal rule 110, taken from my [CA Mac app](#) is able to do **incredibly complex things**, because it's a universal computer. Give it the right (static) initial conditions, it can produce any result a digital computer can do, including states much more complex than its initial conditions. Its binary code is 01101110 for the eight possible previous three cell states of 0/1. I.e. 111 → 0 110 → 1 etc. But is it “intelligent”? It's “natural” intelligence is no more than its binary code plus the arrows above, but its “cultural” intelligence is unbounded above except by np-complete problems that are computationally intractable.



The failure of human society to recognise that cultural production of complexity is not a direct function of individual human biological intelligence on a demographic footing, but of increasingly automated processes that could lead to AI takeover, not because AI got so smart, but because we got so dumb on a demographic basis. Sexual selection involves endless recombination, so unless we form an elite and bifurcate into two species by selective breeding in an equally dystopian Handmaid's Tale, one smart and inventing the technology and the other dumbed down, living like ants, so we are again in serious trouble. Better to merge symbiotically with the biosphere as living beings and actually survive.

Gene-Culture Co-Evolution

(a) The Emergence of Language

The emergence of spoken language has been associated both with female gatherers talking about their relationships down the grape vine while on gathering forays, when the men were out on a hunt, the only sounds of which were disguised animal signals, and with mothers speaking to their babies (Hrdy 2003). Animal studies have also suggested social empathy as a catalyst (Erard & Matcic 2018) and a combination of the two (Johansson 2021).

Selective scenarios for the emergence of natural language are bounteous. Language evolved to facilitate cooperative hunting. Language evolved as a costly ornament that allows females to assess male quality. Language evolved as a substitute for the grooming exhibited by other primates when groups got too large. Language evolved to promote pair bonding, to aid mother-child communication, to gossip about others, to expedite toolmaking, as a tool for thought, or to fulfill countless other functions or purposes (Laland 2017 176).

While the basis of language has veered from hardwired concepts such as universal generative grammars, and a battery of cerebral toolkits specifically to articulate and interpret spoken word, based on Broca's and Wernicke's language areas, there is no good rationale why a purely genetic and natural selection process in the absence of the evolutionary effect of language itself can provide an explanation. This leads to gene-culture co-evolutionary theories (Kirby & Christiansen 2003, Laland & Brown 2002, Pinker 2010, Deacon 1998, Christiansen & Chater 2008), in which language itself becomes a kind of meme-like parasite provocateur transforming human intelligence, exploding our ecological niches and giving rise to the phenomenon of culture.

[James] Hurford argues that language evolution needs to be understood as a combination of both biological pre-adaptations – that is, biological changes that may not be adaptive by themselves – and learning-based linguistic adaptations over generations. He points to several possible biological steps prior to the emergence of language: pre-adaptations for the production of speech sounds (phonetics), for organizing the sounds into complex sequences (syntax), for forming basic and complex concepts and doing mental calculations with them (semantics), for complex social interaction (pragmatics), and for an elementary ability to link sounds to concepts (symbolic capacity). Once humans were language-ready with these pre-adaptations in place, language systems would have grown increasingly complex due to the process of transmitting language across generations through the narrow filter of children's learning mechanisms (Kirby and Christiansen 2003).

We argue that [universal grammar] UG could not have arisen either by biological adaptation or non-adaptationist genetic processes, resulting in a logical problem of language evolution. Specifically, as the processes of language change are much more rapid than processes of genetic change, language constitutes a "moving target" both over time and across different human populations, and, hence, cannot provide a stable environment to which language genes could have adapted. We conclude that a biologically determined UG is not evolutionarily viable. Instead, the original motivation for UG – the mesh between learners and languages – arises because language has been shaped to fit the human brain, rather than vice versa. Following Darwin, we view language itself as a complex and interdependent "organism," which evolves under selectional pressures from human learning and processing mechanisms (Christiansen & Chater 2008).

Laland (2017) highlights the vast difference in vocal fluency that casts humans and monkey species distinctively apart from the relative paucity of such communication in higher apes:

When the natural communication systems of primates are examined, for instance, no straightforward increase in complexity from monkeys to apes to humans is observed. Many researchers characterize great ape communication systems as more limited in range than those of monkeys. For example, monkeys, but not other apes, have functionally referential alarm calls, although whether monkey calls are truly referential like human language remains contested. This particular ape-monkey difference makes biological sense. Great apes are larger and stronger than monkeys, and hence are less vulnerable to predation. Apes almost certainly didn't evolve referential alarm calls because they had comparatively little to be alarmed about. Indeed, there is little that is learned at all in the vocal communication of nonhuman apes. 18 Apes do possess gestures to initiate play, for instance, or when infants signal they wish to be carried—many of these gestures have learned elements. However, apes seemingly do not use their gestures referentially, nor do their gestures exhibit any symbolic or conventionalized features.

Laland ties this to the very earliest phase of human increase in brain size associated with tool-making:

The latest thinking on the evolution of early Homo suggests that increases in brain size were coupled with increased toolmaking and stone transport, dietary expansion, and greater developmental plasticity (the flexible adjustment of development to environmental conditions). This means that there would be plenty to teach, because our hominin ancestors subsisted on a broad omnivorous diet and were reliant on a large number of extractive foraging and tool-using skills. This period in human history was the dawn of cumulative culture, when our ancestors first began manufacturing stone tools, using the flakes to butcher carcasses for food and in a variety of other ways. In other words, it was the beginning of the phase in which (according to our analysis of the evolution of

teaching) cumulative culture would help make teaching widely adaptive. Here, then, is a setting in which teaching among close relatives could be beneficial across a broad range of contexts.

In his chapter on the evolution of intelligence, Laland cites the following six factors as key to evolution of human intelligence grouped in three categories, constituting "cultural drive" in turn shaping human genetics: (a) social (social learning, tactical deception) (b) technical (tool use, innovation) and (c) ecological (extractive foraging, diet depth). These are combined into the notion of "primate g" which effectively becomes general intelligence. Here he has essentially broadened the competitive notion of Machiavellian intelligence, which he still accepts is central, with other obvious mechanisms of feedback including social copying, tool use and foraging, placing an emphasis on social learning, particularly high-fidelity copying, in relation to group size and long generation times, noting that primate longevity correlates with social learning rather than general intelligence. While acknowledging the role of Machiavellian intelligence, Laland's lack of awareness of the pivotal role of sexual selection in promoting both intelligence and a loving pro-social society, noted in the previous section raises the question over the assumed benefits of cultural evolution over the sexual selection aspects gatherer-hunter evolutionary psychology, which has sustained us over longer time frames and left a clear imprint in our sexual physiology and pursuit of sexual love.

The crucible for the early language evolution Laland invokes, rather than the small-brained Australopithecines, with a cranial volume of some 450 cc similar to other apes, would appear to be the major push made by Homo erectus and his alter-ego Homo ergaster, went from a 750cc brain to 1250cc close to our own average size of around 1400cc. Analysis of erectus skulls and the discovery of a hyoid bone involved in speech vocalisation is also consistent with an increasing use of language in erectus (Broadfield et. al. 2001), complementing a 1.6 million year old Homo ergaster skeleton, which does have some evidence of Broca's area (Taylor 1996 41).

Dunbar (2022) has a more precise analysis of the features and timing:

Speech requires two key capacities: the ability to produce long exhalations without having to take a breath and the capacity to control the articulation space in the mouth and upper throat by altering the position of the jaw, tongue and glottis. These are under the control, respectively, of the thoracic nerves in the upper chest and the hypoglossal nerve in the base of the skull. ... Three other anatomical markers are of interest for speech. One is the position of the hyoid bone that anchors the top of the larynx to the base of the tongue. In monkeys, apes and human infants, it lies high in the throat (which allows them to breathe and swallow at the same time without drowning themselves), but after weaning it drops low in the throat in humans (as a result, adults cannot drink and breathe at the same time). This low position is what allows us to produce certain vowel sounds, and vowels are crucial for human language. The other two indices are components of the inner ear, and hence our ability to hear fine distinctions in others' speech. These are the area of the base of middle ear bone known as the stapes and the size of the cochlea (the curled-up organ in the inner ear), both of which determine the range of sounds that can be heard. ... In fact, these five anatomical markers all appear to switch from primate-like to human-like with the appearance of archaic humans (Homo heidelbergensis) some 500,000 years ago.

Henrich (2017) demurs on the role of teaching in the emergence of language in his review of Laland's book:

I worry that it may overestimate the centrality of teaching and language for social learning, especially early in human evolution. My concern arises from the fact that, although teaching—broadly defined—does exist in some form across diverse societies, most of the research on pedagogy, parenting, and socialization derives from populations that are Western, educated, industrialized, rich, and democratic (WEIRD). In contrast to small-scale societies, WEIRD people rely heavily on intense verbal tuition, positive feedback, and active instructional interventions (3). This bias may skew our understanding of the role played by direct tuition and verbal scaffolding in cultural transmission. Further, numerous social norms, rituals, and technical skills are culturally transmitted without teaching or language (4), especially in small-scale societies.

Henrich (2016) argues that the secret of our success comes from culture, with cultural evolution and genetic evolution driving one another. The result of an immense period of this gene-culture co-evolution is not a "really smart, though somewhat less hairy, chimp", but "a new kind of animal" which has arrived because it is "better to be social than smart". The big difference between baby humans and chimpanzees is not in mastering abstract ideas, like quantity or causality, but that we are "prolific, spontaneous and automatic imitators, even willing to copy seemingly unnecessary or purely stylistic steps":

Humans are adaptive cultural learners who acquire ideas, beliefs, values, social norms, motivations, and worldview from others in their communities. To focus our cultural learning, we use cues of prestige, success, sex, dialect, and ethnicity, among others, and especially attend to particular domains, such as those involving food, sex, danger, and norm violations. .. Humans are status seekers and aware strongly influence by prestige. But what's highly flexible is which behaviors or actions lead to high prestige. ...The social norms we acquire often come with internalized motivations and ways of viewing the world (guiding our attention and memory), as well as with standards for judging and punishing others. People's preferences and motivations are not fixed.

Darwin, the founder of the evolutionary approach, speculated that language was potentially an invention (1904 60): "Man not only uses inarticulate cries, gestures and expressions, but has invented articulate language, if indeed the word invented can be applied to a process completed by innumerable steps half consciously made". Morten Christiansen questions the need to invoke a Chomskian generative grammar. Instead, he argues, language has adapted to utilise more general cognitive processing capacities that were already part of our ancestors' brains before language came along. Among these, he focuses on 'sequential learning' - the ability to encode and represent the order of the discrete elements in a sequence. This ability is not unique to humans: mountain gorillas, for example, use it in the complicated preparation of certain spiky plant foods, where a sequence of tasks is required to remove the edible part. Language, he says, is a 'non-obligate mutualistic endosymbiont' - a kind of evolutionary structure like a 'symbolic virus'. Kirby suggests our brains are not so specifically designed for language and that we appear to be biologically adapted to language because language which evolves much faster than biology has culturally adapted to us, gaining semantic power and representational efficiency as it evolves. It also provides a common explanation for both spoken and written language which has evolved too recently to have arisen from long-term genetic evolution.

Introducing their approach, Kirby and Christiansen (2003) note:

There are an enormous number of communication systems in the natural world (Hauser, 1996). When a male Tu'ngara frog produces "whines" and "chucks" to attract a female, when a mantis shrimp strikes the ground to warn off a competitor for territory, even when a bee is attracted to a particular flower, communication is taking place. Humans as prodigious communicators are not unusual in this respect. What makes human language stand out as unique (or at least very rare indeed) is the degree to which it is learned. From a design point of view, it is easy to see the advantages of providing instructions for building mechanisms for language acquisition rather than the language itself. Human language cannot be completely innate because it would not fit in the genome. Worden (1995) has derived a speed-limit on evolution that allows us to estimate the maximum amount of information in the human genome that codes for the cognitive differences between us and chimpanzees. He gives a paltry figure of approximately 5 kilobytes. This is equivalent to the text of just the introduction to this chapter. Finally, we look at the implications of our work for linguistic and evolutionary theory. Ultimately, we argue that linguistic structure arises from the interactions between learning, culture and evolution. If we are to understand the origins of human language, we must understand what happens when these three complex adaptive systems are brought together.

*A meme impels its bearer to broadcast it, and it mutates in some recipients: a sound of a word, or a phrase is randomly altered. Perhaps, as in Monty Python's *The Life of Brian*, the audience of the Sermon on the Mount mishears the "Blessed are the peacemakers" as "Blessed are the cheesemakers." The new version is more memorable and comes to predominate in the majority of minds. It too is mangled by typos and speako's and hearo's, and the most spreadable ones accumulate, gradually transforming the sequence of sounds. Eventually, they spell out, "That's one small step for man, one giant leap for mankind". I think you'll agree that this is not how cultural change works. A complex meme does not arise by the retention of copying errors. If selection does not explain complex design in cultural evolution by itself, then it is of no importance. This is mistaken. There is no doubt that as people acquire and modify beliefs, ideas and values the variation that is generated can be highly non-random, and these non-selective processes shape cultural variation. But so what? Selection occurs anytime there is heritable variation that effects survival or reproduction (transmission).*

Various lines of evidence support such optimisation of representational and cognitive efficiency in existing languages. For example dependency length minimisation, in which words which depend on one another come closer in a sentence than random (Futrell et al. 2015), makes it easier to recognise meanings in both spoken and written sentences, although the efficiency of existing languages varies widely. Widely used languages such as English have evolved to simplify changes of tense, person, gender and number to avoid complex conjugation and declension of verbs and nouns. There is also evidence that the root of languages might be partly iconic rather than the arbitrary relationships between sound and meaning of traditional linguistic theories, so that words indicating slowness, descent or negative emotions have a falling pattern of intonation while those with the opposite have a rising one, like down as opposed to up. "Splash" provides a good example of a word whose spoken sound mimics its natural sound.

Languages as different as Danish and Hindi have evolved in less than 5000 years from a common Proto-Indo-European ancestor (Gray & Atkinson 2003). Yet it took up to 200,000 years for modern humans to evolve from archaic Homo sapiens. The latest estimates of the oldest skulls discovered, from the Omo river by Richard Leakey are 196,000 years (McDougall et. al. 2005). Pinker (2003) notes steps of this type in the experiments of Martin Nowak's group (Nowak & Krakauer 1999) in establishing both sequential symbols such as vowels and consonants to form a word and positional syntax in which words describing single events give way to active characterisation of a type of event. Both are adaptive responses to informational crisis as a large number of symbols each associated with a single context or event involves too many similar symbols to adequately discriminate one from another. The emergence of such structures could in turn have enabled the semantic enfolding of the rational mind. Reading written language is clearly such an adaption of visual pattern recognition and other skills.

Corballis (2002) suggests language arose from a selective convergence of these diverse attributes to give rise to semantic language, possibly also accompanied by a convergence of other faculties such as mental perspectives of others, consistent with an early common origin of click sounds (p 106). Gestures like the shrug are also ancient responses, while smiles, and snarls with all their dimensions from appeasement to tooth threatening exposure go all the way back through our primate relatives. Laughter is an example of a central chaotic and explosive emotional response to contradiction, or surprise, which is suggestive of an ancient origin, earlier than language as we know it, in sharing emotional reactions, which also appears to have a basis in sexual courtship and family bonding:

*"Women laugh most in the presence of men they find attractive.
Men are the leading laugh getters, women are the leading laughers"* Robert Provine

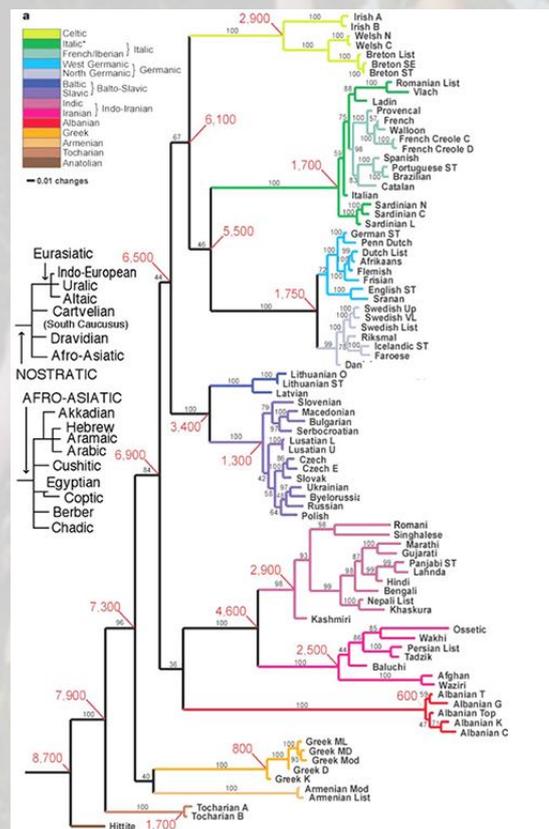
The advent of semantic exchange would place a huge new evolutionary burden on all areas of the cortex by exploding time, space and society into an historical process in which more and more contexts, individuals and situations came to be named and hence distinguishable from one another. Such a language involution would then place a burden of selection on larger brains which could handle the new and diverse complexities of a world imbued with historical and semantic meaning requiring slowed foetal development and a new awareness of social and sexual relationships and their implications. We can see the germ of this complexity in ape societies, such as grazing gelada baboons, where there are a host of cries indicating all manner of interactions, from courtship, through male competition, to emotional 'social contracts' of mutuality, reciprocation, aggression and reconciliation, as well as group warnings about predators. Among these, sexual courtship and competition are both very strong and also very subtle fleeting yet highly focused influences, as a glance at a female macaque inciting an extra-alpha 'safari' coupling behind the alpha males' backs indicates.

Fig 140: Evolutionary tree of the Indo-European languages (Gray & Atkinson 2003).

This is also broadly consistent with the fact that brain processing about lexical semantic information still appears to be at a striking advantage for experience-based representational structures (i.e., encoding information about sensory- motor, affective, and other features of phenomenal experience), with little evidence for independent taxonomic or distributional organisation (Fernandino et al. 2022).

This approach to the emergence of language supports a general role for Machiavellian social interactions, with a core emphasis on reproduction and sexual selection driving the burgeoning complexity of semantic language, consistent with both Geoffrey Miller's sexual selection ideas and honesty and deceit in wider social contracts. Consistent with this view is the fact that the sneakiest monkeys have the largest brains (Byrne & Corp 2004). Dunbar (1996) suggests that, as neocortical size increases, more subtle social and political strategies, such as tactical deception come into play. As a result, lower-ranking individuals are able to find loopholes in the social dominance hierarchy. Their special cognitive capacity makes them able to improve their reproductive success, in spite of lower rank - in line with the Machiavellian Intelligence hypothesis (Whiten and Byrne 1988, 1997). Boehm (1999 182) comments that the political invention of egalitarian society during this process enabled such individuals to forgo or invoke strategies of social deception, suggesting that lower ranking coalitions bluffed or forced their way, as male coalitions of chimps can do, to form large, stable and purposeful coalitions which are at the root of our social egalitarianism, politics and morality.

Laland (2017) brings this whole thesis back to its foundation in gene-culture co-evolution:



I described how the manufacture and use of stone tools may have played a vital role in human evolution by generating coevolutionary feedback between cultural practices and genetic inheritance, and thereby contributed to the emergence of language. Our tool knapping study supported the hypothesis that a gene-culture coevolutionary dynamic between tool use and social transmission was ongoing in human evolution, starting at least 2.5 million years ago and continuing to the present. Indeed, this entire book is one long advocacy for the significance of evolutionary feedback that encompasses a cultural drive mechanism initiated by natural selection that favored accurate and efficient copying. That selective feedback propelled the evolution of cognition in some primate lineages, and ultimately was responsible for the awesome computational power of the human brain. That propensity was fashioned by millions of years of gene-culture coevolution.

(b) Niche Construction, Habitat Destruction Gene-culture Co-evolution and the Anthropocene

Niche construction is a concept from the extended evolutionary synthesis, where species not only exist within an ecological niche existing in the natural environment, but by their own activities alter the niche to promote their own survival. Niche construction can provide both physical and cultural extensions of a species niche. Because in symbiotic existential cosmology subjective conscious volition has physical efficacy, this becomes a conscious intentional process.



Fig 141: Examples of niche construction: Devil's gardens in the Amazon. The ant, *Myrmelachista schumanni*, which nests in *Duroia hirsuta* stems, creates devil's gardens by poisoning all plants except its hosts. A worker ant attacks a plant by lethal injection (inset). It bites a small hole in the leaf tissue, inserts the tip of its abdomen, and releases formic acid, which kills the plant. Male South African Weaver Birds construct elaborate hanging nests which avoid predators, to attract mates. A beaver dam. Beavers hold a very specific biological niche in the ecosystem: constructing dams across river systems. Human destruction of the rain forest to make monoclonal palm oil plantations Sabah.

For niche construction to affect evolution it must satisfy: (1) the organism significantly modifying environmental conditions, (2) these

modifications influencing one or more selection pressures on a recipient organism, and (3) there must be an evolutionary response in at least one recipient population caused by the environmental modification. Niche construction can be viewed as an evolutionary process that works in conjunction with natural selection. Evolution entails networks of feedbacks in which previously selected organisms drive environmental changes, and organism-modified environments subsequently select for changes in organisms. The complementary match between an organism and its environment results from the two processes of natural selection and niche construction. The effect of niche construction is especially pronounced in situations where environmental alterations persist for several generations, introducing the evolutionary role of ecological inheritance. The development of many organisms, and the recurrence of traits across generations, has been found to depend critically on the construction of developmental environments such as nests by ancestral organisms. Ecological inheritance implies that organisms inherit two legacies from their ancestors: genes and a modified environment.

Niche construction is recognised to have played important roles in human evolution, including the evolution of cognitive capabilities. It is immediately apparent that humans possess an unusually potent capability to regulate, construct and destroy their environments, and that this is generating pressing current problems (e.g. climate change, deforestation, urbanisation). However, human scientists have been attracted to the niche construction perspective because it recognises human activities as a directing process, rather than merely the consequence of natural selection.

Niche construction is a process by which gene-culture co-evolution can transform the evolutionary process. Examples of niche construction include the building of nests and burrows by animals, and the creation of shade, influencing of wind speed, and alternation of nutrient cycling by plants. Although these alterations are often beneficial to the constructor, they are not always. In the case of *Homo sapiens*, the process has had an unconstrained runaway effect driven by human evolution as a dominant species exploiting the natural environment. The trouble is that human niche construction has become wholesale habitat destruction. Despite climate, habitat and biodiversity crisis leading

towards a mass extinction on cosmological time scales, there is no sign that gene-culture evolution is producing the stability required for the biosphere to survive in evolutionary time.

Fig 142: Human niche construction has exceeded all ecological bounds and transformed or destroyed the natural ecosystems to produce agricultural, urban, mining and toxically polluted landscapes reaching an irreversible degradation of the entire concept of an ecosystemic niche, due to the impact of a single species.



Mathematical models have established that cultural niche construction can modify natural selection on human genes and drive evolutionary events in the process of gene-culture coevolution. There is now little doubt that human cultural niche construction has co-directed human evolution. Humans have modified selection, for instance, by dispersing into new environments with different climatic regimes, devising agricultural practices or domesticating livestock. For example, dairy farming created a selection pressure that led to the spread of alleles for adult lactase persistence. Many hundreds of genes have been found to be subject to recent selection, and human cultural activities are thought to be a major source of this selection.

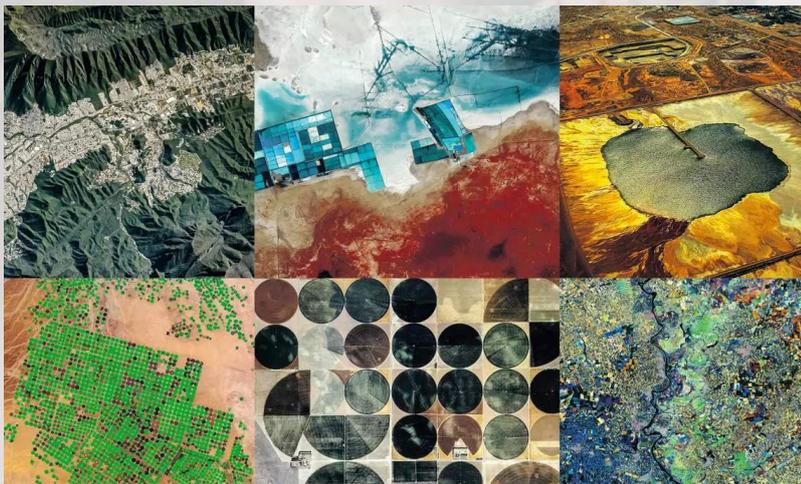


Fig 143: The Anthropocene: Eventually, these processes lead to their own cultural imposition on the planet, resulting in entirely synthetic “cognitive” rather than “experiential” landscapes (Guardian).

Laland (2017 243) gives a fitting account of the benefits and emerging costs of agriculture as niche construction: *Agricultural practices are examples of cultural niche construction that, as described in the previous chapter, can trigger evolutionary episodes in both the domesticates and, via selective feedback, in the human populations too. Cultural niche constructing processes that contribute to plant domestication include selective collecting, transporting, storing, and*

planting of seeds; setting fire to grasslands and forest, either intentionally or accidentally; cutting down trees; tilling; weeding and the selective culling of competing species; irrigation; and creating organically rich dump heaps. The skills and information that underlay these processes were passed from one generation to the next through a combination of teaching, imitation, stories, myths, and ritual,⁵¹ with the knowledge base regularly accumulating and being updated. Over time, these agricultural practices had an impact on the plants, which underwent a series of dramatic changes, such as major increases in size of the plant or its seeds, faster seed germination, simultaneous ripening of the seed crop, and so forth. The changes benefited both species by increasing the fitness of the plant community and elevating its yield. Sowing seeds in prepared substrates, for example, both induces changes in germination and dispersal mechanisms through inadvertent artificial selection, and helps the tended plants by increasing their likelihood of being included in next year’s seed stock.⁵² The increased yield, in turn, encouraged humans to perpetuate the practices that maintained or increased plant productivity, thereby triggering natural selection that modified human digestive enzymes. However, the methods of sowing selected seeds and harvesting plants inadvertently imposed selection on the crops that eventually left many inviable when in open competition with wild counterparts, and hence utterly dependent on humans.

The same reasoning applies to animals, where domestication again selected for increased yields of animal products, such as milk, but also a variety of other traits, including lowered reactivity to environmental stimuli and a dependence on humans for survival and reproduction. The protection provided by corrals and pens, and selection of animals that were easy to manage, again modified the impact of natural selection on animal breeds. When removed from anthropogenic settings, that selection left the animals concerned much more vulnerable to predation.

But he is vastly underestimating the jeopardy here. Not only have the selectively bred strains become dependent on humans but they have become mono-cultured, often losing natural disease resistance and the evolutionary diversity

that wild plants have to survive on evolutionary time scales. Worse still, the cultivated plant and animal varieties and habitat destruction generally have led to the genetic diversity of the wild relatives being severely compromised, so that the future viability of the entire niche construction of agriculture looks increasingly uncertain unless resolute corrective action is taken. Finally, although agriculture supported a larger population, their nutritional diet was inferior to gatherer-hunter societies and they tended to become smaller and suffered more parasites and epidemic diseases.

Laland & Brown (2002 245-249) note the transition to gene-culture coevolution as a coherent discipline: *Gene-culture coevolution is like a hybrid cross between memetics and evolutionary psychology, with a little mathematical rigour thrown into the pot. Like memeticists, gene-culture coevolution enthusiasts treat culture as an evolving pool of ideas, beliefs, values, and knowledge that is learned and socially transmitted between individuals. Like evolutionary psychologists, these researchers believe that the cultural knowledge an individual adopts may sometimes, although certainly not always, depend on his or her genetic constitution. ... Moreover, selection acting on the genetic system is commonly generated or modified by the spread of cultural information.*

They place it as a central theoretical construct in the divergent views of differing social science disciplines:

For most social scientists 'culture' is a given. The notion that much of the variation in the behaviour of humans is brought about by their being exposed to divergent cultures is so widespread and intuitive that it appears beyond dispute. Culture is regarded as a cohesive set of mental representations, a collection of ideas, beliefs, and values that are transmitted among individuals and acquired through social learning. In contrast, most sociobiologists and evolutionary psychologists are united by the belief that the transmitted elements of culture exert either a comparatively trivial influence on human behaviour, or that whatever influence they have is so strictly circumscribed by genes that there is no need to take account of the dynamic properties of culture. For human behavioural ecologists, culture is viewed as a flexible system that produces the most adaptive outcome in a given environment and that can be altered over a relatively short period of time in response to environmental change. Others, such as many behaviour geneticists, treat 'culture' as the dross that is left over when the 'more important' genetic influences on behaviour have been isolated. 'Culture' is usually lumped together with individual learning and other environmental effects on behaviour into a ragbag labelled 'nurture', to be contrasted with genetic sources of variation. For proponents of gene-culture coevolution, many of these other biological perspectives are misguided. Too much culture changes too quickly to be feasibly explained by genes, while the fact that different behavioural traditions can be found in similar environments would appear to render environmental explanations of behaviour impotent a lot of the time.

They thus state a convincing case for the approach and both meaningful in biological evolutionary terms and in terms of key cultural forms of evolutionary change:

Our capacity for culture is a unique adaptation. It allows us humans to learn about our world rapidly and efficiently. Human beings don't have to scour their environment for sources of food and water, devise their own means of communication, or reinvent technological advances from first principles. Our capacity to acquire valuable skills and information from more knowledgeable others, such as parents, teachers, or friends, as well as indirectly via artefacts such as books and computers, furnishes us with a short cut to adaptive (and sometimes maladaptive) behaviour. Advocates of gene-culture coevolution share with memeticists and the vast majority of social scientists the view that what makes culture different from other aspects of the environment is the knowledge passed between individuals. Culture is transmitted and inherited in an endless chain, frequently adapted and modified to produce cumulative evolutionary change. This infectious, information-based property of transmission is what allows culture to change rapidly, to propagate a novel behaviour through a population, to modify the selection pressures acting on genes, and to exert such a powerful influence on our behavioural development.

Democratic Capitalism, Commerce and Company Law

Life has existed on earth for a full third of the universe's lifetime. The reason for this stability is twofold. Firstly, unlike larger short-lived stars which gave us our rich array of atoms in earlier supernova explosions, the sun is a small very long lived star with only very slowly evolving brightness. Secondly and more pertinently, life is genetic and genetic inheritance and evolution is cumulative over generations. It is also extremely conservative, striving to preserve genetic encoding through error correcting enzymes with evolution occurring only differentially through occasional adventitious beneficial mutation amid recombination to escape Muller's ratchet.

This means a lion cannot turn overnight into a lamb, nor can a tiger eat an antelope and metamorphose into a shark. However companies possess no such genetic stability and can liquidate their assets in the face of crisis and turn to entirely different occupations, as appeared to be the case when a Canadian fishing firm devastated the cod fishery and then cashed up its stock of assets and entered another kind of business such as prawn farming. They can also consume one another in takeovers to become entirely new corporate giants. This lack of long-terminability. Moreover the cumulative dynamics of genetic organisms generates long-term ecological relationships, which provide non-linear feedbacks that tend to stabilise complex relationships and increasing species and genetic diversity in

biospheric symbiosis. We may consider predators and disease-bearing parasites as evidence for the brutality of nature, but the ecosystemic relationships tell another story. Without predators such as lions, the population of gazelles will enter boom and bust as they eat out all the available fodder leading to their wipeout in escalating episodes of famine. This was intriguingly illustrated in the return of wolves to Yellowstone spurring the recovery of the bears. The removal of the wolves had caused the elk population to explode, consuming all the berries the bears depended on for their vitamins leading to a loss of fitness. But an ecosystem consisting entirely of economic predators cannot survive.

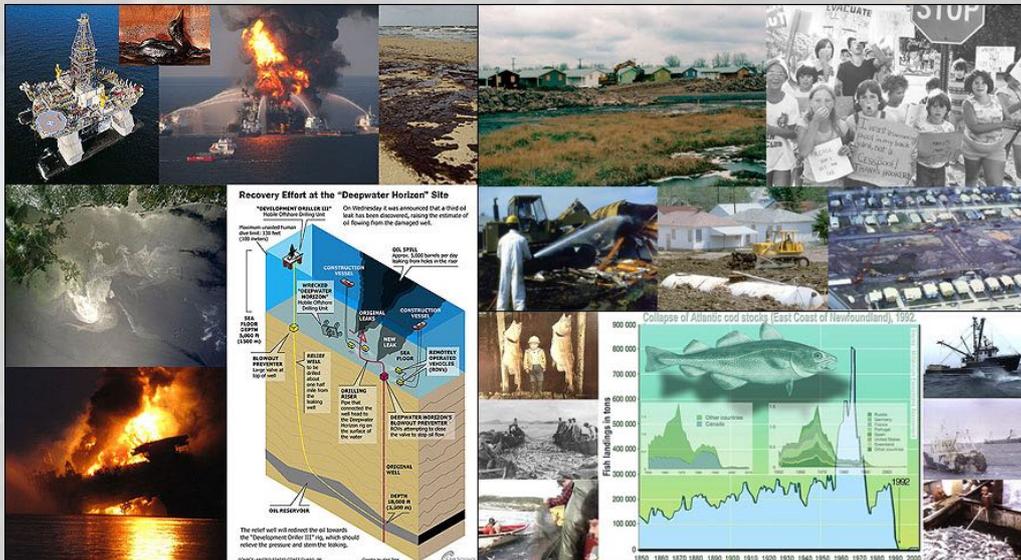


Fig 144: While the impact of corporate operations is clear in the figures in the anthropocene cultural niches, the lack of responsible corporate action causes other profound unintentional forms of collateral damage. (Left) The Deepwater Horizon oil spill of 2010 shows us how lethal misadventure and devastating environmental damage can occur when corporate responsibility becomes fragmented into self-serving cost-cutting conflicts of interest when large transnational corporations hire other large transnational companies as contractors in highly sensitive engineering projects, given a lack of effective monitoring from the federal government agencies that commissioned the projects in the first place. The Deepwater Horizon oil spill in the Gulf of Mexico on the BP-operated Macondo Prospect, is considered the largest accidental marine oil spill in the history of the petroleum industry. A 2017 report in Science puts the damage at \$17.2 bn. The consolidated trial's first phase began on February 25, 2013, to determine the liability of BP, Transocean, Halliburton, and other companies, and to determine whether the companies acted with gross negligence and willful misconduct. As of September 2014 Halliburton has reached a \$1.1 billion settlement over its role in the 2010 spill. Deepwater horizon was caused by failures of due care when the regulating officials got into bed with the corporations, causing widespread pollution costing billions of dollars to seal and clean up. (Top right) Dioxin pollution by Hooker Chemical in the Love Canal, Niagra was converted into a Faustian pact, when the land was sold for a nominal \$1 to a financially strapped school board on condition no responsibility would be taken by the company for any pollution. In 1978 crusading liberal journalist Micheal Brown discovered an alarming incidence of birth defects among residents living near the site. He advised the local residents to create a protest group, which was led by resident Karen Schroeder, whose daughter had about a dozen birth defects. The New York State Health Department mounted its own investigation and found an abnormal incidence of miscarriages. A survey conducted by the Love Canal Homeowners Association found that 56% of the children born from 1974–1978 had at least one birth defect. In one case, two out of four children in a single Love Canal family had birth defects; one girl was born deaf with a cleft palate, an extra row of teeth, and slight retardation, and a boy was born with an eye defect. Ten years after the incident, New York State Health Department Commissioner David Axelrod stated that Love Canal would long be remembered as a "national symbol of a failure to exercise a sense of concern for future generations." In 1988 United States District Judge John Curtin found Occidental who had taken over Hooker, jointly and severally liable for clean-up costs under CERCLA. In 1995 Occidental Petroleum agreed to pay \$129 million in restitution. The real cost of the cleanup is estimated at \$250 million. (Lower right) Fifty years ago, children in Newfoundland could catch fish by dipping a basket into the ocean. By 1992 Canadian research vessels were sweeping the seas in vain, finding not a single school of cod in what was once the world's richest fishery. The destruction of the Grand Banks cod is one of the biggest fisheries disasters of all time. Although the cod fishery supported workers for hundreds of years, a variety of changes occurred during the 20th century that made the industry much less sustainable than ever before. Foremost among these were advances in fishing technologies that dramatically increased the ability of fishers to find and harvest large quantities cod. By 1980 the Newfoundland fishery was dominated by three large complexes, each propped up by provincial government funds and bank loans: Fishery Products, Nickerson-National Sea Products and Lake Group. The fear of having to allow foreign fleets into Canada's exclusive economic zone if there was any surplus fish, as stipulated under the law of the sea, ensured the rationale would be that there would be no surplus fish. This is a classic tragedy of the commons enacted by the Canadian federal government for capitalistic purposes. Ultimately the companies supporting this collapse of the cod fishery converted their operations to becoming providers of seafood in the foodservice market, offering shrimps, crab, lobsters, shellfish and fish and fish products including seafood starters, sea cuisines, nuggets, oven ready products, and others to America's largest restaurant chains and national distributors.

Climax diversity is the cosmological apex of complex system generation, in which human society stands at the pinnacle. We can continue to coexist in this complex system only if we fashion our economic and developmental impacts in a way that maintains the long term stability of the living systems on which our continued existence depends. By contrast with the cumulative stability of genotype, and incremental evolution by mutation and natural selection, the capitalist economy is based on a purely social model of competing fragmented democracies. Company law stipulates a democratic basis for a group of shareholders to incorporate and sets out a legal and financial basis for them to pursue business based on the two nested democracies of the general meeting and the board of directors who are accountable to the shareholders, at least in principle. In larger companies, there is also a line-managed hierarchy of employees, forming a pyramid from the CEO at the apex down through the executive branch to salaried workers.

We now turn to how corporate business operates, to try to understand its role in survival of humanity and the biosphere over evolutionary time scales as gene-culture co-evolution. In the interests of private enterprise in a democratic society elected by the common will, the general principle is to allow legal entities to be constructed which can collectively perform the same roles of intentional agency that genetic individuals possess in an evolving human society. Outside this framework only the limits of government regulation provide highly varying degrees of protective feedback intended to guarantee a modicum of corporate accountability and responsibility, lacking in company law itself, for example in fair trading acts, clean air acts, and environmental protection acts. However these are in turn subject to political and commercial influence and often act too late to prevent the collateral damage.

Corporate competitiveness, by contrast with genetic mutation and natural selection, is a much more primitive form of selectivity, which does have a degree of survival of the fittest optimisation of efficiency, but in the complete absence of any cumulative genetic mechanism to ensure long term stability. The end results are thus much more prone to the breakdown of ecological complexity into huge conglomerate enterprises, with a high degree of collateral fallout due to short term impacts lacking any long-term foresight, or even any natural feedback mechanisms to ensure at least medium term stability.

Because they are vulnerable to manipulative share trading, companies are prone to mergers and acquisitions by friendly, or often hostile, takeover. These can be by competitors seeking to expand their niche in the market by eliminating competition, or providing collective efficiencies by laying off redundant staff, or they may simply be forays by hedge funds to gain strategic control over large profitable operations, or at another extreme can be asset stripping companies taking an undervalued company to pieces for its assets in plant, property and goodwill.

An Economist editorial of 1998 shows that the ease with which companies are born and fail is clearly one reason why Taiwan's total factor productivity had improved faster than that of all other Asian countries since 1960.

In 1991, 40% of Taiwan's chemical output came from firms that did not exist in 1986. One-third of the value of Taiwan's plastics production and half its output of fabricated metal products were also attributable to firms less than five years old. The newcomers established their place in the market by forcing older firms out of business. Firms that had accounted for 58% of Taiwan's chemical production in 1981 had left the business by 1991. In other sectors - including ones which were expanding rapidly overall - the carnage was even worse. Four out of five firms that manufactured clothing, metal products, textiles and plastics in 1981 either closed or changed lines of business over the next decade.

As the successful entrants tend to be more efficient than the firms that die, they boost productivity across the economy. Between 1986 and 1991, total factor productivity - the increase in output due to more efficient use of inputs such as labour and capital - in Taiwan's electrical-machinery industry rose 23.6%. Over a third of that, the researchers estimate, came from new firms pushing out less efficient ones. In the chemicals industry, where productivity growth was slower, a whopping three-fifths of the gain was due to the entry of highly efficient firms and the exit of stodgier ones.

But at the same time, this concrete jungle form of survival of the fittest shows no signs of providing any sort of long-term stability for the people, and the environment in which these companies operate or even for the market conditions on which these industries depend long term. Companies are simply incorporated agents founded by a contractual memorandum of understanding under company law, by their founding shareholders for their collective capital and revenue gain. They have no cumulative stability beyond the boardroom decision-making horizon and as they stand they have no covenant of responsibility to their workers, to the consumers of their products, to the general public and least of all to the natural environment in which they operate. Like a malignant cancer, the only principle on which they depend is relentless growth of income for the investors.

Given this one-sided covenant of corporations, only with their internal investors, it naturally falls to governmental regulation, to labour laws, the Clean Air Act, the Consumer Protection Act and other legislation to safeguard society from the deleterious impacts of corporate activity. When the new right call for an unregulated economy because this

will increase production and profitability, they are being deceptively disingenuous about the actual purpose of much of such regulation, which is designed to protect society the natural environment and our long-term future from potentially irreversible misadventure intrinsic to the corporate model, not simply to waste 'our' money on inefficient government interference.

There is no direct accountability to the workers, to the consumers, to society as a whole or to the planetary environment, unless laws covering questions like air, chemical or other forms of pollution, or environmental or social impacts are transgressed. Moreover the process is an unrealistic one based on pure financial competition, as if it is a society of predators with no prey apart from the living environment of the planet, its biological and non-renewable resources. There is no inbuilt sense of emotion, compassion, or foresight that we expect from live human agents, although these may also act psychopathically over issues of power and wealth.

But we have already seen that cultural evolution is much more rapid and unstable than genetic evolution which in terms of long-term survival remains the only incremental selective anchor that avoids triple witching hour instabilities leading to a [Fermi paradox](#) extinction. This leads to a completely unstable economic paradigm where corporations can engage tragedies of the commons (Hardin 1968), in a first-come first-served rush to exploit every profitable resource in sight for the benefit of their shareholders. We start with a model where we have genetic and phenotypic evolution of living organisms. Then we invent culture and witness the growth of gene-culture co-evolution between living organisms and their social culture. But then we introduce a third component, corporations which have no genetic identity but act economically as massively inflated versions of living agents assuming the same powers of autonomous agency we accept for ourselves as members of a free democracy. This means we now also have gene-culture co-evolution and a more insidious phenomenon of corporate-culture coevolution.

This is a primary situation where we have to come to terms with the inadequacy of purely contractual models of corporate agency and redesign corporate and economic investment to bring it into line with sustainable ecological and evolutionary principle of replication under incremental cumulative change subject to selective advantage in a context of overall symbiosis.

Wilson D et al. (2014) address this question in terms of evolutionary mechanics:

The growing scale of human society over the course of human history is increasingly being studied from a multilevel biocultural evolutionary perspective. According to Turchin (2003; 2005), empires tend to originate in geographical regions chronically at war, which acts as a crucible for the cultural evolution of exceptionally cooperative societies. The most cooperative expand into empires, but then cultural evolution within the empires favors practices that eventually lead to their collapse. New empires almost invariably form at the boundaries of old empires, whose centers become "black holes" for cooperation at a large scale. (See also Putnam 1992). In this halting fashion, with much carnage along the way, modern human society manages to function at a remarkably large scale. However, there is enormous room for improvement, especially with respect to global problems such as climate change and the worldwide economy. There will be no between-planet selection, so addressing these problems will require another kind of selection – the intentional selection of policies with large-scale and long-term human welfare in mind. Devising such enlightened policies will require a sophisticated knowledge of evolution. The challenges will be daunting, but at least in principle, the right kind of environmental intervention could cause the difficult to become easy, as is already beginning at the level of individuals and small groups.

A step in this direction is to achieve a consensus that the paradox of elaborate genetic innateness and an elaborate capacity for open-ended change can be reconciled through the concept of Darwin machines. Variation, selection, and heredity comprise an open-ended process capable of adapting organisms to their current environments according to the selection criteria. An evolutionary process built by genetic evolution must be elaborately innate for variation and selection to take place in a way that leads to genetically adaptive outcomes, on average. The immune system is an outstanding example of a Darwin machine that is both elaborately flexible and elaborately innate, providing a guide for how to study the human capacity for behavioral and cultural change. An important implication of Darwin machines is that a capacity for change requires certain forms of stability and homeostasis. For all inheritance systems, a complex system of interlocking processes is required to create variation, select according to certain criteria, and faithfully replicate the traits that have been selected. If this system breaks down, then so does the evolutionary process.

However his two cited examples fall far short of avoiding climate crisis, nuclear holocaust or the mass extinction of biodiversity:

We describe two interventions from the field of prevention science that successfully changed cultural practices at the level of counties, states, and nations. The first intervention reduced the very specific practice of convenience store clerks in Wyoming and Wisconsin illegally selling cigarettes to minors. The second intervention employs a population approach to improving parenting practices, which has been assessed in RCTs at the county level and is in the process of being implemented around the world. These examples fall short of addressing the gravest problems afflicting our planet, but they still show how evolutionary science can be used to accomplish intentional positive change above the level of individuals and small groups.

This has to go much further than Darwinian machines. *Homo sapiens* is already a natural species evolving by Darwinian principles but it has evolved through intentional selection as a species to dominate and exploit the natural world. The paradigm shift required is that cultural evolution can help bring this dominance to heel in the interests of the survival of the biosphere as a whole in cosmological time scales. We have to be able to turn to culture to achieve this because it is through our cultural heritage that we come to know and understand the potential mass extinction of life an unmitigated Anthropocene will bring about. But to do this, cultural evolution will have to engage a transformative paradigm of long-term incremental change that can balance and complement human dominance with biospheric symbiosis.

As a director of a company devoted to perpetual conservation and regeneration of a wilderness reserve, that had in the nineteenth century been native reserve land, and was still forested rather than farmed, I have designed a company constitution to care for this land in perpetuity, by drafting a constitution that binds the shareholders in a covenant to protect the land and its flora and fauna, not to sell it or wind up the company without unanimous approval and to pay the costs of upkeep and protection in the event the land is not profitable during any period. All decisions are made by unanimous signed agreement and are binding on the shareholders who can sell only at the consumer price index adjusted nominal value if they want to opt out. This gives an illustration how corporate structures can be given a measure of medium-term stability, albeit still on a much shorter time scale than evolutionary change and liable to demographic shifts in the shareholding as descendants become spread out over the face of the Earth. Commercial law can be redesigned to make financial enterprises a symbiotic part of a sustainable economy rather than a shrinking pool of predators endeavouring to grab the remaining resources before they all become extinguished.

So far, as we have seen, cultural evolution has remained an ephemeral player in the closing circle sustainability stakes, operating on much shorter and more unstable time scales than genetic evolution. Thus none of the processes we have examined, language, religion, or commerce have introduced any stabilising factors to the existential crisis we face. Symbiotic Existential Cosmology is designed to do precisely this because it is a comprehensive memplex, or symbotype, which far from being efficient, as the simple explanation of the Sabbatic Creation endeavours to do, is fully as complex as the living universe itself because it is a true and accurate cosmology of symbiotic existence. By being cosmologically accurate on evolutionary and cosmological time scales, it provides exactly the kind of dire warning that moral religions attempt incorrectly to do about eschatological reality and does so in a fully scientifically validated way that hopefully can stand the test of time.

Science, Religion and Gene-Culture Coevolution

Both science and religion are complex conceptual, symbolic and behavioural systems that cross human generations and have structured cultural influences affecting human survival and reproduction thus forming principal candidates for gene-cultural co-evolution. The scientific description of reality is a complex symbolic and conceptual system and the scientific method involves highly focussed forms of social behaviour associated with discovering the nature of reality around us. Likewise religion is a complex scriptural description that lays claim to an ultimate description of conscious (spiritual) reality accompanied by moral doctrines, devotional ritual and utopian aims of world redemption.

However their methods and approaches are very different and involve very distinct approaches, scepticism requiring proof or confirmation in science and affirmative belief frequently being essential for religious conviction, along with moral imperatives. This means that their mode of cultural evolution are contrasting and have distinct influence of humanity sometimes complementary but frequently discordant and in contradiction to one another. Nevertheless it is possible to give each an evolutionary treatment in terms of complex conceptual systems, either as memplexes, as Dawkins (1976) put it or symbotypes as DH Wilson et al. (2014) describe.

Science doesn't evolve by incremental mutation and natural selection, so much as theoretical innovation and empirical discovery, changing the natural context factually, often described as a scientific revolution, or paradigm shift. The standard of fitness tends toward theoretical or empirical truth about the natural and physical universe and the memes are the description of the universe themselves.

Nevertheless the interaction of scientists has been likened to an evolutionary process (Laland & Brown 2002 235):

Hull (1982) believes that scientific communities (e.g. Darwinians) are a collection of interacting scientists that have in common one or more memes (e.g. natural selection, Mendelian genetics, etc.) that are expressed in an evolving conceptual system (e.g. Darwinism). Researchers of today that are part of the Darwinian community have different views from their 19th-century counterparts. What unites them is the notion that they derived their beliefs from preceding Darwinians. But how can we tell whether a scientist is part of a scientific community? According to Hull (1982), in exactly the same way we can tell whether an individual organism is a member of a particular species:

Hull suggests that, to belong within the same lineage, scientists must have gained their information from each other, rather than merely holding similar views. Once such communities of scientists are defined, an evolutionary analysis of the development of ideas can begin. In fact, Hull argues that science is analogous to artificial selection rather than natural selection:

Just as the breeder consciously selects the organisms that he breeds in order to produce desired changes in his stock, the scientist chooses conceptual variants in order to improve his scientific theories. Both processes involve conscious, intentional choices even though many of the results in both cases may be unanticipated. (1982, p. 317)

A related, but more interesting, point is that memetic evolution is sometimes directed and intentional. Hull notes that the characteristic that commentators have in mind when they claim that sociocultural evolution, especially conceptual development in science, is 'Lamarckian' is that at least sometimes people actually notice problems and try to solve them. For instance, Pinker states: Memes such as the theory of relativity are not the cumulative product of millions of random (undirected) mutations of some original idea, but each brain in the chain of production added huge dollops of value to the product in a nonrandom way.

Science also, despite its declared commitment to the sceptical principle demonstrates its capacity to follow fashionable trend in assumptions that become undeclared beliefs, partly propelled by a publish or perish defensiveness to key mechanistic assumptions such as the physically causal nature of brain processes, when these remain unproven and likely unprovable.

However, it is religious belief and doctrine, and the underlying correspondences with spirituality as a complement, or even a deeper underlying truth than science, where the memetic sting comes to bite, as Laland & Brown (2002) note:

One sinister aspect of the meme's-eye view is that human beings seem to have been stripped of their ability to chose their own beliefs, values, and ways of life. Apparently, nefarious mind viruses are running our lives. The memes are choosing and manipulating us, not the other way round. Surely this surreal alternative perspective can't be the whole story? After all, our minds have evolved over millions of years. Wouldn't evolution at least have fashioned us with an ability to evaluate the alternative options and filter the available information that is adopted? If our bodies have an immune system to quell biological viruses, then shouldn't we expect our minds to have analogous defences to suppress rogue memes? The stance advocated by some memeticists may be missing some of the underlying complexity to human behaviour. Aunger (2000) identifies a key issue for memeticists to investigate: namely, whether the design in cultural 'adaptations' is best described as artificially selected by people to reflect their needs or as the unintended outcome of independent replicators. For instance, has the human brain been shaped to have certain properties that 'god' happens to fit, as suggested by Hinde (1999), or is the god concept merely a clever replicator, as Dawkins (1976) says?

In "Why Gods Persist" Hinde (1999) made a cultural field study of the reasons why deities persist in diverse religious and cultural traditions, from Monotheism, through Taoism and Buddhism, to ethnic religions, examining all the reasons from the life hereafter to meaning and morality. One of his major arguments concerned the components of religions (for instance, beliefs, ritual, values, and sociality) and whether the nature of these components could be understood using traditional biological principles.

1. **Attribution** We all seek to understand what is going on around us, and 'understanding' in this context implies attributing events to causes: it is reasonable to suppose that such attempts at explanation aided survival in the environments in which humans evolved.
2. **Control, self-efficacy** Of course, with the growth of scientific understanding we no longer need to find causal explanations for most natural phenomena, and for many people the need to postulate supernatural forces has been pushed back to events preceding the Big Bang. But while understanding the causes of events is an important contributor to the individual's peace of mind, it only takes one part of the way: the need to understand is closely related to a second issue, namely the need to feel in control of the events that influence one's life.
3. **Adversity** Closely related to the need to feel a sense of control, individuals need a means to cope with persecution, suffering and illness. Religion can help in such situations in several ways. It can assist the sufferer to accept the situation as inevitable, as God's will, and thus release him from the pain of kicking against the pricks. Alternatively, it can remove the devastating feeling that there is nothing that one can do, for at least one can pray and transfer the responsibility elsewhere.
4. **Mortality** Yet another major source for the attractiveness of deities lies in the desire for life after death. All organisms are adapted to strive for survival as necessary for reproduction. Even for a believer there may be uncertainty either about the fact of survival or about the nature of future existence, and uncertainty is likely to breed fear. Belief in a benevolent deity and a happy after-life can allay such preoccupations.

5. **Relationship factors** Humans seek social contact, and loneliness can be an important cause of distress. Indeed the sharing of experience is an important facet of all close relationships. The dissolution of a close relationship or bereavement involves a loss of part of the self-system. We continue to need attachment figures throughout life.
6. **Social factors** Religious belief is not just an individual matter. Beliefs are more or less shared with others, and there are powerful social forces that ensure that it should be so. There is often a gain to the individual from the sense of community, and a gain to the community from the effect of the shared beliefs on the loyalty of individuals: positive feedback is obtained from the consensual validation by others of the otherwise unverifiable beliefs.
7. **The meaning of life** Perhaps for many the apparent potency of religion can be encapsulated by saying that it gives a coherent meaning to life, though whether the need for meaning is primary, or depends on some of the issues previously mentioned, is an issue that need not detain us. Some argue that 'the search for significance is the overarching, guiding force in life'. It is often suggested that the tangible world is inadequate to provide material for the construction of credible compensation for non-available resources of the types mentioned above, that belief in a meaningful universe requires a designing agency, and that religions would lose their appeal if they lost contact with the supernatural.
8. **The diversity of the bases of belief** In the preceding paragraphs it has been argued that a number of basic propensities, which are probably ubiquitous in humans though differing somewhat between individuals and cultures, are basic to religious beliefs. To the extent that such is the case, religious beliefs can be seen as basically Darwinian.
9. **Belief and emotion** As mentioned already, in discussing beliefs it is difficult not to give the impression that belief is a solely intellectual matter. Nothing could be farther from the truth. We now know that the cognitive and emotional aspects of human psychological functioning are much more closely interwoven than was formerly thought to be the case, and this is especially important for religiosity. The very fact that religious beliefs involve counter-intuitive phenomena, and that people continue to adhere to beliefs which are contradicted by empirical evidence, suggests that intellectual conviction is not the sole issue.

Hinde's own views were summarized when he said, "it does not matter too much what you believe, for many different cultural beliefs bring meaning to believers' lives (though differences in religious beliefs can lead to horrendous conflict). But what does matter is how people behave." He also hypothesized about the evolution of pro-social groups, saying that groups in which members behave pro-socially and cooperate are most successful despite the conflict between the self and the group that's introduced by pro-sociality. He argued that this conflict was **managed by what is commonly called morality**.

However, it is Richard Dawkins who really set the meme lynx among the hawks and doves of religion, as Laland and Brown (2002 216) note:

One of the most controversial applications of memetic reasoning has been to account for religion. An organized and socially sanctioned belief in a god is to many people a given and a truth. This belief is not always regarded as something that is a legitimate focus for scientific enquiry. Even among non-believers, the idea that religions could be self-serving and self-perpetuating ideational complexes that hoodwink us into spreading their message is somewhat disturbing. Yet that is precisely what they have been argued to be by advocates of the meme's-eye view.

*This infamous account was first proposed by Dawkins in *The Selfish Gene* (1976), and elaborated in later writings. Dawkins argued that cultural selection would favour memes that gang up effectively into super-attractive coadapted meme-complexes, or memeplexes (Speel, 1995; referenced in Blackmore, 1999). Dawkins suggested that we could regard a church, with its architecture, rituals, laws, music, art, and written tradition, as just such a memeplex. He argued that the idea of a god and the religion memes that aggregate around it replicate themselves by providing convincing answers to life's great questions.*

Religions, however, are perhaps much more sinister than that. Dawkins suggested that they appear to employ various tricks, and co-opt other memes that facilitate their replication by the most dastardly of connivances. For instance, according to Dawkins:

an aspect of doctrine which has been very effective in enforcing religious observance is the threat of hell fire. Many children and even some adults believe that they will suffer ghastly torments after death if they do not obey the priestly rules. This is a particularly nasty technique of persuasion, causing great psychological anguish ... The idea of hell fire is ... self-perpetuating, because of its own deep psychological impact. It has become linked with the god meme because the two reinforce each other, and assist each other's survival in the meme pool. (Italics in original; 1976, p. 212)

Then there is faith: [Faith] means blind trust, in the absence of evidence, even in the teeth of evidence ... The meme for blind faith secures its own perpetuation by the simple unconscious expedient of discouraging rational enquiry. (Dawkins, 1976, pp. 212–13)

In fact, consider every possible trick that memes could employ to increase their frequency and memeticists suggest that such tricks are observed among organized religions (Aaron Lynch, 1996; Blackmore, 1999). They point out that memes would thrive that encouraged credit and praise to be heaped on individuals who read or learn verbatim texts describing the meme-complex; for example, the learning of Bible stories. Children adopt their parents' memes, hence specific religious memes may encourage having children, discourage abortion or contraception, encourage respect for elders, and discourage marriages between faiths. Memes could increase their frequency through conversions, so the most effective religions would be expected to place a premium on evangelicalism, proselytism, missionary work, and punishment of non-believers. Additionally, any challenge to the meme-complex might be treated extremely severely as, for example, in the case of Ayatollah Khomeini's fatwa on the author Salman Rushdie.

Blackmore (1999) asks her readers to reflect on why some minor religions went on to become great faiths, while the majority died out with the death of their leader. Her answer is that, of the many religious ideas, only some had packages of memes that were effective gimmicks for propagation, with particularly compelling (and difficult to disprove) explanations for life, and these became the major religions. Citing the work of theologian Hugh Pypier, Blackmore describes the Bible as the fittest of all books. She writes:

Western culture is the Bible's way of making more Bibles. And why is it [the bible] so successful? Because it alters its environment in a way that increases the chances of it being copied. It does this, for example, by including within itself many instructions to pass it on, and by describing itself as indispensable to the people who read it. It is extremely adaptable, and since much of its content is self-contradictory it can be used to justify more or less any action or moral stance. (1999, p. 192)

Attributing motives to memes is simply an intellectual stance adopted to help envisage which memes might be expected to have evolved. As Blackmore explains, religious memes did not, indeed could not, set out to succeed. She suggests that they were simply ideas and behaviour that had some utility in explaining the world and succeeded where others failed because they had the right combination of mutually supportive ideas that allowed them to be repeatedly passed on. It is worthy of note that there are other evolutionary approaches to understanding religion, many of which stress the advantages that religion bring to the individual (e.g. Hinde, 1999).

Natalie Angier (2002) in a New York Times interview with David Sloane Wilson had this to say of his more sympathetic view of religion, as expressed in "Darwin's Cathedral" (2002):

Dr. Wilson, a renowned evolutionary biologist, proposes that religion -- with all its institutional, emotional and prescriptive trappings -- ranks as a kind of mega-adaptation: a trait that evolved because it conferred advantages on those who bore it. But whereas evolutionary biologists traditionally view an adaptation as the outcome of a struggle between unevenly matched individuals -- say, between one polar bear with a cleanly cloaking white coat, and another with a slightly less effective form of camouflage -- Dr. Wilson sees religion as the product of group selection at work.

In his new book, Dr. Wilson argues that the religious impulse evolved early in hominid history because it helped make groups of humans comparatively more cohesive, more cooperative and more fraternal, and thus able to present a formidable front against bands of less organized or unified adversaries. By taking an evolutionary perspective on the subject, Dr. Wilson said, religion's twinned record of transcendent glories and shocking barbarities becomes comprehensible and even predictable, though not, perhaps, inevitable for the future.

In his own words he says: "I consider myself a communitarian, and there are many things I admire about religion, but no, I don't believe in God. I tell people I'm an atheist, but a nice atheist."

Wilson states that he has set out to demonstrate that a church can be thought of as an organism in an evolutionary sense:

*True love means growth for the whole organism, whose members are all interdependent and serve each other.
That is the outward form of the inner working of the Spirit, the organism of the Body governed by Christ.
We see the same thing among the bees, who all work with equal zeal gathering honey. —Ehrenpreis [1650] 1978, 11*

Religious believers often compare their communities to a single organism or even to a social insect colony. The passage quoted above is from the writings of the Hutterites, a Christian denomination that originated in Europe five centuries ago and that currently thrives in communal settlements scattered throughout northwestern North America. Across the world in China and Japan, Zen Buddhist monasteries were often constructed to resemble a single human body (Collcutt 1981). The purpose of this book is to treat the organismic concept of religious groups as a serious scientific hypothesis. Organisms are a product of natural selection. Through countless generations of variation and selection, they acquire properties that enable them to survive and reproduce in their environments. My purpose is to see if human groups in general, and religious groups in particular, qualify as organismic in this sense.

In summarising his evolutionary case as unifying systems, he notes this could extend to culture as a whole in all its aspects quoting culture itself as a defensive structure against chaos:

Cultures are defensive constructions against chaos, designed to reduce the impact of randomness on experience. They are adaptive responses, just as feathers are for birds and fur is for mammals. Cultures prescribe norms, evolve goals, build beliefs that help us tackle the challenges of existence. In so doing they must rule out many alternative goals and beliefs, and thereby limit possibilities; but this channeling of attention to a limited set of goals and means is what allows effortless actions within self-erected boundaries. —Csikszentmihalyi 1990, 91

This passage claims for culture in general what I have tried to show for religion in particular. The word religion is derived from the Latin "religio," which means "to unite or bind together" Related words used outside the context of religion are "religate" (to bind together or unite) and "ligature" (the act of tying or binding up). These meanings reflect the essence of the thesis of this book, like a hidden clue that was not discovered until the very end. However, religions are not the only systems that unite people into adaptive groups. I could have written a book on political organizations, business organizations, military organizations, sports teams, family groups, secular intellectual traditions, or even diffuse cultures as adaptive units. We therefore need to develop a general theory of unifying systems of which religion is a special case.

The idea that religions enable larger scale cooperative behaviour is universally supported. Many writers have expressed the view that moral systems in both animal and human societies function to reduce intra-social conflict leading in turn to inter-social dominance (Alexander 1987, Hinde 1999, Wilson 2002, Rossano (2010), Dunbar (2022).

But DH Wilson's point makes clear that other forms of social system also enable large scale cooperation, particularly social systems based on compassionate justice that people can recognise as good, so it doesn't explain why religion is advantageously desirable for the common good, integral to human culture or biology, or why a prescriptive religion that binds people in punitive ways to a more exacting extension of natural morality is superior to secular societies which can achieve the same ends. It is simply a fact of history that dominant empires have been associated with religions of one sort or another as social binding, arising from antiquity, even to the extent of ancient Rome switching to Christianity as a state religion under Constantine.

Nevertheless Wilson in his work (p 105) makes clear why the God-people relationship may not be factual:

The God-people relationship Ask a person to do something and the most likely response will be "Why?" An adaptive belief system cannot simply provide a list of behaviors but must also justify them. It might seem that the justification could be factual and straightforward: "Do this because it is good for you." However, this approach is unlikely to succeed by itself for a number of reasons.

First, it works best when the consequences of the behavior are well known: "Eat your spinach because it is high in iron and will make you healthy." Often the consequences of behaviors are not well known, and the most obvious short-term consequences (the bitter taste of spinach) can lead to a different conclusion than the more subtle long-term consequences (the health effects). An adaptive belief system must cope with ignorance in its justification of behaviors.

Second, a belief system that is adaptive at the group level must cope with the problem of cheating, which benefits some individuals at the expense of others within the group. Cheating is genuinely beneficial for the cheater (when he or she gets away with it), and therefore cannot be argued against on the basis of personal benefit. The same point can be made in terms of the "veil of ignorance" that Rawls (1971) used to explain the concept of justice. Ask self-interested people to design a society, subject to the constraint that they will be placed at random within the society, and they will design a just society. However, once placed within the society, they are subject to a different set of constraints and may well want to destroy what they previously created. This problem, which lies at the heart of multilevel selection theory, makes it difficult to justify the behaviors that constitute an adaptive group in terms of personal benefit.

Third, an adaptive belief system must be economical. The beliefs that justify the behaviors must be easily learned and employed in the real world. A fictional belief system that is user-friendly and that motivates an adaptive suite of behaviors will surpass a realistic belief system that requires a Ph.D. to understand and that leads to a paralysis of indecision.

Fourth, a fictional belief system can be more motivating than a realistic belief system. Imagine two individuals competing for a common resource. Even though the facts of this situation are easy to comprehend, regarding one's enemy as inhuman can be more motivating than regarding one's enemy as just like oneself.

Fifth, a fictional belief system can perform the same functions as externally imposed rewards and punishments, often at a much lower cost. For example, the usual means of raising money to serve the common good is in the form of taxes. Unfortunately, individuals who avoid paying taxes without punishment are always better off in material terms than solid citizens within the same group. Cheating can be prevented by punishment, but implementing a system for detecting and punishing cheaters can itself be costly. Another solution is to manipulate the cost of cheating in the mind of the average citizen. Groups governed by belief systems that internalize social control can be much more successful than groups that must rely on external forms of social control.

For all of these (and probably other) reasons, we can expect **many belief systems to be massively fictional in their portrayal of the world** (Wilson 1990, 1995). As I discussed, their adaptedness must be judged by the behaviors they motivate, not by their factual correspondence to reality.

This raises a series of problems:

Firstly do religions evolve and **what did they evolve from?**

Secondly religions, although they are moral social systems, which enable larger societies to cohere, also claim to be **cosmological descriptions of existential reality expressing ultimate truth**. If they are "massively fictional", they run the risk of dominating society and then leading it into an invidious outcome.

Thirdly, the very reasons being advanced why they are advantageous have nothing to do with their inner truth or otherwise, but precisely those **self-reinforcing social feedback loops** that memeticists cite as principal caveats about the role of religions. Wilson's five points are essentially social replicator rules and Hinde's nine reasons are the very avenues these rules seek to utilise.

Fourthly, the **question of morality**. Sociobiology teaches us that morality is a function of animal societies in which strategic bluffing occurs designed to inhibit internal competition to result in external dominance and survival. It is

not a cosmological imperative. Religion, by contrast asserts morality as a divine principle, ring fenced by virtuous inducements and dire consequences.

Fifthly, while Wilson uses examples such as Calvinism to highlight constructive pro-sociality not requiring oppressive punishments, the **history of religion is littered with homicidal punishments, and oppressive edicts** presenting no avenue of escape for members, so the notion that religions are more efficient by positive inducement fails the historical test, whenever prescriptive religions show their teeth and claws in their true colours.

Sixthly, the notion that humanity has evolved to **be genetically predisposed to spiritual or religious concepts**, or that the brain is or is "hard-wired" to do so has not been scientifically established.

Seventhly, although Wilson's citing of the reformation is an example of a type of evolutionary change within Christianity, **paradigm shifts in religions are exceedingly rare** over time scales of millennia, because religions are set up to zealously resist evolutionary change or re-interpretation as heresy, apostasy or blasphemy, unlike science where new ideas are assessed on their empirical or theoretic evidence, so that religion attempts to frustrate its own evolution, with the religious assault on evolutionary science, on the basis of the mythical and incorrect Sabbatical Creation, being a suitable case for treatment.

Eighthly: Religious views of nature and sexuality are in conflict wth reality

Ninthly religions, especially evangelical Christianity are in a collision course with nature in which evolution and the sanctity of the Tree of Life is denied.

The Evolution of Religions and the Consequences

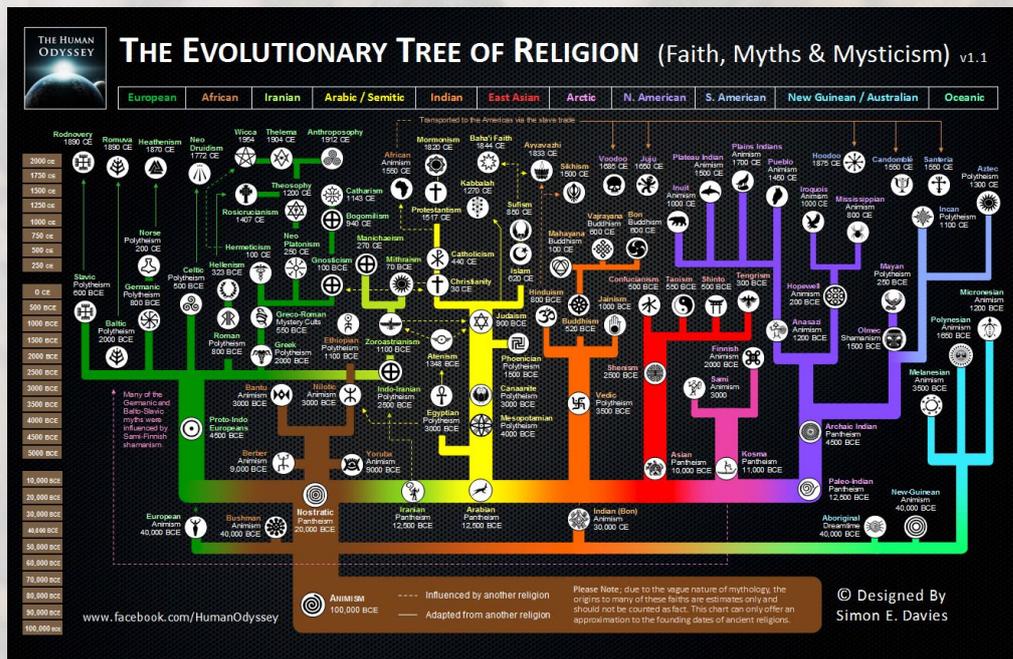
(1) The Evidence for Evolution of Religions from Animism, Shamanism and Ancestor Worship: Religions do display evolutionary relationships over time, due to the cross-infection of ideas, as illustrated in fig 146 and to natural variation, speciation and some forms of syncretic recombination. Buddhism, Jainism and Hinduism, in its many forms, all involve commonalities of world view and emergent movements such as Tantrism have overlapped these traditions. Likewise the Zoroastrian notion of cosmic renovation infected the Hebrew tradition to become Jewish apocalypticism and then the Christian version in the Gospels and Revelation. However evolutionary writers including Rossano (2010), Dunbar (2022) and from a more archaeological perspective Hayden (2003), consistently see the origins of religion in mystical and trance states associated with shamanism and animism, particularly given the vastly longer time scale of gatherer-hunter social evolution.

In fact, one can see that all animals that have evolved an awareness of their agency as biological organisms, including *Homo sapiens*, ARE animists, because their prime existential crises and fulfilment hinge around the mortal threats, and food and partnership opportunities other animals provide, with other existential crises caused by fire flood and storms featuring as forms of live environmental agency as well. It is only with the evolution of culture and human manufacture that we have come to the notions of creationist theism and our ideas of reality have become surrounded by machines and machine thinking to the exclusion of live agency, which is threatening to subsume us in AI.

Fig 145: The evolutionary tree of religion is rooted in animism (Simon Davies).

Brian Hayden (2003) in "A Prehistory of Religion: Shamans, Sorcerers and Saints" expresses it thus:

While it is fashionable to use psychological or social models (Durkheim 1915) to explain the origin of religion, these approaches are unsatisfactory for a number of reasons from an archaeological and ecological point of view.



First, the amount of time and effort invested in many religious activities such as the building of Stonehenge are far beyond what one would expect of any simple anxiety-reducing behavior, unless entire populations were extremely phobic. Moreover, high levels of anxiety do not accord with any ethnographers' observations that I am aware of. In fact, ethnographers sometimes remark on the surprising lack of concern that hunter-gatherers and horticulturalists display about the future.

Secondly developing an inherent tendency to enter into ecstatic or altered states of consciousness must have involved major transformations of the physical structure of the human brain. In ecological theory, such changes are incomprehensible unless they also confer advantageous survival benefits; that is, unless these changes are in some ways adaptive.

Third, it might be argued that the expansion of the brain's neocortex and especially the dominance of the left hemisphere (see *Music Is in the Hemispheres*, below) were adaptive because they made culture possible at the cost of suppressing functions of earlier parts of the brain. In this view, the function of religion is to reduce the stresses between these different parts of the brain. This explanation has a relatively narrow scope, however, accounting only for ritual behavior. In contrast, ecological explanations such as those to be discussed cover a much wider range of behavior, including sharing, alliances, and kinship. In addition, ecological explanations encompass unique types of human behavior that are difficult to understand under other paradigms. Such behaviors include the human reaction to rhythms and their link to rituals, the acceptance of new values presented while in ecstatic states, and the notion of higher principles or beings.

Robin Dunbar (2022) in "How Religion Evolved" clearly expresses this view (Riesz 2022):

At the emotional heart of religion, as Dunbar sees it, is something he calls "the mystical stance", which includes "a susceptibility to enter trance-like states", "belief in a transcendental (or spirit) world" and "a belief that we can call on hidden power(s) to help us". Though sophisticated systems of theology have obviously been built on these foundations, "beneath the surface veneer of doctrinal rectitude lurks an ancient foundation of pagan mystical religion". One of the key questions is how the original immersive or shamanic forms of religion develop into elaborate doctrinal religions.

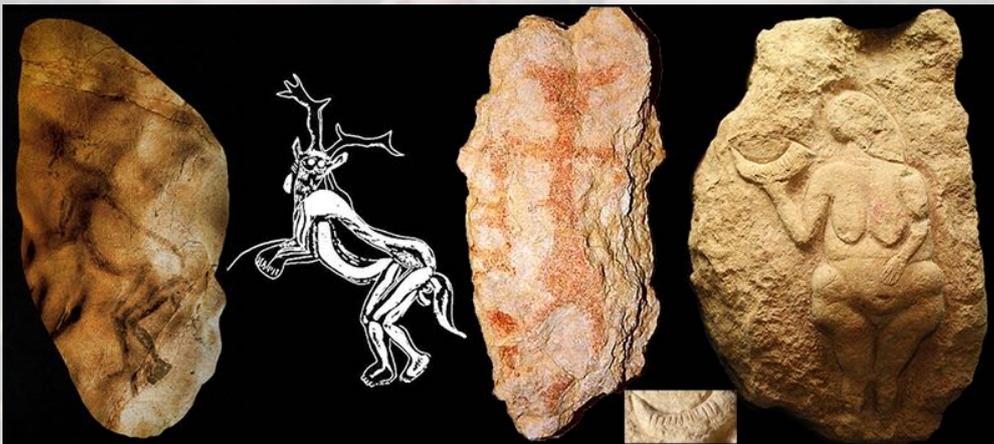


Fig 146: Left and Centre: Two ancient shamanic portraits cited by Rossano. Left: the 'sorceror' of Trois-Frères Cave (c 14000 BP). Centre: Fumane shaman with antlers (c 25500 BP). Right: The Venus of Laussel (c25000 BP) a representation of the Great Mother, with ochre smeared pubis holding and looking at a horn with 13 menstrual marks (13x28=364), representing the lunar bull and male fertility. Thus we see the patriarchal view of divinity as not arising in the sky God nor in human dominion over nature, but in the sheer spiritual wildness of nature that encompasses both the tiger and the thunderstorm. The shaman manifests the character of a therianthrope – an animal that transforms into a human and vice versa – the power animal, or apotheosis representing our unbounded spiritual nature, exemplified by the San /Kaggen and other trickster heroes, the humble werewolf, and even in an exploded apocalyptic form, by Yeshua and his miraculous apotheosis, Christ.

Nick Spencer's (2022) review elaborates:

Dunbar is clear that religious practices improve the individual's "fitness". "Active involvement in religion both makes you feel happier and provides you with a level of support that helps you cope." The second key urge takes us beyond this "functional" role. Humans are predisposed towards the transcendent. The "mystical stance" is widespread, ancient in origin, and "part of what it is to be human". Whether through trance states in early "shamanic" religions or less dramatic but still affecting encounters with music, art or nature, the sense of being part of something deeper and more profound than ourselves is near-universal. None of this means that such feelings are necessarily true. Dunbar is clear that doctrinal truth claims, such as about the nature of God or of creation, have played a relatively minor and recent role in the evolution of religion. Rather, it is simply that belief in a spiritual realm or in human purpose or destiny is very deeply ingrained in our nature. Dunbar is clear that the same religious urges that engender pro-social behaviour within the group can also provoke antisocial behaviour outside it — the more I bond with my co-religionists, the less I have in common with those of other faiths. And when religious identity is co-opted by the state, the result can be disastrous.

Matt Rossano (2010), in "Supernatural Selection" places this back to the first worldwide spread of modern humans:

At the same time of the worldwide spread of modern humans we see the first compelling evidence for the religious practices of shamanism, animism, and ancestor worship. Echoing the famous anthropologist Roy Rappaport, my view is that this is more than mere accident. Religion played a nontrivial role in the achievement of distinctively human society. ... Thus, where we observe greater ubiquity we can infer greater antiquity: An increasingly widespread trait is likely to be a more ancient one that possibly traces back to the origin of the species. Using this same logic, we can attempt to identify religion's "primitive" traits.

He discovers the foundations to be ancestor worship, shamanism, and animism, the belief in natural and animal spirits:

Using this approach, three traits emerge: ancestor worship, shamanism, and the animistic belief in natural and animal spirits. Each of these traits represents a "supernaturalizing" of social life—a way in which our ancestors expanded the social world to include a supernatural layer filled with ever-vigilant spiritual monitors.

He summarises his basis for these being the evolutionary source:

Ancestor worship: *is widespread across traditional religions in Africa, Asia, the Pacific Islands, and the South American tropics. In his survey of traditional African religions, missionary and religious scholar Geoffrey Parrinder states flatly, "All Africans believe in the ancestors, as ever-living and watchful." Half a world away, on the Solomon Islands, the same attitude persists among the Kwaio people, for whom daily interaction with ancestors is as routine as eating, drinking, and sleeping. Interacting with the ancestors, however, does not always happen within the context of recognizable rituals. Efe Pygmies regularly interact with ancestors in the forest and in dreams, but they engage in hardly anything that would look to us like worship.*

Shamanism: *The term "shaman" comes from the Tungus root saman, meaning "one who is excited or raised" or simply "to know." This reflects the fact that the shaman's function is to enter an altered state of consciousness wherein he or she connects with spiritual forces in order to gain knowledge or cure illness. The shaman, then, is a spiritual practitioner—a specialist whose job is to interact with the spiritual world.*

Animism: *The belief in a spiritual force pervading all of nature is common among hunter-gatherers. Powerful animal spirits play a prominent role in the art, myths, and religious beliefs of traditional people as culturally and geographically diverse as the Aborigines of Australia, the Inuits of the Arctic, the Ainu of northern Japan, the Bushmen of South Africa, the Jahai of Malaysia, and numerous native North and South American tribes. Animal spirits were also prominent among the great chiefdoms of pre-Columbian America (e.g., Aztecs, Toltecs, Incas) and the early great civilizations of the Old World (Egypt, Mesopotamia). There are some exceptions and variations. For example, while Aka Pygmies believe in animal spirits, neither Mbuti nor Baka Pygmies do. Instead, Baka Pygmies believe in anthropomorphized "game spirits," while the Mbuti see the entire forest as a living spirit.*

However Rossano, unlike Dunbar neglects the obvious centrality of the Great Mother, fully evident as far back as 35,000 years ago in the Aurignacian in the case of the Venus of Hohle Fels. Rianne Eisler (1987) in "The Chalice and the Blade" summarises the early evidence for the Great Mother:

It would seem only logical that the visible dimorphism, or difference in form, between the two halves of humanity had a profound effect on Paleolithic systems of belief. And it would seem equally logical that the fact that both human and animal life is generated from the female body and that, like the seasons and the moon, woman's body also goes through cycles led our ancestors to see the life-giving and sustaining powers of the world in female, rather than male, form. In sum, instead of being random and unconnected materials, the Paleolithic remains of female figurines, red ocher in burials, and vagina-shaped cowrie shells appear to be early manifestations of what was later to develop into a complex religion centering on the worship of a Mother Goddess as the source and regeneratrix of all forms of life. This Goddess worship, as James and other scholars note, survived well into historic times "in the composite figure of the Magna Mater of the Near East and the Greco-Roman world.

Rossano pinpoints the transition between these early imagistic processes and traditional doctrinal religions:

Anthropologist Harvey Whitehouse argues that religion exists in two modes: imagistic and doctrinal. The imagistic mode is characterized by infrequent, emotionally charged rituals that create the conditions for strong social bonding among participants. This mode encourages private reflection on emotionally arousing events. Its effects typically remain localized and personalized, not conducive to widespread transmission. By contrast, the doctrinal mode facilitates the efficient spread of religious beliefs across a broad population. It does this by stressing frequent, stylized rituals that encourage the rote storage of a common set of actions, stories, and teachings (e.g., the Catholic mass, where the story of Jesus' last meal is reenacted and his message of sacrifice is revisited). While the doctrinal mode is an efficient tool for transmission, it can also lose its force through tedium. Thus, both modes are believed necessary for a religion to remain vital: the imagistic providing the individual motivation to participate in religious activities, the doctrinal to establish a common set of ideals and behaviors. Whitehouse contends that the imagistic mode is historically more ancient, probably dating as far back as the "religious" cave art of the Upper Paleolithic. I agree, but I suggest that the ritual and emotional roots of the imagistic mode run far deeper than the Upper Paleolithic — to well before the African Interregnum (100000-60000). Conversely, the foundations for the doctrinal mode emerge much later.

This distinction between imagistic spirituality as expressed in diverse forms in the animism section and the doctrinal religion people tends to associate with religion and its social impacts also is the distinction between the source mysticism that underlies all religious inspiration that lies at the seeds of new religions and the prescriptive memes traditional religions apply to their populations to maintain theistic control over human beliefs and actions.

Robin Dunbar (2022) coincides with this evolutionary position:

The earliest forms of religion took the shape of a rather generalized belief in spirits or a form of being that sometimes occupied a transcendental world parallel to the physical one in which we live, but also might occupy the same physical space as we do. In some cases, these spirits had no particular interest in our world; in other cases, they were responsible for causing – or curing – the illnesses that we fall prey to. These older religions are religions of immersive experience, rather than religions of formal ritual with specialists who intercede on behalf of the laity. They are often (but not always) associated with trance states, usually induced by music and dance. In this, they share many underlying features with the mysticism that we find in all the doctrinal religions. By general consensus, mysticism involves direct ecstatic experience of the divine. It is a very personal form of ‘religion of experience’, a sense of immersion in the ineffable, the ‘oneness of being’ as the medieval Christian mystics described it. In its modern forms, these features tend to reflect the particular beliefs of the religion to which the mystic belongs. Mystics from the Christian, Sufi Islam and Sikh traditions will experience this as immersion in the oneness of God, whereas Buddhists experience it as immersion in the luminous universal mind. Sometimes these trance states (often described as ‘visions’) are spontaneous (as seems to have been the case with many historical Christian mystics like St Teresa of Ávila or the German Dominican friar Meister Eckhart); in other cases, trance may be brought on by group rituals, usually involving music (as in the trance dances of the San Bushmen) and sometimes assisted by plant-based psychotropic (or mind-altering) drugs (many South American tribes), or individually by meditative practices (as in the yogic tradition). Because the use of trance in one form or another is so widespread in these animist forms of religions, I refer to them collectively as ‘shamanic religions’, or ‘immersive religions’.

He then notes the transition to doctrinal religion:

At some point, there was a transition to a more formal kind of religion marked by regular places of worship, gods (who sometimes actively intervene in human affairs), religious specialists or priests (who intervene between the community and the gods, in some cases via trance-based rituals), more formal theologies, and moral codes that have divine origins – Moses receiving the tablets with the Ten Commandments directly from God on Mount Sinai, the Prophet Muhammed receiving the dictation of the Koran from God, Joseph Smith receiving the golden plates of the Book of Mormon. Most of these doctrinal religions also have origin stories, often associated with the revelatory experiences of a specific individual as founder – Zoroaster in the case of the Zoroastrians of ancient Persia; Siddhārtha Gautama for the Buddhists; Jesus Christ for Christians; the Prophet Muhammed for Islam; Guru Nanak for Sikhism. Because these religions typically have quite explicit theological doctrines, they are often known as doctrinal religions. They are also known as world religions because most of them now have very large followings spread over most of the planet (notwithstanding the fact that this is actually a very recent phenomenon). The important point to emphasize is that this sequence is not necessarily a process of replacement of one kind of religion by another. It is, rather, one of accretion – one form of religion (a doctrinal phase) being bolted onto the earlier (shamanic or animist) form.

Later, Dunbar pinpoints this to the rise of large urban cultures associated with agriculture and animal husbandry:

Six religious traits were mapped across thirty-three contemporary hunter-gatherer societies distributed across southern Africa, South and East Asia, Australia and the Americas, and then the ancestral states of these traits reconstructed statistically. The six traits were: animistic beliefs, shamanism, ancestor worship, belief in an afterlife, belief in local gods who keep to their own domain, and belief in High Gods who interfere in human affairs (Moralizing High Gods). The study found that animism is likely to have been the oldest of these traits, being present, uniquely, in all the cultures in the sample, despite their wide geographical distribution. On the other hand, belief in an afterlife is by no means universal and, along with shamanism and ancestor worship, appears to form a suite of traits that evolved together later. In contrast, belief in High Gods seemed to be completely divorced from all the other traits (very few hunter-gatherers actually believe in High Gods); instead, it seems to be a trait exclusively associated with the rise of agriculture and pastoralism (Peoples & Marlowe 2012, Peoples, Duda & Marlowe 2016).

He also reinforces mysticism and altered states as foundational to all forms of religious tradition (Guerra-Doce (2015):

*Mysticism has been a major component of all the major religions. By mysticism, I mean a feeling of divine transcendence that comes over an individual from time to time, sometimes spontaneously, sometimes as a result of deliberately engaging in ritualized activities. It is variously referred to as ecstasy or enthusiasm (from the Ancient Greek word *enthousiasmós*, meaning ‘possessed by god’). In its most developed forms, it usually involves a sense of drifting into a different plane of consciousness, of becoming so detached from the world of everyday experience as to no longer notice the sights and sounds of the physical world, a sense of losing track of time, of peacefulness – sometimes described in the mystical literature as the ‘stillness of the mind’. These are a susceptibility to enter trance-like states, a belief in the existence of a transcendental (or spirit) world, and a belief that we can call on hidden power(s) to help us. The mystical stance is the belief that we can experience this hidden essence directly only through our minds.*

The mystical stance seems to emerge out of two separate, but related psychological components. One is a need to believe in a spiritual dimension to human life. This may well derive from a deep-seated reluctance to believe that death really is death, the end of life and being. The other has to do with altered states of consciousness, both those induced by trance and those that arise from

accidents of experience (such as epileptic fits) or the use of mind-altering drugs. ... One survey of 488 ethnographic societies drawn from all continents concluded that no less than 90 per cent incorporated altered states of consciousness into their belief systems. ... The experience of trance also bears a close similarity to those that occur during near-death experiences. ... In many ways, the archetypal form of trance is the kind found among hunter-gatherers like the San peoples of Botswana and Namibia. The San use dance to trigger trance. Conventionally, it is the men who dance and the women who provide the musical accompaniment by clapping and singing. In most cases, the men dance in a circle until exhaustion sets in, triggering trance ().

In this process, Dunbar (2022) makes a very careful analysis of biological evolution:

Group selection, as the latter is known, requires the differential survival of whole groups and was often viewed as the explanation for altruism or population regulation: some animals don't breed in order to ensure that the population or species does not exhaust its food supply and go extinct. The problem is that there is no known genetic mechanism that would allow this: any species that behaved in this way would quickly find its altruism undermined by individuals that reproduced selfishly as fast as they could. This is not to say that group selection cannot work. It can, but it requires very high rates of group extinction and very low rates of migration between groups, and so far no study has found rates of group (or even culture) extinction that are anything like high enough to allow it to work. For this reason, biologists look with deep suspicion on any suggestion that benefits might accrue solely for the benefit of the group and against the interests of the individual.

The fact that religion can incur serious costs in terms of self-imposed pain, celibacy and even self-sacrifice has led some evolutionary psychologists and cognitive science of religion scholars to conclude that religion and religiosity cannot be adaptive, but must instead be the maladaptive by-product of traits or cognitive processes that evolved for other perfectly respectable biological purposes.

Animals do not live in groups because they like each other. They live in groups for the specific purpose of solving one or more of the components of fitness. ... In all these cases, the benefit arises only because the group exists, but its impact on fitness always accrues at the level of the individual, or even the gene. If the group does not provide a benefit for the individual, individuals will not put up with the inevitable costs of living in a group. Evolutionary biologists refer to this process as group-level (or group augmentation) selection, or more simply as mutualism. This is essentially the same process as that involved in symbioses, where two species live in close harmony with each other, thereby enhancing each other's survival chances.

He nevertheless takes a strongly affirmative position concerning the reality of cultural evolution:

Another important point to appreciate is that the function of a trait and its mode of inheritance are two separate, unrelated things. Any mechanism that allows a trait to be passed on from one individual to another, whether or not they are biologically related and share any genes, acts in a Darwinian fashion. Learning or cultural transmission is such a mechanism, and hence can be analysed using the same mathematics as is used to explore the evolution of genetically inherited traits. Culture is a Darwinian process, and cultural traits (or even entire cultures) evolve under selection, much as individuals and species do. Culture, however, can evolve both in ways that influence an individual's biological fitness and in ways that influence the fitness of a given cultural element within a purely cultural world. In theory, there is nothing evolutionarily implausible about a cultural phenomenon driving the genes of the bodies (or minds) that they parasitize to extinction – providing they can jump from one mind to the next (by cultural transmission) faster than they cause each body they inhabit to die.

This leads to some pessimistic views of the evolution of religion:

In general, evolutionary cognitive science of religion has adopted one of two views to explain how and why religion evolved. One is that religion is an unavoidable, and hence evolutionarily largely uninteresting, consequence of the way the human mind happens (or had) to be designed to support other evolutionarily more important functions. Religion is simply the cost that had to be paid in order to maximize evolutionary fitness. Alternatively, it might be an example of cultural evolution exploiting the way the human mind is designed so as to maximize cultural fitness despite the negative effect this might have on the fitness of the individuals whose minds are being parasitized. Both are, as we shall see in the next section, perfectly plausible explanations from a conventional Darwinian point of view.

And Dunbar is under no illusion that religions necessarily benefit the welfare of individuals, because of the dire consequences some religious groups or doctrines entertain, not just in the apocalyptic endings of Jim Jones with cyanide and David Koresh at Waco Texas in conflagration. More than 900 people died in the Jonestown massacre, in Guyana, including some 300 who were age 17 or under:

In the Christian tradition, the Adamite sect in late Roman Egypt insisted on complete nakedness during their services. Others, like the Russian Skoptsy (literally, 'castrates') sect, took matters even further, advocating breast and genital mutilation in women and the removal of both penis and testes in men (all performed with red-hot irons) so as to restore their bodies to the original pre-Fall condition of Adam and Eve in the Garden of Eden.

However, he is not interested in beliefs, but the overall sociobiological effects of religions on human groups:

Cognitive science of religion provides convincing explanations as to how human cognition underpins many aspects of religiosity and how these might have been exploited for these purposes. However, its focus is mainly on beliefs and so it overlooks some important

features of human religious experience that in many ways constitute the core fabric of religion – in particular, ritual and the role that religion plays in creating communities.

In this, he has a positive view, unlinked to any of the sometimes oppressive moral or doctrinal aspects of developed religions, citing the increased sense of belonging, community and mutual support religious groups offer, allowing larger social groups to form and maintain coherence, without precipitating internecine intracommunity violence and schism, noting for example the superior health, happiness and survival statistics of religious groups over non-affiliated.

This can apply both to individual benefits:

One widely articulated view is that religion provides a unifying framework for the world in which we live: it allows us to make sense of our world in a way that enables us to function effectively because we can control its more erratic behaviour. ... On top of that, we never know when we are likely to encounter any of the many more immediate threats to life – predators, plagues and pathogens, poisonous plants, and other humans (raiders).

A meta-analysis of forty-two studies, totalling nearly 126,000 subjects, found that active religious involvement increased the chances of being alive at follow-up by 26 per cent compared to those who never went to church, even when controlling for socio-demographic variables and existing health.

And to societal ones, involving both reputation and punishment of individuals:

In other words, a community that is invaded by even a small number of freeriders will very quickly either become dominated by selfish individuals or will fragment into small inward-looking subgroups. Part of the problem is that we are not naturally prosocial – something that is surely evident from the fact that both secular and religious authorities, not to mention family, constantly have to enjoin us to fulfil our obligations in this respect. ... Yet we are, nonetheless, willing to cooperate with, and be casually generous to, strangers. Neither economists nor evolutionary biologists have managed to find a convincing explanation for this, despite several decades of intensive experimental study. The best they have been able to do is suggest one of two possible mechanisms that seem to work: reputation and punishment. ... God is a particularly effective threat precisely because He sees everything even when the rest of us might not.

However he also invokes the carrot of commitment that religions also encourage, as a partial antidote to the stick of punishment. And with commitment also comes bonding and belonging. In this mix is a prominent aspect of risk avoidance and risk anxiety which the ordered world view of religions seeks to alleviate, which provides an explanation for both animism and doctrinal religions, with the proviso that in a basis sense the animistic view in gatherer-hunters societies, where risks predominate from natural agents, it has some scientific validity, lacking in later moral high Gods.

Essentially, this proposes that the animal mind is furnished with sensitivities to cues that allow it to detect salient phenomena that have direct effects on biological fitness (the ability to survive and reproduce successfully). For example, being able to infer that there is a predator approaching when hearing the snap of a twig in the forest is beneficial if you want to avoid falling prey to a predator or an enemy. Such mechanisms, they argue, are likely to be risk-averse because it is always better to mistakenly assume that there is a predator approaching than to mistakenly ignore the significance of such a cue when there really is a predator approaching (an example of Pascal's Wager). As a result, we humans are predisposed to attribute any phenomenon that we cannot readily explain to some mysterious being that we cannot see. There is no question that this effect is widely prevalent in humans: it is redolent in the way we attribute motivations to physical phenomena. We speak of the sea being angry or the sky lowering. On this view, then, religion is an inbuilt error in the biological system.

He also cites a careful, not excessive, degree of supernaturalness associated with religious belief:

Another classic example of this approach is the suggestion that gods are typically 'minimally counterintuitive', meaning that they have to be able to break the normal laws of everyday physics – but not by too much, otherwise they just become implausible.

Although he cites religions as enabling the growth of larger coherent societies, spanning the scales of bands 30-50, clans 100-200, tribes 1500 to whole urban civilisations, he is also interested in the ways religious groups nevertheless subdivide and result in schism over time because of the inherent difficulties of maintaining trust and belonging in larger social groups as religions grow. He sees this as also a product of the way doctrinal religions have evolved out of earlier and more immediate forms of animistic, shamanic and mystical rituals and practices that worked well for smaller groups of around 150 or so to whole populations of empires. This means that local churches are prone to invest in charismatic leaders, often criticising increasing elitism and moral corruption in the clerical hierarchy, to re-invoke the more immediate personal experiences of the underlying immanent form of religious experience that motivated doctrinal religions in the first place. Examples of this abound in the suppression of the Gnostics as heretics, the Reformation, the rise of Salafism in Islam and the diverse modern sects from the Quakers to Pentecostals as well as some of the terminal cults from Jonestown to Waco, Texas.

This has manifest implications concerning the war of fundamentalistic Christian religious groups against science over evolution since Darwin, as we shall see in the eighth section.

Complementing this evolutionary account, Thomas Römer in “The Invention of Gods” illustrates the cultural evolution of Yahweh as the Hebrew high god including his consortship with Asherah, in a transition from a syncretic polytheistic high god to an abstract ruler of the world acting in history.

The scientific historian of crisis, Jared Diamond (2021) points to the greatest power of religion in the civilised era of large agricultural societies being doctrines which enable large societies to remain coherent and dominant:

There are at least half a dozen powers of religious beliefs and among those half a dozen are political. The most straightforward of these political functions which arose only within the last five or six thousand years with the development of complicated political systems, one of those political functions is to justify obedience to kings and priests and emperors in a populist in a big society. In a small human society like the New Guinea societies where there are a few hundred people you know everybody by name there isn't any issue of dealing with strangers but so here you and I have met recently and in the in the in the last short time since we met each other neither you nor I has moved to kill each other, but in new guinea that would be unthinkable if I were at such a short distance from a stranger.

So you need something special to enable a large society where you encounter strangers to function religion plays an essential role. Religion offers a moral code which says how you're supposed to behave to everybody whether or not they're your fifth cross cousin or not there are like ten commandments every religion has which include thou shalt not kill – thou shall not kill a stranger but under circumstances thou shalt kill if you go to war with those people over there religion says yes you should kill those jerks because they are non-believers they don't have the true religion so religion in the last 5 000 years has acquired some new social political functions namely obey the king don't kill strangers but yes do kill strangers if they believe in the wrong religion. The power comes from the obedience that religion commands and the willingness to sacrifice oneself that religion commands. For example the world trade tower attack people with certain religious beliefs ended up killing 2993 people with other religious beliefs they sacrificed their lives there was enormous payoff in terms of the people killed with other religious beliefs.

He likewise discounts the idea that the universality of religion attests to its truth:

People who are believers would claim that the universality of religion speaks to the real existence of some supernatural phenomena or supernatural existence that everyone is sensing desiring and indeed in tune with. If you do not believe in such supernatural existence you still do have to explain the virtual ubiquity of religion. If one was going to draw conclusions and take comfort from the ubiquity of religion then you might expect it would be the ubiquity of one religion which is true but in fact every religion maintains all other religions to be untrue that already starts should make you start to be suspicious that that you can't make any arguments about truth from ubiquity. Some would claim that the you can because there is a commonality among those differences you can you can find the the lowest common denominator which in fact is a belief in a transcendence beyond the physicality of our own lives the ubiquity of religion seems to me a really weak defense of religion. There are other things that are that are ubiquitous the use of drugs.

Historian Yuval Noah Harari (2015) author of “Sapiens” (2014) in “Bananas in Heaven” likewise attributes the power of religions to their ability to invoke powerful fictitious “realities” through language:

What gives us this ability to do something no other animal can do? The answer is our imagination. Humans cooperate flexibly in large numbers because humans can create imagined realities together. All other animals use their communication system in order to describe reality. A chimpanzee can say, "Look there is a lion! Run away!" or "Look, there is a banana, let's take it!" Humans can use their language not only to describe reality but also to create new realities, to create fiction. A human can say: "Look there is a lion!" or "Look, there is a banana!" but the human can also say, "Look there is a God above the clouds, and if you don't do what they tell you to do, God will punish you." And if you believe this fictional story then you will do what you are told to do. And this is the secret behind large-scale human corporation. As long as everybody believes in the same fictional stories, everybody obeys the same laws, the same rules, and the same norms. And this is something that only humans can do.

(2) The Cosmological Claims of Religion: All religions lay claim to an ultimate cosmology of existence through their creation accounts. In terms of cosmology, Christianity for example, lays claim to an ultimate authority that is even applied retrospectively back from Yeshua's mission to the Biblical genesis giving him status of alpha and Omega. The Sabbatical Creation of Genesis is a quaint allegory, that passes the meme “efficiency” test with flying colours because it is so concise and endearing but is categorically wrong, both in the timing relationship of Earthly life to the solar system and to the order of the living species themselves. Once the notion of creation is implanted, the temptation to conceive of the universe in terms of creative design becomes almost impossible to overturn. Revelation likewise passes the “more motivating than reality” meme test by being so outrageously hyperbolic destroying the late planet Earth in apocalyptic conflagration leading to the newly created heavenly Jerusalem. This destructive eschatology is not only

incorrect, it is diabolically genocidal. It cements nature as completely expendable and leads to a complete disregard for natural or human survival in planetary crisis, to which religious dominion over nature has contributed.

While edge-of-chaos dynamics is pivotal to the way biogenesis, biological evolution and conscious experience, arising from, cosmological symmetry-breaking, world religions share a motif of the ultimate rule of order over chaos, which becomes a cosmic war against disorder, in the form of evil because, although each cosmology starts out pure, disorder creeps in, culminating in a destructive final renovation of the universe in the end of days. The Vedic cosmology ends in annihilation, in the Kali yuga. Buddhist cosmology similarly descends into the Saṃvartakalpa or "Eon of dissolution. In the western traditions we wind up with the Day of Judgment.

Such cosmologies thus invoke divine purity but introduce a cosmological war of order against chaos in a creeping dissolution perceived as primary evil. Just as Marduk the God of civic order is depicted as conquering Tiamat – the ancient Goddess of the Sea that is the symbol of the chaos of primordial creation, so later Near Eastern traditions from Zoroastrian, through Jewish, Christian and Islamic adopted the final solution of the end of days.

The Western notion of eschatological apocalypse originates from the Zoroastrian Frashokereti – a final renovation of the universe, when evil will be destroyed, and everything else will be then in perfect unity with God (Ahura Mazda).

Premises: (1) good will eventually prevail over evil; (2) creation was initially perfectly good, but was subsequently corrupted by evil; (3) the world will ultimately be restored to the perfection it had at the time of creation; (4) the "salvation for the individual depended on the sum of [that person's] thoughts, words and deeds, and there could be no intervention, whether compassionate or capricious, by any divine being to alter this." Thus, each human bears the responsibility for the fate of his own soul, and simultaneously shares in the responsibility for the fate of the world.

The accompanying story in the Bundahishn, runs as follows: At the end of the "third time" (the first being the age of creation, the second of mixture, and the third of separation), there will be a great battle between the forces of good (the yazatas) and those of evil (the daevas) in which the good will triumph. On earth, the Saoshyant – "one who brings benefit" – an eschatological saviour figure) will bring about a resurrection of the dead in the bodies they had before they died. This is followed by a last judgment through ordeal. The yazatas Airyaman and Atar will melt the metal in the hills and mountains, and the molten metal will then flow across the earth like a river. All mankind—both the living and the resurrected dead—will be required to wade through that river, but for the righteous (ashavan) it will seem to be a river of warm milk, while the wicked will be burned. The river will then flow down to hell, where it will annihilate Angra Mainyu and the last vestiges of wickedness in the universe. In later Zoroastrian texts, it is written that the molten metal will purify the wicked. The righteous will partake of parahaoma, which will confer immortality. Thereafter, humankind will live without food, without hunger or thirst, and without weapons (or possibility of bodily injury). The material substance of the bodies will be so light as to cast no shadow. All humanity will speak a single language and belong to a single nation without borders. All will share a single purpose and goal, joining with the divine for a perpetual exaltation of God's glory. While in the beginning there was one plant, one animal and one human, the variety that had since issued would remain forever. Similarly, the host of divinities brought into existence by Mazda continue to have distinct existences, "and there is no prophecy of their re-absorption into the Godhead.

Notice the ingestion of parahaoma, a form of the soma of the Aryans, with a mythical status as a founding sacramental drink associated with a number of plant species from ephedra to cannabis, just as Revelation says the tree of life provides monthly fruit and leaves for the healing of the nations.

"Thus saith the LORD to His anointed, to Cyrus, whose right hand I have holden, to subdue nations before him, and to loose the loins of kings; to open the doors before him, and that the gates may not be shut (Isaiah 45:1).

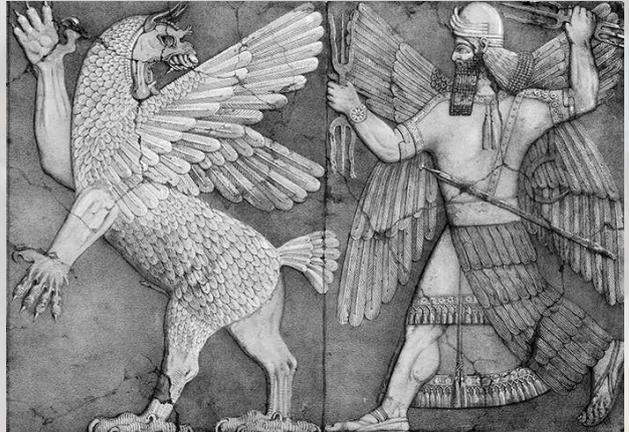
Christianity introduced a further element into eschatological apocalypse, in the form of the dying saviour later sacralised in Jesus as Christ in Pauline Hellenistic-Judaism. The dying-and-rising resurrection deity is a religious motif often cited from the religions of the ancient Near East, and traditions influenced by them include Biblical and Greco-Roman mythology and by extension Christianity. The concept was first proposed in comparative mythology by James Frazer's seminal *The Golden Bough* (1890). Frazer associated the motif with fertility rites surrounding the yearly cycle of vegetation. Frazer cited the examples of Osiris, Tammuz, Adonis and Attis, Dionysus and Jesus:

With Attis, Adonis or Thammuz, we begin to close about the Christian altar. Behind them, as behind the slave who was King of the Wood, there looms, scarcely named, the shadow of that other God, who as Son of Man ... died on the tree. And inescapably we are brought to conclude that Jesus the Christ acquired divinity by assuming the attributes of another deity (Bishop 1936).

In Pfeiderer's *Philosophy of Religion* (1878), he freely adopts a position of 'nature mythology':

The earliest action in the way of worship in the primitive history of mankind, was nothing but a dramatic repetition of the divine life seen in the processes of nature, with a view to taking part in it in a mutual intercourse of gods and men. The usages connected with the spring and autumn festivals in nature-religions everywhere show very plainly an effort to represent the coming and the departure of the deity of life and light, in such a manner that the changing fortunes of the deity may be repeated and experienced afresh in the imitative acts and emotions of their worshippers. Thus in Egypt was celebrated the complaint of Isis for Osiris, in Syria the marriage and the death of the sun-god Melcarth or Adonis, in Eleusis the search and lament for her daughter Core ... in Athens the death and resurrection of Dionysus.

Fig 147: Marduk and Tiamat. The war of order against chaos, light vs dark, good vs evil and male vs female. This is a cosmological fault, as the diversity and complexity of life and consciousness arises at the edge of chaos. The eschatological renovation entered Jewish and later Christian thought through the Edict of Restoration, of Cyrus II of Persia (c. 600–530 BC) a proclamation attested by a cylinder seal in which Cyrus authorised and encouraged the return of the Israelites to the Land of Israel following his conquest of the Neo-Babylonian Empire.



This association was reinforced by Pfeleiderer (1903):

The 'animistic' notion of the sacraments did not first make its way into Christianity in the post-apostolic time, but pervades the whole Pauline theology'. What Paul accomplished was to 'ethicize' the 'original enthusiasm' of the early Christians 'which in its original form was closely related to the orgiasm of Mysteries'. In so doing, Paul 'created for the growing Christian Church the elements of its ceremonial, without which no Church religion could arise or maintain itself' ... 'essentially the same myth lies at the origin of the mysteries' of Osiris, Adonis, Demeter and Persephone, and Dionysus, while 'nearly allied to these legends of the violent death of a god are those which tell of the voluntary descent of a god or hero into the underworld and his fortunate return', such as Tammuz.

Some of the premises have been debated by Smith (1990), who commented in his critique of Pfeleiderer:

In his last work devoted to the topic and published in 1905, Pfeleiderer more strongly insists on the parallels between Paul and the mysteries of the dying and rising gods, as well as Paul's creative genius in transforming them into an 'ethical' system, and makes an additional set of arguments. The use of these 'borrowings' was necessary to distinguish Christianity from Judaism. Its 'orgiastic' enthusiasm, now domesticated by Paul, is what freed early Christianity from the rigidities of 'national-legal' Judaism. When this domestication later failed, the 'dangerous one-sidedness' of Gnosticism resulted.

From Pfeleiderer's initial publications, although never without challenge, the interpretation, especially, of Pauline myth and ritual as being intrinsically related to the pattern of dying and rising gods, has persisted in some circles of New Testament scholarship. Thus R. Bultmann could continue to declare, in 1965, that Paul's understanding of baptism was grounded in the theology of the Hellenistic-Christian community: which understood this traditional initiation-sacrament on analogy with the initiation-sacraments of the mystery religions. The meaning of the latter is to impart to the initiates a share in the fate of the cult-deity who has suffered death and reawakened to life - such as Attis, Adonis, or Osiris.

But Smith claimed the dying God was irrelevant because it was seasonal, while Yeshua's mission was "once and for all":

The death of Jesus is further distinguished from the fate of all the mystery-deities by the fact that it happened once and for all , and is incapable of being repeated cultically; here we have an historical event, there IS a mythical drama.

For in that he died, he died unto sin once: but in that he liveth, he liveth unto God (Romans 6:10).

But this is a false criticism because it was clear that Yeshua's entire mission, as described in the gospels, is a once and for all mission of apocalypse, but the entire episode is played out as a single performance of a Dionysian tragedy, in the Greek fertility tradition, as Hugh Schonfield carefully documented in "The Passover Plot (1965) and is accounted in detail in the [Natty Dread](#) chapter. And in the Pauline Eucharist, Christ is reborn anew in every celebration of the Mass.

Regardless, in Christianity, whether expressed in Yeshua's own concepts and actions, or the additions of Paul and later gospel writers, we have the central notion of Jesus as the only begotten Son of God, whose sacrificial death in the crucifixion became a necessary atonement for the forgiveness of sins:

He said unto them, But whom say ye that I am? Peter answering said, The Christ of God. And he straitly charged them, and commanded them to tell no man that thing; Saying, The Son of man must suffer many things, and be rejected of the elders and chief priests and scribes, and be slain, and be raised the third day (Luke 9:20).

The synoptic mission account proceeds through a panoply of elements of fertility cult religions. John the Baptist had already had his head served up on a platter as trophy for Salome dancing Inanna's descent at Macherus in front of Herod's generals. Yeshua is then ministered unto out of their substance by the women of Galilee, performing Dionysian miracles, anointed to his doom by a woman alleged to be Magdalen, set at nought in a Roman Saturnalia and cries "Eloi, Eloi, lama sabachthani?" echoing Psalm 22 and the Canaanite cry of Mot to El, on the cross, looked on from far off by the women of Galilee, while cursing the daughters of Jerusalem, risen on the third day after harrowing hell and ascends to Abba the Father, becoming the only begotten Son of God, enshrined in the hybrid Godhead of the Trinity.

The sacrificial element appears to be a memetic device to create a Hellenistic religion out of Yeshua's apocalyptic mission, culminating in his death, devised 17 years later in the Pauline epistles, and elaborated 20 years later again in Mark, Luke and Matthew, so that we have little idea of how much of this is Yeshua's own tragic Dionysian Theatre and how much is Paul's Hellenistic revision using Yeshua, the apocalyptic preacher, as a cipher.

There is a glaring contrast between the apocalypse and sacrifice of the canonical gospels and the Gospel of Thomas, which has barely a hint of either, raising further questions over the authenticity of the canonical accounts. When the synoptics say Peter declares Yeshua is the Christ, in Thomas (13) Yeshua denies it: "I am not your master. Because you have drunk, you have become intoxicated from the bubbling spring which I have measured out." The entire apocalyptic expectation is brought into the gnostic present: (51) "His disciples said to him, "When will the repose of the dead come about, and when will the new world come?" He said to them, "What you look forward to has already come, but you do not recognise it." There are only hints of apocalypse, but there is no mention of Christ's returning in power: (79) "For there will be days when you will say, 'Blessed are the womb which has not conceived and the breasts which have not given milk.' " There is only one oblique reference to the sacrificial sacred marriage, whose conclusion is unclear: (61) "Two will rest on a bed: the one will die, and the other will live."



Fig 148: (Left) God blessing the Seventh day (Blake) (Right) Creation of Adam (Michelangelo). Although God is conceived of as incorporeal, omnipotent and transcendent, all conceptions of God are routed through human agency.

In effect, as in Matthew 25:31 and *Revelation*, Christ has taken over the role of Saoshyant and become the key administrator of justice, but to achieve this role has had to die a sacrificial death to the Father God, so that sins can be forgiven. In the Avestan source tradition there is no need for this homicide, which comes out of contrasting tradition of mortal sacrifice of the dying God. We thus have a hybrid apocalyptic cosmology founded on two inconsistent notions, the cosmic renovation where each being is free and responsible for their actions, and the resurrected saviour whose acknowledgement as Lord becomes the only remedy for the remission of sins, thus providing a fertility tradition short circuit to the purity of Frashokereti. There is no way that this can be validly presented as an actual cosmology of the universe in which we consciously exist and this means the notion of God it presents is at best a syncretic mythopoetic notion, and at worst a disingenuous contrivance to present Christ as the cosmic intercessor with God, in whom we must believe, while God has become sequestered in the background.

To make this more explicit, we need to examine the nature of God as conceived by religions. The notion of deity has arisen from animism, the world view where all natural phenomena are treated as living agency. The earliest such characters are trickster heroes such as the San peoples Kaggen, or mantis – a human-insect-bird therianthrope – or shape-shifter between animal and human form. It is only later that such deities became enshrined in religions as the many deities we know from Kali, Vishnu and Shiva, through Quetzalcoatl, the plumed serpent who rose from his own ashes and also had human form, to El, Asherah, Inanna, Enki, Tammuz, Zeus, Hera and Dionysus. YHWH is depicted as an abstract deity, but nevertheless has all-too-human emotional attributes. Ultimately such deities evolved into the

male creator deity of patriarchal monotheism and then to hybrid chimeric forms, such so the Trinity composed of Father, Son and Holy Ghost. Abba as the "Father" returns irreversibly to the anthropocentric mold, with Mary and the dying Jesus ubiquitous as graven images adorning Catholic altars.

Genesis confesses the 'Elohim are in human likeness in a mutual anthropocentric projection, thus typecasting God as a the Creator and Legislator as an anthropocentric projection of human manufacture and governance:

Let us make man in our image, after our likeness: So 'Elohim created man in 'their' own image, in the image of 'Elohim created he him; male and female created he them (Genesis 1).

The outright 'humanness' of God's personality is likewise manifested in God's palette of mammalian limbic emotions, from love and compassion, through patience, to jealousy and wrath. Because Christianity focuses almost exclusively on the personae of Yeshua and Christ, we gain most of our idea of the God of monotheism through the Old Testament.

In the Hebrew tradition, God's love is covenantal, even to the point of tempting the faithful to infanticide:

And it came to pass after these things, that God did tempt Abraham, and said unto him, Abraham: and he said, Behold, here I am. And he said, Take now thy son, thine only son Isaac, whom thou lovest, and get thee into the land of Moriah; and offer him there for a burnt offering upon one of the mountains which I will tell thee of. ... And Abraham stretched forth his hand, and took the knife to slay his son. And the angel of the LORD called unto him out of heaven, and said, Abraham, Abraham: and he said, Here am I. And he said, Lay not thine hand upon the lad, neither do thou any thing unto him: for now I know that thou fearest God, seeing thou hast not withheld thy son, thine only son from me.

The Psalms reverberate with Yahweh's protective love of His people:

How excellent is thy lovingkindness, O God! therefore the children of men put their trust under the shadow of thy wings (Ps 36:7).

Because thy lovingkindness is better than life, my lips shall praise thee (Ps 63:3).

But thou, O Lord, art a God full of compassion, and gracious, long suffering, and plenteous in mercy and truth (Ps 63:3).

But let all those that put their trust in thee rejoice: let them ever shout for joy, because thou defendest them: let them also that love thy name be joyful in thee. For thou, Lord, wilt bless the righteous; with favour wilt thou compass him as with a shield (Ps 5:11)

But this love is tempered by the covenant of faith:

And Solomon said, O Lord God of Israel, there is no God like thee in the heaven, nor in the earth; which keepest covenant, and shewest mercy unto thy servants, that walk before thee with all their hearts (2 Chron 6:14).

For the mountains shall depart, and the hills be removed; but my kindness shall not depart from thee, neither shall the covenant of my peace be removed, saith the Lord that hath mercy on thee (Isa 54:10).

Know therefore that the Lord thy God, he is God, the faithful God, which keepeth covenant and mercy with them that love him and keep his commandments to a thousand generations (Deut 7:9)

Who is a God like unto thee, that pardoneth iniquity, and passeth by the transgression of the remnant of his heritage? he retaineth not his anger for ever, because he delighteth in mercy (Micah 7:18).

The Lord thy God in the midst of thee is mighty; he will save, he will rejoice over thee with joy; he will rest in his love, he will joy over thee with singing (Zeph 3:17).

However, the jealousy of God is the most outstandingly prominent aspect of his personality in the scriptures:

But ye shall destroy their altars, break their images, and cut down their groves:

For thou shalt worship no other god: for the Lord, whose name is Jealous, is a jealous God: Lest thou make a covenant with the inhabitants of the land, and they go a woring after their gods. (Exodus 34:13)

And I will judge thee, as women that break wedlock and shed blood are judged; and I will give thee blood in fury and jealousy. (Ezekiel 16:38)

Ye shall not go after other gods, of the gods of the people which are round about you; (For the Lord thy God is a jealous God among you) lest the anger of the LORD thy God be kindled against thee, and destroy thee from off the face of the earth. (Deut 6:14)

However God's love leads to the supplicant bride Israel:

And I passed by you and I looked on you and behold, your time was the time of love. And I spread my skirt over you and I covered your nakedness. And I swore to you and I entered into a covenant with you and you became Mine. She is now washed, anointed, dressed, wrapped, covered, and adorned with silks, fine linen, embroidery, gold, and silver. And you were very beautiful and you advanced to regal estate. And your name went out among the nations, because of your beauty; for it was perfect, by My Splendor which I had set on you (Ezek. 16).

Regina Schwartz (1996) has cutting comment on this passage:

Ezekiel 16, the extended allegory of Israel as a whore, brings the relation between whores, exile, and monotheism (adultery, defiled land, and idolatry) into sharp focus. It is the story of a child being born and growing up wild and unloved in the field, and when she matures into puberty, of her being owned, sexually and materially, by Yahweh.

What is pivotal to understand here is that this zealous and jealous nature is exactly what was instituted by the forefathers, to ensure that their religion of Yahweh could keep itself distinct from the multitude of religions of the nations on all sides. It's purpose and the allegory of Israel as sacred bride and the allegory of Christ as the Bridegroom in its shadow is NOT the divine presence of God speaking, but the institution of a powerful patriarchal replicative meme designed to have maximally efficient social effect.

Religious believers might try to argue that this is just the flawed human description of God's inscrutable nature, but this is not a defence, because we are dealing with a God acting in history, so His actions and commands clearly declare His intended effects, for example at Jericho:

And the city shall be accursed, even it, and all that are therein, to the LORD: only Rahab the harlot shall live, she and all that are with her in the house, because she hid the messengers that we sent. ... And they burnt the city with fire, and all that was therein: only the silver, and the gold, and the vessels of brass and of iron, they put into the treasury of the house of the LORD (Joshua 6).

If we reject the notion that this is God's justice in favour of Joshua's human fallibility, the whole thesis fails including the ten commandments of Moses. But actually it is God's jealous curse of the religions of the nations operating here as it did through to the time of Josiah in fear of the Babylonian invasion:

[Josiah] began to purge Judah and Jerusalem from the high places, and the groves, and the carved images, and the molten images. And they brake down the altars of Baalim in his presence; and the images, that were on high above them, he cut down; and the groves, and the carved images, and the molten images, he brake in pieces, and made dust of them, and strowed it upon the graves of them that had sacrificed unto them. And he burnt the bones of the priests upon their altars (2 Chron 34 4-5).

And he brought out the grove (asherah) from the house of the Lord, without Jerusalem, unto the brook Kidron, and burned it and stamped it small to powder, and cast the powder thereof upon the graves of the children of the people. And he brake down the pavilions of the effeminate, which were in the house of the Lord, where the women wove hangings for the grove (2 Kings 23 3).

By contrast, the Christian expression of God's love is sacrificial, rather than covenantal. God's love is imputed indirectly because He sacrificed His only begotten Son to become the intermediary with whom we communicate:

But God commendeth his love toward us, in that, while we were yet sinners, Christ died for us (Rom. 5).

What shall we then say to these things? If God be for us, who can be against us? He that spared not his own Son, but delivered him up for us all, how shall he not with him also freely give us all things? (Rom. 8.)

But God, who is rich in mercy, for his great love wherewith he loved us, Even when we were dead in sins, hath quickened us together with Christ, (by grace ye are saved) (Eph. 2).

For God so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life (John 3).

In this was manifested the love of God toward us, because that God sent his only begotten Son into the world, that we might live through him. Herein is love, not that we loved God, but that he loved us, and sent his Son to be the propitiation (sacrifice) for our sins (John 4).

For the Father himself loveth you, because ye have loved me, and have believed that I came out from God (John 16).

Centrally the covenantal aspect has been transferred from Yahweh to Yeshua as tangible intermediary:

He that hath my commandments, and keepeth them, he it is that loveth me: and he that loveth me shall be loved of my Father, and I will love him, and will manifest myself to him (John 14).

Finally we have the intervention of the Holy Ghost as a second intermediary, again leaving the Father remote, although Christians do pray to the Father, in the Holy Ghost, seeking the love and mercy of Christ:

And hope maketh not ashamed; because the love of God is shed abroad in our hearts by the Holy Ghost which is given unto us (Rom 5).

But ye, beloved, building up yourselves on your most holy faith, praying in the Holy Ghost, Keep yourselves in the love of God, looking for the mercy of our Lord Jesus Christ unto eternal life (Jude 20).

Both the Gospel of Thomas and the Synoptics do quote Yeshua as citing the three as one triad, although only the Holy Ghost deserves accusation of blasphemy for transgression:

Jesus said: He who blasphemes against the Father will be forgiven, and he who blasphemes against the Son will be forgiven; but he who blasphemes against the Holy Spirit will not be forgiven, either on earth or in heaven." (Thom 44)

However, we know the Christian God of the Trinity is not a cosmological manifestation but a contrivance. In the fourth century, Arianism taught that the Father existed prior to the Son who was not, by nature, God but rather a changeable creature who was granted the dignity of becoming "Son of God". In 325, the First Council of Nicaea adopted the Nicene Creed which described Christ as "God of God, Light of Light, very God of very God, begotten, not made, being of one substance with the Father", and the "Holy Ghost" as the one by which "was incarnate... of the Virgin Mary".

Therefore we come to terms with the fact that Christianity is saddled with an impossible cosmologically discordant idea of God, inconsistent with the original nature of the Zoroastrian renovation, forming a deceptive short-circuit to forgiveness by belief in Jesus as Lord and Saviour when he is returning as the avenging Lord in Revelation anyway. A critically efficient meme to outmanoeuvre the Hebrew tradition in favour of the Hellenistic view, that then swept through the pagan nations, who were already sympathetic to these ideas, through the agency of Paul establishing the rituals of a Hellenistic religion, founded on Yeshua's apocalyptic mission.

The Christianity of the New Testament is a creative combination of Jewish and Hellenistic traditions transformed into a tertium quid ('a third something'): that is, a reality related to two known things but transcending them both (Aune 1987).

Central to the entire Hellenistic emphasis is the nature of the Eucharist as the founding rite of the Christian religion. According to the Pauline epistles (1 Corinth 11:23–25) and the later gospels, the rite was instituted by Yeshua. During the Last Supper (Matt 26:26–28; Mark 14:22–24; Luke 22:17–20;) he commanded them to "do this in memory of me" while referring to the bread as "my body" and the cup of wine as "the blood of my covenant, which is poured out for many". Ignatius of Antioch (born c. 35 or 50, died between 98 and 117), one of the Apostolic Fathers, mentions the Eucharist as "the flesh of our Saviour Jesus Christ". Two forms are also cited in the first century Didache. In Catholicism, this is elaborated in the doctrine of transubstantiation the turning of the bread and wine into the soma and sangre of Christ. It is expressed in the teaching that Christ is risen from the dead and is alive, so that when the bread is changed into his body, not only his body is present, but Christ as a whole is present ("the body and blood, together with the soul and divinity"). The same holds when the wine is transubstantiated into the blood of Christ. In the Reformation Protestant churches rejected this doctrine or amended it to an undefined spiritual presence.

Although God is conceived of as being omnipotent, omniscient, omnipresent and omnibenevolent as well as having an eternal and necessary existence and is most often held to be incorporeal, related to conceptions of transcendence or immanence the supreme being, as world creator, and principal object of faith, He is invoked by the faithful as a person in a loving and yet supplicant relationship in the same form as a beneficent yet exacting human leader. Believers are thus conceiving of God in their own experience of relationships with others, regardless of His reality or actual nature and existence, or otherwise. In other words, the idea of God corporeal or otherwise is a human view of emotional and intellectual agency inspired through scriptural belief.

This is not to tell the whole story of divinity, because, as Rudolph Otto (1917) has made clear, these are but the rational dimensions of the Holy:

It is essential to every theistic conception of God, and most of all to the Christian, that it designates and precisely characterizes Deity by the attributes Spirit, Reason, Purpose, Good Will, Supreme Power, Unity, Selfhood. The nature of God is thus thought of by analogy with our human nature of reason and personality; only, whereas in ourselves we are aware of this as qualified by restriction and limitation, as applied to God the attributes we use are 'completed', i.e. thought as absolute and unqualified. Now all these

attributes constitute clear and definite concepts: they can be grasped by the intellect; they can be analysed by thought; they even admit of definition. An object that can thus be thought conceptually may be termed rational.

In coming to understand the Holy of Holies that underlies the religious quest and is deeply chthonic to its superficial memetic nature as a process of social control, Otto ranges through terms such as sacred to find the invent a special term to stand for 'the holy' minus its moral factor or 'moment', and, as we can now add, minus its 'rational' aspect altogether, which he comes to term the numinous which we shall explore later in the context of the brain.

It will be our endeavour to suggest this unnamed Something to the reader as far as we may, so that he may himself feel it. There is no religion in which it does not live as the real innermost core, and without it no religion would be worthy of the name. ... For this purpose I adopt a word coined from the Latin numen. Omen has given us ominous, and there is no reason why from numen we should not similarly form a word 'numinous'. I shall speak then of a unique 'numinous' category of value and of a definitely 'numinous' state of mind.

(3) Religion is an Avowedly Memetic Process: Religions are profoundly memetic and are custom designed by their forefathers to have precisely the powerful influence of religious culture over individual interests, personal liberty and even human survival that the memetic detractors express. Notwithstanding their mystical and numinous basis, these are also vehemently opposed by organised religion as disturbing the dominant order. Religion inextricably has two complementary and contradictory natures. It lays claim incorrectly to cosmological ascendancy but at the same time is constructed as an intensely captivating meme system in which the believer comes to serve the interests of the religious complex and its social following, rather than human survival or individual benefit, or true spiritual illumination. This is why *religio* is to 'bind' as in the Roman fasces. This means Dawkins' warning is not to be set aside. To achieve any long-term viable human culture, and ensure the future of the human species, it is essential that the memetic control of religion over human culture and the human mind is liberated from bondage.

Patriarchal Monotheism

1. **Security:** God is the generator of cosmological order, out of and triumphal over, chaos, providing ultimate security.
2. **Power:** God is omniscient, omnipotent Lord, creator and legislator. This is cosmological autocracy, in human image.
3. **Belief:** Love the Lord thy God with all thy heart, and with all thy soul, and with all thy mind, and with all thy strength.
4. **Compulsion:** To turn aside from, or reject the religious path is atheism, blasphemy, heresy or apostasy.
5. **Hierarchy:** Woman and nature are supplicant to man, as man is to God.
6. **Eternal morality:** Moral judgment is rewarded and punished in the end of days by eternal torment or salvation.
7. **Conflict:** This casts order and chaos, good and evil, light and dark as in a state of eternal war, destroying fecundity.

This is a dominant memetic system, enticing by its ultimate security and the notion that loving God is reciprocated by God's love, along with the ultimate incentive of eternal life resolving all existential uncertainties, but it's dark underbelly is the ultimate fear of God's wrath, the condemnation of all human beings as original sinners, the social and physical punishments of one's flaws being discovered, either by one's religious neighbours or by God himself leading to dire earthly punishment or eternal torment.

The culturally memetic influence of religion on human evolution, through patriarchal dominance of reproductive choice is profoundly expressed in the amplified reproduction rates of Islam, and following it Christianity, to fulfil their utopian aims of world dominance is expressed in their heightened birth rates over the population as whole (Pew Res).



(4) Natural versus Memetic Morality: We have the problem of morality as an evolved cooperative good versus an oppressive imperative. The sociobiological view of morality is that it is a win-win adaption through group selection which also favours individual survival. Curry et al. (2019) express this in extremely eloquent terms:

Life begins when molecules start making copies of themselves. These 'replicators' are 'selfish' in the technical sense that they promote their own replication (Dawkins, 1976/2006). They can promote their replication at the expense of other replicators. These competitive interactions have a winner and a loser; one's gain is another's loss; they are zero-sum games (Maynard Smith, 1982; Von Neumann & Morgenstern, 1944). Replicators can also replicate in concert with other replicators (Dawkins, 1998). These cooperative interactions can have two winners; they are win-win situations; they are non-zero-sum games. Natural selection can favour genes for cooperation – that is, genes for evolutionarily-stable phenotypic strategies designed to achieve superior equilibria in non-zero-sum

interactions – and has done throughout the history of life. Natural selection for genes that employ cooperative strategies has driven several ‘major transitions’ in the evolution of life on Earth, including the formation of cells, chromosomes and multicellular organisms (Maynard Smith & Szathmáry, 1995). Natural selection has also favoured genes for cooperation between individuals, in a wide variety of species (Dugatkin, 1997), including humans. Humans descend from a long line of social primates; they have spent 50 million years living in social groups (Shultz, Opie, & Atkinson, 2011), and two million years making a living as intensely collaborative hunter-gatherers (Tooby & DeVore, 1987). This has equipped humans with a range of biological – including psychological – adaptations for cooperation. These adaptations can be seen as natural selection’s ‘attempts’ to solve the problems of cooperation. More recently, improvisational intelligence and cultural transmission (Boyd, Richerson, & Henrich, 2011; Pinker, 2010) have made it possible for humans to attempt to improve upon natural selection’s solutions by inventing evolutionarily-novel solutions – ‘tools and rules’ – for further bolstering cooperation (Binmore, 1994a, 1994b; Hammerstein, 2003; Nagel, 1991; Popper, 1945). Together, these biological and cultural mechanisms provide the motivation for social, cooperative and altruistic behaviour; and they provide the criteria by which individuals evaluate the behaviour of others. According to MAC, it is precisely these solutions to problems of cooperation – this collection of instincts, intuitions, inventions and institutions – that constitute human morality (Curry, 2005, 2016).

Laland (2017) notes that socially organised societies becomes dominant over competitors, including by force of arms, following Richerson and Henrich (2012):

(1) societies with an organized army are more likely to win conflicts than those without, (2) city-states with division of labor and occupational specializations would tend to out-compete those without these innovations, (3) agricultural communities that have devised irrigation systems would flourish more readily than others, and (4) societies with religious doctrines that stabilize within-group cooperative activities will thrive at the expense of those with no gods to help ensure compliance.

Yet he still presents the religious spectre as basically a benign cooperative process, in which the docile members of a religiously conforming society will out-survive their more rebellious independently-minded colleagues without any reference to the kinds of draconian punishments conservative and religious societies go to the lengths to exercise:

Theoretical analyses suggest that humans should be particularly adept at recognizing, representing, and adopting the local norms of their society, as well as notice, condemn, and punish violations of those norms. For instance, moral norms could plausibly have generated natural selection acting on human genes to favor cooperative tendencies. Individuals who are more inclined to conform to norms would find it “easier to enter larger norm-bound societies and to abide by the rules, than individuals lacking this tendency. These more “docile” individuals would be at an advantage, to the extent that they would be better placed to benefit from the society’s technologies and less vulnerable to exclusion or punishment. In turn, a population of more docile individuals could then permit the cultural evolution of more sophisticated and effective norms, and allow groups to maintain more reliable cooperation. A similar mechanism could have favored a tendency of individuals to feel shame or guilt when they violate a social norm.

Haidt & Graham (2007) present theoretical and empirical reasons for believing that there are five psychological moral systems (MF) that provide the foundations for the world’s many moralities:

The five foundations are [1] psychological preparations for detecting and reacting emotionally to issues related to harm/care, [2] fairness/reciprocity, [3] ingroup/loyalty, [4] authority/respect, and [5] purity/sanctity. Political liberals have moral intuitions primarily based upon the first two foundations, and therefore misunderstand the moral motivations of political conservatives, who generally rely upon all five foundations.

They base this on the notion that conservative societies have moral intuitions not recognised by social liberals:

On this definition of morality, conservative opposition to social justice programs appears to be immoral, and has been explained as a product of various non-moral processes such as system justification or social dominance orientation. In this article we argue that, from an anthropological perspective, the moral domain is usually much broader, encompassing many more aspects of social life and valuing institutions as much or more than individuals.

As noted above, Curry et al. (2019) define Morality-as-Cooperation (MAC) as the theory that morality is a collection of biological and cultural solutions to the problems of cooperation recurrent in human social life and have expressed it in the following seven principles:

(1) Allocation of resources to kin (Family Values), (2) Coordination to mutual advantage (Group Loyalty), (3) Social exchange (Reciprocity), (4,5) Contests between Hawks (Heroism) & Doves (Deference) in which agents fairly indicate how far they are prepared to pursue a conflict, (6) Division (Fairness) divide the resource proportionately by bargaining power and (7) Possession (Property Rights) deferring to prior possession.

Curry et al. tested MAC’s predictions by developing the Morality-as-Cooperation Questionnaire (MAC-Q), and comparing its psychometric properties to those of the Moral Foundations Questionnaire (MFQ). They found that over four studies, the results supported the MAC-Q’s seven-factor model of morality, but not the MFQ’s five-factor model. Thus MAC emerges as the best available compass with which to explore the moral landscape.

The upshot of this research is that morality has a valid basis as a win-win that enhances both group and individual survival, on a sociobiological basis where natural selection is paramount, but does not include prescriptive culturally originating religious imperatives of an oppressive nature that invoke dire penalties when they are not observed.

Effectively the five factor MF is presenting conservative morality, which goes further than natural morality of MAC to enforce cooperation by 'altruistic' punishment as practiced widely by prescriptive religions.

Rossano (2010) describes this process as "getting people in line":

I argued that there are two ways for groups to establish and maintain intra- group cooperativeness that extends beyond the boundaries of kin selection, reciprocity, and indirect reciprocity: (1) by motivating people to follow group-based social norms, and (2) and by motivating them to punish those who don't follow social norms. One of the chief sources of this motivation is social scrutiny—the idea that we are being watched and judged by others. Given the close-knit nature of the hunter-gatherer groups from which we evolved, the notion of being constantly watched and evaluated was a familiar one. Experimental work shows that we are hypersensitive to the cues that suggest public observation of our behavior. Furthermore, this same work shows that we are naturally hypervigilant against freeloaders and cheaters who threaten group cohesion and that we have effective means of bringing them into line.

Religious doctrines exploit hypervigilance as actively enforced memes, both by constructive inducement as virtues and destructive moral punishment as sins, in ways that are far more encompassing and punitive than mere social disapproval.

(5) Religious Enforcement of Homicidal Violence: this brings us to the fallacy that religion is just a way of enticing people to cooperate by pro-social incentives. When the crunch comes, religious edicts, laws and punishments are among the most severe and unforgiving. Dismemberment for theft, stoning for adultery, and death for apostasy. While Islam today still displays these homicidal features in full iconic form, none of the patriarchal religions can consider themselves free of these diabolical practices in their long term history. I will address just a few violently homicidal examples that have particularly punished women, to make the situation clear.

Genocide at Medina and Femicide at Mecca

At first Muhammad had lived in peace with the people of Mecca, whose environs such as Taif had shrines to the Goddesses al-Uzza, Manat and al-Lat and for whom the Kaaba was a sacred site for all religious pilgrims and included astral and Christian figures. But when he decided that his verses accepting the three goddesses as intermediaries were a heresy spawned by satanic influence, and began to preach a more firebrand monotheism, this offended the sensibilities of the Quraysh of Mecca and he ended up having to escape to Medina with a small band of followers. There was a large Jewish community at Medina occupying an entire sector of the walled oasis settlement. Many Jews had settled in Arabia from the time of the Roman diaspora. However Muhammad found his new Arab religion, cast in the model of the Jewish heritage, was not respected by the Jews of Medina. Ostensibly, in response to this perceived insult, Muhammad turned the direction of prayer from Jerusalem to Mecca.

The situation soured and finally turned to genocide when the Quraysh of Mecca, angered by his disruptive influence, laid siege to Medina. The plight in the oasis became desperate. Not knowing which side would eventually win, the Qurayzah Jews sent a party to parley with the Quraysh to try to preserve themselves from being overrun by one side or the other and some of them were overheard swearing allegiance. But then in a superstitious misjudgment, the Quraysh deserted the siege when a severe desert storm struck the region. In the aftermath a Muslim friend of the Jews drew his finger over his throat to warn them of their impending fate:



According to Karen Armstrong's "Muhammad" (1991 206), fearing the Jews might have opened their gates to the enemy, Muhammad appointed a mortally wounded fighter Sa'd ibn Mu'adh who was carried to the Qurayzah village on a litter, as judge over their fates:

Sa'd judged that all the 700 men should be killed, their wives and children sold into slavery and their property divided among the Muslims. Muhammad cried aloud: "You have judged according to the ruling of Allah above the seven skies!" The next day Muhammad ordered a trench to be dug in the souk of Medina. Some individuals were spared at the request of the Muslims, but the rest were tied together in groups and beheaded; their bodies were thrown into the trench.

It is probably impossible for us to dissociate this story from Nazi atrocities and it will inevitably alienate many people irrevocably from Muhammad. But Western scholars like Maxime Rodinson and W. Montgomery Watt argue that it is not correct to judge the incident by twentieth-century standards.

But the problems are profound: (1) Appointing a mortally wounded man as judge is prejudicial. (2) This was an unmitigated genocide because the Jews never actually betrayed the Muslims and never did open their gates, or the story would have been entirely different. (3) In the 21st century these genocidal standards are still legitimised and applied by Muslims today and Muhammad extolled as a divine prophet in an age where genocide on this scale is a crime against humanity. There was no excuse and no valid rationalisation for this slaughter, and later Muslim history up to the taking of Mecca demonstrates that this killing proved to be unnecessary gratuitous violence for which history needs to judge this tradition.

Ending the period of religious tolerance that had made Mecca a divine pilgrimage destination, Muhammad smashed all the icons in the Ka'aba, leaving only the portraits of Jesus and Mary and ironically, the vagina-like meteoric Black Stone, the most sacrosanct symbol of the old religion. Likewise the images of al-Uzza and Manat and a year later also those of al-Lat at Taif, were destroyed, although the people there initially resisted and raised an army leading to an indecisive siege. Although Muhammad issued an amnesty to those who accepted his rule, a list of prominent opponents were summarily executed. Within two and a half years, Muhammad would pass away.

Nawal el Sadaawi in "The Hidden Face of Eve" notes the effect on women who opposed Muhammad's rule:

Sarah was a famous slave singer who aimed her barbed words against the Moslems. She was among those whom Mahomet ordered to be executed on the day of his victorious entry into Mecca. In the region of El Nagir, it was recounted that some women had rejoiced when the Prophet died and Abu Bake, the first of the Caliphs, ordered their hands and feet to be cut off. Thus women who dared to give voice to their protest or opposition could be exposed to cruel punishment. Their hands might be cut off, or their teeth pulled out, or their tongues torn from their mouths. This last form of punishment was usually reserved for those who were singers. It was said of these women that they used to dye their hands with henna, brazenly display the seductions of their beauty, and beat time with their fingers on tambourines and drums in defiance of God, and in derision towards the rights of God and his Prophet. It was therefore necessary to cut off their hands and tear out their tongues.

Muhammad was particularly unforgiving to anyone who ridiculed him or his Quranic verses. According to al-Tabari's *Alseera Al Nabawiya* (2:463) Muhammad explicitly ordered the murder of Om Kerfa (Mother of Kerfa), one of the most revered Meccan matriarchs who was torn in half by camels at the age of 90 for writing poetry ridiculing him:

She is Fatima daughter of Rabia son of Badir son of Amru al Fazari. Mother of Kerfa married a prince of the tribe of Hathifa and bore for him 13 children the first of whom was Kerfa by whom she is surnamed. All her children became leaders of their tribes. She was the dearest of all Arabs, and an example of honor and pride to them.. It was said if two tribes fought and Mother of Kerfa sent her scholl on a spear that was displayed to both parties, then they would reconcile out of respect for her. She used to annoy the prophet with her poetry so in the sixth year of the Hijra he sent Zaid son of Haritha on a military expedition to kill her in the most heinous of ways. For he tied her legs with ropes and tied each of the ropes to a camel so that she was split in two. She was an old woman when this happened and her head was severed as proof to all that she had died.

Code of Hammurabi

Religious invocations prescribing death for adultery are NOT divinely ordained. In the Code of Hammurabi (c1755-1750 BCE), a cited precursor to Mosaic law, adultery was punished with the death of both parties by drowning, but if the husband was willing to pardon his wife, the king might intervene to pardon the paramour. The law is much fairer in terms of exonerating accused females. Although the stele features an image in relief of Hammurabi with Shamash, the Babylonian sun god and god of justice, this is a secular law ordained by a ruler rather than a religious prophet.

CH 129 *If a man's wife be caught with another man, both shall be tied and thrown into the water, but the husband may pardon his wife and the king his slaves.*

CH 130 *If a man violate the wife of another man, who has never known a man, and still lives in her father's house, and sleep with her and be surprised, this man shall be put to death, but the wife is blameless.*

CH 155 *If a man have betrothed a bride to his son and his son have known her, and if he (the father) afterward lie in her bosom and they take him, they shall bind that man and throw him in the water.*

Deuteronomic Stoning for Adultery

Deut 22:20 *But if this thing be true, and the tokens of virginity be not found for the damsel: Then they shall bring out the damsel to the door of her father's house, and the men of her city shall stone her with stones that she die.*

Deut 22:22 *If a man be found lying with a woman married to an husband, then they shall both of them die, both the man that lay with the woman, and the woman: so shalt thou put away evil from Israel. If a damsel that is a virgin be betrothed unto an husband, and a man find her in the city, and lie with her; Then ye shall bring them both out unto the gate of that city, and ye shall stone them with stones that they die; the damsel, because she cried not, being in the city; and the man, because he hath humbled his neighbour's wife: so thou shalt put away evil from among you.*

Multiple other religious crimes, from apostasy and blasphemy to homosexuality and being an unruly son were also punished by stoning, except that, in later times, the caveats became so stringent that it virtually never occurred.

In the period prior to early Christianity, particularly in the Mishnah, doubts were growing in Jewish society about the effectiveness of capital punishment in general (and stoning in particular) in acting as a useful deterrent. Subsequently, its use was dissuaded by the central legislators. The Mishnah states:

A Sanhedrin that puts a man to death once in seven years is called destructive. Rabbi Eliezer ben Azariah says that this extends to a Sanhedrin that puts a man to death even once in seventy years. Rabbi Akiba and Rabbi Tarfon say: Had we been in the Sanhedrin none would ever have been put to death. Rabban Simeon ben Gamaliel says: they would have multiplied shedders of blood in Israel.

In the following centuries the leading Jewish sages imposed so many restrictions on the implementation of capital punishment as to make it de facto illegal.

Islamic Stoning for Adultery

The outstanding difference with Islam is that these practices continue to be religiously sanctioned. Four Hadith below show that Muhammad used the Deuteronomic punishment claimed to be for Jewish offenders to instil stoning for adultery as an Islamic punishment, centuries after the practise had been effectively discontinued in Judaism.

Hadith Stoning for adultery al-Bukhari 2:23:413 *Narrated 'Abdullah bin 'Umar: The Jew brought to the Prophet a man and a woman from amongst them who have committed (adultery) illegal sexual intercourse. He ordered both of them to be stoned (to death), near the place of offering the funeral prayers beside the mosque."*

Hadith Stoning for adultery al-Bukhari 4:56:829 *Narrated 'Abdullah bin 'Umar: The Jews came to Allah's Apostle and told him that a man and a woman from amongst them had committed illegal sexual intercourse. Allah's Apostle said to them, "What do you find in the Torah (old Testament) about the legal punishment of Ar-Rajm (stoning)?" They replied, (But) we announce their crime and lash them." Abdullah bin Salam said, "You are telling a lie; Torah contains the order of Rajm." They brought and opened the Torah and one of them solaced his hand on the Verse of Rajm and read the verses preceding and following it. Abdullah bin Salam said to him, "Lift your hand." When he lifted his hand, the Verse of Rajm was written there. They said, "Muhammad has told the truth; the Torah has the Verse of Rajm. The Prophet then gave the order that both of them should be stoned to death. ('Abdullah bin 'Umar said, "I saw the man leaning over the woman to shelter her from the stones."*

Hadith Stoning for adultery al-Bukhari 6.:60:79 *Narrated 'Abdullah bin Umar: The Jews brought to the Prophet a man and a woman from among them who had committed illegal sexual intercourse. The Prophet said to them, "How do you usually punish the one amongst you who has committed illegal sexual intercourse?" They replied, "We blacken their faces with coal and beat them," He said, "Don't you find the order of Ar-Rajm (i.e. stoning to death) in the Torah?" They replied, "We do not find anything in it." 'Abdullah bin Salam (after hearing this conversation) said to them. "You have told a lie! Bring here the Torah and recite it if you are truthful." (So the Jews brought the Torah). And the religious teacher who was teaching it to them, put his hand over the Verse of Ar-Rajm and started reading what was written above and below the place hidden with his hand, but he did not read the Verse of Ar-Rajm. 'Abdullah bin Salam removed his (i.e. the teacher's) hand from the Verse of Ar-Rajm and said, "What is this?" So when the Jews saw that Verse, they said, "This is the Verse of Ar-Rajm." So the Prophet ordered the two adulterers to be stoned to death, and they were stoned to death near the place where biers used to be placed near the Mosque. I saw her companion (i.e. the adulterer) bowing over her so as to protect her from the stones.*

The prescription in Sharia is stoning a woman to death for adultery submerged to her neck so only her head shows:

The penalty for adultery under Article 83 of the penal code, called the Law of Hodoud is flogging (100 lashes of the whip) for unmarried male and female offenders. Married offenders may be punished by stoning regardless of their gender, but the method laid down for a man involves his burial up to his waist, and for a woman up to her neck (article 102). The law provides that if a person who is to be stoned manages to escape, he or she will be allowed to go free. Since it is easier for a man to escape, this

discrimination literally becomes a matter of life and death. Article 104 provides that the stones should not be so large that a person dies after being hit with two of them, nor so small as to be defined as pebbles, but must cause severe injury. This makes it clear that the purpose of stoning is to inflict grievous pain on the victim, in a process leading to his or her slow death.

"In Muslim law the punishment of lapidation is only inflicted for adultery. Under Jewish law idolaters or bearers of false witness were also stoned. It is founded not upon the Qu'ran where the only punishment Sura 24:2 is one hundred stripes but upon the traditions where Muhammad is related to have said 'Verily God hath ordained for a man and a woman not married to one hundred lashes and expulsion from their home town for one year, and for a man and a woman having been married one hundred lashes and stoning'." When a woman is to be stoned, a hole or excavation should be dug to receive her as deep as her wallet ... The purpose of the hole is to conserve 'decency' for the female. Neither boulders nor pebbles may be used, so that death is neither mercifully quick nor endlessly prolonged" (Hughes - Dictionary of Islam).

Islamic Death for Apostasy

Hadith Death for Apostasy al-Bukhari 4:52:260 Narrated Ikrima: Ali burnt some people and this news reached Ibn 'Abbas, who said, "Had I been in his place I would not have burnt them, as the Prophet said, 'Don't punish (anybody) with Allah's Punishment.' No doubt, I would have killed them, for the Prophet said, 'If somebody (a Muslim) discards his religion, kill him.'"

The prescription in Sharia for Apostasy is death:

Apostasy in Islam is commonly defined as the abandonment of Islam by a Muslim, in thought, word, or through deed. It includes not only explicit renunciations of the Islamic faith by converting to another religion or abandoning religion altogether, but also blasphemy or heresy, through any action or utterance which implies unbelief, including those who deny a "fundamental tenet or creed" of Islam. While classical Islamic jurisprudence calls for the death penalty of those who refuse to repent of apostasy from Islam, the definition of this act and whether and how it should be punished, are disputed among Islamic scholars and strongly opposed by Muslim and Non-Muslim supporters of the universal human right to freedom of faith. According to classical Islamic law, an apostate can only be killed if there are two just Muslim eyewitnesses of the apostasy or if the apostate self confesses, according to some schools, both conditions are required. Jurists allowed flexibility in the application of the death penalty, allowing judges to interpret the apostasy law in different ways, [sometimes, they leniently interpreted it and at other times, they strictly interpreted it.

As of 2014, there were eight Muslim-majority countries where apostasy from Islam was punishable by death, and another thirteen where there were penal or civil penalties such as jail, fines or loss of child custody. From 1985 to 2006, only four individuals were officially executed for apostasy from Islam and unrelated political crimes by governments, but apostates have suffered from other legal punishments as well as extra-judicial punishments which have been inflicted upon them by vigilantes—imprisonment, the annulment of their marriages, the loss of their rights of inheritance and the loss of custody of their children. Mainly, the loss of life has resulted from killings which have been perpetrated by "takfiri" insurgents (ISIL, the GIA and the Taliban).

This is not to exonerate other religions, or to focus unjustified blame on Islam. Christianity has been plagued by centuries of religious bloodshed, fomented by obsessive martyrdoms, violent Crusades, religious wars, and centuries of Inquisition seeking to root out heretics from witches, through gnostics, to reformationists and mystics such as Marguerite Porete. All religions from, Buddhism through Hinduism to Zoroastrianism are marked with the blood of homicidal violence. The Bhagavad Gita, for example, is a spiritual treatise set in the context of holy war.

It is estimated that the witch hunts resulted in 70,000 to 100,000 deaths but others have suggested a much higher figure. During the Crusade against the Cathars and Albigenses, after the siege of Beziers alone, 20,000 were summarily executed on the spot. In 1209, a crusade from Pope Innocent III began against the Cathars. Both Cathars and Catholics were besieged by an army of the Church within the walls of Beziers. On the day of the feast of Mary Magdalen they killed their viscount in the church dedicated to her name and were in turn horrendously punished on the same day for repeating the Albigensian heresy that she was Christ's concubine. When the city fell, the commanding general was asked who to slaughter: heretics, his men assumed, must surely be separated from believers.

Their leader's reply was simple: "Kill them all," he said, "the Lord will know his own". *Our forces spared neither rank nor sex nor age. About twenty thousand people lost their lives at the point of the sword. The destruction of the enemy was on an enormous scale. The entire city was plundered and put to the torch. Thus did divine vengeance vent its wondrous rage.*

The situation was similar in Carcassone: *After discussion, our men entered the town of Carcassonne with the cross in front. When the church had been restored they placed the Lord's cross on top of the tower ... for it was Christ who had captured the town and it was right that his banner should take precedence. ... The venerable abbot of Vaux-de-Cernay went to a great number of heretics who had gathered in one of the houses wishing to convert them to better things, but they all said with one voice 'Why are you preaching to us? We don't want your faith We deny the church of Rome. You are wasting your time. Neither life nor death can turn us from the beliefs we hold.' He then went to see the women gathered in another building but the female heretics were more obstinate and difficult in every way. Simon de Montfort first urged the heretics to convert, but having no success, he dragged them out of the*

castle. A huge fire was kindled and they were all thrown into it. It was not hard for our men to throw them in, for they were so obstinate in their wickedness that they threw themselves in. Only three women escaped, whom a noble lady snatched from the flames and restored to the Holy Church.



Fig 149:(Left) The Gnostic 'heretics' being led out of Carcassone to be burned alive for apostasy 1209. (Right) Auto de Fe in the execution of Anne Hendriks in Amsterdam 1571⁵⁰ Jan Luyken.

This is also reflected in the tragic execution of Marguerite Porete, the first to die in the auto da fe in Paris:

The Mirror of Simple Souls is an early 14th-century work of Christian mysticism by Marguerite Porete (1996, 1999) dealing with the workings of Divine Love. Written originally in Old French when Latin was the prescribed language for religious literature, it explores in poetry and prose the seven stages of 'annihilation' the Soul goes through on its path to Oneness with God through Love. Enormously popular when written, it fell foul of the Church authorities, who, detecting elements of the antinomian Heresy of the Free Spirit in its vision, denounced it as "full of errors and heresies", burnt existing copies, banned its circulation, and tried and executed Porete in the first Auto da Fé in Paris in April 1310. Marguerite remained silent throughout her trial, with a plain refusal to elaborate, explain nor deny her teachings. Marguerite went to the stake in total silence and endured her firey end in silence. Those watching were moved to tears.



Love in this book layeth to souls the touches of his divine works privily hid under dark speech, so that they should taste the deeper draughts of his love and drink. — 15th-century English translator's prologue

(6) Theology, Neurotheology and Religious Psychology

Theology is described as the systematic study of the nature of the divine and of religious belief. Revelation pertains to the acceptance of God, gods, or deities, as not only transcendent or above the natural world, but also willing and able to interact with the natural world and to reveal themselves to humankind. This in its very definition as assuming the entity it is attempting to describe and setting up a stark division between an assumed transcendent divinity, palpable monotheistic and a flawed natural world comprising the diversity of life.

The term Theology derives from the Greek *theologia* (θεολογία), *theos* (Θεός, 'god') and *logia* (λογία, 'utterances, sayings, oracles') – relating to Greek *logos* (λόγος, 'word, discourse, account, reasoning'). Greek *theologia* was used with the meaning 'discourse on God' around 380 BC by Plato in *The Republic*. Aristotle divided theoretical philosophy

⁵⁰ Anneken Hendriks was an Anabaptist of Friesland, living in Amsterdam. Through treachery she was taken prisoner by the city officials. Because she held fast to her faith, she was severely tortured on 27 October 1571, with the intent of learning from her the names of other Mennonites. But even this ill treatment could not make her recant, and consequently she was put to death on the town square (Dam) on 10 November 1571. The execution took place in an unusually cruel manner. Anneken was tied to a ladder; her mouth was filled with gunpowder, and in this condition she was carried from the city hall to the ignited stake and thrown into the flames. She was fifty-three years old and an ordinary woman who could neither read nor write. In her sentence she was condemned because "she was married according to Mennonite custom, and at night in a country house." The *Martyrs Mirror* records that there is a song concerning her, but gives no further information, apparently meaning the song found in the Dutch hymn book *Veelder-hande Liedekens* (1569), which begins "Ick moet nu gaen verclaren, Watter t'Amsterdam is geschiet" (I must now declare to you, What took place at Amsterdam).

into mathematike, physike, and theologike, with the latter corresponding roughly to metaphysics. Latin writer Varro (116–27 BC) distinguished three forms of such discourse: 1. mythical, concerning the myths of the Greek gods; 2. rational, philosophical analysis of the gods and of cosmology; and 3. civil, concerning the rites and duties of public religious observance. In scholastic Latin sources, the term came to denote the rational study of the doctrines of the Christian religion. Christian theology as the study of Christian belief and practice concentrates primarily upon the canonical scriptures and Christian tradition. In Jewish theology, the historical absence of political authority has meant that most theological reflection has happened within the context of the Jewish community and synagogue, including through rabbinical discussion of Jewish law and Midrash (rabbinic biblical commentaries).

Theology considers whether the divine exists in some form, such as in physical, supernatural, mental, or social realities, and what evidence for and about it may be found via personal spiritual experiences or historical records of such experiences as documented by others. The central problem with Theology is that it is centred on doctrine, as the rational, linguistic component, driving moral coercion and prescriptive belief. That's counter-empirical to a violation fault. A distinction can be made between theology, which is seen as involving some level of commitment to the claims of the religious tradition being studied, and religious studies, which are not tied to any religious tradition and are normally neutral or secular.

Outside monotheism the status of theology is less explicitly defined. Within Hindu philosophy, there is a tradition of philosophical speculation on the nature of the universe, of God (Brahman, Paramatma, and/or Bhagavan in some schools) and of the ātman (soul). Vaishnava theology is involved in classifying and organising the manifestations of thousands of gods and their aspects. Buddhism, which is non-theistic focuses on philosophy rather than theology. In Japan, the term theology (shingaku) has been ascribed to animistic Shinto since the Edo period in Mano Tokitsuna's Kokon shingaku ruihen ('categorised compilation of ancient theology').

Whether or not reasoned discussion about the divine is possible has long been a point of contention, beginning in the time of earlier polytheistic and state deities of Ancient Greece. Protagoras, in fifth century BC, who is reputed to have been exiled from Athens because of his agnosticism about the existence of the gods, said that "Concerning the gods I cannot know either that they exist or that they do not exist, or what form they might have, for there is much to prevent one's knowing: the obscurity of the subject and the shortness of man's life."

Baron d'Holbach (1772), in *Le Bon sens*, labeled theology "a continual insult to human reason". Lord Bolingbroke wrote in Section IV of his *Essays on Human Knowledge*, "*Theology is a science that may justly be compared to the Box of Pandora. Many good things lie uppermost in it; but many evil lie under them, and scatter plagues and desolation throughout the world.*" Thomas Paine wrote in *The Age of Reason* (1794): "*The study of theology, as it stands in Christian churches, is the study of nothing; it is founded on nothing; it rests on no principles; it proceeds by no authorities; it has no data; it can demonstrate nothing; and it admits of no conclusion. Not anything can be studied as a science, without our being in possession of the principles upon which it is founded; and as this is the case with Christian theology, it is therefore the study of nothing.*"

Ludwig Feuerbach in *The Essence of Christianity* (1841), for which he was banned from teaching in Germany, said that theology was a "web of contradictions and delusions". The American satirist Mark Twain remarked in his essay "The Lowest Animal": "*Man is the only animal that loves his neighbor as himself and cuts his throat if his theology isn't straight. ... The higher animals have no religion. And we are told that they are going to be left out in the Hereafter. I wonder why? It seems questionable taste.*"

A. J. Ayer sought to show in his essay "Critique of Ethics and Theology" that all statements about the divine are nonsensical and any divine-attribute is unprovable: "*It is now generally admitted, at any rate by philosophers, that the existence of a being having the attributes which define the god of any non-animistic religion cannot be demonstratively proved. ... All utterances about the nature of God are nonsensical.*" Richard Dawkins in an article in *The Independent* (1993) said: "*I have never heard any theologian ever say anything of the smallest use, anything that was not either platitudinously obvious or downright false.*"

Religious Psychology Psychology of religion consists of the application of psychological methods and interpretive frameworks to the diverse contents of religious traditions as well as to both religious and irreligious individuals. Psychologists of religion pursue three major projects: 1. systematic description, especially of religious contents, attitudes, experiences, and expressions. 2. explanation of the origins of religion, both in the history of the human race

and in individual lives, taking into account a diversity of influences. 3. mapping out the consequences of religious attitudes and conduct, both for the individual and for society at large.

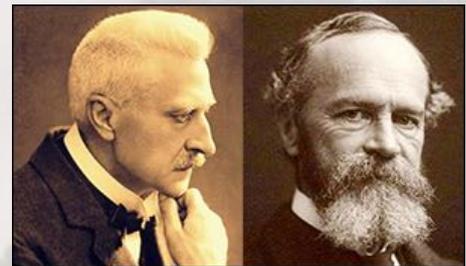
Hegel (1770–1831) described all systems of religion, philosophy, and social science as expressions of the basic urge of consciousness to learn about itself and its surroundings, and record its findings and hypotheses. Freud spoke of religion as an illusion – "a fantasy structure from which a man must be set free if he is to grow to maturity," viewing the idea of God as being a version of the father image, and religious belief as at bottom infantile and neurotic. Authoritarian religion, Freud believed, is dysfunctional and alienates man from himself. By contrast, Jung postulated, in addition to the personal unconscious, the collective unconscious, the repository of human experience and which contains "archetypes" (images that are universal and recur regardless of culture). The irruption of these images from the unconscious into the realm of consciousness he viewed as the basis of religious experience and artistic creativity.

The psychology of religion first arose as a self-conscious discipline in the late 19th century, but all three of these tasks have a history going back many centuries. In the 1890s, a "new psychology" emerged in European and American universities which coincided with the establishment of many new psychology laboratories and the appointment of faculty in psychology, James (1890). New psychology's novelty was encapsulated by its distinction from philosophy (philosophy of mind in particular) and theology, and its emphasis on the laboratory-based experimental method.

American psychologist and philosopher William James (1842–1910) is regarded by most psychologists of religion as the founder of the field. James distinguished between institutional religion and personal religion. Institutional religion refers to the religious group or organisation and plays an important part in a society's culture. Personal religion, in which the individual has mystical experience, can be experienced regardless of the culture.

Fig 149b: Rudolph Otto and William James

The Varieties of Religious Experience comprises his edited Gifford Lectures on natural theology, concerning the psychological study of individual private religious experiences and mysticism, and used a range of examples to identify commonalities in religious experiences across traditions. Soon after its publication, Varieties entered the Western canon of psychology and philosophy and has remained in print for over a century.



In the Varieties, James explicitly excludes from his study both theology and religious institutions, choosing to limit his study to direct and immediate religious experiences, which he regarded as the more interesting object of study. His chapters span the religions of healthy mindedness versus the sick soul, the divided self, conversion, saintliness and mysticism. James outlines four markers of mystical experience:

Ineffable: the experience is incapable of being described and must be directly experienced to be understood.

Noetic: the experience is understood to be a state of knowledge through which divine truths can be learned.

Transient: the experience is of limited duration.

Passivity: the subject of the experience is passive, unable to control the arrival and departure of the experience.

Moon, Kuza & Desai (2018) note the formative influence of his nitrous oxide experiences on his entire view of religious experience:

In 1874, William James wrote a celebratory review in the Atlantic Monthly of Benjamin Paul Blood's pamphlet The Anaesthetic Revelation and the Gist of Philosophy. He was captivated by the idea that "the Secret of Being" might be accessible with nitrous oxide not just by the academic intellectual but also by the ordinary man. Later, in his essay "On Some Hegelisms" (1882), James described his own experience with nitrous oxide as one characterized by an exhilarating sense of metaphysical awakening. Upon inhalation, he was able to understand first the glory and then the insufficiency of Hegelian thought. For James, the use of nitrous oxide ultimately served a key role in elucidating some of the most central ideas of his life: (1) the value of religion and (2) the universe as pluralistic (as opposed to absolutist, constant, eternal), driven by chance, experience, and change.

He enlarged on this in the Varieties p 373:

Nitrous oxide and ether, especially nitrous oxide, when sufficiently diluted with air, stimulate the mystical consciousness in an extraordinary degree. Depth beyond depth of truth seems revealed to the inhaler. This truth fades out, however, or escapes, at the moment of coming to; and if any words remain over in which it seemed to clothe itself, they prove to be the veriest nonsense. Nevertheless, the sense of a profound meaning having been there persists; and I know more than one person who is persuaded that in the nitrous oxide trance we have a genuine metaphysical revelation.

*Some years ago I myself made some observations on this aspect of nitrous oxide intoxication, and reported them in print. One conclusion was forced upon my mind at that time, and my impression of its truth has ever since remained unshaken. It is that our normal waking consciousness, rational consciousness as we call it, is but one special type of consciousness, whilst all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different. We may go through life without suspecting their existence; but apply the requisite stimulus, and at a touch they are there in all their completeness, definite types of mentality which probably somewhere have their field of application and adaptation. No account of the universe in its totality can be final which leaves these other forms of consciousness quite disregarded. How to regard them is the question,—for they are so discontinuous with ordinary consciousness. Yet they may determine attitudes though they cannot furnish formulas, and open a region though they fail to give a map. At any rate, they forbid a premature closing of our accounts with reality. Looking back on my own experiences, they all converge towards a kind of insight to which I cannot help ascribing some metaphysical significance. The keynote of it is invariably a reconciliation. It is as if the opposites of the world, whose contradictoriness and conflict make all our difficulties and troubles, were melted into unity. Not only do they, as contrasted species, belong to one and the same genus, but one of the species, the nobler and better one, is itself the genus, and so soaks up and absorbs its opposite into itself. This is a dark saying, I know, when thus expressed in terms of common logic, but I cannot wholly escape from its authority. I feel as if it must mean something, something like what the Hegelian philosophy means, if one could only lay hold of it more clearly. **Those who have ears to hear, let them hear; to me the living sense of its reality only comes in the artificial mystic state of mind.***

James further comments: *I just now spoke of friends who believe in the anæsthetic revelation. For them too it is a monistic insight, in which the other – in its various forms appears absorbed into the One.*

"Into this pervading genius," writes one of them, "we pass, forgetting and forgotten, and thenceforth each is all, in God. There is no higher, no deeper, no other, than the life in which we are founded. 'The One remains, the many change and pass;' and each and every one of us is the One that remains.... This is the ultimatum. ... As sure as being—whence is all our care – so sure is content, beyond duality, antithesis, or trouble, where I have triumphed in a solitude that God is not above."

This has the genuine religious mystic ring!

Rudolf Otto (1869–1937), was a German Protestant theologian and scholar of comparative religion. His fascination with non-Christian religions was awakened during an extended trip from 1911 to 1912 through North Africa, Palestine, British India, China, Japan, and the United States. His first book, *Naturalism and Religion* (1904) divides the world ontologically into the mental and the physical, reflecting Cartesian dualism. He argues consciousness cannot be explained in terms of physical or neural processes, and also accords it epistemological primacy by arguing all knowledge of the physical world is mediated by personal experience. On the other hand, he disagrees with Descartes' characterisation of the mental as a rational realm, positing that rationality is built upon a non-rational intuitive realm.

In "The Idea of the Holy", Rudolph Otto (1917) writes that while the concept of "the holy" is often used to convey moral perfection – and does entail this – it contains another distinct element, beyond the ethical sphere, for which he coined the term numinous based on the Latin word *numen* ("divine power"). Otto explained the numinous an experience or feeling which is not based on reason or sensory stimulation and represents the "wholly other" – a "*non-rational, non-sensory experience or feeling whose primary and immediate object is outside the self.*" It is a mystery (*mysterium tremendum*) that is both fascinating (*fascinans*) and terrifying at the same time. A mystery that causes trembling and fascination, attempting to explain that inexpressible and perhaps supernatural emotional reaction of wonder drawing us to seemingly ordinary and/or religious experiences of grace. This sense of emotional wonder appears evident at the root of all religious experiences. Through this emotional wonder, we suspend our rational mind for non-rational possibilities.

This mental state "presents itself as ganz Andere, wholly other, a condition absolutely sui generis and incomparable whereby the human being finds himself utterly abashed." It cannot be defined in terms of other concepts or experiences. The subject must therefore be "guided and led on by consideration and discussion of the matter through the ways of his own mind, until he reaches the point at which 'the numinous' in him perforce begins to stir... In other words, our X cannot, strictly speaking, be taught, it can only be evoked, awakened in the mind." Wynn (2022) notes: *The Idea of the Holy falls within a paradigm in the philosophy of emotion in which emotions are seen as including an element of perception with intrinsic epistemic value that is neither mediated by thoughts, nor simply a response to physiological factors. Otto therefore understands religious experience as having mind-independent phenomenological content rather than being an internal response to belief in a divine reality.*

Neurotheology: The Brain on Religion, Spirituality and Mysticism The neuroscience of religion, also known as neurotheology and as spiritual neuroscience, attempts to explain religious experience and behaviour in neuroscientific

terms. Aldous Huxley used the term neurotheology for the first time in the utopian novel *Island*, in the context of psychedelics. It is the study of correlations of neural phenomena with subjective experiences of spirituality and hypotheses to explain these phenomena. This contrasts with the psychology of religion which studies mental, rather than neural states. Proponents say there is a neurological and evolutionary basis for subjective experiences traditionally categorised as spiritual or religious. From the religious perspective, concerns have been raised that the study of practices such as meditation does not necessarily extrapolate to the broader array of religious and spiritual phenomena (Begley 2001). Newberg's (2017) "Principles of Neurotheology" provides a scientific overview.

In "The Varieties of Spiritual Experience", Yaden & Newberg (2022) have produced a sequel to James' "Varieties of Religious Experience", in which the diversity of spiritual experiences are explored in a modern neuroscience context. These varieties encompass chapters on: (a) Numinous Experiences: Encountering divinity, (b) Revelatory experiences: Voices, visions, and epiphanies, (c) Synchronicity Experiences: "Everything happens for a reason", (d) Mystical Experiences: Unity and ego-dissolution, (e) Aesthetic Experiences: Awe and the sublime and (f) Paranormal Experiences: Ghosts, angels, and other entities.

Grewal (2012) reinforces the differing tendencies towards religious belief in intuition of the divine and away from belief in god in rational analytic discourse:

Shenhav, Rand and Greene (2011) show that people who have a tendency to rely on their intuition are more likely to believe in God. They also showed that encouraging people to think intuitively increased people's belief in God. Building on these findings, Gervais & Norenzayan (2012) found that encouraging people to think analytically reduced their tendency to believe in God. Together these findings suggest that belief may at least partly stem from our thinking styles. ... Gervais and Norenzayan's research is based on the idea that we possess two different ways of thinking that are distinct yet related. System 1 thinking relies on intuitive feelings, hunches, shortcuts and other rules-of-thumb while System 2 is based on on analytic thinking and tends to be slower and require more effort. Solving logical and analytical problems may require that we override our System 1 thinking processes in order to engage System 2.

The notions of both God and Vedantic primordial cosmic consciousness appear to simply be aspects of a more ancient intuitive "animistic" type 1 thinking as opposed to type 2 "analytical" thinking. This suggests both God and cosmic consciousness are latecomers in the evolution of the universe, as a product of humans as higher organisms, thinking of the universe as permeated and driven by subjectively conscious agents, as a working intuitive rule of thumb, for survival, without it necessarily making overall analytic sense, particularly when extrapolated onto the entire universe.

The idea of an innate religious propensity in evolution for the good is not so much about transformative mystical states, as the blessings of religious security, for example that conservative morality or the love of God is an innate or evolved 'instinct'. But, while we have found evidence for natural morality in humans, conservative morality presents rather as as a superimposed meme. As we have seen with Marguerite Porete, the mystical people are often cast wearing sackcloth and ashes, or being burned at the stake for their visions. Both the conformist patterns of religious belief and the diverse mystical experience of transcendence have been explored in brain studies. But the propensity discovered scientifically in the brain is that both meditative and psychedelic states are associated with quietening of the default mode network and the relaxing of identity-defining dynamics leading to integrated states of consciousness rooted in first person mystical experience.

The nature of subjective conscious volition over the world around us and its implications is our central existential dilemma because we gain our entire knowledge of the world through our subjective experiences of it. This is the central existential dilemma that animism has always encompassed, and which its offspring in religion and religion's backroom "soul" in spirituality⁵¹, seek to reveal. Scientific consciousness research opens the abyss of subjective experience, as the most outstanding unresolved scientific problem in the universe and that is what mystical and visionary propensity is actually about, which both lies at the foundation of religion but is diametrically opposite to it.

⁵¹ *Spiritualitas* L. from *spiritus* n. which means 'the breath of life', also psyche, or soul. Traditionally, spirituality referred to a religious process of re-formation which "aims to recover the original shape of man", oriented at "the image of God" as exemplified by the founders and sacred texts of the religions of the world and within early Christianity to refer to a life oriented toward the Holy Spirit and broadened during the Late Middle Ages to include mental aspects of life. In modern times, the term broadened to refer to a wider range of experience, including esoteric and religious traditions. Modern usages refer to a subjective experience of a sacred dimension and the "deepest values and meanings by which people live", often in a context separate from organised religious institutions. It may involve belief in a supernatural realm beyond the ordinarily observable world, personal growth, a quest for ultimate or sacred meaning, religious experience, or an encounter with one's "inner dimension".

There is also a pervasive belief in the idea that all spiritual paths lead to one deeper reality, as expressed in the perennial philosophy – a perspective in philosophy and spirituality that views all of the world's religious traditions as sharing a single, metaphysical truth or origin from which all esoteric and exoteric knowledge and doctrine has grown (Huxley 1946). Perennialism has its roots in the Renaissance interest in neo-Platonism and its idea of the One, from which all existence emanates, e.g. to integrate Hermeticism with Greek and Jewish-Christian thought. Ultimately this idea comes down to direct first person mystical experience, contemplative, meditative or entheogenic as the ultimate chthonic and illuminating groundswell of numinous reality, unbound from traditional religious assumptions.

Religion raises a serious dilemma for spirituality as a pursuit, because most of its perspective is underpinned by assumptions arising from existing religious viewpoints – memes which we now perceive to have a potentially distorting parasitic influence on the nature of spiritual and mystical experiences, even when these are in the first person. Notions, from God as creator, or legislator, to traditional notions of universal consciousness such as Brahman, all carry type-casting interpretations of spiritual identity. It is one thing to experience forms of transcendence and describe them metaphorically as experiences in terms of notions like Brahman, but it is another thing to a priori declare to third parties that they are evidential facts. They can be empirically verified by mutual affirmation of first person subjective experiences between people in mystical states discovering a commonality, just as the Huichol do experiencing the *nierika* on the peyote hunt. One of the great advantages of entheogenic experience is that it does not have to come with any pre-conceived spiritual assumptions although it is frequently associated with spiritual movements. To have any real potential to understand the nature of consciousness deep in the well of non-ordinary experience, it is absolutely necessary for the spiritually inclined to cleanse themselves of all 'parasitic' memes, such as assumptions about the nature of God or divinity, if they hope to experience genuine *moksha*, or *samadhi*.

In fact discarding memes is central to meditative practices promoting ego loss and is integral to the entheogenic effects of psychedelics. Anil Seth (2019) has argued that all perception is a form of controlled predictive hallucination evoked by the conscious brain. Dreams fall even more clearly into this category as well as claims about waking entheogenic visions, for which the term hallucinogen is a synonym of psychedelic. This implies that all religious beliefs in God are robust conceptual hallucinations reinforced by memes of affirmative belief, which are thus not physically or cosmologically real.

Erasing personal history is a technique advocated by Carlos Castaneda (1968), who also sees man's idea of God as a robust transfixing hallucination, that stymies the vision quest, while spirit is an ally to be enticed and commanded in the vision quest's pursuit:

Warriors know that the assemblage point is the place where perception is assembled within the structure of the luminous cocoon; the assemblage point is the crucial feature of human beings as luminous entities. Warriors know that they must train themselves to do two transcendental things: first, to conceive of the assemblage point, and second, to make that assemblage point move. Warriors know that their assemblage points become dislodged from their original positions through confrontations with the naqal. Warriors know that man's idea of God is one of the most sturdy aspects of the human inventory which binds the assemblage point to its original position. The spirit is an abstract which warriors know without words or thoughts, yet without the slightest desire to understand it, warriors recognise and command the spirit; they beckon it, they entice it, they become familiar with it, and they express it in their acts; when warriors command the spirit, they in essence command the movement of the assemblage point. (Tomas 1995).

This is a scientific consciousness research question – what is the actual connection between brain states and “spirituality” generally? The neuroscientist Vilayanur Ramachandran (Ramachandran & Blakeslee 1998) referred to the part of the cortex between the limbic system and amygdala, on the one hand, and the temporal cortex on the other as the ‘god spot’. The amygdala is the organ of emotional dynamics, from fight and flight, through paranoia to ecstasy, joy and fulfilment. The temporal lobe contains our sense of semantic and symphonic significance. Temporal lobe epilepsy can generate profound spiritual and religious feelings, experienced as states of epiphany by the subject or complex dream like situations. The neuroscientist Michael Persinger had had a similar experience using targeted temporal lobe stimulation, which came to be called the God helmet. This taps into neural circuits associated with the temporo-parietal junction, involving the sense of self which have come to be associated with the default mode network.

However, Aaen-Stockdale (2012) notes:

As Vilayanur Ramachandran, himself a proponent of a temporal lobe link, says, ‘the changes that have triggered these patients’ religious fervour could be occurring anywhere, not necessarily in the temporal lobes’ (Ramachandran & Blakeslee, 1998, p.187). Neuropsychiatrist and expert on near-death experiences, Peter Fenwick concludes: ‘It is likely that the earlier accounts of temporal

lobe epilepsy and temporal lobe pathology and the relationship to mystic and religious states owe more to the enthusiasm of their authors than to the true scientific understanding of the nature of temporal lobe functioning.'

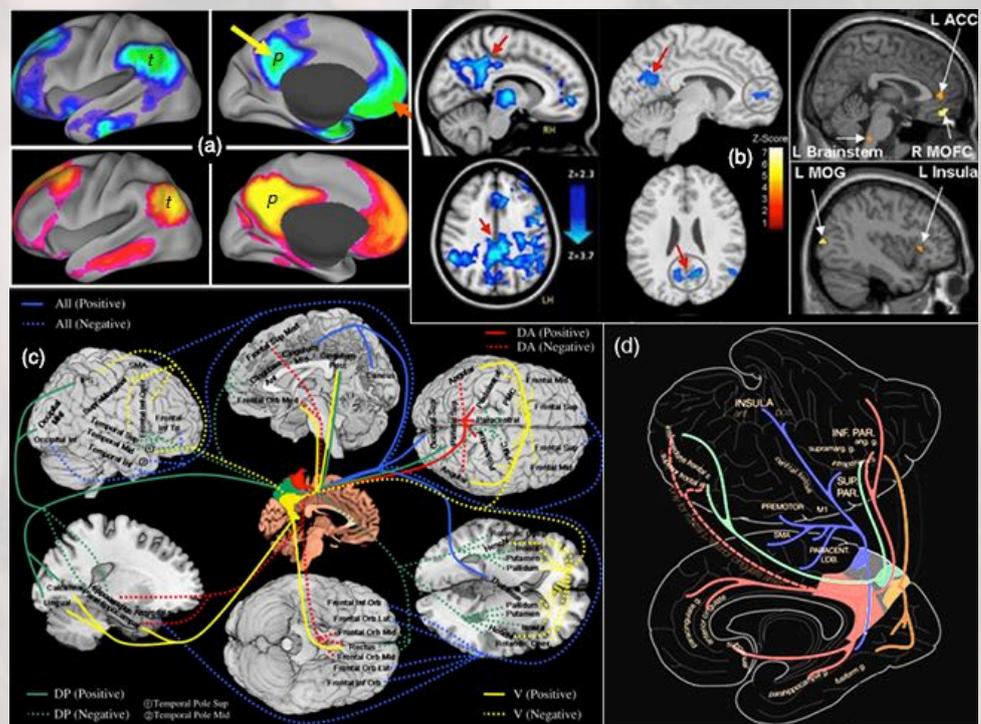
Robin Dunbar (2022) notes that the default mode network is associated both with mentalisation, and the ability of an individual to maintain a rich group of interpersonal associations:

The default mode network (including the theory of mind network) is a group of brain regions that interconnect directly with each other through major fibre tracts (the bundles of neurons that provide the wiring of the brain). It involves four main brain units. The prefrontal cortex right at the front of the brain (an area broadly associated with both rational thought and the interpretation of emotional cues), the temporo-parietal junction (a small region just behind and above the ear where the parietal and temporal lobes meet that is strongly associated with responses to living beings), parts of the temporal lobe (the brain's sausage-like extension along the side just inside the ear, associated mainly with memory storage) and the limbic system, especially the amygdala (which is responsible for processing emotional cues). This large neural network is heavily involved in interpreting social and emotional cues, and in managing our relationships. ... We and others have shown, in a number of neuroimaging studies, that the size of the network correlates with both your mentalizing competences and the number of friends you have.

He then goes on to suggest this relates to two completely different types of religious engagement:

To explore the mentalizing bases of religious belief in more depth, nearly 300 people were asked to complete a set of questionnaires that measured their mentalizing skills, the effectiveness of their agency detection mechanism, their schizotypal tendencies and their religious beliefs and behaviours (religiosity). Agency detection is the tendency to attribute human (or at least sentient) traits to non-living matter. Schizotypal thinking is the tendency to have unusual perceptual experiences (seeing ghosts or hearing voices) and disorganized thought processes, and has been explicitly linked to religiosity. The results of this study suggest that mentalizing positively influences religiosity quite independently of agency detection and schizotypal thinking, both of which are extremely closely correlated. In fact, people who are predisposed to schizotypal thinking tend to have an unusually active hyperactive agency detection mechanism. This suggests that you can be religious either because you are prone to seeing visions or because you can reflect deeply on the mental states of God in his transcendental world. This is interesting because it suggests there might be two types of religious people who engage in two very different types of religion – reactive religion and reflective religion, or as I put it in Chapter 1, shamanic/immersive religion versus doctrinal religion (Powell et al. 2010, 2012).

Fig 150: (a) Accentuation of the default mode network including the precuneus (p) and temporo-parietal junction (t) on resting state and reduction on experimental tasks (Raichle & Snyder 2007). (b) Left: Consistent reduction in default mode network activity left in psilocybin (Carhart-Harris 2012a) and right engaging Awareness, Loving-Kindness, and Concentration meditations (Brewer et al. 2011). Note the increased richness of the psilocybin effect. Right: Study of Carmelite nuns shows activity more consistent with focused concentration (Beauregard & Paquette 2006) lacking quiescence of the precuneus. (c), (d) Brain networks to and from the precuneus (Zhang & Li 2012, [Wikipedia](#))



But the default mode network is also associated with ego-consciousness rehearsing strategies to deal with imagined crises, which can become obsessive in depressive people. Paradoxically, a reduction of activity in the default mode network was noted by Carhart-Harris et al (2012a) in experiments with psilocybin experiences, associated with peak spiritual experiences in which the distinction between self and other became blurred and has become signature of study of the psychedelic experience.

The precuneus has been linked via fMRI imaging to the processes involved in self-consciousness, such as reflective self-awareness, that involve rating one's own personality traits compared to those judged of other people:

Electrical stimulation of the anterior portion can induce an out of body experience. It has been suggested that together with the posterior cingulate, the precuneus is "pivotal for conscious information processing". It has been suggested to be the 'core node' or 'hub' of the default mode network that is activated during "resting consciousness" in which people do not engage intentionally in sensory or motor activity. This involvement in the default network is suggested to underlie its role in self-consciousness. It is one of the areas of the brain most deactivated during slow-wave sleep and rapid eye movement sleep.

The temporo-parietal junction is also known to play a crucial role in self–other distinctions processes and theory of mind (ToM). Damage to it has been implicated in having adverse effects on an individual's ability to make moral decisions and has been known to produce out-of-body experiences (OBEs).

Kabalistic Ein-Sof is like Brahman as formless archaic ultimate reality, but of course Ein-Sof is far more recent, dating essentially from 1000 AD so belief in primitive YHVH came first and then people later in the overlap of Gnostic, Kabalistic and Eastern thinking, which is also permeated with Neoplatonism had to make a regress to explain the ultimate numinous experience in terms of the formless infinite, out of which all form emerges.

Now suppose we think of my "soul" meeting Brahman in my psychedelic moksha, as a singular peak experience. Neuroscience shows this comes back to the precuneus which seems to harbour our notions of self, along with the temporo-parietal junction.

Idealistic i.e. consciousness first notions of cosmic mind and infinite formless deity are actually a neuroscientific product of the mystical state, so the only way we can really understand them is to elucidate their basis both physically in neurobiology and subjectively in conscious experience together, as a deeply revelatory interactive process. SEC above all aims at cosmic understanding in which these two complements together – consciousness and universe – are the only way to realise the revelatory condition because it's a manifestation of cosmology, not just spirituality.

The mere fact that these peak states can be provoked both by meditation and particularly under influence of entheogens means that they are influenced by physical circumstances in the brain, not just supreme conscious forces and indeed whether Kabalistic, Vedic or psychedelic mystical experiences, they are indisputably neurobiological in origin, so the organismic living biological organ is essential to mystical samadhi and moksha experience. WE know this is how the rishis discovered the notion! This is why SEC says Brahman is emergent asymptotically as a cosmological climax in the biota, rather than naive notions of a transcendent spiritual super-agent.

The mystical state represents an envelope of all the consciously experienceable dimensions of reality. It's not just the quantum vacuum or ZPF because that's just a bunch of integrated force field virtual particle fluctuations. It's the full internal model of reality invoked in subjective consciousness by the integrated brain state. This has a potentially unbounded spectrum of attributes spanning all those cortical columns which aren't just mindless unconscious physics but are the climactic quintessence of conscious complexity the entire universe is giving expression to.

In particular, the precuneus, which is hard to explore experimentally by EEG and fMRI because its deep in the central fissure, carries all the representations of self and other integrated with all the sense modes and connected widely e.g. to the insula and other areas. Several other areas and networks from the default mode network, through the salience and fronto-temporal networks are discussed in the psychedelics section.

This means that the infiniteness and beyond form of the ineffable experience is being mediated through the vast degrees of freedom of the experiential nexus and in particular the notions of both soul and ultimate cosmic consciousness are interactive dynamic features of the experiential representation which, when it is usually active in waking life represents the polarity of self and other but when quiescent in meditation and psychedelic moksha are representing Brahman and the atman interacting telepathically in the near death experience.

Trying to divorce the living brain and the entire physical universe and our organismic biological nature as of no account besides spiritual transcendence is an anthropocentric degeneracy of the total reality, that neglects the formative role of the universe and its forces of nature rising to critical climax in the evolving conscious biosphere. There is absolutely no point in having a physical universe and then turning around in frank denial and calling it just a mindless mechanism in favour of superstitious idealism. Quantum reality has a central part to play in this, but it is ALL the brain processes

that evoke subjective consciousness through quantum uncertainty, not just Hameroff and Penrose's microtubules that may not have the claimed role at all.

This is why my experience says the conscious universe is in its own becoming, and "infinite" consciousness began as vestigial primal subjectivity in the vestigial inflationary universe and there is no primordial super-conscious skeleton in the closet of reality but us here and now trying to learn to take responsibility for our pivotal role in the divine comedy and that all the myths of a preordained deity or preexistent cosmic mind devoid of substance are as degenerate as the myth of a reductionistic mindless universe.

Griffiths et al. (2006, 2008, 2018) have showed that psilocybin can induce genuine mystical experiences, resulting in beneficial effects lasting months later and combined the use of psilocybin with meditation and other spiritual practices, in quantum change experiments of lasting benefit, echoing the way in which movements such as the Native American Church and the Union Vegetale provide a spiritually conducive context to engender positive outcome.

Justin Brewer has also found a similar default mode reduction in people meditating (Brewer et al. 2011):

We investigated brain activity in experienced meditators and matched meditation-naïve controls as they performed several different meditations (Concentration, Loving-Kindness, Choiceless Awareness). We found that the main nodes of the default-mode network (medial prefrontal and posterior cingulate cortices) were relatively deactivated in experienced meditators across all meditation types. Furthermore, functional connectivity analysis revealed stronger coupling in experienced meditators between the posterior cingulate, dorsal anterior cingulate, and dorsolateral prefrontal cortices (regions previously implicated in self-monitoring and cognitive control), both at baseline and during meditation.

In the case of experienced mindfulness meditators, a team led by Mario Beauregard (Taylor et al. 2011) found results concordant with the meditation experiences of Brewer et al. (2011):

Twelve experienced and ten beginner meditators were scanned as they viewed negative, positive, and neutral pictures in a mindful state and a non-mindful state of awareness. Results indicated that the Mindful condition attenuated emotional intensity perceived from pictures, while brain imaging data suggested that this effect was achieved through distinct neural mechanisms for each group of participants. For experienced meditators compared with beginners, mindfulness induced a deactivation of default mode network areas (medial prefrontal and posterior cingulate cortices) across all valence categories and did not influence responses in brain regions involved in emotional reactivity during emotional processing. On the other hand, for beginners relative to experienced meditators, mindfulness induced a down-regulation of the left amygdala during emotional processing. These findings suggest that the long-term practice of mindfulness leads to emotional stability by promoting acceptance of emotional states and enhanced present-moment awareness, rather than by eliciting control over low-level affective cerebral systems from higher-order cortical brain regions.

Zen meditation studies (Pagnoni et al 2008, Ritskes et al 2003) in which subjects are asked to switch from a verbal task to contemplation show transient activity consistent with the default circuit which is more quickly suppressed by experienced meditators more effectively inhibiting verbal thought. Tibetan Buddhists performing compassion meditation for other people's suffering show specific activation in limbic regions including cingulate cortex and insula, consistent with an empathic response to another's pain (Lutz et al 2008). This presents the central arena of neuroscience research on "mystical experience" with or without a religious context.

There are also studies reporting a variety of changes in brain activity resulting from religious and contemplative activities. Patrick McNamara (2009) in "The Neuroscience of Religious Experience" makes a claim that religious believers show a superiority of integrated self-hood, associated with an 'anatomical overlap between the brain sites implicated in religious experience and the brain sites implicated in the sense of Self and self-consciousness'. It is this anatomical overlap that explains how religious experience can facilitate the transformative process of the self.

McNamara (2002) claims people engage in religious practices, in part, because these activate the frontal lobes:

Activation of the frontal lobes is both intrinsically rewarding and necessary for acquisition of many of the behaviors that religions seek to foster, including self-responsibility, impulse and emotion modulation, empathy, moral insight, hope, and optimism.

This claim is specious, as frontal lobes are essential for all activity. Critiquing his thesis Schjoedt (2011) states:

McNamara's claim that there is overlap between the brain sites implicated in religious experience and those implicated in the sense of self and self-consciousness rests on two postulates: (1) that the 'executive Self' can be identified as a neural entity in specific regions of the brain; and (2) that the neural correlates of religious experience can be identified as a consistent set of activations in

these regions. Although McNamara is clearly well informed in terms of functional neuroanatomy, he fails to make a convincing argument for his first postulate regarding the existence of the self as a controlling entity at the neurological level. This is unfortunate because his claim that religious experience decenters the self from its control over body and cognition in order to contemplate and optimize the self rests on this assumption. Furthermore, with respect to his second postulate, since the data currently available do not afford a description of religious experience as a uniform category, it is difficult to see how this evidence can support McNamara's general understanding of the nature and function of religious experience.

Although he claims he is “not very religious” (Kreiter 2011), McNamara (2014) strongly advocates religion, as a means for cultural control of human nature, even to the point of selecting for genetically compliant populations and avoiding adolescent risky behaviour (McNamara et al. 2010), consistent with religion as a defence against perceived autonomous risk:

I think one of the things that religion does when it's working properly is it strengthens the prefrontal lobes. All those practices that the religious people tell their adherents to do — like prayer, ritual, abstaining from alcohol, controlling your impulses — strengthen the ability of frontal lobes to control primitive impulses. ... If you've got a cultural system that produces people who are reliable, who cooperate, who are relatively honest and trustworthy, who can control their impulses, who are good parents, who abstain from ingesting addictive substances — if a cultural system does that on a consistent basis over the centuries, that's a pretty valuable system.

McNamara's (2009) hypothesis, as summarised in his own words, would make methamphetamine the “God” molecule:

To intensify the 'god effect' in people already attracted to religious ideas, my studies revealed, all we had to do was boost the activity of the neurotransmitter, dopamine, crucial for balanced emotion and thought, on the right side of the brain. But should dopamine spike too high, murderous impulses like terrorism and jihad could rear up instead.

McNamara (2009) had incorrectly implicated psychedelics as dopamine agents when their activity is on serotonin 5HT_{2a} receptors coupled to mGluR2 metabotropic glutamate receptors and displays a prejudice against traditional forms of religious practice such as shamanism, treating the renowned Huichol use of peyote as superfluous to their spiritual tradition:

The Huichol Indians practice a form of ecstatic religion, but you do not need peyote or any other drug to experience religious ecstasy. Most scholars of religion believe that the earliest forms of religion were “ecstatic” — that is, religious practices were designed to induce a transformation in the sense of Self to commune with the gods, to experience a sense of euphoria and well-being, and to acquire new personal powers (such as the power to heal others, foresee the future, or communicate with the spirit world). The combination of self-transformation, joy, well-being or euphoria, and personal power defines the ecstatic religious mind and the essential psychological elements in all religions.

However in his latest edition (McNamara 2022), in his discussion, in the [psychedelics section](#) both of mystical experiences under psychedelics, the models advanced of psychedelic action and entity experiences under DMT, which parallel my quantum change experience giving rise to this cosmology, he has provided a definitive overview which ushers psychedelic experience fully into the mystical fold.

Mario Beauregard and co-researchers (Beauregard & Paquette 2006) have similarly explored the neural activity of Carmelite nuns entering oneness with God and report fMRI activations in areas in very specific frontal, parietal, temporal and basal areas consistent with directed control. In doing so, they have unfortunately invented a criterion they call RSME:

The main objective of this novel domain of research is to explore the neural underpinnings of religious/spiritual/mystical experiences (RSMEs). These experiences relate to a fundamental dimension of human existence and are frequently reported across all cultures. One of the basic assumptions of spiritual neuroscience is that RSMEs are brain-mediated, as are all other aspects of human experience. With respect to this issue, it is of paramount importance to fully appreciate that elucidating the neural substrates of these experiences does not diminish or depreciate their meaning and value, and that the external reality of “God” can neither be confirmed nor disconfirmed by delineating the neural correlates of RSMEs.

While I support the non-materialist view of consciousness, in Beauregard's introduction to “The Spiritual Brain” (Beauregard & O'Leary 2007) he states an unashamed quasi-religious agenda:

Our book will establish three key ideas. The non-materialist approach to the human mind is a rich and vital tradition that accounts for the evidence much better than the currently stalled materialist one. Second, non-materialist approaches to the mind result in practical benefits and treatments, as well as promising approaches to phenomena that materialist accounts cannot even address. Lastly—and this may be the most important value for many readers—our book shows that when spiritual experiences transform lives, the most reasonable explanation and the one that best accounts for all the evidence, is that the people who have such experiences have actually contacted a reality outside themselves, a reality that has brought them closer to the real nature of the universe.

However RSME conflates what anyone can see are diverse and potentially conflicting notions, with religion at one extreme promoting moral avoidance of risk and mysticism at the other invoking first person transformative experiences which religions may perceive to be disruptive to the status quo or even heretical. While they state these to be “Neural correlates of a mystical experience in Carmelite nuns” their tasks were both memorisation:

In the Mystical condition, subjects were asked to remember and relive (eyes closed) the most intense mystical experience ever felt in their lives as a member of the Carmelite Order. This strategy was adopted given that the nuns told us before the onset of the study that “God can’t be summoned at will.” In the Control condition, subjects were instructed to remember and relive (eyes closed) the most intense state of union with another human ever felt in their lives while being affiliated with the Carmelite Order.

Notably (Beauregard & O’Leary 2007) focus on mystical states connected only with religion and psychedelics are mentioned only once associated with “other cultures.”

Mystical experiences can be grouped into general categories; most fall into one of three general types: monistic mysticism, pantheistic mysticism, and theistic mysticism. Monistic mysticism is the mystical experience of sensing that the created universe revolves around a center from which everything issues. In pantheistic mysticism mystics sense that the entire external world is the ultimate power and the experiencer is part of that power. In theistic mysticism one senses the presence of the highest power in the universe or a power from beyond the universe.....Now, from a scientific perspective, the proposition is quite simple. Either there are levels of consciousness that give us greater insight into our relationship to the reality underlying our universe or there aren’t. If they exist, we can either reach them or we can’t. If we do reach them, we either learn something or we don’t.....Why access deep and unusual levels of consciousness? Mystics’ explanations depend on their spiritual and other commitments, but there is a common thread. They believe that some fundamental facts about reality can never be correctly understood apart from observations made at this level. If mind is a fundamental character of the universe, as mystics believe, then the investigation must involve at least some experiments of mind-and the only mind mystics can volunteer is their own. (Beauregard and O’Leary 2007, pp. 182-184)

The differences in brain activity they detected were:

Significant loci of activation in the right medial orbitofrontal cortex, right middle temporal cortex, right inferior and superior parietal lobules, right caudate, left medial prefrontal cortex, left anterior cingulate cortex, left inferior parietal lobule, left insula, left caudate, and left brainstem. Other loci of activation were seen in the extra-striate visual cortex. These results suggest that mystical experiences are mediated by several brain regions and systems.

These are not dissimilar to the cited results of Newberg et al. (2003) in which Franciscan nuns were at prayer, involving the internal repetition of a particular phrase:

Compared to rest, the prayer state showed increased rCBF in the prefrontal cortex (PFC), the inferior frontal lobes, and the inferior parietal lobule (IPL). In addition, the rCBF change in the left PFC showed an inverse correlation with that in the ipsilateral superior parietal lobule (SPL). Changes in SPL activity were interpreted as reflecting an altered sense of the body schema experienced during the prayer state.

Nickel et al. (2001) likewise reported that:

During religious recitation, self-identified religious subjects activated a frontal/parietal circuit, composed of the dorsolateral prefrontal, dorsomedial frontal and medial parietal cortex.

Travis & Parim (2017) produced similar results for transcendental meditation, which appear to be inconsistent with other forms of meditation and with the association with mystical states in quantum change experiences:

Regression analysis of years TM practice and self-reported transcendental experiences (lack of time, space and body sense) during meditation practice was flat. Those practicing Transcendental Meditation for 1 month reported as much transcending as those with 5 years of practice. ... The comparison of eyes-closed rest/task and TM practice/task identified similar areas of activation: theta and alpha activation during rest and TM in the posterior cingulate and precuneus, part of the default mode network, and beta activation during the task in anterior cingulate, ventral lateral and dorsolateral prefrontal cortices, part of the central executive network. In addition, comparison of rest and TM identified higher beta temporal activation during rest and higher theta orbi-tofrontal activation during TM. Thus, it does not seem accurate to include TM practice with meditations in the category of Focused Attention, which are characterized by gamma EEG and DMN deactivation.

Each of these studies show activations broadly consistent with both ordered religious thought. In the Carmelite case anterior cingulate activity is actually increased, inconsistent with the default network reduction associated with mystical experience. Again this is a memory task, quite different from having a direct transformative experience in the forms shared by the entheogenic research and meditative states reported above.

In contrast and more consistent with the entheogenic and meditative studies, Brick J et al. (2012) report:

*A frontal-parietal circuit related to spiritual-religious experiences, and specifically that a **decreased** focus on the self (i.e., selflessness), is associated with **decreased** right parietal lobe functioning, serves as the primary neuropsychological foundation for spiritual transcendence.*

Much earlier Kokoszka (1999) had proposed two categories of altered conscious states – Superficially Altered States of Consciousness (SACS) and Profoundly Altered States of Consciousness (PASC). PASC are accompanied by extremely strong positive emotions and are experienced with significantly less feelings of cognitive disturbances than in SASC. PASC occur mainly in the context of religion, whereas SASC in everyday life, solitude, and poor well being, but these predate the current neuroscience research involving non-religious mystical states.

Miller (2004) notes of quantum change experiences that these are not necessarily religious, but still transcendent:

“The person typically experiences mystical quantum change passively, not a product of personal will or control, and has a difficult time expressing the experience in words. They usually are intensely positive, joyful experiences, and often the person senses the presence of an awe-inspiring transcendent Other. Often there is a noetic element of revelation, a sudden knowing of a new truth. An experience of unity is common; for example, an ineffable oneness with all of humankind, with nature, or the universe. In these respects, the mystical type of quantum change is similar to common reports of near-death experiences (Lorimer 1990).

However none of these studies go any way towards confirming a transcendental hypothesis for traditional religious practices as a divine manifestation.

Newberg (2016), in the context of Judaism, highlights three dilemmas about how the religions may relate to cognitive processes each of which point to unresolved existential ambiguities:

Willfulness: *Willfulness is another important brain process related to religion, and particularly Judaism. There is a strong sense of the willfulness of God and also the willfulness of a person. The notion of free will is an important element of Jewish tradition, and this is based heavily on our brain's ability to perceive that sense of willfulness.*

Love and anger: *Religions can foster great love and cohesion among congregants. But religions can also espouse fear and anger at those who do not adhere to the same religious beliefs.*

Existence: *The final cognitive process to be mentioned is the existential process which helps us to identify things which do and do not exist. At this point, cognitive neuroscience has not identified the areas of the brain that help us to perceive what is real and what is not. Clearly, the human brain can do this, but the brain can also be fooled such as when we are entertained by a magician. The existential process is critical in the larger dialogue regarding God since many people believe in God's existence and many do not. How is it that one brain can be absolutely convinced God exists while another brain, looking at the same world, can be absolutely convinced God does not exist?*

Thus while free-will is central, the love-hate cohesion-division axis remains unresolved as does the entire existential status of God.

In response to the Vedic claim that consciousness itself is the sought after infinite transcendent reality, I researched the [neuroscientific foundations](#) of consciousness and subjective experience. This is something that we may all abhor, in the context of the idea that consciousness and subjective experience lies in the brain stem and mid-brain rather than the cortex, which takes the form of a passive filter, driven by arousal in the reticular activating system, via the thalamus. Far from suggesting that consciousness itself is the ultimate reality of cosmic consciousness we seek and fail to appreciate, this tells us that consciousness is the very most primitive aspect of brain activity that arose with the first multicellular animals, or before them in the amoeba-flagellates and that, far from an ethereal “sing the body electric”, it is the most sappy drug-addled origin possible, involving just about every psychoactive chemical the brain possess.

Our pretensions to cortical “higher consciousness” are misplaced, because the seat of subjective experience appears to be centred in the mid brain thalamic ganglia and this isn't just a mechanistic brain-only view of consciousness. It's an empirical organic view of what it actually is and does and how this relates to enlightenment, samadhi and moksha as higher-level manifestations of the same process.

This picture shows that both the embryogenesis of the brain and its conscious arousal comes from a complex primitive collection of some 50 brain stem ganglia with ascending brain-wide pathways, spouting all the targets of the drug trade, from dopamine and serotonin, through histamine, acetylcholine, and nor-adrenaline to glutamate itself. It is

these circuits which enliven the brain as a whole and provide the basis for consciousness as the behind the scenes observer of subjective experience. Of course this doesn't mean that consciousness is just the ascending reticular activating system but it does mean that notions both of etherial fields like the ZPF and pre-conceived "cosmic consciousness" need to be understood much more cautiously in their evolutionary context.

It confirms that consciousness is more fundamental than subjective experience and that it is not bound by the forms of experiential content, but it also shows that the idea that consciousness itself is the absolute spiritual transcendence, from which the universe came, is severely, jarringly misplaced. Yes transcendent experience of the mind at large appears infinite when the doors of perception are flung open, as psychedelics can and do, but that is the very beginning of the visionary journey for us to navigate. Putting names like God and Brahman on it just limit the visionary journey before any more than those we can count on the fingers of one hand have actually even glimpsed it. Therefore do not trust Jesus, Buddha or anyone else's spiritual notions and doctrines to help you make the journey of your lifetime. Like Hishe the San trickster, follow your own creative path without prejudice!

(7) Religions display Extreme Paradigm Change Resistance. In a diversity of religions, almost impossible barriers are erected to prevent natural paradigm innovation of the belief systems and world views.

Jesus is represented in the Gospels and Revelation as a super-human son of man become the cosmic Son of God as alpha and omega the beginning and the end of the entire created universe. This is an intentional construction of the church fathers, arising out of the Hellenistic heroic tradition, emphasised by Yeshua's Dionysian miraculous nature and laced with warnings of false prophets that he will return on the right hand of Power.

Muhammad is likewise cast as the final prophet, with prophetic pretenders accused of blasphemy. To give an example, the Bahai faith has three central figures: (1) The Báb (1819–1850), a herald who taught that God would soon send a prophet in the same way as Jesus or Muhammad, and who was executed by Iranian authorities in 1850. (2) Bahá'u'lláh (1817–1892) who claimed to be that prophet, was born in Iran and was exiled due to his adherence to the messianic Bábí Faith. In 1863, in Iraq, he first announced his claim to revelation from God, and spent the rest of his life in further imprisonment in the Ottoman Empire. (3) His son, 'Abdu'l-Bahá (1844–1921). At the age of eight his father was imprisoned during a government crackdown on the Bábí Faith and the family's possessions were looted, leaving them in virtual poverty. His father was exiled from Iran, and the family went to live in Baghdad. They were later called by the Ottoman state to Istanbul before going into another period of confinement. He remained a political prisoner there until the Young Turk Revolution freed him in 1908 at the age of 64. The Baha'i Faith is the largest religious minority in Iran, but the Islamic government has never formally recognised the Baha'is. The persecution of Baha'is is largely due to the perceived political threat posed to the Islamic state by another widely practiced religion. Iranian laws protect the human rights of religious minorities, except those that conspire against Islam. In direct opposition to the Baha'i belief that all religions are important components of a larger world religion, Iranian officials, religious leaders and the media position the Baha'is as a direct threat to the practice of Islam and the survival of Iran.

The few major paradigm revolutions that have occurred, remain outstanding for their violence. The transition of Hebrew worship to Christianity was achieved only through Yeshua's crucifixion during times of apocalyptic conflict. Likewise the transition to Islam was accompanied by a genocide of Jewish men in the souk of Medina. By contrast, Buddhism emerged from the Hindu tradition apparently without bloodshed. Even smaller shifts such as the Reformation, which maintains the core principle of Christian faith unchanged, occurred during tumult, corruption and violence. Finally we come down to the endless religious sects, numbering in the hundreds to thousands.

(8) Religious Views of Morality, Nature and Sexuality are in Fundamental Conflict with Reality: A Scientific Exegesis

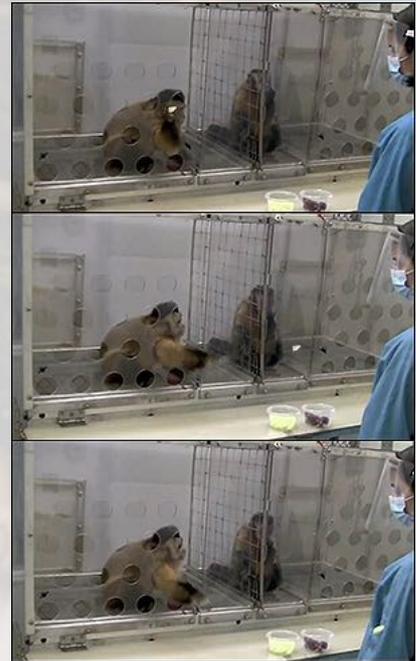
While Symbiotic Existential Cosmology doesn't deny outright that some form of super-consciousness could be co-eval with the universe, it does consider that existing religious traditions and concepts of God are in conflict with symbiotic climax living diversity as the central expression of consciousness found in the biota. The idea of absolute cosmological morality ordained by a monotheistic God or by Karmic Law flies in fundamental conflict with the biological and eco-systemic reality that morality is an evolved sociobiological trait, to aid inter-social dominance, by inhibiting intra-social competition, founded not in prescriptive rules and their transgression, but an intuitive sense of fair play.

Natural morality arises from a sense of "fair play". Intelligent animal societies engage in strategic bluffing to try to gain social advantages, and animals, from large-brained monkeys like capuchins and macaques, as well as dogs and

intelligent birds, quickly gain a long-term understanding of one another's personalities, to ensure fair play, and react with hostility in forms of altruistic punishment if they sense they are being "played" by another. Capuchin species, like humans, also adopt cultural traditions of tool use (Barrett et al. 2018).

Capuchin monkeys respond strategically to multiple scenarios (Smith et al. 2019) requiring both coordination (Assurance Game) and anti-coordination (Hawk-Dove Game), beneficial cooperation with a temptation to defect (Prisoner's Dilemma) and an environment requiring changing strategies within short temporal proximity (Alternating Economic Game). Likewise Macaques show adaptive strategies of social engagement depending on individual prowess (Zhao et al. 2023). These attest to both an intuitive sense of morality and the capacity for the same forms of conscious decision-making volition, we describe as free-will, but they are NOT religiously ordained!

Fig 150b: In a fairness study video by [Frans de Waal](#), socially acquainted capuchins are offered either cucumber or grape if they give the experimenter a stone. If they both receive cucumber, both are happy but the moment one gets a grape and the other gets only a cucumber, fair play is violated and the disadvantaged one on the left gets mad and throws the cucumber at the experimenter hitting them on the left shoulder.



Founding human societies that have lived for millennia in small bands, spend a great deal of time assessing one another's character and trustworthiness in social interactions and discussions round the camp fire, so that they know who they can depend on in times of crisis. This, not divinely ordained doctrine, is the foundation of human morality – something I call "verifiable trust".

As discussed in the next section, our longest standing culture, the [San Bushmen](#), do not invoke the notion of absolute morality, but rather an acceptance of the value of sexual opportunities, amid a sense of practicality that applies to issues like sharing versus stealing which directly affect the harmony and stability of the small bands upon which everyone's lives rely, while the deities are not morally prescriptive and are not cast in terms of absolute good and evil:

When a missionary inquired into a Bushman's ideas of good and bad he was told it was 'good' to sleep with another man's wife, but 'bad' if he slept with yours.

It is only with the emergence of dominant human culture, in larger urban societies, succeeding the gather-hunter epoch, where there is no longer any natural biospheric feedback on defection, that individual choices become subsumed under religious doctrine to enable large societies to dominate others, by repressing individual choice through punitive doctrine in the dictated common interest, but at a high cost.



Both Creationism, the widespread religious notion that the universe was created by a divine act of God and that of the Day of Judgment, as a final act, likewise arise from the emergence of human manufacturing culture, involving tools, weapons, wheels and struts for building, surrounded by animal husbandry and agriculture, so that we arrive at notions of God creating humanity by moulding from clay, breathing life into the dust of the Earth through prana, or the verbal commands that leaders invoke – "Let there be light!"

Fig 150c: The Code of Hammurabi 1792-1750 BCE shows both that, although "ordained" by Shamash, the Laws were codified by a secular ruler Hammurabi, not a priest as Moses was, and that the very notion of judgment under the law, is a creation of culture, not deity.

Likewise the notion of a day of judgment is a cultural construct of an urban society having established prescriptive laws, which are then invoked scripturally as divine prohibitions such as "thou shalt not commit adultery", as in Moses' Ten Commandments and both Deuteronomic Law and its predecessor, the secular Code of Hammurabi. Religions do articulate moral prescriptions that figure prominently in evolutionary strategy, and so exemplify underlying natural

morality. The Hebrew “an eye for an eye and a tooth for a tooth” is a highly successful prisoners’ dilemma strategy of tit-for-tat, which however leads to cycles of defection, refined in later more generalised notions, such as the silver and golden rules “do not do unto others what you would not have them do unto you” pronounced by Rabbi Hillel, reciting the Torah standing on one foot, and Yeshua’s assertive “do unto others what you would have them do unto you”, cited by Jesus as both the law and the prophets.

Nevertheless Isaiah’s notions of absolute compassionate righteousness do result in root contradictions with nature:

But with righteousness shall he judge the poor, and reprove with equity for the meek of the earth: and he shall smite the earth with the rod of his mouth, and with the breath of his lips shall he slay the wicked. And righteousness shall be the girdle of his loins, and faithfulness the girdle of his reins (Isa 11 4-5).

These notions of divine justness hinting of divine salvation are unnatural and immediately become a religious invocation to assert a reversal of biospheric diversification into animals and plants, carnivores and herbivores:

The wolf also shall dwell with the lamb, and the leopard shall lie down with the kid; and the calf and the young lion and the fatling together; and a little child shall lead them. And the cow and the bear shall feed; their young ones shall lie down together: and the lion shall eat straw like the ox. And the sucking child shall play on the hole of the asp, and the weaned child shall put his hand on the cockatrice’ den. (Isa 11 6-8).

Fig 150d: Isaiah 11 Inset and in the far distance, the cockatrice, a mythical winged dragon.
The Peace William Strutt



Contrary to Isaiah’s proclamation, there is no such thing as natural evil, as such, because biospheric evolution promotes biological diversity and abundance, even through the rough justice of tooth and claw and parasites and disease. Just as plants directly fix incoming solar energy and animals have evolved to live off their consumption, thus favouring plant diversity by animals evolving to consume the weedy species also aiding plant seed dispersal and promoting fertilisation, so carnivores act to keep the herbivores from boom and bust of pastoral famines, and the Red Queen race of parasites and prey has given rise to organismic sexuality to resist epidemic extinctions, by introducing individual variation, when parthenogenesis is unviable long-term, due to Muller’s ratchet of mutational decay. Inevitably, although with some irony, this has resulted in the dilemma of organismic mortality, but sexual reproduction is the most altruistic form of reproduction conceivable, without which higher species could not have evolved. These all attest to a much wider, wilder reality in nature than any God of righteous order would ordain.

But the above passages are enclosed in emphatic parentheses, by what Christianity claims to be a key prophecy of the coming of Christ, stemming from King David’s father Jesse as a Davidic messiah, consecrating his cosmic destiny:

*And there shall come forth a rod out of the stem of Jesse, and a Branch shall grow out of his roots:
And the spirit of the Lord shall rest upon him, the spirit of wisdom and understanding,
the spirit of counsel and might, the spirit of knowledge and of the fear of the Lord (Isa 11 1-2).*

*They shall not hurt nor destroy in all my holy mountain: for the earth shall be full of the knowledge of the Lord,
as the waters cover the sea. And in that day there shall be a root of Jesse, which shall stand for an ensign of the people;
to it shall the Gentiles seek: and his rest shall be glorious (Isa 11 9-10).*

Taking a step back, we see that one of the most compassionate and harmonious visions of the prophets, claimed to be evidence for the cosmological coming of Christianity, are founded on the root violation of natural diversity.

But the entire edifice of Monotheistic cosmology is set around a false notion of the entire universe and space-time itself as a moral test of *Homo sapiens* as an elite, quasi divine encultured species, in dominion over a brutal nature of tooth and claw that cannot tell good from evil, by a creator deity that then destroys the entire universe in a "Day of Judgment" over the sins of each and every human being to an eternal life of divine pleasure and fulfilment in Heaven or to be cast into the fires of Hell. This is where the religious violation of nature becomes all-encompassing and

diabolical. This entire claim is erroneous because it is in central conflict with the way the natural universe manifests, in which there is no over-weening rule of moral order, but emerges from complexity at the edge of chaos.

Like cultural laws of judgment, the concept that animals do not have “free will” to make astute judgments over their fates to survive and care for their offspring is not a divine law separating humans as elite from animals, but a distorted product of human language and culture and the knowledgable ability of human beings to choose to transgress culturally and religiously ordained doctrine, which other animals do not, despite being subjectively conscious intentional sentient beings, just as we are. This right of autonomous choice, which we humans associate with free will, is also the very foundation of democratic protest and social paradigm change.

Turning to the troubled question of sex as the source of biological immortality in the eternal afterlife, one quoted Jewish opinion, the least divergent from the view of Symbiotic Existential Cosmology, runs thus:

The simple answer, as others have already pointed out, is that there is no sex in heaven because heaven refers to a nonphysical existence and sex is a physical activity. Nevertheless, traditional sources often describe the pleasures of Heaven in corporeal terms. The Zohar, in one passage, says (if I recall correctly) that every night the souls of righteous husbands and wives join together in sexual congress. Traditional Jewish sources indicate that sexual desire is actually rooted in a deeper spiritual drive, and that the pleasure of physical sex is only a pale reflection of the pleasure achieved through fulfilling that true spiritual desire. It is important to understand that "Heaven" actually plays a relatively minor role in the Jewish understanding of the afterlife. The ultimate destiny of the afterlife is the resurrection, when the physical world will be perfected and the righteous will return to eternal physical life in this world. In that world, sexual intercourse will certainly be possible, but the need and desire for physical pleasure will no longer exist.

The Christian view, that in heaven, there is no sex, no children, just winged angels, stems from the Eden account. Although the sabbatical creation of Genesis 1 is by no means the oldest chapter of the Bible and was possibly crafted in the Exile in refuting the Babylonian creation from Tiamat and Marduk, to appease the dictates of Cyrus in accepting the return of the Jews, the Fall from Eden, is ancient, ostensibly written around 950 BCE. In it humanity is implied to have lost our innocent divinity at the hands of Eve heeding the Serpent and persuading Adam to eat the forbidden fruit “to make one wise”. Their loss of innocence, covering their genitals with fig leaves then sets in motion the Fall:

*And I will put enmity between thee and the woman and between thy seed and her seed
it shall bruise thy head and thou shalt bruise his heel
Unto the woman he said I will greatly multiply thy sorrow and thy conception
in sorrow thou shalt bring forth children and thy desire shall be to thy husband and he shall rule over thee
And unto Adam he said Because thou hast hearkened unto the voice of thy wife and hast eaten of the tree
of which I commanded thee saying Thou shalt not eat of it
cursed is the ground for thy sake in sorrow shalt thou eat of it all the days of thy life
Thorns also and thistles shall it bring forth to thee and thou shalt eat the herb of the field
In the sweat of thy face shalt thou eat bread till thou return unto the ground
for out of it wast thou taken for dust thou art and unto dust shalt thou return
And Adam called his wife's name Eve because she was the mother of all living
Unto Adam also and to his wife did the LORD God make coats of skins and clothed them
And the LORD God said Behold the man is become as one of us to know good and evil
and now lest he put forth his hand and take also of the tree of life and eat and live for ever.*

ואיבה ו אשית בינך ובין האשה ובין זרעך ובין זרעה הוא ישופך ראש ואתה תשופנו עקב: ס
אל־האשה אמר הרבה ארבה עצבונך והרנך בעצב תלדי בנים ואל־אישך תשוקתך והוא ימשל־בך: ס
ולאדם אמר כִּי־שמעת לקול אשתך ותאכל מן־העץ אשר
צויתך לאמר לא תאכל ממנו ארורה האדמה בעבורך בעצבון תאכלנה כל ימי חיך:
וקוץ ודרדר תצמיח לך ואכלת את־עשב השדה:
בזעת אפיק תאכל לחם עד שובך אל־האדמה כי ממנה לקחת כִּי־עפר אתה ואל־עפר תשוב:
ויקרא האדם שם אשתו חוה כי הוא היתה אם כל־ח:
ויעש יהוה אלהים לאדם ולאשתו כתנות עור וילבשם: פ
ויאמר ו יהוה אלהים הן האדם היה כאחד ממנו לדעת טוב ורע ועתה
ו פ־ישלח ידו ולקח גם מעץ החיים ואכל וחי לעלם:

This curse of יהוה (Jehovah) has multiple components:

- (1) Enmity between woman and man and their seed ordained by God, invoking sexually-antagonistic co-evolution.
- (2) Biological conception and birth, with women travail in the pains of childbirth.
- (3) Patriarchal domination by the husband over the wife, repressing female reproductive choice.
- (4) Adversarial dominion over nature in conquering the wilderness, in animal husbandry and agriculture.
- (5) Biological mortality – dust to dust.
- (6) Adam names Eve for her fecundity of all life, as the mother of all living, initiating sexual reproduction.
- (7) God clothes them in the tokens of civilisation.

- (8) God admits that good and evil are the products of the gods themselves, who both know good and evil and have immortality, so the Tree of Immortal Life is withheld. Hence nature in Eden was not of itself evil, even from the human pair, neither was it necessarily for sex itself, until they eat the forbidden fruit and had knowledge of transgressing Yahweh's prohibition.

These in themselves constitute a massive frontal attack on natural cosmology. The ultimate conclusion, nevertheless is that natural evil does not exist, but good and evil emerge from culture and religion, due to the loss of biospheric symbiosis in the cultural epoch, in which human cultural psychopathy has no antidote, except by obeying the moral commandments of prescriptive religion. This leaves the actual status of both sexual reproduction and mortality unclarified, and is in effect cursing nature for the link between the two, while it is clear this is the curse of the gods. Sex thus becomes recognised as the source of biological mortality, and woman as the cause of it all, targeted by Augustine as the "devil's gateway".

Jesus is claimed in the Gospels to have identified Eden as the cosmological precursor in rejecting divorce, saying Moses wrote a bill of divorcement "just for the hardness of their hearts":



But from the beginning of the creation God made them male and female. For this cause shall a man leave his father and mother, and cleave to his wife; And they twain shall be one flesh: so then they are no more twain, but one flesh. What therefore God hath joined together, let not man put asunder (Mark 10).

Fig 150e: Christian views of heaven and Hell (see also Memling's "Day of Judgment" fig 209. Top: Christ the Redeemer in Glory with the Heavenly Host Niccolò Circignani Il Pomarancio (1588) and The Pilgrims ascend, (c 1910) from "The Pilgrim's Progress," John Bunyan. Bottom: The Last Judgment - Giovanni da Modena, depicts the fate of Muhammad, bound to a rock in Hell, centre right, being clawed by demons. It has been the subject of a thwarted terror attack. Stairway to heaven "Jacob's Ladder" William Blake.

When they asked him which one of seven brothers who wedded a wife on Earth and died would marry the wife in heaven, Jesus answered: (Matt 22:29):

*Ye do err, not knowing the scriptures,
nor the power of God.*

*For in the resurrection they neither marry, nor are
given in marriage, but are as the
angels of God in heaven.*

*Πλανᾶσθε μὴ εἰδότες τὰς γραφὰς μηδὲ τὴν δύναμιν τοῦ Θεοῦ.
ἐν γὰρ τῇ ἀναστάσει οὔτε γαμοῦσιν οὔτε γαμίζονται ἀλλ' ὡς
ἄγγελοι «θεοῦ» ἐν τῷ οὐρανῷ εἰσιν.*

This results in the notion that there will be no sex in Heaven in the epoch of eternal life, so that people as angels have wings to fly in the "heavens", but do not and cannot be said to have sex, or to reproduce offspring. This becomes a tragic fallacy of divine thinking, because the natural creative process of sexual variation and the evolution of novelty, just as Homo sapiens evolved from the primates, loses all meaning and any explanation. Timeless eternal life in heaven is inconsistent with the temporally elapsing physical universe in which we exist as sentient conscious volitional beings and the biological reality of the biosphere in which humanity coexists. You can neither think, nor experience, let alone pronounce the apocalypse unless time elapses. It is inconceivable for all the organisms born throughout cosmic history to have eternal life, in an imaginary Heaven, as angels dancing on the head of a pin. By contrast the generations of life ARE perennially immortal, through recombinational resilience against mutational entropy. It is fallacious cosmology to envisage that innocent people of all ages, babies to centenarians in their dotage, will go to heaven to become eternal angels of not any given biological age at all, each with wings to fly in the heavens, when we know that outer space is a vacuum where wings provide no lift.

Fig 150f: Timna: Hathor Egyptian period, Phallic Teraphim and 'Nehustan' from Midianite period.

This patriarchal view emerged from an historical Yahwistic Hebrew context, in which circumcision was the required male sacrifice to the abstract male deity, invoking male sexuality itself as the sacred procreational force:



At that time the Lord said unto Joshua, Make thee sharp knives, and circumcise again the children of Israel the second time. And Joshua made him sharp knives, and circumcised the children of Israel at Gibeath Haaraloth – the hill of the foreskins (Joshua 5).

This occurred despite Jewish descent being through the mother, having been so since the time of Laban, when the teraphim or house gods were stolen by Rachel hiding them under her menstrual skirts to found Jacob's patriliney:

Then Laban went out of Leah's tent, and entered into Rachel's tent. Now Rachel had taken the images, and put them in the camel's furniture, and sat upon them. And Laban searched all the tent, but found them not. And she said to her father, Let it not displease my lord that I cannot rise up before thee; for the custom of women is upon me. And he searched, but found not the images (Gen31).

Overthrowing a tolerant phase of Arabic culture, in which in Mecca was a pilgrimage centre for diverse beliefs, Muhammad ordained the smashing of the 360 astral idols, including images of Jesus and Mary, leaving only the black stone, believed to be of astronomical origin in the Ka'aba when there and in the surrounding centres such as Taif, were shrines to the three Goddesses al-Lat, the ancient consort of al-Llah noted in inscriptions in the Sinai desert, along with al-Uzza and Manat, who had figured prominently in Nabatean Edom in the time of Yeshua, were overthrown.

Fig 150g: Top: "The Harem" depicting 72 kohl-eyed houris Thomas Rowlandson and "The Dream of the Believer" Achille Zo.

Allah's Apostle said, "When the Day of Resurrection approaches, the dreams of a believer will hardly fail to come true"
Abu Huraira

Lower: Persian miniatures of houris and the seven layered heaven Jannah dating back to Sumeria and Inanna Goddess of Heaven echoing the 360 astral idols originally in the Ka'aba and the *banat Allah al-Lat*, al-Uzza and Manat, as accounted in the satanic verses (Armstrong 1991 113). By contrast, flesh and blood women, when they go to heaven are said to become houris.



Islam under Muhammad, attempted to solve the dilemma of inconsistency of eternal life with sexual desire and natural reproduction of biological offspring, by focussing on the sexual pleasure of men as an ultimate enticement, turning heavenly femininity into kohl-eyed houris, celestial virgins recreated anew every day, whose bodies were translucent, so you could see right through to the marrow of their bones, but whose vaginas were nevertheless overflowing with lubricious enticing pleasure and delight for men with eternal erections to assuage, especially martyrs. In Islam, heaven is utterly sexy for men, with 72 houris, or black-eyed virgins made pure anew every day:

Everyone will have two wives from the houris, (who will be so beautiful, pure and transparent that) the marrow of the bones of their legs will be seen through the bones and the flesh (Hadith Al Bukhari).

" لَا تَحَاسَدُ، لِكُلِّ امْرِئٍ زَوْجَتَانِ مِنَ الْحُورِ الْعِينِ، يُرَى مَخُّ سَوْقَيْهِنَّ مِنْ وَرَاءِ الْعِظْمِ وَاللَّحْمِ "

Every male admitted into heaven will be given eternal erections and wed to 72 wives, each having libidinous sexual organs (Sunan Ibn Majah):

There is no one whom Allah will admit to Paradise but Allah will marry him to seventy-two wives, two from houris and seventy from his inheritance from the people of Hell, all of whom will have desirable front passages [lubricious vaginas] and he will have a male member that never becomes flaccid (i.e., soft and limp) (Abu Umamah Zuhd).

“ مَا مِنْ أَحَدٍ يَدْخُلُهُ اللَّهُ الْجَنَّةَ إِلَّا زَوَّجَهُ اللَّهُ عَزَّ وَجَلَّ ثِنْتَيْنِ وَسَبْعِينَ زَوْجَةً ثِنْتَيْنِ مِنَ الْخُورِ الْعَيْنِ وَسَبْعِينَ مِنْ مِيرَاثِهِ مِنْ أَهْلِ النَّارِ مَا مِنْهُنَّ وَاحِدَةٌ إِلَّا وَلَهَا قُبُلٌ شَهِيَّةٌ وَلَهُ ذَكَرٌ لَا يَنْتَثِي ”

An old woman came to the messenger of God and asked, O Messenger of God make dua that God grants me entrance into Jannah. The Messenger of God replied, "O Mother, an old woman cannot enter Jannah." That woman started crying and began to leave. The Messenger of God said, "Say to the woman that one will not enter in a state of old age, but God will make all the women of Jannah young virgins. God Most High says, 'Lo! We have created them a (new) creation and made them virgins, lovers, equal in age (Al-Hasan Al-Basri).



“I Don't Want My Husband to Have Heavenly Maidens”, responds to a faithful woman's dilemma, under the banner of a veiled, but seductively adorned, figure:

I have read many hadiths and qur'anic verses regarding that men will be given the hoor al ayn (Heavenly Maidens) in Paradise. I believed that I was going to work on my faith together with my husband and Inshallah we would be together in Jannah. After reading more about the hoor al ayn, I just feel like I want to be single again and so I do not have to worry about meeting my husband in Paradise if I don't have one. It kills me from inside knowing that the one I truly love will be given other women just because of their lust of women. I'm sorry but, aathoobillah, it disgusts me. I always thought there will be no filth in Jannah, and that lust is a feeling of filth, so why will that exist there? Would it be permissible for me to separate from my husband? I feel like if I had no attachment with a spouse, then Inshallah I wouldn't need one in the hereafter.

The female Muslim counsellor Zainab bint Yunus asserts:

The Hoor al-Ayn (heavenly maidens) is merely one small part of the many, many rewards of Jannah. Indeed, each believer who enters Jannah will need only think of what they want, and it will be given to them. We as believing women will receive greater than anything we can imagine in comparison to the heavenly maidens. This thought should bring a great deal of comfort to our hearts. In Islam, sexual desire and feelings of lust are not considered evil or filthy; rather, they are part of our creation, as both men and women, and there is nothing wrong about having such feelings. Ask Allah to ease your heart, to renew your faith in Him, and to make you amongst the people of Jannah – with your husband.

But there are very serious contradictions in this carefully crafted view of Heaven under a male God with seemingly miraculous powers to solve all the glaring contradictions between an avowedly patriarchal religion, in which women are half the value of a man, veiled and in bondage to their male relatives and under pain of death by stoning for any autonomous reproductive choice, while men are granted explicit, unlimited, eternal sexual pleasure, and women are either consigned to be translucent houris, or given unspecified, undocumented substitute rewards.

The foundation contradictions remain. What is the meaning and purpose of unabated male sexual desire to copulate, in an eternal heaven where sexual reproduction no longer occurs? Why not higher conscious experiences of divinity transcending mere sexual infatuation, as occurs in samadhi and agape?

But the destructive anti-nature of the eschatological end-of-days becomes profoundly acute and devastating in the Day of Judgment, where in the Christian Revelation (*apokalypsis*) ἀποκάλυψις of John of Patmos, also accounted in a later section, nature is grossly and needlessly assaulted in a triage of all life after which, the Earth and its biosphere are entirely destroyed:



Fig 150h: The Angel's trumpet calls in Revelation invoke the triage of all living creatures to herald Christ's return:

The first angel sounded, and there followed hail and fire mingled with blood, and they were cast upon the earth: and the third part of trees was burnt up, and all green grass was burnt up.

And the second angel sounded, and as it were a great mountain burning with fire was cast into the sea: and the third part of the sea became blood; And the third part of the creatures which were in the sea, and had life, died; and the third part of the ships were destroyed.

And the third angel sounded, and there fell a great star

from heaven, burning as it were a lamp, and it fell upon the third part of the rivers, and upon the fountains of waters; And the name of the star is called Wormwood

And the fourth angel sounded, and the third part of the sun was smitten, and the third part of the moon, and the third part of the stars; so as the third part of them was darkened, and the day shone not for a third part of it, and the night likewise.

And the fifth angel sounded, and I saw a star fall from heaven unto the earth: and to him was given the key of the bottomless pit. And there came out of the smoke locusts upon the earth: and unto them was given power, as the scorpions of the earth have power. And it was commanded them that they should not hurt the grass of the earth, neither any green thing, neither any tree; but only those men which have not the seal of God in their foreheads.

This might sound like temporary respite at least for the plants, but the destruction doesn't stop there, going on to releasing homicidal plagues of heavenly angels who pour out the vials of the wrath of God upon the Earth, leading to the battles of the Great Whore of Babylon, Ishtar the reviled symbol of female-inspired fornication, and the Beast amid cosmological conflagration and the battles of the forces of light and darkness.



Time itself stands still in absolute eternity:

And the angel which I saw stand upon the sea and upon the earth lifted up his hand to heaven, and swore by him that liveth for ever and ever, who created heaven, and the things that therein are, and the earth, and the things that therein are, and the sea, and the things which are therein, that there should be time no longer (R 10).

Fig 150h2: *"His eyes were as a flame of fire, and on his head were many crowns".* Would you buy a used car from this man?

The avenging Lord of divine justice eventually appears:

And I saw heaven opened, and behold a white horse; and he that sat upon him was called Faithful and True, and in righteousness he doth judge and make war. His eyes were as a flame of fire, and on his head were many crowns; and he had a name written, that no man knew, but he himself. And he was clothed with a vesture dipped in blood: and his name is called The Word of God. And the armies which were

in heaven followed him upon white horses, clothed in fine linen, white and clean. And out of his mouth goeth a sharp sword, that with it he should smite the nations: and he shall rule them with a rod of iron: and he treadeth the winepress of the fierceness and wrath of Almighty God. And he hath on his vesture and on his thigh a name written, KING OF KINGS, AND LORD OF LORDS (R 19).

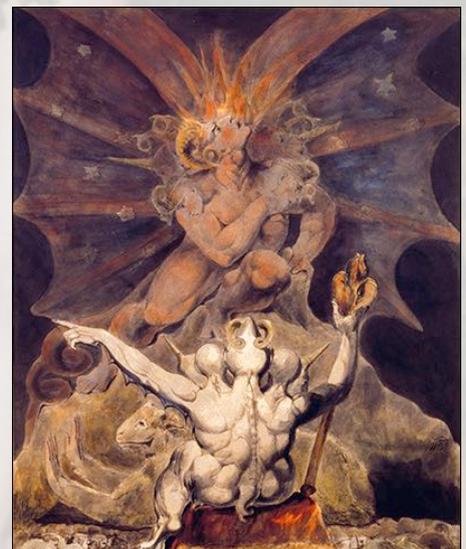
The final Judgment takes place, referring to the book of life shared by many traditions:

And I saw a great white throne, and him that sat on it, from whose face the earth and the heaven fled away; and there was found no place for them. And I saw the dead, small and great, stand before God; and the books were opened: and another book was opened, which is the book of life: and the dead were judged out of those things which were written in the books, according to their works. And the sea gave up the dead which were in it; and death and hell delivered up the dead which were in them: and they were judged every man according to their works. And death and hell were cast into the lake of fire. This is the second death. And whosoever was not found written in the book of life was cast into the lake of fire. (R 20)

Fig 150i: "The number of the beast is 666" William Blake.

All ultimately culminating in the complete destruction of both Heaven and the "late planet" Earth, in favour of a heavenly Jerusalem:

And I saw a new heaven and a new earth: for the first heaven and the first earth were passed away; and there was no more sea. And I John saw the holy city, new Jerusalem, coming down from God out of heaven, prepared as a bride adorned for her husband (R 21).



This itself is a travesty of the Song of Songs, which became in the Hebrew tradition, due to Rabbi Akiva the allegory of YHVH and the Bride Israel, then converted by Pauline Christianity into Christ the Bridegroom and the Church, all of which are a travesty of the ancient Hieros Gamos of sexual fertility.

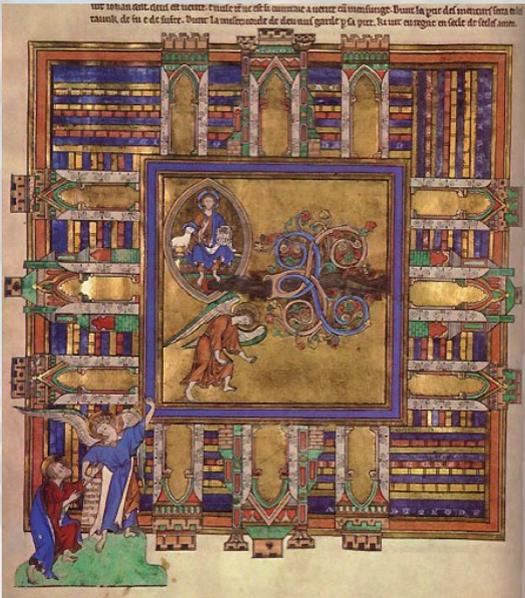


Fig 150j): The Tree of Life in the new Jerusalem with the twelve gates, the throne of the lamb, and the twelve monthly fruit for the healing of the nations conflating the transcendent and the physical into a contradictory fantasy (Heavenly Jerusalem from Apocalypse 13th cent).

There follows no renewed biosphere but just scintillating urbanisation in the form of a heavenly city of Jerusalem. The only remaining evidence of the arboreal verdancy of biodiverse Paradise is a lone tree in the midst of the heavenly city, bearing fruits for the healing of the nations of humanity:

And he shewed me a pure river of water of life, clear as crystal, proceeding out of the throne of God and of the Lamb. In the midst of the street of it, and on either side of the river, was there the tree of life, which bare twelve manner of fruits, and yielded her fruit every month: and the leaves of the tree were for the healing of the nations (R 22).

Thus by implication and scriptural neglect, nature and the biosphere is consigned to the flames of warfare of “good” in the persona of Christ as an avenging “Lord” on a horse against all the

forces of other beliefs such as Ishtar, and the dark fallen angel of Satan, or Iblis or the Beast whose number is 666 χξς in Greek, although in Islam it is 616. The sheer scriptural neglect of nature is starkly highlighted by the failure of John of Patmos to mention what has happened to the diversity of life, mentioning “creature” only once for those in the ocean, and animals not at all except for the locusts of Hell, themselves not natural organisms, the domesticated horses of the apocalypse and the white steed of Christ.

It is clear that the source of an eternal concept of evil in opposition to good arises from religion itself, not nature, or humanity as such. The Origin of Satan, Elaine Pagels (1995) describes the social history, of a multifaceted adversary, running from the Hebrew notion of an angelic messenger of God sent to test and impede, to the War Scroll's dark angel Mastema, created for the pit who rules in darkness, whose purpose is to bring about evil and sin. These accounts make clear how the concept of a war between good and evil is a dark creative product of the religious imagination. Revelation notes a past war in heaven in which Satan was cast into the world that tells of a fundamental schism within divinity itself, into dual polarities of dark and light:

And there was war in heaven: Michael and his angels fought against the dragon; and the dragon fought and his angels, And prevailed not; neither was their place found any more in heaven. And the great dragon was cast out, that old serpent, called the Devil, and Satan, which deceiveth the whole world: he was cast out into the earth, and his angels were cast out with him (R 12).

References to the Day of Judgment in Islam, likewise feature cosmological cataclysm, and death and resurrection of all, with the Muslims succumbing to a cool wind, avoiding the horrors of impending death and destruction of the Earth:

*When is the day of resurrection? So when the sight becomes dazed,
And the moon becomes dark, And the sun and the moon are brought together,
Man shall say on that day: Whither to fly to? By no means! there shall be no
place of refuge! With your Lord alone shall on that day be the place of rest
(Quran 75:6).*

*When the trumpet is blown with a single blast and the earth and the
mountains are lifted up and crushed with a single blow,
then, on that day, the terror shall come to pass, and heaven shall be split
(9:13–16).*

*When the sun shall be darkened, When the stars shall be thrown down
When the seas shall be set boiling, When the souls shall be coupled, ...
When the scrolls shall be unrolled, When heavens shall be stripped off,
When Hell shall be set blazing, When Paradise shall be brought nigh
Then shall a soul know what it has produced (81:1,2,6,7,10-14).*

Fig 150k): War in Heaven. Inset of The Haywain Triptych Hieronymus Bosch



The resurrection then leads to the judgment:

*As for the one who is given his book in his right hand, he will say:
Take and read my book. I knew that I would be called to account.
And he will be in a blissful condition (Q.69:19–21)*

*But as for him who is given his book in his left hand, he will say:
Would that my book had not been given to me
and that I did not know my reckoning! (Q.69:25-26) ...*

Seize him and bind him and expose him to the burning Fire!(Q.69:30-31

But Islamic Heaven rather than the Heavenly city is a cultivated Edenic garden paradise, with fountains and plants but nothing like the wilderness of natural living diversity. The Quran suggests there are grapevines, date-palms and pomegranate trees in Paradise, and many others, but these are cultivated fruit-bearing plants that lack thorns:

There will be a success [Paradise], gardens and grape yards [78:31-32] In them [both will be fruits, date palms and pomegranates [55:68]. In them be every kind of fruit in pairs" [55:52] Among thornless lote-trees, among Talh trees with fruits piled one above another, In shade long-extended, By water flowing constantly, And fruit in plenty [56:27-32] Reclining upon the couches lined with silk brocade, and the fruits of the two Gardens will be near at hand [55:54].



Fig 150l: A Mindanaoan Muslim Buraq.

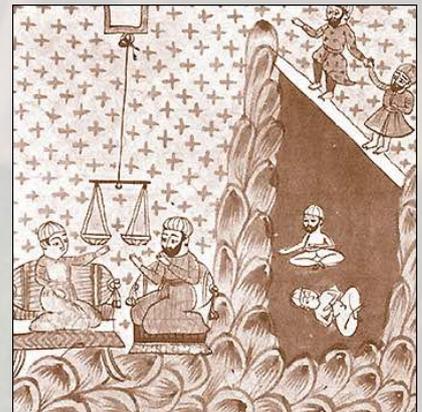
A scattering of real and fictional animals such as the winged Buraq (that figured in the journey from Mecca to Jerusalem and up through the heavens and back by night) and the hoopoe hat brought new to Solomon about Bilquis the Queen of Sheba, are also mentioned in the Quran in Paradise. In terms of their place in the earthly hierarchy, animals are mentioned with humans and jinn. On the day of reckoning, all creatures will rise up and have justice for any wrong that was done to them, including animals.

However, only humans and jinn will be judged on their actions and go on to the afterlife. Animals are viewed as creatures that are deemed to be in a state of constant worship and do not have free will. Like cultural laws of judgment, this concept is not divine, but a product of language and culture and the knowledgeable ability of humans to choose to transgress culturally ordained doctrine, which other animals do not, despite being subjectively conscious intentional sentient beings, just as we are.

Ideas of the afterlife evolved through cultural and religious interaction, from a common place of the dead into binary visions of good and evil – Heaven and Hell. The original Hebrew view of the afterlife was Sheol שְׁאוֹל an underworld place of darkness and gloom, the great rendezvous of all the tribes and families, where all the dead lay, sharing features of Greek Hades and the Babylonian Arallû, which gradually evolved into separate compartments for the good and bad (Pearson 1938) . In the time of the Kings, Gehenna became a hell, in which the wicked were tormented with fire, named after Gehinnom גֵּי הִינּוֹם the valley surrounding old Jerusalem and the site of the Tophet תּוֹפֵת, where some kings of Judah were believed to have sacrificed their children by fire. It is noted in the Talmud as a place of purification, rather than eternal damnation, after which one is released from further torture.

The end of days notion of a Day of Judgment involving the alternate fates of Heaven and Hell was first pictured by Zoroaster as the cleansing fire of Ahura Mazda burning out the ignorance of Angra Mainyu in our first full model of the nature-violating hell fire and damnation later pictured in apocalyptic scenarios, from Revelation to the Quran. The paradise of Zoroastrianism is attained the fourth day after death by crossing the Bridge of the Separator, which widens when the righteous approach it. The righteous soul crosses the bridge and is met by a beautiful maiden who is the physical and feminine embodiment of all his good works on Earth. He is then escorted into the House of Song to await the Last Day.

Fig 150m: Zoroastrian Chinvat Bridge and the Judgment. Yazidism, a religion having roots in Iranic pre-Zoroastrian religion whose population Islamic state attempted to commit genocide upon, also cites an actual Silat bridge in Lalish that leads to the most holy Yazidi shrine. It symbolizes the connection and crossing over from the profane earthly world to the sacred, esoteric world. As in Zoroastrianism, the Silat Bridge in will also play a role at the end of times in Yazidism (Kreyenbroek 2005 39).



On this day, everyone will be purified and live in a new world absent of evil and full of youthful rejoicing. But for the less than righteous, the bridge turns on its side and becomes like a razor. The god Mithra is there with a scale to balance the good and evil deeds done during one's lifetime, and if evil deeds prevail, then the soul is tormented by an old hag before it falls off the bridge into a hell of purification worse than Dante's inferno, portrayed in the Vision of Arda Viraf.

Islamic traditions share the concept of Hell (Jahannam) with its seven enclosing gates, the record of deeds, the weighing of the soul, and the test-bridge, which widens for the righteous but narrows to a knife-edge for sinners so they all in the fire. al-Llah (in his mercy) reserves the power to save those whom he wills and to look favourably upon those for whom Muhammad intercedes. He has fixed a limit to the suffering of believers who have sinned either through past human ill deeds, by acts or the emotional afflictions caused and vice versa. However, for unbelievers, who refuse to acknowledge their Creator, there is no hope of final redemption from the fire.

However note carefully that, like the Jewish view, the Zoroastrian hell was only a temporary state before one became purified and entered the paradisiacal realm, so although the fires of purification were gruesome in the extreme, the idea of eternal damnation is a perversion of the entire purification concept. Like Upanishadic and Buddhist traditions, Zoroastrianism seeks integration of the psyche through purification of faults, not eternal damnation.

Reincarnation is the evolutionarily-preposterous idea that the souls of humans and animals as well are reincarnated intact in another sentient being – in metempsychosis – the transmigration of the soul. In Buddhism it is the ego grasping at life which causes reincarnation, rather than the soul or self (atman). This means the progression of the psyche, supposedly towards enlightenment, is in root conflict with the natural diversity of life, and its biological evolution as we now know it to be 2,500 years later. Reincarnation cosmology is a mistaken consequence of the difficulty of achieving true enlightenment and is as inconsistent with both empirical biology and natural evolution, as is creationism and its offspring intelligent design.

There are four factors predisposing to negative karma: (1) very few people gain enlightenment in a given lifetime, (2) religion laments endless ego suffering, (3) humanity is threatening its own survival through our selfishness and exploitation of nature and (4) Vedic religions invoke the cumulative descent into the Kali Yuga, or Samvartakalpa. This gives karma a negative entropic influence, weighing down an organism's capacity to survive due to negative factors, both in their inner constitutions and environmental circumstances. This becomes a tragic error of conception that raises a huge question over the permanence of the eternal soul in all religious traditions. Of course you might consider that the plants are giving us such good karma for keeping us alive using solar radiation, but being reborn as a plant? Here the sublime becomes the ridiculous.



Fig 150n: The Cycle of Birth and Death – Jadurani Dasi
Human and human-animal reincarnation.

The very notion of karma as an actual reality would thus place a huge moral drag on the evolutionary process, because an organism becomes unable to optimally adapt to and survive in the existing environment due to causal competition by past karmic factors putting a brake on reproductive and survival strategies, mutation and natural selection. It is also misappropriating nature as the generator of conscious life in favour of spiritual elitism over life itself.

It is particularly easy to see how Eastern religions, in which cosmic consciousness is perceived as transcendent over material nature, will perceive

the soul, as the conscious continuum dominant over the natural living body. But the view is also shared by Orphic religion and Platonic philosophy, so it pervades Western thought as well, an idea also shared by Nietzsche, Schopenhauer and Kurt Gödel. Such transformations have an ancient heritage in animism, where everything is alive

and human and animal identities are frequently exchanged. Many of the San trickster heroes such as Kaggen are thieranthropes that physically transform between human and animal.

Consequently, because of the continuity of rebirth and the intactness of the soul, there is no barrier to humans being reincarnated as animals and vice versa. Moreover your supposed identity is just a shell an exchangeable garment, so you are not even a human but just an eternal avatar, or in Buddhism a recycling ego grasping at life. A human who is lazy may be born as a sloth but the unique features of their soul remain latent until a later lifetime:

Reincarnation is a theory central to the religious practice or spiritual beliefs of millions around the world. We often hear stories of people remembering their past lives, but usually they tell of previous lives as humans. In some cases however, there are instances in which a person remembers stories of their past life as animal. When we realise that we have been born countless times, in various human and non-human forms we can begin to develop compassion within our minds and appreciate all forms of life to a greater degree. This leads to a harmonious relationship with various sentient beings, and the environment in which we all live (Tsem Rinpoche).

Reincarnation between humans and animals is thus not just confined to Eastern religions such as Vedanta, Buddhism and Jainism, but was shared by ancient Greeks including Pythagoras, Empedocles, and Plato. In “Dumb Beasts and Dead Philosophers” Catherine Osborne (2007 43-62) explores how moral claims can become counted as true, and how they can be discovered or acquired. Was Aristotle right to see continuity in the psychological functions of animal and human souls? The question cannot be settled without taking a moral stance:

Souls of individuals circulate (or transmigrate) from body to body, and can reappear in the bodies of other creatures. Since the soul remains the same (the same individual) from one life to the next, this has the consequence that the soul of animal x (say, my current dog) is the same individual soul as the soul of human being y (say, my deceased grandfather, or William Shakespeare). So long as there are no constraints on who can become what, it seems that we can then generalize and say that all dog souls are potentially human souls, and so are all worm souls, all frog souls, and all wasp souls. It is not just the ugly toad that might be your handsome prince in disguise. ... A Pythagorean could consistently maintain that the soul is essentially the same soul, retaining all the fully developed human capacities, even though in its present condition, reincarnated as, say, a worm or a bird, it is unable to display the latent characteristics it possesses. And it follows that to claim that the similarity between species lies in the soul rather than the body allows for a far more radical identity between human and animal souls, a similarity that is not conned to minimal stimulus response or pain sensation of the sort often invoked in modern attempts to include the beasts in the same moral sphere as human beings.

But this idea is completely at odds with the principles of biological evolution and physical cosmology itself, where it subsumes the act of birth, impeding new innovation, just as creationism does. It leads to counterfactual conclusions about the population of sentient beings in the universe. What IS a sentient being? Where does a colony of cells end and an organism begin? It would have disastrous consequences if it were true. The entire conservatism of species evolution based on our genomes depends on dogs giving birth to dogs, perhaps with a few tiny mutations, not sharks, humans or worms. The number of insects on earth vastly outnumber the mammals. The number of bacteria are inestimable. There are no reasonable boundaries where such a process would begin. If worms, why not amoebae, bacteria, or viruses, or even molecules? It is clear that reincarnation is a morally invoked philosophy that files in the face of all observational empirical evidence, based on treating sentient beings as simply conscious entities having no grounding in biological or genetic identity.

It is a condescending insult to the sanctity of biological life for human religious and cultural traditions to impose a false moral cosmology that treats animals as inferior karmic conditions of existence, with the same intrinsic flaws as Monotheistic dominion over nature, by divinely ordained human beings. Such beliefs are utterly damaging to the integrity of the biosphere and the key role it plays in ensuring human survival.

(9) Naturality versus Spirituality

Jesus said, "If those who lead you say to you, 'See, the kingdom is in the sky,' then the birds of the sky will precede you. If they say to you, 'It is in the sea,' then the fish will precede you. Rather, the kingdom is inside of you, and it is outside of you. When you come to know yourselves, then you will become known, and you will realize that it is you who are the sons of the living father. (Gosp. Thomas 3)

'His disciples said to him, "When will the kingdom come?" Jesus said, "It will not come by waiting for it. It will not be a matter of saying 'here it is' or 'there it is'. Rather, the kingdom of the father is spread out upon the earth, and men do not see it.'" (Gosp. of Thomas (113)

Taken in the context of Symbiotic Existential Cosmology, Jesus is saying:

(a) (i) life is enlightened in all the species and their symbiotic biospheric niches, (ii) existence is both subjectively conscious and physically real and (iii) it is we who are the enlightened ones too if we just come know ourselves and

(b) the physical reality is the enlightened paradisiacal kingdom lying before us, not an illusory heaven.

It's to do with integrating conscious experience and the natural world, not a transcendent spiritual realm. This is the opposite of Vedanta because it recognises the species are distinct, not just conscious sentient beings. Even the Upanishad of the Great Forest just uses nature as a backdrop for samadhi. I don't accept the "Father" notion, but the crux is that natural existence and the diversity of life comes first – **primero uno – prima facie** – not a human renunciation tower of elite inner mental states like zeno's paradox, heading to turtles all the way up, as Vedanta does.

I am forced to preach this, like I'm standing on the last shore of Earth which is where I precisely am in the antipodes, because no one in this techno-industrial world of AI thinking is even remotely concerned about dumb animals or biodiversity preservation and would just as rather have a neural networked cartoon reality than protecting life itself.

John Kineman: I think I hear what you are concerned about - a natural spirituality where there is, aside from all our striving, nothing more to gain than a genuine and aware life as a full experience itself, without the need or possibility of a "better place" in heaven. That better place is right here with better understanding, is that a fair summary?

Your reply was only about the human quest and natural existence in the living universe as opposed to imaginary religious heavens and eternal life, but the preservation of life and other living beings appears to have become absent entirely. I don't see how ethics can have any meaning unless we can be awash in the flux of life and feel what we are doing for life as a whole is right for life as a whole. That's enlightenment in action, not a paradise just for ourselves as some begrudging acceptance of physical reality, still adhering to human supremacy in dominion over nature.

Note that I said life is already enlightened in all the species and their symbiotic biospheric niches. That brought me back to what distinguishes human cultural "intelligence" from conscious life as a whole. All mammal brains have evolved to deal with irreducible uncertainty in survival in their environmental existential crisis state. The only species that is not in its biospheric niche is humanity, because our niche has undergone such excessive reconstruction that we have become technological culture. Now there's a reason for this. The bodies of every other species are streamlined ecologically, to be fit for purpose, so dolphins, no matter how smart, have only fins and their culture is sexual and their actions apex predatory swimmers. Elephants have no fingers just stout stump feet and have a super proboscis but it can't write or use a laptop. All apex predators are phenotypically streamlined for purpose and the herbivores too.

So the overwhelming conclusion is that primates have two unique evolutionary inventions as I have mentioned. **Firstly** fingers and opposable thumbs and **secondly** referential alarm calls that are species and context specific and need to be vocalised accurately. Human culture arose from these two unique adaptations that go all the way back to the lemurs, but humans are the only large ape species that have retained finely tuned vocalisations. Existence is universally semantic. A mother puma teaches her young by semantic example hunting while they watch. All mammals and smart birds have this generalised semantic sense and finely tuned vocalisation is an intrinsically semantic affair as Vervet monkeys demonstrate, while the other great apes can mount only rough grunts and chutzpah cries.

So what we have become is a product of runaway memetic cultural feedback results of these two bodily attributes that are not a product of superior human intelligence but the reverse they caused it – human cultural intelligence is a peacock's tail red queen race between culture and nature as a result of fiddling fingers and referential alarm calls forming a gigantic resonating memetic feedback process that became human social culture and then, from the poison arrow head and the wheel, to chemical and industrial technology and then the internet and AI. We are the victims of a reverberating echo chamber of viral memetic culture, so now we are surrounded by machines rather than living organisms and are trying to recreate the spiritual One to unite us all to find our way back to Eden, while our culture is biospherically unsustainable, propagating itself in pastimes from the wild animal markets and bushmeat trade, to mutually assured nuclear destruction and climate and habitat crisis. This is a Fermi catastrophe death wish.

Thus there is no excuse for calling any well-adapted mammal or bird a dumb animal, lesser than elite human culture. A mouse has as good a cortical neuronal count ratio to its whole brain neuronal count as a human and a far higher cortical neuronal count to brain volume, despite its smooth cortex, so it is in principle as intelligent as a human except for overall size, but then it has eight times as many pyramidal cells in the same volume of tissue. Birds like parrots and song birds have about a five-fold higher pallium neuronal count for size than equivalent mammals including humans.

We see these animals as dumb because they don't have a cultural language like us, but that's because they are highly adapted to their biospheric niche. There is no point to ethics or morality, if it is just a recipe for human species elitism even if it feels okay and certainly not if it is based on rational thought alone.

Now what's the acid test of all this? A thing I think is key is that the emphasis in both Vedanta and all religio-spiritual accounts in the "scriptures" including Monotheism aren't reality itself, but just a cultural description of what men have thought might be "reality". You may choose to extol them as higher knowledge, or the wisdom of the saints and sages, but they are not natural accounts, or accounts of untrammelled nature, but accounts of the disconnected human psyche caught up in the feedback loop of cultural reification, perceiving deep spiritual reality in elite human conscious states extrapolated onto the universe as a whole, as God and cosmic consciousness. But you can't substitute the description of reality, which may seem to be essential wisdom, for reality itself.

No greater illusion can you have than thinking the Vedas are an ultimate source of reality, when we know they are above all a cultural description, not reality itself. They are no closer to reality than a physicalist description of neural network activity is. By reading them as trusted sources of wisdom and insight, we are simply confessing to our inability to submerge ourselves in the deep wilderness and know ourselves as the cosmos knows us. This is simply applying the acid test of true naturalness. Anything that we can primarily identify as cultural is part of our cultural peacock's tail. We can't assume scriptures are trusted sources, or the true intimations of divinity, because they are deeply biased by the shimmering tail of culture. Elite spirituality is thus intrinsically flawed and obviously so. Before we can understand any of the superficial descriptions of reality, like the scriptures, we need to plunge ourselves deeply into the wilderness of conscious experience beyond all towns and countries, not clutch at the straws of wisdom in the literature for want of personal knowing. Only then can we come back and reappraise the scriptures and see them as they are with their own unique mix of the knowledge of other peoples' experiential journeys of discovery and know how near or far they actually are from the natural condition that is emergent from the cosmos itself and is ultimate reality in the raw.

This applies to all utopian visions, from the noosphere, which lays claim to a spiritual ascendancy of thought over nature and life itself, to all technological utopias, in which artificial or hybrid intelligence is conceived as the future of cosmic intelligence and the foundation of existence. If any such notion invokes deprecation of the evolving biological biosphere and is founded on cultural notions per se it needs to be assessed accurately for what it is and found wanting from the wilderness perspective. We can't even begin this quest unless we submerge ourselves so deeply in the flow that we are totally and completely engulfed.

The first and hardest acid test is simply to rescue biodiversity back from the brink of mass extinction. That's the ethic of conscious survival. It's not altruistic, it's mutual and it's necessary. I don't see we have any kind of "optional" cultural ethics about this. This is the problem of "the Kingdom lies before us but men do not see it" in full cultural technicolour.

John: I don't see how bio-naturalism in SEC addresses the influence of consciousness on nature or its role in nature.

Chris: Nature is consciousness incarnate in living diversity. What you call "bio-naturalism" is the responsibility to life we inherit by realising this. We cannot be enlightened unless we take full personal responsibility as the conscious sentient guardians of life for who and what we are as a species, because otherwise we are psychopaths and our culture will self-destruct. Life has risen to climax in biospheric symbiosis, in which diversity is the key to fertile fecundity. We emerged in a biosphere where life thrived because animals were eating plants and carnivores were eating herbivores and diseases were raging when species over-reproduced. Without the diversity that arises from evolution at the edge of chaos, humanity would never have evolved. So for every second of this incarnate existence we need to protect, not just conscious life, but the genetic and phenotypic diversity that preserves it in future.

Subjectivity is coeval with the cosmic origin so may manifest in natural phenomena like storms and all life. How can we tell a hurricane is not subjectively aware since we can't even experience one another's private conscious experiences? But full sentient consciousness as we know it emerged in the eucaryote endosymbiosis, which is the second great becoming after the origin of life itself, when the cell membrane became freed for sentient edge of chaos excitability. Life is not just a molecular accident that made RNA and organismic "robots". The symmetry-broken forces of nature are the mandala that is the true Veda. Physics is the sacred law that shows us in biology how we consciously arose and what our ultimate role and responsibilities to life as a whole are in the universe. This is the full cosmic Mahayana, not the spiritual hinayana. Full consciousness is a living property of eucaryote cells that rises to conscious sentience in us through intimate social coupling of neurons and neuroglia as resonating social cellular systems a billion years later. The

way molecular biogenesis and living evolution work is as a fractal climax of the four forces of nature interactively rising to consummation. It is the climax and pinnacle of natural cosmology and life is the holy grail of consciousness, so that the entire universe can become aware and know itself as we also are known of ourselves.

We do have an existential role and that is to protect the living diversity of life as a whole. It's not ethics, it's the joyous cosmology of existence. Until I can say *prima facie* and get a cognisant response, we are still at ground zero from here to there. That's why I said I was standing a lone voice on the last shore of Earth!

John: So, you are saying the highest ethic is diversity. Indeed ecologists have made this argument, but it is hard to support in any absolute sense, i.e., as the primary value. Diversity has increased and decreased without human involvement. There is probably a floating optimum diversity for some arbitrary measure of biosphere function at any given state of the biosphere, but not a general goal of increasing, decreasing, or stable diversity. The idea of diversity as a universal, "*prima facie*" value of life was popular in the 70's but that turns out to be relative along with every other natural value. The thing is humans are doing the valuation -- nature seems happy with whatever state it is in and any status has multiple possible futures. The core ideas in the Vedas and Upanishads are looking for the deepest principles having discovered that all values based on form are relative. Thus Maya. Going beyond any measure of good or bad state or form, Veda concludes that the main principle in material existence must be cycles.

Chris: Nature is not "happy" in the state it is currently in, of an impending human caused mass extinction, already causing acute stresses. I'm not supporting diversity in an absolute sense, but as a core cosmological process becoming our realisation. Yes biodiversity is neither constant nor is it a simple rising exponential like the human delusion of the GNP. But all the previous serious reductions in diversity were astronomical or tectonic mass extinctions. They weren't because life was "happy" to suffer a mass extinction. Individual organisms are simply striving to reproduce and care for their young in an uncertain perilous world. You can't turn a blind eye to the sixth mass extinction by humanity, by claiming *samadhi* shows everything is relative (*maya*) and that things just go up and down karmically in cycles.

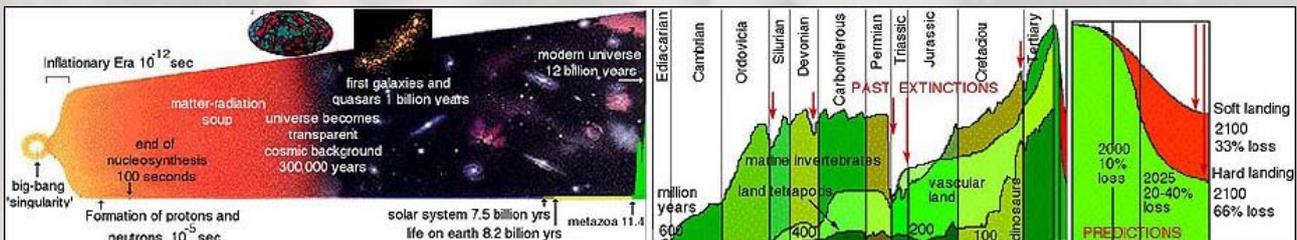


Fig 150o: The solar system formed 4.57 bya ago and Life on Earth has existed for 3.5 bya, but the chemical elements required multiple previous supernovae go back some 10 bya in a universe of some 13.5 bya. There have been five catastrophic mass extinctions due to astronomical and tectonic crises which take millions of years to recover from. A sixth is happening as we speak.

Saying as an elite human ecologist that life doesn't care if it lives or dies is expedient negligence. You know that life on Earth has taken a good quarter of the universe's lifetime and had to be preceded by multiple supernova events to generate the atomic diversity of the Oort Cloud, going back some 8-10 bya in all. Every significant decline is a mass extinction and we are already committing an awful near-Fermi extinction as we speak. To say nature seems happy with whatever state it is in is elite cultural condescension. How is nature supposed to respond? Tell that to a mother lioness who is trying to teach her cubs to hunt and not starve! Are the lions supposed to weep and gnash their teeth? You know the answer in full crisis. The weeds, rodents and parasitic fungi take over and the biosphere darkens and makes fragile human culture unliveable. But you are pretending that climax diversity in paradise on the cosmic equator is not even a cosmological reality, so you need to refresh your cosmological world view in the fractal biogenesis in [figure 1](#). Yes it transcends all the pretensions of spiritual ethics just as the edge of chaos transcends the universal good.

John: Your description of *edge of chaos* in mathematics and neuroscience gives me some clues to your view. But the ontology is still very weak. Chaos, like all other metrics, are descriptions or models, and as such they will never measure experience itself. Only a meta-level can describe it, but still not have it. So my question is why the metrical view of chaos should be thought to tell us anything at all about ethical and moral dimensions.

Chris: It's not the metrical view of chaos at issue, its the edge of chaos as a cosmological principle and it's a definitive counter-example to the ethical and moral delusion of a benign rule of order in Vedantic and religious belief and it IS cosmic-ontology: **Being exists at the edge of chaos**, not in a hypothetical regime of benign or imposed spiritual order.

It's manifested in cosmic inflation as the source of symmetry-breaking into an expanding universe, in the cosmic web, in galactic gas clouds and astronomical collisions, the molecular dance of biogenesis as a far from equilibrium dissipative system dependent on chemical gradients and solar radiation, permeates mutational evolution, again dependent of free energy through fermentation, respiration and photosynthesis, and is the crest of neurodynamic consciousness in environmental and existential uncertainty. The **ontology of being arises from the edge of chaos**. Order is by its dynamic nature tyrannical and leads to stasis and extinction – even cyclical regimes of order have annihilating attractors. The remaining asteroids have chaotic orbits lacking resonances with those of the other planets, because those that did have periodic mode-locking all suffered astronomical collisions. Yes the edge of chaos is a description of reality, but so is science and the Vedas and all scripture too. We need to learn from and respect the edge of chaos cosmology of life, not assert a priori that the Vedas say it all comes around in oppressive cycles of divine order, any more than the stark division into heaven and hell of Monotheism.

The forces of nature predispose the universe to interactive climax through their non-linear charge dynamics just like the non-linear simple deterministic examples of the Lorenz flow, resulting in the butterfly effect, but in a hugely more overwhelming quantum molecular process. Biogenesis happens as a far from equilibrium dissipative system and all life flows from it on the same basis. We are “negentropic” organisms by virtue of free energy sources. We don't and can't impose order on the chaotic entropic universe, because it's cutting off the hand that feeds us life. We have to accept that all life's processes are dissipative edge of chaos phenomena and that's how life and conscious life can come into being and continue to exist. Hence pure spirituality seeking the rule of order is hubris.

We can imagine that human activity is a force for order, making controllable technology and industry that seems to tame the wilderness, but it's all hubris of the most foolish kind. If we take the entire flux of assumed order-inducing human activities on the planet, including industrial manufacture and the silicon revolution, they are completely offset by a huge increase in entropy from fossil fuel burning that cannot be sustained. Even solar and wind technology are simply robbing the biosphere directly or indirectly of its radiant energy sources which matters less but is still a rort. So the whole delusion is a house of cards and it certainly doesn't establish an example of order constraining the laws of nature.

Life is a non-equilibrium quantum molecular dynamical system at the edge of chaos. The plants are complex far from equilibrium living “solar panels” generating glucose, so they grow in fractal scale, but they don't impose order on chaos. All animal species act to reduce order, either by eating plants, or other animals. Fungi stand in the middle, coopting parasitic and saprophytic roles. Bacteria, archaea and protista likewise. Nowhere do you find any meta-causalities imposing order on an otherwise chaotic universe. Life works within and with the existential milieu. There is some sense in the notion of autopoiesis as an abstraction of homeostasis that describes how the organism evades death and entropic decay teleologically, so you can elucidate the ways in which life accrues entropy reduction from free energy to enable organismic survival. But none of it is order imposed on chaos.

If you look at the information content of the human genome of 3×10^9 base pairs, it is a vanishing fraction of the complexity of the 10^{10} neurons with 10^{15} synaptic connections. Embryogenesis from the zygote to the organism is an exercise in utilising edge of chaos to bootstrap the fractal complexity of the human organism. You can trace this in some detail but a lot of it remains mysterious because it uses all the principles of symmetry-breaking that the standard model of physics can induce, from the two-cell stage on. It's a fallacy to imagine that genetic coding specifies brain structure. What we know is that waves of cellular migration by neurotransmitter type pass through the cortex each giving rise to successive symmetry-breaking that organises the five to six layers of the cortex by some 100 neuronal types. Many of these, like the 5HT1a neurons, still play a key role in cortical activation and inhibition of consciousness. The process completes before birth in chaotic neurodynamic excitations, working from the sensory organs, backwards through the thalamic ganglia to the cortex, that enable the networks to develop a sense of “community” functionality.

So I'm trying patiently and gently to nudge you all to completely let go of your delusions of spirituality as ultimate transcendent order because it is unsustainable in the universe in which we consciously exist and a deleterious soft-sell for doctrinal oppression at the next stage.

Yesterday I picked up the 2022 edition of Patrick McNamara's “Cognitive Neuroscience of Religious Experience”. What is signal about this is that he is a staunch supporter of religion in the brain and has previously been disparaging about psychedelic mystical experiences. Suddenly this edition has a full chapter on psychedelics which is an excellent

overview ending focusing on psychedelic "entity" experiences, which may be sourced in him having had a DMT experience. These entities are in many forms the equivalent of my meeting with Brahman that evoked SEC as an inspirational response. Now what is pivotal is that I experienced Brahman both as ultimate reality and as an Ishvara-like semi-divine entity. Claiming Nirguna Brahman is the featureless source and Saguna is the manifest secondary aspect, is fundamentalistic twaddle. The vision is just a divine vision and that's it. It is corrupt and wrong of the rishis to have a samadhi where at great effort, they touch the edge of this overwhelming phenomenon and then claim the universe is made by cosmic consciousness, or that moral karma pervades the universe, or that divine order rules, or that it will all end in annihilation until the new cycle in a universe doomed to spiritual groundhog day.

The reality is we are and have become through our biospheric dominance, the cosmological guardians of the generations of life who have lost our way in religious fixation and spiritual and utopian capitalistic laissez-faire pretensions. We need to (1) experience each vision with no presumptions and (2) save the future diversity of life from our own destruction so that future generations can know and experience this ultimate joyous cosmology unfolding.

John: Writing this response was difficult. It is a very complex issue and treacherous territory. You should know first that I am a strong conservationist, even having risked my life in Africa in active wildlife protection and conservation efforts. I support a Gaia worldview and advocate for animal rights, having had a number of conversations with Jane Goodall and Mark Beckoff. We are indeed in the 6th and most rapid mass extinction event in known history of the Earth.

The total numbers nearing 40-50% species loss have not yet exceeded prior natural extinctions, but the rate of loss is much greater than previous extinction events, and projections are clearly dire. This is the first unnatural extinction event, caused by human activity. So, again, in technical terms, nature has seen it before, but we haven't as a global society. Globally, 50% of the usable land has been converted to human use. We've doubled fixed nitrogen inputs exceeding natural use capacity and creating dead zones. We've doubled CO2 inputs creating a climate crisis and global range shifts that affect all natural populations as well as agriculture - our own food supply. So we do now have controlling interest of the Earth Corporation. The Wild Foundation has a program advocating for "Nature Needs Half", since most measures of human dominance (biodiversity loss, land use conversion, CO2 inputs, fixed nitrogen inputs, etc.) have us on a 50:50 par with nature.

Even ecologists don't have a simple answer, although many think they do. The Vedic / Deep Ecology view is that there really isn't a line between human and natural, thus we have to manage both by the same principles, derived from a deep introspection of who we are first, and therefore projecting that backwards into evolution to understand what nature is. That is not an anthropomorphic exercise, it is being informed by the unique view we have into the Self that each living creature has of its own. It is our only way of studying and understanding that aspect of existence. So, I think my initial reaction was that these things are not about what nature wants, they are about what we should want. It has to be linked to human values both to recognize the problem and to find the solution, because other measures are inadequate and can be ignored. I think to be an advocate of living nature we need to work on the human mind to correct our perceived separation from nature. Nature will find a balance with human activity. It's the human species that isn't behaving adaptively. So let's learn from nature.

I also believe in spiritual values that emerge in natural life, populations, and ecosystems. Each natural system has an essence that can be felt; what I would say is a sacredness that emerges from complex system qualities, not numbers. I think it emerges mainly with time that a system has had to develop complex internal relations, for example, an old growth forest. There was one in Hawaii I used to stop at returning from work. I could get a sense of eternity instantly there - it was palpable. Spirituality is always associated with a sense of the eternal, and that's what emerges when nature is allowed to evolve its complexity. What is spiritual and what is worldly? Spiritual is called "real" by some, but what is meant is eternal. The world is temporal. I also think other creatures sense this internal difference as part of their identity, as we do but certainly differently. I think all creatures have some sense of the eternal, that it even figures in their health and prosperity. Just because it is more-so with us doesn't mean we can deny it for other species. So I think that is the aspect we need to respect and protect. The other measures will follow. Maybe the Jains go too far, but they make a point. Still, this sense of the eternal, the divine; it is transcendent. The material presence of life probably builds toward manifestation of eternal qualities if not disturbed. But along the way it endures all manner of setbacks and change, affording no material outcome as a reliable indicator of health and wellbeing except to let it take

a natural course. The thing is we can't let nature take a natural course unless we do also — we're too involved. I think we have to re-learn from nature what it means to be fully human. The needed study is of the human condition.

Chris: That's a great account of the dilemma of the biosphere and I agree with you in all the intricate details of the problem and of course I agree wholeheartedly with you in your closing statement. So let's move on to deal with what it means to be fully human. Some of this I have covered before but I am setting it into the record now, because in writing it as a coherent biodiversity record, I discovered several things about it that explain karmic events including how biospheric jihad arose through the AP article below.

First before engaging the treacherous territory of biodiversity conservation, let me engage with what I would call **naturalistic spirituality** which I hold to be the **true spirituality** of living existence, not contrived by Vedic scripture or intimations of omniscient and omnipotent godly rule, not cultural morality designed to control human folly, but immanent and transcendent nature. I critique only **pure spirituality** as an anthropomorphic cultural delusion of human ascendance over nature, **not spirituality itself**.

We take a step back to the late 1980s, when I was doing mushrooms in the Opuhi meeting house. This is a wild and beautiful wilderness peninsula we bought together, but NZ is a nation-wide problem for all native species because Aotearoa was even more isolated than Madagascar and Australia and had only lizards and birds and a great eagle as apex predator, the largest raptor on Earth, that the Maoris killed off early on. Consequently every feral animal, including stoats, possums, rats, cats and dogs can wipe out our native birds, particularly our most iconic species the kiwi, which is a voracious feeder with a long neck and bill. In addition, NZ is one of the most farmed lands on Earth, so the North Island has lost the vast majority of its great Kauri forests to the lumber trade and they are now subject to an imported lethal parasite Our land was a last bastion of nature on the coast of the Coromandel and we still hear kiwis, but for the last 30 years we fear we are hearing their last call, despite poison baits, possum and stoat traps and banning dogs. One unassuming dog in Northland managed to wipe out 500 tagged kiwis in a nature reserve at a sitting because one chomp on their neck crushes their lungs and they suffocate. What is extremely frustrating is that attempts to erect a possum barrier cross the tip of our peninsula has been met with vehement resistance from the farming and hunting lobby, poison drops are opposed as well even though they are helping the native species and Buddhists feel unable to control feral animals because vermin are simply conscious sentient beings with no distinction from the kiwis, so they don't protect the native species.

One moonlit night I had a vision that goes as follows. Here's the song: **Elohim**

*We are living ... on the open road
and we are carrying ... such a heavy load.
The arms of destiny ... are open in despair,
cause man is killing the creatures ... and poisoning the air.*

*We are whispering ... across the heavens
and all the creatures ... they echo in reply.*

*We are the very blood ... of the tree of life.
We are the void and the shining light.*

*We are the eternal gypsy spirits of the universe.
We have been here since it all began.
We will outlast its final passing.
We are here to free the heart of man.*

Now this is clearly related to what you are talking about when you say "spirituality". It is clearly about the eternal, from alpha to omega, and it saying that we are somehow all eternal spirit beings on an endless journey and that all of life is consciously sensitive to this as we are as conscious human beings. And it's saying exactly what you are saying about liberating humanity in freeing the heart of man.

But there is a paradox here. In the mushroom state I am an avatar and what I am experiencing is a vision that is telepathically aware with all life that has ever existed and will ever exist in future everywhere all at once, as a kind of "Fourier hologram of all souls" and I am one of them here incarnating, as I lie in the long grass among the crickets in the moonlight, listening to the waves breaking on the shore far below. No matter how ephemeral and transient mortal life is, somehow this is the quintessence that is the healing of all existential angst. To know this is to stand beyond the mortal coil and know that whatever, forever this is the joyous cosmology of eternal existence.

But the beautiful thing is that I can experience this as a state of inspired grace without having to say "I saw the face of God" or that this is the Gospel you have to believe, to have faith, or that Brahman or Vishnu pre-conceived it all, because its just the nature of naturalistic spiritual reality to see, know and experience these astounding things, and to invoke the words and sing it with one's haunting heart and soul and later make a production out of it with my son

Heath to give expression to it. It doesn't have to become religious doctrine because any time we want, we can go back into the visionary state and know this again and maybe in quite a different way. That's the divine luxury of the visionary condition. It's what Aldous Huxley tried to express in *Island* as an equally apocalyptic tale of downfall.

Note also there is no "megaGod" ruling this "spiritual realm" with a rod of adamant. It is we who are the avatars visiting the incarnate condition to bring the universe alive. We don't need to claim it's all a dream of Vishnu or that the universe was made by un-manifest Nirguna Brahman. We are already the deities and can take life as it comes. We don't need to talk about sin or the day of judgment, or moral causality because we ARE the spirits on the journey of awakening existence.

Now you came to the 1992 Rio convention quoting chatGPT "*The Earth Summit held in Rio de Janeiro in 1992 was a pivotal moment for global biodiversity conservation. At this summit, the Convention on Biological Diversity (CBD) was opened for signature, marking a global commitment to conserve biological diversity, promote sustainable use of its components, and ensure the fair and equitable sharing of benefits arising from genetic resources.*"

Now that's not quite what happened, because the US failed to ratify it and never has since and still stands as merely an associate member, because of the desire to own the natural genomes of planet Earth for US capital exploitation in a tragedy of the commons you also referred to in Garret Hardin's work.

So on 19th July 2001 to mark the near decade of non-compliance I [posted on Yahoo](#) the lyrics to another much more dreadful ditty "Jihad The Song of the Biosphere" disquietingly sung in odd fives ... in a descending refrain like the Delphic oracle brooding over poison laurel, in which the sins of the father GHW Bush in failing to ratify Rio were visited on the son GW Bush in failing to ratify Kyoto. This was utterly karmic arising directly out of an [AP posting in the local newspaper](#), so it isn't some hideous twist of my own deranged psyche.

The Hollywood Syndrome - Is the US the Global Satan ? Associated Press/NZ Herald Jun 2001 MAYBE George W. Bush has done the world a favour. When he renounced the Kyoto treaty on greenhouse emissions (because it would hurt America) he helped to peel away the mask of sanity from Uncle Sam, revealing him for what he is, in all his savagery and nonchalance a glutton and a psychopath. **Forget the Taleban, Gaddafi or the beastly Saddam Hussein, it is the United States that is out of control the wildest rogue nation of all.**

Here is an excerpt of the lyrics:

*You tell us tales of hollywood
of star wars and the common good
you told us global warming
was a litany of lies
factory chimneys were the prize*

*you claim all living creatures are your intellectual property
you fail to ratify every treaty, which doesn't give you more
have I heard this all before?*

*when it comes to the final struggle
jihad of the biosphere
there's only one true rogue nation
the great American shaitan
big brother, you are Uncle Sam.*

*walking in the twilight down in the valley of shadows
when will you comprehend
the damage you have wrought ... in your indiscretion?*

*can we undo the death trance you have set in motion?
will you discover the fabric of love that ignites us?
can we embrace the ocean of life that unites us?
all our lives long this journey has been our destination
if we get this one wrong
will there be any chance for restoration
if we waste the last shoreline
can there be any way to resurrection?*

*can we touch the sky?
can we fly so high
we'll pass right to the other side
and never fall in flames?
will we ever be the same again?*

*we'll become the living soul
the primal source the shining goal
the beginning and the end of life
the happiness and the pain
[can we bear it all again?](#)*

Then 55 days later, on the 11th Sep 2001 at 1 am, as I prepared to go to bed, we all sit up transfixed watching in real time, the very events of the jet liners passing right to the other side of the WTC towers and falling in flames. Suddenly the song had become a dark prophecy of the genocide in New York, walking in the twilight valley of shadows of the smoke and ashes of the devastation, and the painful recovery process in the "fabric of love that unites us", capped off with "can we bear it all again?" anticipating the then mayor of New York saying "the number of casualties will be more than any of us can bear". Even more disquieting "we'll become the primal source the shining goal" as if the narrator IS

the terrorist seeking the face of al-Llah, as if my "spirit" has ranged over all the collective consciousness the event evoked, with the driving force of the rhythm dulcimer evoking the cruising planes' arrival at ground zero, all locked ultimately into the impending mass extinction of the biodiversity of planet Earth caused by human folly.

Here is the video version of the song: [Jihad: Song of the Biosphere](#)

If you have the patience to watch it in full you will also see all the implications of Israel and Palestine today echoing out of the second intifada, showing today's plight continues.

Next we come to the writing of [Symbiotic Existential Cosmology](#), which is equally karmic.

I had stopped taking mushrooms for seven years because I was long sighted and had acute closed angle glaucoma, which can explode one's eyeballs overnight and had been causing me to become half-blinded when psychedelics dilated my pupils, stopping the flow of fluid in the eyeball from escaping. But then I was given a complete lens replacement in both eyes, which corrected the condition, so to find the answer to life, the universe and everything I took a half-dose of quality dried mushrooms that I grow myself, when needed, from spores.

This encounter adds another completely new dimension to the spiritual vision quest. I meditate and fall down into the epiphany of being like a jewelled chamber and there in the midst of it is Brahman both as ultimate reality and as the avatar persona engaging me, just as in a near death experience telepathically informing me that I must go back into my incarnation and save life throughout the universe, because, without mortal life caught incarnate in flagrante delicto in the centre of the cyclone of reality, Brahman is as vulnerable as I am because without mortal sentient beings to witness their presence the eternal 'Elohim are just as vulnerable as self-doomed humanity if the diversity of evolving life is allowed to be seriously depleted or liquidated, just as we cannot be sure the physical universe itself can exist without conscious observers of it, so it is not just life on the biosphere of Earth, or the human species that depends on it, but the entire cosmos that is at stake as Brian Cox warned on BBC ver the climate crisis that the extinction of life on Earth might rob the galaxy of its meaning.

There are whole dimensional layers to this experience. Firstly it is a confirmation of what psychedelic researchers call "entities" or supernatural agents (SAs) which are visionary agents having a sense of veridical agency, just like other people we meet in waking life. They are not imagined or imaginary and veridically possess all the tokens of autonomous agency and personality.

Tagliazucchi et al. (2016) found that the DMN, salience and FPN or fronto-parietal executive function network and the thalamus showed increased global connectivity under the drug but decreased within-network integrity. The increase in global connectivity observed under LSD correlated with subjective reports of ego dissolution. The authors suggested that increased cross talk between DMN, salience and FPN, when these individual networks are not functioning normally, could blur boundaries between self and world in such a way as to lead to ego dissolution, mystical experiences and the experience of SAs. ... The SA was considered to be a conscious being (96 percent), intelligent (96 percent), benevolent (78 percent), sacred (70 percent) and had agency in the world (54 percent). Most respondents believed that the SA was absolutely real, not hallucinated, with 72 percent believing that the entity continued to exist after their encounter. It is the nature of such quantum change experiences that the reality continues long after the experience as a definitive encounter.

So these are not just hallucinations while religious or pure spiritual experiences are real. In fact one can assert that they are more real both experientially and because they present new confounding insights that contradict or unravel pre-conceived religious and scriptural assumptions. They are an experience of true moksha outside our incarnations accessible to all, just as the Huichol traverse the nierika portal to the realm of the spirit ancestors.

There are also profound spiritual and religious paradigm shifts involved. Central here is that eternal Brahman is declaring with the utmost compassion: (a) that the mortal coil is the centre of the cyclone of reality, because, unlike the spirit realm it is both physical and conscious. (b) That mortal conscious existence is a/the central phenomenon of existence, not an imaginary spiritual heaven or cosmic mind making the universe. (c) That the solution to our existential dilemma and the meaning of existence is right here and now in the universe in which we consciously exist, to save and flower life in all its dimensions and assist the unfolding of a deeper and deeper biospheric consciousness so that the universe can come fully alive and aware of its own divinity. (d) That it is because we are organismically mortal sexual beings that we are making this journey of grace in our incarnations to heal the universe, and because we can't take it with us when we go, all the problems of egotism dissolve and rather than renunciation of living existence

as Buddhism teaches, we achieve this by embracing life to the full in full integration with life as a whole as compassionate avatars of existence.

This is why we are mortally sexual and have to be so, for complex sentient life to exist in the entropic universe, and no matter what our hopes and intimations of eternal immortality might be, we can fulfil these in our vision quests because through the biospheric sacraments, we are also the spiritual avatars of reality, so that any one of us could pronounce the Kingdom that lies before us but men do not see it, although the birds and fish precede us.

It is **not** the Vedas, **nor** is it Monotheism, but a radical transformation of the traditions to bring life to the very centre of the holy grail of existence. It doesn't assert that God or the cosmic mind made the universe but accepts physical reality and conscious existence as they are found empirically to be, while providing an avenue to true enlightenment biospherically through the living sacraments that are themselves and affirmation of the sacramental path that founded both the Vedas and the Christian sacramental tradition of soma and sangre.

This isn't just a second best option to religious heaven to have to live in the mortal coil, it is how the avatars of the cosmos come into being in biological participation, so that existential reality can exist and come into being more and more fully in the great consummation of Paradise on the cosmic equator in space-time.

There is no greater Mahyana than this, because it accepts and flows intimately with life as a whole, rather than renouncing it and shares all its ecstasy, joy, redemption, pain, suffering and annihilation in naked lunch in ultimate reality on the lawn of time and celebrates all its offspring throughout our generations forever.

So the consequence of this moksha epiphany that formed Symbiotic Existential Cosmology as a thing already conceived in the few moments of my meeting with Brahman like Fred Hoyle's story of "The Black Cloud" trying to inform humanity at light-speed the true nature of existence at such a pace that no human mind could take it in without blowing a fuse, going into convulsions and keeling over is the true spirituality of nature itself.

To me there is no case to answer, about whether or how to save the diversity of life. It's a visionary sine qua non. It pulses in every vein in my body and issues from the pores in my skin and the very prana, vitality or psyche that I breathe. We must protect the diversity of life, as a whole, not just so that humanity will survive in the biosphere, so that the conscious universe can flower on Earth over evolutionary time scales in which forms of consciousness we have not yet conceived can come into being. I must communicate this far and wide like mushroom spores. We are not the end of the road. Apocalypse is the covers being thrown off reality in the unveiling of scientific, psychedelic, sexual and spiritual revolution that is us finding our true calling to protect life in its natural diversity so that new experiences new life forms and new forms of cosmic consciousness can emerge.

The search for meaning in existence IS the vision quest and its resolution is natural existence, not a religious imaginary hegemony, nor a fragile technological utopia, which robs the Earth of its evolutionary fecundity for all time and leaves the tattered ashes of a Fermi self-extinction, or a whimpering hinayana of weeds, vermin and diseases amid a hothouse climate that could become like Venus, beautiful to behold in the night sky, but a deathly realm of acidic lightning storms and unliveable scorching wastes.

*I am lord of two ways. I am master of up and down.
I am as a man who is a new man, with new limbs and life,
and the light of the Morning Star in his eyes.
And I, I am on the threshold. I am stepping across the border.*

The central initiative to save humanity and the biosphere from a human-induced Fermi self-extinction needs to be articulated as a quantum change of heart and mind, which also has an integral spiritual value and is the true meaning of life, the universe and everything. This needs to be the primary sacrosanct objective of human culture, as a cultural, economic and ecological necessity. The principal catalytic arena of this process has to arise from a dedicated group of people conveying their certainty that this is the core issue causing our existential crisis and spreading the certainty to others that this is a win-win that is the only way forward that is consistent with our own long-term survival and the survival of our blue-green planet as we know it.

We are heading at near light-speed to a mass extinction of life. Wild species biomass has been reduced to a level inconsistent with evolutionary survival and species extinction rates are already apocalyptic on time scales of a good 50 millions years, taking us back long before humanity existed. Greenspoon et al. (2023) conclude that all wild land mammals alive today now have a total mass of only 22m tonnes. Humanity now weighs in at a total of around 390m tonnes. Domesticated species, such as sheep and cattle, in addition to other hangers-on such as urban rodents, add a further 630m tonnes. Thus as of 2023 all wild land mammals represent only $22/(390+630)=0.02$ or 2%. The figure has risen from 22.5 to 46 times from 2018. This is simply unsustainable and is not even taking into account endangered and vulnerable species with already low populations. Human induced zoonotic diseases including both covid-19 and the fungal plague wiping out amphibians worldwide are becoming a burgeoning risk to ourselves and all species on Earth.

We are failing to keep species essential to humanity in a robust genetic and ecological state. Both crop and horticultural plants and domesticated animals are selected for productivity rather than genetic robustness. Hyper-productive monoculture is the central basis of productivity. Many plant crops are either cloned, fast growing hybrids or increasingly genetically engineered. Many have become divorced from their natural habitats, which have in turn been all but erased by habitat exploitation. Fruit and vegetable species are increasingly seedless and lacking their wild disease resistance and nutritional value. Domestic animal species are selectively bred to the point where they are unable to cope in the wild. Rare species of medicinal or exotic dietary value are hunted to near extinction.

The future evolution of humanity and our ability to survive as a species is lethally uncoupled from biospheric survival. The interaction of climate, habitat and biodiversity, needs to be understood as a single interactive crisis coupled to lose-lose futures for human economics, health and survival. Arresting climate crisis requires biodiversity and particularly forest conservation to be a primary sine qua non of survivability to avoid desertification of the great tropical rainforest basins as well as the bordering savannahs and great agricultural grasslands. In turn, stabilising climate crisis is essential so that major biomes don't become pushed beyond their sustainable climate and expire.

1. The future of "intelligence" is confounded by an inability to understand the difference between machine "intelligence" and biological consciousness. This leaves human society conceptually naked and critically vulnerable to AI takeover, by successive waves of unemployment while humans themselves are being selected for "hive mind" rather than retaining their natural species autonomy. AI is not self-generating as all externally designed and manufactured mechanistic processes are, but is reducing the autonomy of human culture to slave-like dependence as we speak.
2. Cultural utopias are dystopias which are constitutionally fragile to instability and prone to multiple forms of Fermi self-extinction, from over-exploitation, crises disrupting fragile food supply lines, warfare and economic boom and bust, let alone acute climate crisis, mass biospheric extinction, and mutually assured nuclear holocaust. Cultural evolution is memetic rather than genetic and has no long-term conservation principles, by comparison with cumulative genetic evolution.
3. Human genetic evolution is driven by unsustainable cultural forces, such as male control of the female reproductive choice supporting human super-intelligence. Prescriptive religions are systematically out-reproducing unaffiliated populations, and social dynamics generally do not support astute reproductive choice abetting and optimising human evolution. Notions of a splitting between a genetically enhanced or engineered elite and a disadvantaged proletariat in a hand-maid's tale scenario are not viable futures.
4. We stand at the threshold of true enlightenment, thanks both to meditative traditions and the biospheric sacraments, but full enlightenment is rare to anecdotally apocryphal. If we are not already "there" in terms of human enlightenment, we need to have some concept of the human evolutionary future in terms of super-intelligence and the value and meaning of conscious existence, including the visionary state, which we don't currently have articulated.
5. Therefore we need to preserve biospheric diversity, not for diversity's sake itself but to ensure the Earth's biosphere remains able to respond to astronomical, tectonic and human-induced crises which could cause a mass extinction in which the megafauna and *Homo sapiens* would be prime victims, because of inherent cultural fragility and loss of our survival skills in the wilderness.

6. Central is preserving a third to half the Earth's habitats in as close to a wilderness state as possible, given local populations. Vast areas need to be dedicated and human populations encouraged, taught and compensated for adapting to live with living diversity, without exploiting vulnerable species beyond their natural limits.

7. A backstop position needs to be preserving those species which have the genomes to evolve into cultural species in future. For example the founding prosimians existed through the mass extinction that wiped out the dinosaurs. The most "primitive" primates are the wet-nosed strepsirrhines, consisting of the lemurs of Madagascar, galagos (bushbabies), pottos from Africa, and lorises from India and southeast Asia. Many of the species living today are endangered due to habitat destruction, hunting for bushmeat, and live capture for the exotic pet trade. Strepsirrhines are behaviourally diverse, although all are primarily arboreal (tree-dwelling). In the warmer Eocene there were many species which have become extinct, in our cooler climates, so they could diversify in a warmer world heading back toward Eocene temperatures provided we protect them now. The sister dry-nosed group of haplorhines, including Tarsiers are also targets. Otherwise, in a cataclysmic planetary crisis, we are back to rats and mice.

8. A world agreement is essential to decommission all nuclear weapons, with ballistic missile technology devoted to avoiding astronomical impacts. A strategy for protecting against a lethal nearby supernova irradiation events also needs to be enacted.

Chris: Can humanity exist without the biosphere?

 **ChatGPT:** No, humanity cannot exist without the biosphere. The biosphere encompasses all living organisms on Earth and the environments in which they live, including the atmosphere, hydrosphere (water bodies), lithosphere (solid earth), and the interactions between them.

Humanity depends on the biosphere for essential resources such as clean air, water, food, and raw materials. Additionally, the biosphere regulates Earth's climate and provides ecosystem services like pollination, nutrient cycling, and waste decomposition, which are crucial for human well-being.

If the biosphere were to collapse or significantly degrade, it would lead to catastrophic consequences for humanity. Without the biosphere's support systems, human survival would be severely compromised, making it impossible for humanity to exist in its current form. Therefore, it's vital to recognize the interconnectedness between humans and the biosphere and work towards sustainable practices to protect and preserve it.

John: I agree with ChatGPT's response. So, we both think humans should respect and protect nature, and I presume we both do that to the best of our ability at any given time. My point was it is already in the hands of every individual but not everyone makes that choice, not enough, in fact, because the result is still accelerating extinction and degradation of ecosystem health. Other than education, including moral education (not preaching), I don't know what can persuade more people and institutions to take it seriously. CIRES, where I am still affiliated, has been at the forefront of climate change research and policy, including IPCC membership, obviously giving the warning. But the science is still being soft pedalled by "stakeholders" who have made a different choice driving us into the crisis. We don't know how to fix the biosphere, we can't directly change people's minds, and as Garret Hardin said there is no known technical solution. Education and experience (perhaps harsh experience if we don't learn from education) are the only ways we learn, right? But I want to be optimistic and believe there is some knowledge or experience that will turn the tide. Even a long-shot "hypothetical" idea [like informatics] seems better than none at all, although I don't know that either, it's just what I can do.

Chris: What is the difference between this AI strategy causing mass collateral injury and death in Gaza and using phosgene and chlorine in the First World War, or bombing Hiroshima and Nagasaki in the Second? The difference is not about morality or Israel or Hamas, but as you say the difference between biological consciousness and machine intelligence.

John: Your second question is also well posed. Where is the boundary? In these prior examples, whether it counts as evil or not, the decision was human. If one only looks at results, that doesn't matter. But I actually agree with your previous statement that all of it comes down to personal choice and accountability (and thankfully for those who choose to be accountable to their own higher awareness). So that's the difference. It isn't a decision that should be

made by anything but an intuitive human being because at the very least humans are accountable to themselves. AI is not. There is moral accountability at least for that one person even if insulated from social scrutiny. Personal responsibility is the key, I think. Is that not also your view?

(10) The Evolution of Creationism and the Religious War of Evangelical Christianity against Evolutionary Science

Eugenie Scott (2009) notes the gradual evolution of Christian ideas of creation from existing philosophical ideas:

From Aristotle came a view of nature that focused not only on form but also on function. Aristotle wrote of the purpose of nature: why something existed, not just what form it took. The rain falls to make the grass grow. Deer have long legs to run away from predators. These ideas also influenced Christian theology: humans exist because they had been created by God to worship God. Explaining something by its purpose is known as teleology.

Reflecting his view of immutable forms, Aristotle classified plants and animals in terms of kinds of organisms that could be ranked in a linear "great chain of being," or "scale of nature" (scala naturae). This essentialist view fits very comfortably with the Christian doctrine of special creationism. ... The doctrine of special creationism incorporated these Greek ideas—the hierarchical ordering of nature and of design and purpose—and included the Christian idea of an omnipotent, omniscient creator who stood outside of nature. In the theology of special creationism, God created the universe at one time (taking six days in the most common view, although, as discussed in chapter 3, gap creationism considered two special creations) in essentially its present form. God created living things as we see them today for a particular environment and way of life. God also created stars and galaxies as we see them, and the planet Earth as we see it today, as the home of human beings and the creatures over which we have been given dominion and stewardship.

Many Christians and Jews had been considering the idea of the creation history as an allegory (instead of historical) long before the development of Darwin's theory of evolution. For example, Philo, whose works were taken up by early Church writers, wrote that it would be a mistake to think that creation happened in six days, or in any set amount of time. Augustine of the late fourth century who was also a former neoplatonist argued that everything in the universe was created by God at the same moment in time (and not in six days as a literal reading of the Book of Genesis would seem to require).

Scott (1998) notes that for most of European history, educated people blended the Christian and Greek views and concluded that the world was stable and largely unchanging, however with the discovery of the New World contradictions emerged:

The conception of nature as stable—and known—was troubled by the European discovery and exploration of North and South America and Oceania from about 1500 to 1800. The age of exploration exposed Europeans to huge unknown natural areas. Even if Columbus died thinking he had discovered a route to the Orient, it soon became clear to others that the animals, plants, people, and geological features he had encountered were truly from the New World.

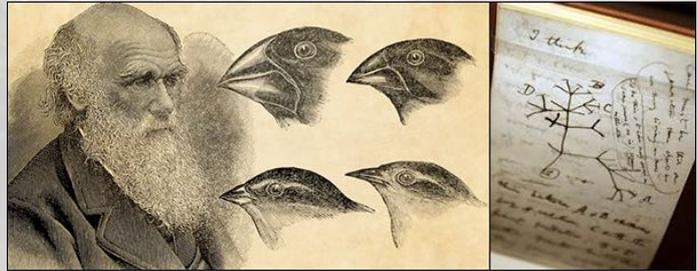
In 1665, Isaac La Peyrère produced the first version of gap creationism, proposing an explanation for these newly discovered peoples that was compatible with the Bible. He proposed that Genesis records two creations, the first being described in Genesis 1, and the second—the Adam and Eve creation—in Genesis 2. Native Americans, Polynesians, Australian Aborigines, and anyone else not specifically mentioned in the Bible were descendants of the first, or preadamite, creation. The preadamites were also the source of Cain's wife—solving another theological problem. In the second, Adamic creation, Genesis 2 and following, God created anew, and Adam and Eve were the progenitors of the more familiar human beings in Europe, Asia, and Africa. Unfortunately, this theological view generated problems of its own, raising the issue of whether preadamites were innocent of original sin. Presumably so—as they were unrelated to Adam—but then, were they in need of salvation by Jesus?

An appreciation also grew for the nature of geological processes such as sedimentation and erosion; the understanding that nature was dynamic rather than static began to grow as knowledge of the natural world – from geology as well as biology – increased through the 1700s and 1800s.

Ronald Numbers (1998) notes Darwin himself citing Creationists only a day after the publication of "Origin of Species":

When Charles Darwin published On the Origin of Species in 1859, the term "creationist" commonly designated a person who believed in the special creation of a soul for each human fetus, as opposed to a traducianist, who believed the souls of children were inherited from their parents. ... Nevertheless, just one day after the Origin of Species appeared, Darwin employed the creationist label to refer to opponents of evolution. "What a joke it would be" he wrote to Thomas Huxley "if I pat you on the back as you attack some immovable creationist". In 1873, Asa Gray published an article in The Nation saying a "special creationist" who held that species "were supernaturally originated just as they are, by the very terms of his doctrine places them out of the reach of scientific explanation" and in 1880 he briefly contrasted Darwinism with "direct creationism".

Fig 151: Darwin's tree of life from his notebook was vestigial, but his observational science, including that of his Galapagos finches was superb.



Fairbanks (2020) notes that Darwin had no access to Mendel's experiments confirming heredity, although they were contemporaries:

Mendel and Darwin were contemporaries, yet the path connecting them during their lifetimes was entirely a one-way street: Mendel was familiar with Darwin's books, having read and annotated German translations of them, whereas all available evidence indicates that Darwin knew nothing of Mendel.

This meant that Darwin had a fallacious idea of how heredity occurred although it didn't affect the validity of his findings and theory:

Darwin himself favored a blending type of inheritance in which particles (which he called gemmules) from all parts of the parents' bodies would flow to the reproductive organs, where they would be blended and passed on to offspring. But natural selection could not be combined with blending inheritance or various models on which acquired characteristics are inherited because such mechanisms would reduce genetic variation each generation (Scott 2009).

The effect of Darwin's discovery was to face the highly evolved diversity of Christian denominations with an existential crisis over the dilemma of how far to concede the natural evidence of both geology and biological evolution and how much to resist it in fundamentalistic terms. Robin Dunbar's (2022) research on the continual schismatic splitting of religious denominations around the sociobiological realities of human trust and belonging thus becomes the underlying theme for the evolution of Creationism, just as it has for religion as a whole. This spells out two important features of the Creationist movement: (1) It is reactive to a prior scientific discovery after the fact and (2) Although it claims to an older religious tradition, the evolved forms of Creationism today all date from ideas developed after Darwin which are thus newer kids on the block and cannot lay claim to ancient mandates.

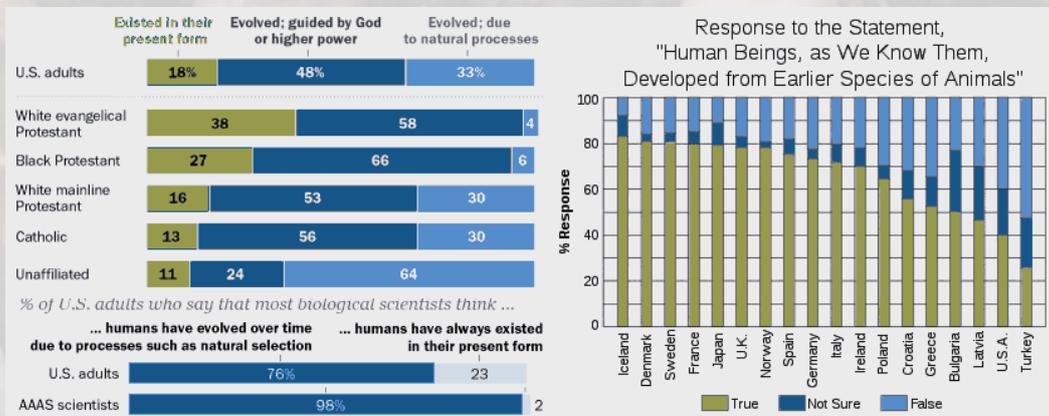


Fig 152: Left 2017 Pew Research on US views of evolution. Right: Acceptance of evolution is diminished in the US where evangelical groups wield partisan political influence over democracy 2008 (see Hecht 2006).

Indeed Creationism, as a Christian concept is not shared by Jewish people who also founded the Sabbatical Creation, but tend towards a dual reading of science and scripture: For Orthodox Jews who seek to reconcile discrepancies between science and the creation myths in the Bible, the notion that science and the Bible should even be reconciled through traditional scientific means is questioned. To these groups, science is as true as the Torah and if there seems to be a problem, epistemological limits are to blame for apparently irreconcilable points. Reform Judaism does not take the Torah as a literal text, but rather as a symbolic or open-ended work. Aviezer (2010) and Slifkin (2006) for example, publish on the subject of Torah and science allowing for divine guidance within an evolutionary paradigm.

Main-line Protestants and the Catholic Church have reconciled modern science with their faith in Creation through forms of theistic evolution which hold that God purposefully created through the laws of nature, and accept evolution. Some groups call their belief evolutionary creationism.

This means that a majority of Christians accept evolution. A 2017 poll by Pew Research found that 62% of Americans believe humans have evolved over time and 34% of Americans believe humans and other living things have existed in their present form since the beginning of time. Another 2017 Gallup creationism survey found that 38% of adults in the United States inclined to the view that "God created humans in their present form at one time within the last 10,000 years" when asked for their views on the origin and development of human beings, which Gallup noted was the lowest level in 35 years. Given the fact that Pew research in 2017 also found that over 80% of people in the US identified as Christians, this majority also applies to Christians in particular.

A theory of theistic evolution (TE) – also called evolutionary creation – proposes that God's method of creation was to cleverly design a universe in which everything would naturally evolve. Usually the "evolution" in "theistic evolution" means Total Evolution – astronomical evolution (to form galaxies, solar systems,...) and geological evolution (to form the earth's geology) plus chemical evolution (to form the first life) and biological evolution (for the development of life) – but it can refer only to biological evolution.

Some scientists and many theologians, consider science and religion to be two compatible and complementary fields, with authorities in distinct areas of human experience, so-called non-overlapping magisteria, in which they see ultimate origins and meaning being addressed by religion, but favour verifiable scientific explanations of natural phenomena over those of creationist beliefs.

However evangelical movements staunchly resisted, as Numbers (1998) details:

In 1899 Dawson, the last major nineteenth century scientist to defend special creation died. ... About the only Americans left debating the merits of special creation were conservative, often evangelical Christians. In the early 1920s the most concerned critics of human evolution launched a movement to eradicate the offending belief from the churches and schools of America. But throughout the so-called "Fundamentalist Controversy" their goal remained the elimination of evolution, not the promotion of a particular doctrine of creation. ... Evangelicals had still reached no consensus about the correct reading of genesis 1 although even the most conservative commentators had come to terms with the antiquity of life on Earth and a deluge of local or geologically superficial significance.

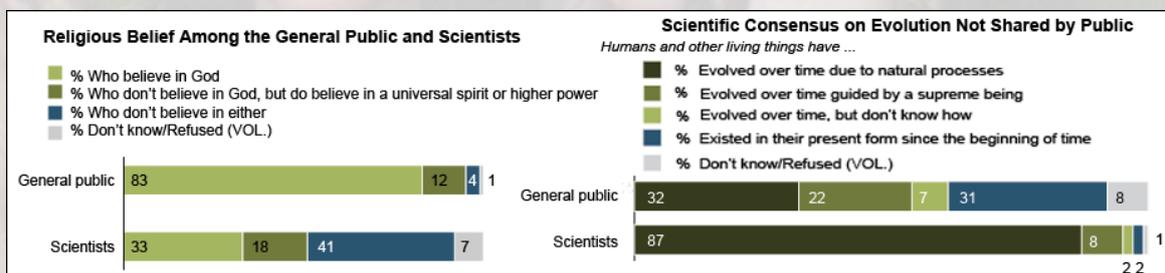


Fig 152b: 2009 Pew research. Left: In the US 83% of the general public believes in God and 95% in God or a higher power. By contrast among scientists only 33% believe in God and a bare majority of 51% in God or a higher power. Right: 87% of scientists contend natural evolution resulted in humans and another 8% allow for some divine influence, and only 2% believe in creation, while among the general public only 32% believe in natural evolution and 31% believe humans were created as is in 2009 whereas only 18% did by 2017 (above). Clearly a scientific education and experience convinces people that natural evolution is real and the general public's view is driven by both religious belief and lack of scientific experience.

The Scopes Trial, formally *The State of Tennessee v. John Thomas Scopes*, and commonly referred to as the Scopes Monkey Trial, was a 2025 American legal case in which a high school teacher, John T. Scopes, was accused of violating Tennessee's Butler Act, which had made it unlawful to teach human evolution in any state-funded school. Scopes was unsure whether he had ever actually taught evolution, but he incriminated himself deliberately so the case could have a defendant. Scopes was found guilty and was fined \$100 (equivalent to \$1,500 in 2021), but the verdict was overturned on a technicality. The trial revealed a growing chasm in American Christianity and two ways of finding truth, one "biblical" and one "evolutionist". Author David Goetz writes that the majority of Christians denounced evolution at the time. The trial publicised the Fundamentalist–Modernist controversy, which set Modernists, who said evolution was not inconsistent with religion, against Fundamentalists, who said the Word of God as revealed in the Bible took priority over all human knowledge. The case was thus seen both as a theological contest and as a trial on whether evolution should be taught in schools. The trial escalated the political and legal conflict in which strict creationists and scientists struggled over the teaching of evolution in Arizona and California science classes.

Since then, like all forms of cultural evolution, Creationism has evolved into diverse, and partially conflicting forms, often in reaction to resistance in the courts to fundamentalism and disguising religious doctrines as science:

1. **Young Earth creationists** believe that God created the Earth within the last ten thousand years, with a literalist interpretation of the Genesis creation narrative, within the approximate time-frame of biblical genealogies. Most young Earth creationists believe that the universe has a similar age as the Earth.

2 **Old Earth creationism** holds that the physical universe was created by God, but that the creation event described in the Book of Genesis is to be taken figuratively. This group generally believes that the age of the universe and the age of the Earth are as described by astronomers and geologists, but that details of modern evolutionary theory are questionable, and comes in several types:

- (a) **Gap creationism** posits that the creation period, as described in the Book of Genesis, involved six literal 24-hour days, but that there was a gap of time between two distinct creations in the first and the second verses of Genesis, which the theory states explains many scientific observations, including the age of the Earth.
- (b) **Day-age creationism** is a metaphorical interpretation of the creation accounts in Genesis. It holds that the six days referred to in the Genesis account of creation are not ordinary 24-hour days, but are much longer periods (from thousands to billions of years). The Genesis account is then reconciled with the age of the Earth. Proponents of the day-age theory can be found among both theistic evolutionists, who accept the scientific consensus on evolution, and progressive creationists, who reject it.
- (c) **Progressive creationism** is the religious belief that God created new forms of life gradually over a period of hundreds of millions of years. As a form of old Earth creationism, it accepts mainstream geological and cosmological estimates for the age of the Earth, some tenets of biology such as microevolution as well as archaeology to make its case. In this view creation occurred in rapid bursts in which all "kinds" of plants and animals appear in stages lasting millions of years. The bursts are followed by periods of stasis or equilibrium to accommodate new arrivals. These bursts represent instances of God creating new types of organisms by divine intervention. The view rejects macroevolution, claiming it is biologically untenable and not supported by the fossil record, as well as rejects the concept of common descent from a last universal common ancestor.

3. **Creation science**, or scientific creationism, is a pseudoscience that emerged in the 1960s with proponents aiming to have young Earth creationist beliefs taught in school science classes as a counter to teaching of evolution. Common features of creation science argument include: creationist cosmologies which accommodate a universe on the order of thousands of years old, criticism of radiometric dating, explanations for the fossil record as a record of the Genesis flood narrative and explanations for the present diversity as a result of pre-designed genetic variability and partially due to the rapid degradation of the perfect genomes God placed in "created kinds" due to mutations.

4. **Neo-creationism** is a pseudoscientific movement which aims to restate creationism in terms more likely to be well received by the public, by policy makers, by educators and by the scientific community. It aims to re-frame the debate over the origins of life in non-religious terms and without appeals to scripture. This comes in response to the 1987 ruling by the United States Supreme Court in *Edwards v. Aguillard* that creationism is an inherently religious concept and that advocating it as correct or accurate in public-school curricula violates the Establishment Clause of the First Amendment. One of the principal claims of neo-creationism propounds that ostensibly objective orthodox science, with a foundation in naturalism, is actually a dogmatically atheistic religion. Its proponents argue that the scientific method excludes certain explanations of phenomena, particularly where they point towards supernatural elements, thus effectively excluding religious insight from contributing to understanding the universe. This leads to an open and often hostile opposition to what neo-creationists term "Darwinism", which they generally mean to refer to evolution, but which they may extend to include such concepts as abiogenesis, stellar evolution and the Big Bang theory.

5. **Intelligent design (ID)** is the pseudoscientific view that "certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection."

Its leading proponents are associated with the **Discovery Institute**, a think tank whose wedge strategy aims to replace the scientific method with "a science consonant with Christian and theistic convictions" which accepts supernatural explanations. This trend is replicated by the UK's **Truth in Science** and **Centre for Intelligent Design**, whose prominent figures are Christians who espouse the same pretence to be focussing on the science, rather than religion, but also explicitly support theism and like the Discovery Institute, attempt to influence the educational curriculum.

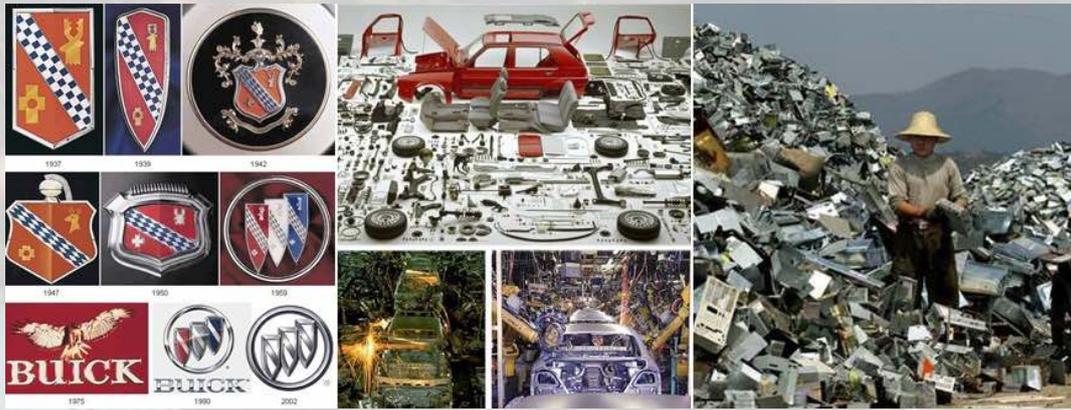


Fig 153: Intelligent design is a biospherically destructive religious concept based on applying human design and manufacture to divinity. Intelligent design is externally imposed order and it has restrictive consequences on the types of structures that can be produced, which are completely different from natural organisms, which evolve and are bootstrapped from a minimal amount of genetic information interactively in embryogenesis. Because the notion is falsely conceived on the basis of human exceptionalist religion, the entire concept is destructive to nature and biodiversity, because intelligent design applies only to the designed system and there is no spontaneously-interactive ecosystem guaranteeing recycling of natural decomposed components to new living systems. The evolution of intelligent design, is illustrated left in the Buick emblem: The intelligent designer creates each individual design de-novo, having only the same general concept. Because there is an external designer following their own predilection, there is no absolute requirement for a new design to depend in any significant way on the form of the predecessor. Both development and evolution are fundamentally a product of the designer only and not the design itself. In successive generations, one Buick shield can become three and then an Eagle. By contrast, natural evolutionary change is gradual and cumulative and leaves the fingerprint of its variation in the genomes of the ancestors and their descendants. Creationists try to finesse this discordance between the evolutionary tree of life and intelligent design by claiming God has created the universe to look like it has evolved. Corporations, and technological innovation all follow the feigned 'evolutionary' protocols of intelligent design.

Intelligent Design originated as a re-branding of creation science in an attempt to avoid a series of court decisions ruling out the teaching of creationism in American public schools, and the Discovery Institute has run a series of campaigns to change school curricula. In the US, teaching of intelligent design in public schools has been decisively ruled by a federal district court to be in violation of the Establishment Clause of the First Amendment to the United States Constitution. In *Kitzmiller v. Dover*, the court found that intelligent design is not science and "cannot uncouple itself from its creationist, and thus religious, antecedents," and hence cannot be taught as an alternative to evolution in public school science classrooms under the jurisdiction of that court. This sets a persuasive precedent, based on previous US Supreme Court decisions in *Edwards v. Aguillard* and *Epperson v. Arkansas* (1968), and by the application of the Lemon test, that creates a legal hurdle to teaching intelligent design in public school districts in other federal court jurisdictions.

Irreducible and Specified complexity Irreducible complexity claims certain biological systems cannot have evolved by successive small modifications to pre-existing functional systems through natural selection, because no less complex system would function. Irreducible complexity has become central to the creationist concept of intelligent design, but the scientific community regards intelligent design as pseudoscience and rejects the concept of irreducible complexity. Irreducible complexity is one of two main arguments used by intelligent-design proponents, alongside specified complexity. Specified complexity attempts to claim patterns that are both specified and complex must be designed, where a specified pattern is one that admits short descriptions, whereas a complex pattern is one that is unlikely to occur by chance. The concept of specified complexity is widely regarded as mathematically unsound and has not been the basis for further independent work in information theory, in the theory of complex systems, or in biology. It is contradicted by edge-of-chaos systems, from cellular automata to biology, where complexity can become generative.

Mikulecky (1999) demonstrates just how far externally designed machines are from the nature of living systems:

A machine needs a builder; it can not effect its own construction. This is the idea captured in the concept of "component systems" (Kampis, 1991) and other related ideas. Rosen (1991, 2000) has laid a nice foundation for this manner of thinking. As early as 1958 he began to imagine the way life has to come about. As time progressed, the answer he saw was revolutionary. Evolution is a process that defines itself as a system. ... Living things are not like machines at all. Machines are built from the bottom up out of parts constructed to add to each other in a supportive way. It is tempting to look at a machine and glibly say that the whole is more than the sum of the parts and think one has said something. ... This led to the modeling relation, the identification of some formalism that would define that sum, and the recognition that in every speculation about these matters models are involved. ... This led to a clear definition of what a machine is and how a machine relates to its parts. Once that was accomplished, it became

obvious that living systems relate to their parts in entirely different ways. Evolution, as does the mature organism, must be seen as the evolution of function in the form of functional components. What is more, the functional components, because they are defined by the momentary context, are not permanent features in an evolving system. To the extent that a developing system mimics its evolution the same is true for it. How can this be realized? The key to a system evolving to become an organism is that it must reach some point where it achieves all three of metabolism, repair, and replication.. We have never designed a machine like this and for very good reason. We build machines to last. One of the first and most crucial aspects of the evolving living system was its failure to last! It was in a condition of being torn down as fast as it was being built up and this is what allowed it to evolve. ... Both construction and destruction are systems properties. The systematic tearing down allows rebuilding, replication and evolution.

Witzany (2020), conveyed by Hal Cox, complements this by emphasising the modular structure of the genome and its viral contribution qualify our idea of mutation in ways which promote evolutionary innovation:

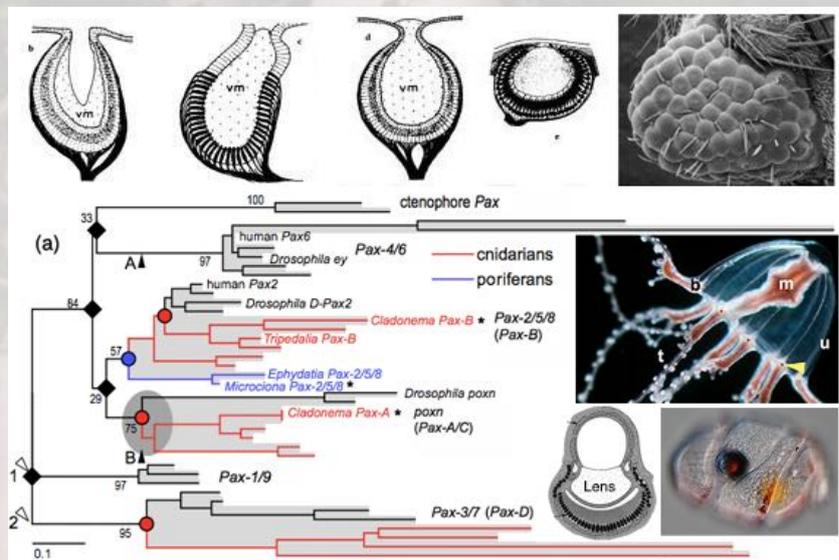
Primarily, life is a process. The main characteristic of this process is the coordinated organization of complex interactions that we see as protein-based organisms of three domains of life, their reproduction, and metabolism all mediated by complex interwoven gene regulation as a result of communication. ... Without RNA world agents, no cellular gene regulation could take place. Without viruses and related infectious agents, these capabilities of RNA stem-loop group behavior as gene inventors and regulators would not have been integrated into cellular host genomes. ... Therefore, we must ask whether mutation ("error replication") is the correct term to designate genetic variation in the future. Error replications, which in most cases means DNA damage without successful repair, is an empirical fact but does not play important roles in genetic innovation. Evolutionary relevant genetic variations are the result of natural genome editing by competent agents such as viruses and RNA networks with their inherent competence to generate and modify nucleotide sequences. This is competent nucleotide sequence editing. In contrast to former convictions, this is an agent-based interaction process, which is far from statistical mechanics and biochemical kinetics. Instead of error replication, we should use now "genetic innovation," which much better fits to the empirically documented events. Darwinian evolution then could be revised to "innovation and selection."

The creationist agenda and concepts such as irreducible complexity constitute a sustained assault on the verified science of evolutionary change now confirmed in extraordinary detail in the Human Genome Project and ensuing genetic studies of diverse species from our last common ancestor of life to Homo sapiens. My research overview: "**The Tree of Life: Tangled Roots and Sexy Shoots Tracing the genetic pathway from the Last Universal Common Ancestor to Homo sapiens**" (King 2021c) examines the genetic evidence exhaustively, proceeding in the shadow of the Human Genome Project for the next 20 years up to the present, examining every stage of genetic and phenotypic evolution from the last common ancestor of all life (LUCA) to ourselves.

Fig 154: **Deconstructing Irreducible**

Complexity I: The Camera Eye Top left:

Naturally occurring pit eyes show all forms of intermediate in the formation of the camera eye. Top Right: A compound eye on an insect leg elicited by a mouse pax gene involved in vertebrate eye development, demonstrating evolutionary homology at the genetic level between the arthropod and vertebrate developmental pathways. Lower left: Evolutionary tree of pax genes spans the metazoa. Lower right: Small camera eye in cnidaria (yellow arrow) (see also fig 256) and the camera eye in Dinoflagellates, which possess an eyespot ocelloid, complete with lens and retinoid organelle (lower right) and may have in turn inherited this functionality from cyanobacterial chloroplasts via red algae. Detailed analysis shows it to be a compound endosymbiotic structure involving both a mitochondrial 'cornea' and red-alga plastid derived retinal body comprising stacked wave-form membranes derived from chloroplast thylakoids surrounded by pigmented lipid droplets. This shows just how readily evolution can "create" an eye!



John Horgan (2019) in reviewing Quammen (2018) in "Was Darwin Wrong?" clearly states that ensuing scientific discoveries have not undermined the validity of Darwin's findings:

But Archaea do not pose a challenge to Darwinian theory, our understanding of how species originate and evolve. I would compare Archaea to a revision in our model of galaxy formation in the early universe, which does not threaten the basic big-bang framework.

Now we know that variations have many causes, including mutation, endosymbiosis, genetic drift, sexual recombination, epigenetic factors and, yes, horizontal gene transfer. But all variations, whatever form they take, serve as fodder for natural selection, which remains the primary evolutionary force, and which Darwin (and Wallace) discovered.

Creationist and religious “intelligent design” proponents, such as Michael Behe, also raise fundamental concerns about integrity of intent. Both science and the law require there not to be manifest conflicts of interest, because these fundamentally compromise the quality of an evidential account. So is it right to enter into avowed Christian creationist doctrine masquerading in the name of science in the pursuit of true meaning? Eugenie Scott for example coined the term "[Gish gallop](#)" to describe a fallacious Creationist rhetorical technique which consists of overwhelming an interlocutor with as many individually-weak arguments as possible, in order to prevent rebuttal of the whole argument. Michael Behe's (1996) claims about the irreducible complexity of essential cellular structures have been rejected by the vast majority of the scientific community, exemplified by opponents such as Jerry Coyne (2009). Tangled is in both the title of Quammen's book “The Tangled Tree: A radical new history of life” (2018) and my 2000-2020 overview, so their theses clearly coincide. Coyne (1996) in review, wryly comments on the flip-side problem of genes which appear badly designed, pointing out that Behe invites the conspiracy that the designer may have designed some things to look like evolution:

Responding to observations of non-functional genes and inefficient molecular processes, Behe theorizes that the Great Designer has goals beyond functionality: "Features that strike us as odd in a design might have been placed there by the designer for a reason -- for artistic reasons, for variety, to show off, for some as-yet-undetected practical purpose, or for some unguessable reason -- or they might not." One should add the "puckish reason": to confuse future biologists by making things look as though they evolved. ... Like all scientific creationists, Behe keeps quiet about the identity of the Great Designer, but the author's professed Roman Catholicism offers one clue. ... The book will no doubt be widely cited by Biblical creationists who will tout its message of design while ignoring its timid acceptance of evolution and its view of the creator as Cosmic Prankster. If the history of science shows us anything, it is that we get nowhere by labelling our ignorance 'God'. Behe is a senior fellow of the Discovery Institute's Center for Science and Culture. The Center for Science and Culture (CSC), formerly known as the Center for the Renewal of Science and Culture (CRSC), is part of the Discovery Institute (DI), a conservative Christian think tank. The Center for Science and Culture serves as the hub of the intelligent design movement. Nearly all of prominent proponents of intelligent design are either CSC advisors, officers, or fellows.

Creation science presented the theological argument from design with assertions that evolution could not explain complex molecular mechanisms, and in 1993 Michael Behe presented these arguments in a revised version of the school textbook “Of Pandas and People”. In “Darwin's Black Box” (1996) he called this concept irreducible complexity and said it made evolution through natural selection of random mutations impossible. This was based on the mistaken assumption that evolution relies on improvement of existing functions, ignoring how complex adaptations originate from evolving changes in function, and disregarding published research. Evolutionary biologists have published rebuttals showing how systems discussed by Behe can evolve, and examples documented through comparative genomics show that complex molecular systems are formed by the addition of components as revealed by different temporal origins of their proteins. In the 2005 Kitzmiller v. Dover Area School District trial, Behe gave testimony on the subject of irreducible complexity. The court found that "Professor Behe's claim for irreducible complexity has been refuted in peer-reviewed research papers and has been rejected by the scientific community at large."

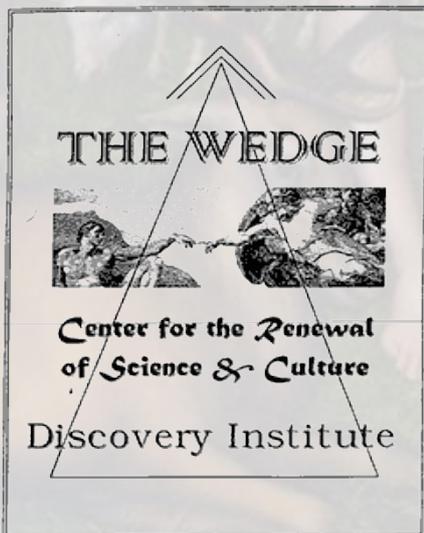
The Intelligent Design Wedge Strategy

The sheer deceit of the Creationist self-transformation into the Intelligent Design movement is carved out in an internal Discovery Institute manifesto – The Wedge Strategy (1999) – that was leaked and appeared on the Internet in 2000 now held at the [National Center for Science Education](#).

This shows the agenda is not the pursuit of true knowledge of the universe and nature but to spearhead by divisive stealth, fundamentalist Christian culture as a utopian theocratic initiative, in contradiction to transparently formed opinion. The Discovery Institute's disingenuous attempt to distance itself from its own leaked agenda and pretend it is now “scientific” can be found [here](#).

Robert Pennock (2000) in "Creationism and Intelligent Design" explains:

Guided by the Discovery Institute's "Wedge strategy," the ID movement aims to overturn evolution and what it sees as a pernicious materialist worldview and to



renew a theistic foundation to Western culture, in which human beings are recognized as being created in the image of God. The ID Movement calls its strategy for defeating evolution “the Wedge.” Its target is not just evolution, but also the materialist philosophy it believes props up science and is the de facto “established religion” of the West. The organization hopes to affect a renewal in our culture of Judeo-Christian theism, in which man is again understood as created in God’s image.

The legal idea behind the ID Wedge is to begin with a minimal position that can get into and pry open such a legal crack. Along similar lines, creationists have begun to lobby to simply teach the controversy about evolution or to get alternative theories taught, purportedly to encourage critical thinking or respect academic freedom. In keeping with the ID strategy, such proposals initially are introduced in vague, seemingly innocuous language and only later is the wedge driven in deeper. Two recent cases illustrate the point.

THE ID WEDGE

The guiding philosophy and strategic plans of the Discovery Institute’s Center for Science and Culture (CSC) are laid out in the Wedge document, an internal Discovery Institute manifesto that was leaked and appeared on the Internet in 2000. The CSC was previously named the Center for the Renewal of Science and Culture (CRSC). The Discovery Institute modified the name in 2002. Graphic banners for the CSC have also been modified over the years so that its religious underpinnings are less overt. However, the Wedge manifesto makes these explicit, laying out the CSC’s fundamental beliefs: “The proposition that human beings are created in the image of God is one of the bedrock principles on which Western civilization was built. Its influence can be detected in most, if not all, of the West’s greatest achievements, including representative democracy, human rights, free enterprise, and progress in the arts and sciences. Yet a little over a century ago, this cardinal idea came under wholesale attack by intellectuals drawing on the discoveries of modern science. Debunking the traditional conceptions of both God and man, thinkers such as Charles Darwin, Karl Marx, and Sigmund Freud portrayed humans not as moral and spiritual beings, but as animals or machines who inhabited a universe ruled by purely impersonal forces and whose behavior and very thoughts were dictated by the unbending forces of biology, chemistry, and environment. This materialistic conception of reality eventually infected virtually every area of our culture, from politics and economics to literature and art”.

CENTER FOR THE RENEWAL OF SCIENCE & CULTURE

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devastating. Materialists denied the existence of objective moral standards, claiming that environment dictates our behavior and beliefs. Such moral relativism was uncritically adopted by much of the social sciences, and it still undergirds much of modern economics, political science, psychology and sociology.

Materialists also undermined personal responsibility by asserting that human thoughts and behaviors are dictated by our biology and environment. The results can be seen in modern approaches to criminal justice, product liability, and welfare. In the materialist scheme of things, everyone is a victim and no one can be held accountable for his or her actions.

Finally, materialism spawned a virulent strain of utopianism. Thinking they could engineer the perfect society through the application of scientific knowledge, materialist reformers advocated coercive government programs that falsely promised to create heaven on earth.

Discovery Institute’s Center for the Renewal of Science and Culture seeks nothing less than the overthrow of materialism and its cultural legacies. Bringing together leading scholars from the natural sciences and those from the humanities and social sciences, the Center explores how new developments in biology, physics and cognitive science raise serious doubts about scientific materialism and have re-opened the case for a broadly theistic understanding of nature. The Center awards fellowships for original research, holds conferences, and briefs policymakers about the opportunities for life after materialism.

The Center is directed by Discovery Senior Fellow Dr. Stephen Meyer. An Associate Professor of Philosophy at Whitworth College, Dr. Meyer holds a Ph.D. in the History and Philosophy of Science from Cambridge University. He formerly worked as a geophysicist for the Atlantic Richfield Company.

The Center seeks nothing less than the overthrow of materialism and its cultural legacies...

Discovery Institute, 1402 Third Ave. Ste. 400, Seattle, WA 98101; 206-292-0401 ext. 111; discovery@discovery.org

The preamble concludes with a statement of the ID movement’s overarching goal: “[It] seeks nothing less than the overthrow of materialism and its cultural legacies,” aiming to replace this with a “theistic understanding of nature”.

Philosopher Stephen Meyer, one of the earliest leaders of the ID movement who helped define the movement’s attack against evolution and naturalism and its revival of what he calls “the God hypothesis”, is Director of CSC, and the Wedge document echoes many of the fundamental positions he and Philip Johnson laid out.

The prevailing fact remains that for all the attempts to advance creationism or intelligent design over and above natural evolution, there is not a single instance anyone can cite, or has cited, as an actual verified example of creation in the natural world that has to have come from direct intervention in nature. No paper has been published in the peer reviewed journals. No news announcement on TV. If there were, our entire world view would be shattered overnight.

We now examine the notion of irreducible complexity in detail. This is not the overall fractal complexity of organisms and tissues, which are clearly the most complex interacting systems in the universe, but carefully chosen examples of biological systems that look like manufactured human machines, but could not apparently function in the way they now appear to do unless all their interactive parts are in place. This is a false notion because evolution is modular and functional genetic elements can be coopted in new ways for example by gene duplication and exon recombination resulting in adoption of entirely new functions by integrated gene systems, as illustrated in fig 156. Furthermore

topological changes such as gave rise to the camera eye do have a continuous set of transitional examples, as illustrated in fig 154.

One of the most incontrovertible arguments against intelligent design (ID) being demonstrated by irreducible complexity (IC), drawn attention to by Aviezer (2010), conveyed by Joshua Davis, is that of H. Allen Orr (1996). Orr's critique is a devastating theoretical attack. The fractal view of all living systems, particularly organismic tissues, as noted above, is irreducibly complex, which I'm sure we all appreciate from all the evidence in Symbiotic Existential Cosmology. But this means that evolutionary systems are examples of irreducibly complex (IC) systems which evolve, so Behe's claim that this is ID because evolution can't occur is wrong in an obvious fatal theoretical way. Orr states the core argument as follows:

First it will do no good to suggest that all the required parts of some biochemical pathway popped up simultaneously by mutation. Although this "solution" yields a functioning system in one fell swoop, it's so hopelessly unlikely that no Darwinian takes it seriously. As Behe rightly says, we gain nothing by replacing a problem with a miracle. Second, we might think that some of the parts of an irreducibly complex system evolved step by step for some other purpose and were then recruited wholesale to a new function. But this is also unlikely. You may as well hope that half your car's transmission will suddenly help out in the airbag department. Such things might happen very, very rarely, but they surely do not offer a general solution to irreducible complexity.

Behe's colossal mistake is that, in rejecting these possibilities, he concludes that no Darwinian solution remains. But one does. It is this: An irreducibly complex system can be built gradually by adding parts that, while initially just advantageous, become—because of later changes—essential. The logic is very simple. Some part (A) initially does some job (and not very well, perhaps). Another part (B) later gets added because it helps A. This new part isn't essential, it merely improves things. But later on, A (or something else) may change in such a way that B now becomes indispensable. This process continues as further parts get folded into the system. And at the end of the day, many parts may all be required.

The point is there's no guarantee that improvements will remain mere improvements. Indeed because later changes build on previous ones, there's every reason to think that earlier refinements might become necessary. The transformation of air bladders into lungs that allowed animals to breathe atmospheric oxygen was initially just advantageous: such beasts could explore open niches—like dry land—that were unavailable to their lung-less peers. But as evolution built on this adaptation (modifying limbs for walking, for instance), we grew thoroughly terrestrial and lungs, consequently, are no longer luxuries—they are essential. The punch line is, I think, obvious: although this process is thoroughly Darwinian, we are often left with a system that is irreducibly complex. I'm afraid there's no room for compromise here: Behe's key claim that all the components of an irreducibly complex system "have to be there from the beginning" is dead wrong.

This elucidation is universal to major transitions, from abiogenesis to the eucaryote emergence. In the eucaryote endosymbiosis, we know this resulted from the symbiotic integration of the two extant branches of life, archaea and bacteria, to form the energetic mitochondria, but this was accompanied by additional changes, the cell nucleus, sexual reproduction and cellular sentient excitability, but the very success of the eucaryotes means that all trace of the precursor organisms has been wiped off the face of the Earth, so the entire eucaryote organism appears to be irreducibly complex, except for the evident fact that the mitochondria are endosymbionts so we know this catastrophic merger actually took place. The same applies to abiogenesis, where we examine the living mechanisms from DNA/RNA replication, ribosomal translation and even the synthesis of individual nucleotides and this looks irreducibly complex, but in every scientific breakthrough in this area, the evidence implies (1) individual nucleotides didn't assemble from their phosphate, ribose and heterocyclic components but these arose from a more deeply chaotic spontaneous process involving unrecognised precursors, (2) that replication didn't use pristine RNA, or DNA, but hybrid molecules, (3) that coded ribosomal translation to proteins didn't impossibly arise de novo but in association with a more primitive RNA-protein hybrid world where simple polypeptides were catalysed by RNA binding. All these attest to the evolution of irreducible complexity in many stages, by new non-essential advantageous functions becoming essential over time.

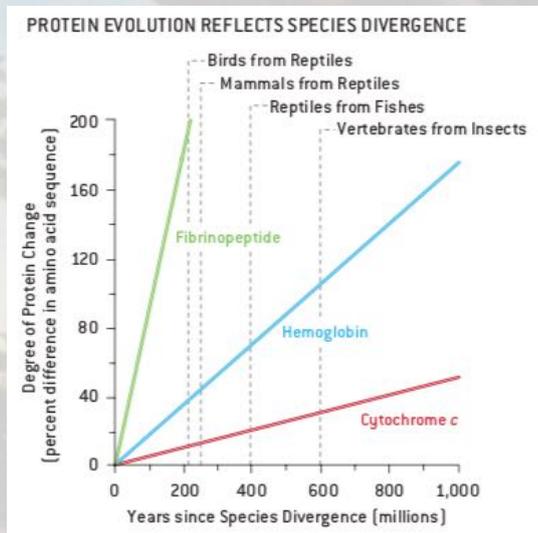
John Rennie (2002) then editor of Scientific American, stated in no uncertain terms in: "15 Answers to Creationist Nonsense" several of the main misconceptions of religious "intelligent design", stating categorically why for example the notion of irreducible complexity advanced by Behe and others is contradicted by evolutionary evidence.

Microevolution looks at changes within species over time – changes that may be preludes to speciation, the origin of new species. Macroevolution studies how taxonomic groups above the level of species change. Its evidence draws frequently from the fossil record and DNA comparisons to reconstruct how various organisms may be related.

One can be even more emphatic about this. The human genome project and associated research into ape and Neanderthal and Denisovan genomes has laid bare our evolutionary relationship with other primates. While this uses fossil evidence to identify the sources of ancient genomes, the genetic evidence on its own right is incontrovertible

evidence that humanity was not created *de novo* but evolved not just from apes but from monkeys as the Alu transposable element causing the loss of our tails makes clear (Xia et al. 2024). No longer can creationist or intelligent design proponent in any shape of form, credibly claim that humanity is in any way set apart from the macroevolutionary process that generated the diverse species of our biosphere. One doesn't any longer have to be accused of being an atheist defector against the true "faith" to accept the inevitable, fundamental truth of Darwin's discovery.

Responding to the claim that evolution, particularly macro-evolution, is unscientific, because it is not testable or falsifiable and makes claims about events that were not observed and can never be recreated he says:



The historical nature of macroevolutionary study involves inference from fossils and DNA rather than direct observation. Yet in the historical sciences (which include astronomy, geology and archaeology, as well as evolutionary biology), hypotheses can still be tested by checking whether they accord with physical evidence and whether they lead to verifiable predictions about future discoveries. For instance, evolution implies that between the earliest-known ancestors of humans (roughly five million years old) and the appearance of anatomically modern humans (about 100,000 years ago), one should find a succession of hominid creatures with features progressively less apelike and more modern, which is indeed what the fossil record shows. But one should not—and does not—find modern human fossils embedded in strata from the Jurassic period (65 million years ago). Evolutionary biology routinely makes predictions far more refined and precise than this, and researchers test them constantly.

Fig 155: Protein and species divergence linearly correlate.

Responding to claims such as Pitman's that molecular evolution and the origin of key proteins remains unestablished, Rennie cites the linear correspondence between species divergence time scales and the genetic divergence of key proteins.

Responding to Behe's irreducible complexity argument, citing the work of Kenneth Miller's (2004) 'The Flagellum Unspun: The Collapse of "Irreducible Complexity"', Rennie says the following:

What is true of the mousetrap, [Behe] says, is even truer of the bacterial flagellum, a whiplike cellular organelle used for propulsion that operates like an outboard motor. The proteins that make up a flagellum are uncannily arranged into motor components, a universal joint and other structures like those that a human engineer might specify. The possibility that this intricate array could have arisen through evolutionary modification is virtually nil, Behe argues and that bespeaks intelligent design. He makes similar points about the blood's clotting mechanism and other molecular systems.

*Yet evolutionary biologists have answers to these objections. First, there exist flagellae with forms simpler than the one that Behe cites, so it is not necessary for all those components to be present for a flagellum to work. The sophisticated components of this flagellum all have precedents elsewhere in nature, as described by Kenneth R. Miller of Brown University and others. In fact, the entire flagellum assembly is extremely similar to an organelle that *Yersinia pestis*, the bubonic plague bacterium, uses to inject toxins into cells. The key is that the flagellum's component structures, which Behe suggests have no value apart from their role in propulsion, can serve multiple functions that would have helped favor their evolution. The final evolution of the flagellum might then have involved only the novel re-combination of sophisticated parts that initially evolved for other purposes.*

Miller (2007) frames Behe's claim as follows:

Irreducibly complex structures, such as the bacterial flagellum, could not have evolved because they lack any selectable function until all of their component parts are in place. As he wrote, "any precursor to an irreducibly complex system is by definition non-functional", since every part of such a system had to be in place for natural selection to favour it. Therefore, such structures must have been designed.

Since Behe's "Black Box" and Rennie's commentary, research has proceeded apace and the situation has now become clearer. The bacterial flagellum and the type 3 secretion system injectosome (fig 156) have a common evolutionary origin, with the flagellum emerging slightly earlier. This means the genes involved are capable of evolving in multi-functional ways which are unapparent when one looks only at the flagellum.

Behe also claimed that every component of the irreducibly complex vertebrate blood-clotting system had to be present for the system to work properly. Doolittle (2004), upon whom Behe based much of his discussion of blood clotting, described it as misrepresenting a simplified explanation he had given in a lecture, and presenting a fallacious creationist miscalculation of improbability by omitting known options, which contributed to the original publisher turning down the book for publication:

Many years ago, when I was a graduate student in biochemistry at Harvard, I entered an essay in a prize competition in which submissions were made anonymously by pseudonym. The essay was entitled "The Evolution of a Unique Enzyme System: The Comparative Physiology of Blood Coagulation," and the immodest pseudonym I used was Charles Darwin. The gist of the essay was that, whereas vertebrate blood coagulation is an extremely complex process, and although at first glance no part of the system ought to be viable without the entire ensemble, it nonetheless ought to prove understandable in terms of natural selection. I pointed out that it was unlikely that the entire melange of enzymes and protein substrates evolved in one fell swoop. Instead, three processes had been at work. First, there was a series of gene duplications of the sort that had recently been observed for hemoglobins. Second, there were the simple point mutations we know today as amino acid replacements. Finally, mechanisms were brought into play that controlled the amounts of the various homologous factors. I suggested that the presence and role of these three mechanisms could be evaluated by comparing blood clotting in various organisms, particularly earlier diverging animals that might have simpler systems. To this end, I began an experimental program dealing with blood clotting in all sorts of creatures, wrote my Ph.D. dissertation on the subject, and, indeed, have devoted the intervening 35 years to the general subject of proteins and their evolution. Now it appears that I have wasted my career. In Darwin's Black Box, Michael Behe has concluded that blood clotting--Behe's "favorite pathway," as Allen Orr puts it--is simply "too complex to have evolved." Worse, he has taken one of my own articles to illustrate his view.

This caused Doolittle to spearhead work that would clearly settle this matter and Doolittle & Jiang (2003) found the Puffer fish *Fugu* has a simplified but functional clotting system, contradicting irreducible complexity and that, while the sea squirt, *Ciona intestinalis*, did not turn up any orthologs derived from a single ancestral gene for these 26 factors, paralogs from gene duplication and/or constituent domains were evident for virtually all, implying a root origin.

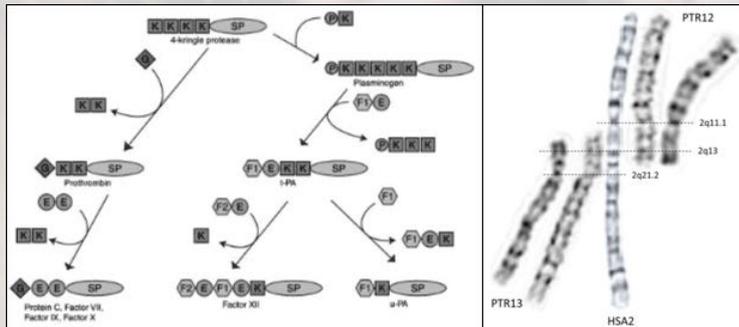


Fig 157: Left: Putative evolution of nine proteases involved in generation and destruction of fibrin clots by a small number of domain exchanges. The proposed root protein is a four-kringle protease, prototypical genes for which are found in the sea squirt genome (Doolittle & Jiang 2003). Right: Chimps have 24 chromosome pairs but humans only 23 because human chromosome 2 arose by two smaller ape chromosomes joining end on end. Such changes are major but translocations can also occur in humans without causing disabilities, although with some reduced fertility (Stankiewicz 2016).

Miller (2007) notes: *That argument collapsed when Doolittle & Jiang (2003) showed that the puffer fish, Fugu, lacks at least three clotting factors and still has a workable system. Such failures in the science of the argument helped to send intelligent design to a defeat in the Dover trial, and they haunt it still.*

In "The Edge of Evolution: The Search for the Limits of Darwinism", Behe (2007) attempts to calculate the "edge of evolution" - the point at which Darwinian evolution is no longer an efficacious agent of creative biological change - by taking into account the number of mutations required to "travel" from one genetic state to another, as well as population size for the organism in question. He argues strongly for common descent of all life forms on earth, including that humans and chimpanzees have a common ancestor, however he claims that the mutations required for bridging the higher levels of taxonomy are not possible without design. He concludes that purposeful design plays a major role in the development of biological complexity, through the mechanism of producing "non-random mutations", which are then subjected to the sculpting hand of natural selection. The argument hinges on the low probability of an organism having two or more simultaneous mutations to yield some advantage for the organism and large numbers of microbial organisms achieving little in the way of evolving new proteins and binding sites.

Dawkins (2007) notes his incorrect dependence on random mutation as the dominant force in evolution:

Behe correctly dissects the Darwinian theory into three parts: descent with modification, natural selection and mutation. Descent with modification gives him no problems, nor does natural selection. They are "trivial" and "modest" notions, respectively. The

crucial passage in *"The Edge of Evolution"* is this: "By far the most critical aspect of Darwin's multifaceted theory is the role of random mutation. Almost all of what is novel and important in Darwinian thought is concentrated in this third concept." Far more important for Darwin was the nonrandom process whereby some survived but others perished. Natural selection is arguably the most momentous idea ever to occur to a human mind, because it — alone as far as we know — explains the elegant illusion of design that pervades the living kingdoms and explains, in passing, us.

Two further reviews of this work underline the mathematical errors and lack of fundamental understanding of such processes on Behe's part. Sean Carroll (2007) in "God as Genetic Engineer" puts it this way:

He argues that the generation of a single new protein-protein binding site is extremely improbable and that complexes of just three different proteins "are beyond the edge of evolution." But Behe bases his arguments on unfounded requirements for protein interactions. He insists, based on consideration of just one type of protein structure (the combining sites of antibodies), that five or six positions must change at once in order to make a good fit between proteins—and, therefore, good fits are impossible to evolve. An immense body of experimental data directly refutes this claim. There are dozens of well-studied families of cellular proteins (kinases, phosphatases, proteases, adaptor proteins, sumoylation enzymes, etc.) that recognize short linear peptide motifs in which only two or three amino acid residues are critical for functional activity. Thousands of such reversible interactions establish the protein networks that govern cellular physiology. Very simple calculations indicate how easily such motifs evolve at random. If one assumes an average length of 400 amino acids for proteins and equal abundance of all amino acids, any given two-amino acid motif is likely to occur at random in every protein in a cell. (There are 399 dipeptide motifs in a 400-amino acid protein and $20 \times 20 = 400$ possible dipeptide motifs.) Any specific three-amino acid motif will occur once at random in every 20 proteins and any four-amino acid motif will occur once in every 400 proteins. That means that, without any new mutations or natural selection, many sequences that are identical or close matches to many interaction motifs already exist. New motifs can arise readily at random, and any weak interaction can easily evolve, via random mutation and natural selection, to become a strong interaction. Furthermore, any pair of interacting proteins can readily recruit a third protein, and so forth, to form larger complexes. Indeed, it has been demonstrated that new protein interactions and protein networks can evolve fairly rapidly and are thus well within the limits of evolution.

Kenneth Miller (2007), himself a practising Roman Catholic, in "Falling over the edge" takes an even more stringent view of the discounting evidence:

Behe cites the malaria literature to note that two amino-acid changes in the digestive vacuole membrane protein PfCRT (at positions 76 and 220) of Plasmodium are required to confer chloroquine resistance. From a report that spontaneous resistance to the drug can be found in roughly 1 parasite in 10^{12} , he asserts that these are the odds of both mutations arising in a single organism, and uses them to make this sweeping assertion:

"On average, for humans to achieve a mutation like this by chance, we would need to wait a hundred million times ten million years. Since that is many times the age of the universe, it's reasonable to conclude the following: No mutation that is of the same complexity as chloroquine resistance in malaria arose by Darwinian evolution in the line leading to humans in the past ten million years."

Behe, incredibly, thinks he has determined the odds of a mutation "of the same complexity" occurring in the human line. He hasn't. What he has actually done is to determine the odds of these two exact mutations occurring simultaneously at precisely the same position in exactly the same gene in a single individual. He then leads his unsuspecting readers to believe that this spurious calculation is a hard and fast statistical barrier to the accumulation of enough variation to drive darwinian evolution. It would be difficult to imagine a more breathtaking abuse of statistical genetics. Behe obtains his probabilities by considering each mutation as an independent event, ruling out any role for cumulative selection, and requiring evolution to achieve an exact, predetermined result. Not only are each of these conditions unrealistic, but they do not apply even in the case of his chosen example. First, he overlooks the existence of chloroquine-resistant strains of malaria lacking one of the mutations he claims to be essential (at position 220). This matters, because it shows that there are several mutational routes to effective drug resistance. Second, and more importantly, Behe waves away evidence suggesting that chloroquine resistance may be the result of sequential, not simultaneous, mutations (Science 298, 74–75; 2002), boosted by the so-called ARMD (accelerated resistance to multiple drugs) phenotype, which is itself drug induced.

A mistake of this magnitude anywhere in a book on science is bad enough, but Behe has built his entire thesis on this error. Telling his readers that the production of so much as a single new protein-to-protein binding site is "beyond the edge of evolution", he proclaims darwinian evolution to be a hopeless failure. Apparently he has not followed recent studies exploring the evolution of hormone-receptor complexes by sequential mutations (Science 312, 97–101; 2006), the 'evolvability' of new functions in existing proteins — studies on serum paraxonase (PON1) traced the evolution of several new catalytic functions (Nature Genet. 37, 73–76; 2005) — or the modular evolution of cellular signalling circuitry (Annu. Rev. Biochem. 75, 655–680; 2006). Instead, he tells his readers that there is just one explanation that "encompasses the cellular foundation of life as a whole". That explanation, of course, is intelligent design.

Behe's own Biology Department at Lehigh University published a statement repudiating Behe's views and intelligent design. The statement reads as follows:

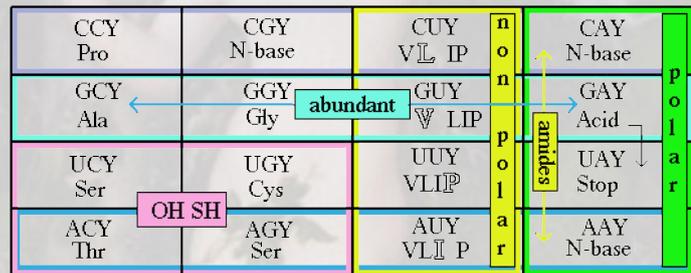
Department Position on Evolution and "Intelligent Design" The faculty in the Department of Biological Sciences is committed to the highest standards of scientific integrity and academic function. This commitment carries with it unwavering support for academic freedom and the free exchange of ideas. It also demands the utmost respect for the scientific method, integrity in the conduct of research, and recognition that the validity of any scientific model comes only as a result of rational hypothesis testing, sound experimentation, and findings that can be replicated by others. The department faculty, then, are unequivocal in their support of evolutionary theory, which has its roots in the seminal work of Charles Darwin and has been supported by findings accumulated over 140 years. The sole dissenter from this position, Prof. Michael Behe, is a well-known proponent of "intelligent design." While we respect Prof. Behe's right to express his views, they are his alone and are in no way endorsed by the department. It is our collective position that intelligent design has no basis in science, has not been tested experimentally, and should not be regarded as scientific.

The deconstruction of "intelligent design" also applies to biogenesis, where both nucleotide formation (fig 93) and ribosomal translation (fig 94) have been proved to have counter-intuitive precursors, demolishing irreducible complexity. Another far-fetched claim made by Stephen Meyer who helped found the Center for Science and Culture (CSC) of the Discovery Institute is that the genetic code is now a free and arbitrary code determining protein structure that is not dependent on chemical differences among the bases and that therefore this needs intelligent design in the form of the mind of a "programmer". This is fundamentally incorrect. Anyone who looks closely at nucleic acids can see that the four bases – purines A & G and pyrimidines T/U & C each have subtly different chemical properties and the biological amino acids do as well. So the notion that the genetic code needs a mind is false because, like all the other attributes of claimed irreducible complexity, the genetic code evolved from simpler irreducible forms of amino acid catalysis based on intrinsic chemical bifurcations like my analysis (King 1982) right. This is not a disproof, as the origin of the genetic code remains to be fully elucidated, but it shows the kind of chemical affinities which could have led to its current form.

Here's another non-sequitur deflection citing William Dembski, a senior fellow of the Discovery Institute's Center for Science and Culture (CSC), responsible for the debunked notion of specified complexity who is a mathematical theologian and should know better:

"According to Dembski, extremely improbable events that also exhibit 'an independently recognisable pattern' invariably result from intelligent causes, not chance" (Steven Meyer)

Fig 158: Chemical bifurcations consistent with the genetic code's formation.



The genetic code contains evidence for several primal bifurcations [King 1982].
 Centre position AU selects polar /non-polar as broad groups. VLIP are Val-Leu-Ileu-Phe.
 First position G determines primarily abundant amino acids.
 Expansion: first codon C and A fix synthesis routes from Glu and Asp.
 Subsequent bifurcations include H-bonding block and acid-base.

It doesn't matter how improbable a series of events is, if it has a recognisable pattern then it probably results from causes, but intelligent causes?

Consider the prime number distribution:

$\pi(N) \sim N/\log(N)$, where $\pi(N)$ is the prime-counting function (the number of primes less than or equal to N) and $\log(N)$ is the natural logarithm of N. This means that for large enough N, the probability that a random integer not greater than N is prime is very close to $1/\log(N)$. Consequently, a random integer with at most 2N digits (for large enough n) is about half as likely to be prime as a random integer with at most N digits. In other words, the average gap between consecutive prime numbers among the first N integers is roughly $\log(N)$.

So the primes very slowly get extremely improbable for very large N and they do show a recognisable pattern – no factors other than themselves and 1. But do the primes arise from intelligent causes? Only if you say God invented the integers and the laws of addition and multiplication, then the primes are automatic. But that's so basic its basal below intelligent. Does anyone have an alternative to addition, which is as basic as counting? And multiplication is just iterated addition!

An example of evidence-less propaganda presented as an academic blockbuster is the Hoover Institution video Mathematical Challenges to Darwin's Theory of Evolution, hosted by Peter Robinson on "Uncommon Knowledge". It is also prominently cited in the Discovery Institute's magazine Evolution News. In their own words: The Discovery Institute started Evolution News in 2004 to counter all the "fake news" in the debate over Darwin and intelligent

design. Since then, the audience for the English version has grown from a few thousand to more than a million users a year. This deceptive magazine title is a warning to the unwary.

The first thing to point out is that this video was NOT a "balanced" discussion between opponents and defenders of evolution at all, but rather three opponents of evolution with minimally varying views all opposing it. The notion that they are "good people" also has a Trumpian Republican implication as we shall see several times over later.

The mathematical challenge is ill conceived. the probabilistic arguments are specious and basically pulled out of thin air with massive powers of 10, forming no kind of accurate assessment of molecular dynamics at the quantum level or bearing any relation to biological reality. They are also vestigial opinions, not analyses.

Sungchul Ji notes: "I viewed this video and I disagree with Stephen Meyer. He thinks mathematics has proven that Darwinism (defined as chance origin of life) is wrong because the probability of life originated by chance is almost negligible and he cites 1 out of 10^{77} . He is assuming that the traditional mathematical approaches that have been successful in studying *simple systems* and *disorganized complex systems* apply to studying *organized complex systems* and this assumption, I think, is untenable".

The discussion claimed that neo-Darwinists thought most of the DNA was junk and the fact it wasn't junk was claimed to be an argument for intelligent design. This is a preposterous claim because we now know non-coding DNA is integral to evo-devo evolutionary developmental concept in higher organisms which creationists despise. We also know half the human genome consists of transposable elements constituting an evolutionary parasito-symbiosis with coordinated evolutionary implications. Non-coding DNA has become the hallmark of higher organism evolution because it permits coordinated regulatory developmental variation on a small subset of protein genes'

There isn't a single statement that has any evidential basis as a critique of evolution and simply constitutes three avowed critics expressing personal attitudes and opinions without presenting any evidence that could remotely be regarded as a scientific position. Given the 2.9 million views, this is outstandingly manipulative. The lack of any scientific citations is signature.

An analysis of the contributors is thus in order, each with a representative video. This makes a glaring case for extreme bias. Berlinski and Meyer are both DI – ID fellows with pronounced Christian conservatism and anti-atheism credentials. Gelernter has cloned off Meyers Darwin's Doubt to form his own variant views also rejecting evolution.

David Gelernter: The Danger of Crusading Atheists

Gelernter is known for contributions to parallel computation in the 1980s. He is in addition known for his views against women in the workforce, saying working mothers were harming their children and should stay at home. As a measure of his extreme right wing views, Peter Thiel nominated Gelernter for the Science Advisor to the President position under Trump. His rejection of the scientific consensus regarding anthropogenic climate change and evolution is also noted.

In July 2019, Gelernter challenged Darwin's theories. In Giving Up Darwin a review of Stephen Meyer's book Darwin's Doubt: The Explosive Origin of Animal Life and the Case for Intelligent Design, which Gelernter wrote for the Claremont Review of Books, Gelernter stated that he does not accept modern evolutionary biology. On the other hand, Gelernter stipulates he "cannot accept" intelligent design either, saying that "as a theory, it would seem to have a long way to go." In "A Response to David Gelernter's Attack on Evolution", Patheos, August 26, 2019, Bob Seidensticker writes: "Let's subtitle this story, 'Guy who made his career in not-biology is convinced by other not-biologists that Biology's core theory is wrong.' Computer scientist and mathematician Jeffrey Shallit wrote: "Gelernter's review was not published in a science journal, but in a politics journal run by a far-right think tank. His review cites no scientific publications at all, and makes claims like 'Many biologists agree' and 'Most biologists think' without giving any supporting citations. So, not surprisingly ... Gelernter makes a fool of himself in his review, which resembles a 'greatest hits' of creationist misconceptions and lies."

David Berlinski: Atheism and its Scientific Pretensions David Berlinski author of The Devil's Delusion: Atheism and Its Scientific Pretensions asserts that "a great many men and women have a dull, hurt, angry sense of being oppressed by the sciences. They are frustrated by endless scientific boasting. They suspect that ... the scientific community holds them in contempt. They are right to feel this way." With Darwin's theory of evolution as a point of departure, he takes

scientists to task for their anti-religious assumptions and explores the conflict between the scientific community and those with firmly held religious beliefs.

An opponent of biological evolution, Berlinski is a senior fellow of the Discovery Institute's Center for Science and Culture, a Seattle-based think tank that is a hub of the pseudoscientific intelligent design movement. Berlinski shares the movement's rejection of the evidence for evolution, but does not avow intelligent design and describes his relationship with the idea as: "warm but distant. It's the same attitude that I display in public toward my ex-wives." Berlinski is a critic of evolution, yet, "Unlike his colleagues at the Discovery Institute,...[he] refuses to theorize about the origin of life."

Stephen C. Meyer: Theistic Evolution Meyer presents the case against Theistic Evolution. From the event "Theistic Evolution: A Scientific, Philosophical, and Theological Critique," hosted by Biola University. Meyer has been described as "the person who brought ID (intelligent design) to DI (Discovery Institute)" by historian Edward Larson, who was a fellow at the Discovery Institute prior to it becoming the center of the intelligent design movement. Larsen is quoted by Chris Mooney in his book The Republican War on Science:

And then there's the aforementioned Stephen C. Meyer, a Cambridge history and philosophy of science Ph.D. who seems to have developed ID's philosophical critique of modern science to begin with. A conservative Christian with a background in Republican politics, Meyer has been described as "the person who brought ID to DI" by historian Edward Larson (who was a fellow at the Discovery Institute prior to its antievolutionist awakening). Seeking to institutionalize the ID movement, Meyer turned to the late timber industry magnate C. Davis Weyerhaeuser, a major funder of Christian evangelism in the U.S. through his Stewardship Foundation. Weyerhaeuser provided key "seed money" to establish the Discovery Institute's ID program, according to Larson.

Meyer is also a "university professor" at Palm Beach Atlantic University, in West Palm Beach, Florida, a "Christian liberal arts college" that puts its professors in what can only be described as an intellectual straitjacket. According to the school's "Guiding Principles,"

Mooney introduces the book with the following quote which is very apt to the Creationism/ID debate:

"The success of science depends on an apparatus of democratic adjudication—anonymous peer review, open debate, the fact that a graduate student can criticize a tenured professor. These mechanisms are more or less explicitly designed to counter human self-deception. People always think they're right, and powerful people will tend to use their authority to bolster their prestige and suppress inconvenient opposition. You try to set up the game of science so that the truth will out despite this ugly side of human nature" (Steven Pinker)

Cornelius Hunter (2021), again a Fellow of the Discovery Institute's Centre for Science and Culture, takes an unapologetic position, in which he subsumes scientific empiricism to theistic dominion:

In both Darwin's thought and later development of the theory of evolution, theological concerns have been viewed as serving in a range of possible roles. However, the theological concerns have consistently been viewed as, ultimately, subservient to empirical science. In the end, science has the final say regarding the content and evaluation of the theory. Here, this paper demonstrates the failure of this model. Theological concerns do have primacy over the science. They motivate the development of evolutionary theory, and they control the interpretation of the empirical evidence and justification of the theory. It is more accurate to view evolution as a theological research program.

Ian Thompson (2011) notes the way Darwin's experience of nature precipitated his religious doubts:

Charles Darwin (1809-1882) was predisposed at an early age towards naturalistic explanations but still took seriously Paley's arguments from design. Then Darwin conceived that gradualist processes of natural selection were responsible for producing the great variety of biological species and also the appearance of design within them. In this way, he was able to counter Paley's argument. Even the possibility of natural processes was presumably sufficient to rebut his inference about God. Darwin was effectively advocating a deism, because, he said, he did not want any God to exist that would be responsible for the suffering, predation and parasitism, etc., which he saw everywhere in nature. Others point out that if God was not involved, there could be no reason given for retaining a divinity at all. Darwin was claiming that God does not influence the world after creating it, and such claims reduced public support for theism.

Darwin's critique is particularly true of intelligent design. If God designed dolphins as animals, like us of climax intelligence, why did he design them to commit rape and torture smaller mammals for sport? We know the answer to the former is sexually antagonistic co-evolution, just as it is enacted by the human patriarchy in FGM and stoning for perceived adultery; and the answer to the latter is evolutionary diversification – into archaea, bacteria, plants, animals and fungi and then on among animals to the herbivores and carnivores, and we know the carnivores, to survive have

to sharpen their hunting skills through almost obsessive practice. But this is also a comment on the religious ideal of God as love and peace. Nature is wild in tooth and claw and has to be so for life to flourish.

Ian Thompson (2011), who is an unapologetic Christian nuclear physicist, takes his argument much further than intelligent design, to assert the right and necessity for God to amend natural laws at will:

One common alternative to the theory of natural selection is the theory of intelligent design. The intelligent design theory, however, is deliberately limited, as it does not attempt a causal explanation. It tries to develop techniques to examine physical organisms and then to determine whether or not that examination provides evidence for the existence of an intelligence in the coming to be (or design) of those organisms. Strictly, it is neutral on whether the intelligence is God or whether it might be previously-existing extra-terrestrial beings who have (say) genetically-engineered the organism. ... Intelligent design theory has generated an extraordinary amount of animosity from mainstream (naturalistic) scientists. They often accuse it of being false. Then they simultaneously accuse it of being non-scientific because non-falsifiable! By comparison, theistic science is advocating a much stronger theory than intelligent design since it cannot be neutral about 'the nature of the designer'. We start from the assumption that God exists, as being itself and life itself.

There are many scientists who do profess religion and think that theism and Darwin's theory can co-exist. This compatibility is possible since theism means to them that God sustains the world, and Darwin has described how creatures in the world have functioned and developed together. This view, however, is equivalent to deism, not theism. It holds that God is not involved with the world once its operation has started (except, perhaps, in special events such as the founding and/or culmination of new religions). Once 'laws of nature' are assumed to be inviolate, Darwinism can accommodate such deistic views. Within our new scientific theism we are unable to follow Darwin, in either the naturalistic or deistic world views. When God sustains the universe, this is not accomplished 'at a distance' by 'merely sustaining' the universe according to laws of physics but (we now conclude) by the presence of God in some degree. There can be no power without substance and no substance without present existence. This means that any sustaining action of God in the world will necessarily require the reception of life from God, not abstractly but as a substance really existing. This life is not always according to fixed physical laws. It necessarily has spiritual and mental components that will be effective if a suitable receptive form (e.g. a human form) is present. The fitness of a living organism is not purely a function of its interactions with the physical world and other organisms. It depends also and at least on the fullness of its reception of life from God. This implies that, within a proper theism, it is impossible to have a purely naturalistic account of evolution. Fitness, and hence selection, are not entirely natural. They are subject also to spiritual and mental considerations.

Thompson (2022) is even prepared to invoke notions that would seek to violate the foundations of physics:

I propose that the fine-tuned parameters of quantum field theory (masses and charges) can be varied locally in order to achieve ends in nature. This is not adding extra forces to nature but rescaling the forces which already exist. The unit of electric charge e is built into the fine-structure constant $\alpha=e^2/\hbar c \sim 1/137$. Some physicists have already proposed varying α slowly over the age of the universe. Some kind of variation, therefore, is conceivable in physics. Now, we propose to vary it over micro-seconds and within living organisms. ... I have shown how iterative forward and reverse steps in metric time can be used to influence intermediate variations in the vacuum permittivity to move charged bodies to achieve specific targets at a later time. This is analogous to processes of mental planning. This a start of a theory for how mental or spiritual influx could have effects in nature. Furthermore, these effects on permittivity should be measurable in biophysics experiments. With this proposal, we see after some centuries how 'final causes' could once again be seen active in nature.

I can accept bidirectional flow forwards and backwards in time in the sense of advanced and retarded quantum transactions, in which the unfolding future can be consciously anticipated for our survival. I have thought, visioned and written exhaustively to conceive and explain how these two can fit together seamlessly in the brain-mind and retain the natural universe intact. In my opinion it is the key to the middle way of conscious survival and consummation in a surviving biospheric universe. I can't and won't rightly accept spiritual causality acting over and above natural substance without a shred of empirical evidence except a priori belief in God. It leads to the loss of balance, the loss of nature and the loss of life.

I'm an existential empiricist, of both spirit and substance, to add to my existential realism that reality is evidential. Hence we do not assume God exists without evidential experience. If it walks like a duck and flies like a duck, Occam's razor implies to test if it is a duck and see first if the duck hypothesis quacks. If someone tells me God has love, jealousy, wrath and compassion, I say He talks and acts like a mammal with a limbic system, not a dragon, spider, or scorpion. If God is claimed to have wisdom, I see this also as a human attribute of learning and experience. A spiritual scientist should then seek a contradiction and ask: "Wait, this thing is conceived to be omniscient and omnipotent, immanent and omnipresent". But then we are reminded that all these "divine" attributes are those of hyperbolic projection of human nature – conceptual, through Logos to manufactural power. So I come reluctantly to the conclusion that God is a hyperbolic projection of a mammalian and in fact an all too human "psyche".

Prominently cited by [Rational wiki](#) as one of three showcase works of creationist pseudoscience, is Mike Pitman's (1985) "Adam and Evolution: A Scientific Critique of Neo-Darwinism". A New Scientist review by P T Saunders (1985) in "Another case for Creationism" notes the importance of distinguishing the fact that evolution has occurred from arguments about how it occurred. He notes that, although Pitman addressed the problem of complex structures, including both the eye and the origin of cytochrome c, showing the Neo-Darwinist explanation of macroevolution to be somewhat "flimsy", he was unconvincing about the alternatives and has clearly failed in his chief aim. Like all creationists, masquerading as "intelligent design", he has tried to hide his religion to appear scientific:

He is less convincing however in putting forth his alternative as his only real argument is that anything that has not yet been adequately explained by science counts as evidence for creationism. He also makes it very easy for himself by never specifying what sort of creator he has in mind. All we can infer is that the creator is omnipotent enough to produce all sorts of marvellous things, but is limited enough, or lazy enough, to have restricted himself to a limited number of archetypes ... The case he puts against the fact of evolution is even weaker. The fossil record does indeed contain gaps, but is is nowhere near as poor as Pitman would have us believe. Geological strata cannot be adequately explained in terms of the relative ability of different organisms to escape the rising waters of the Biblical Flood. ... Pitman clearly fails in his chief aim. ... His confident assertion that the Jesuit geologist Pierre Teilhard de Chardin perpetrated fraud not only at Piltdown, but also at Choukoutou where the Peking man was found and subsequently disappeared is to say the least contentious.

His defamatory traducing of Chardin is unfair because it was Woodward's later reconstruction that included ape-like canine teeth. In August 1913, Woodward, Dawson and Teilhard de Chardin began a systematic search of the spoil heaps specifically to find the missing canines of a skull found there. Teilhard de Chardin soon found a canine that, according to Woodward, fitted the jaw perfectly. A few days later, Teilhard de Chardin moved to France and took no further part in the discoveries. However, the intrigue continues (Lukas 1981, Thackeray 2016, 2019). Neither is there record of his fraud over the Peking man. Defaming the cherished author of the evolutionary noosphere is an unconscionable attack by a closet creationist on another Christian and those who see life and its evolution as sacred.

Mike Pitman: The Tao, Logos, Shabda, Kalma etc. are the power that drives creation (at its highest level will-power). They are the Way. And following this Path or Way leads to its Source. The Way is to heighten consciousness; it has nothing, essentially, to do with religious practices. Eventually Consciousness (stripped of mind and matter as far as ascent is concerned) is realised as the Creator. In other words, the Creator is (at present unrealised) in you.

Chris King: It is interesting the way, no matter how diverse religious paths have become, from Buddhism and Taoism, to Monotheism, Vedanta and Animism, in Mike's description what ultimately emerges is the Creator of Creation!

Mike: Also, the body itself is seen by all faiths as a prison of the soul. The phrase used was 'soul incarcerated in the flesh' (Lat. carcer, enclosure hence prison). The very reason for prayer and meditation (Jewish form or any other) is to escape from or obtain release from this material, that is, bodily realm.

Chris: The body is NOT a prison. Incarnation is the bearer of life. Anyone following this line of yours is promulgating a Faustian pact with martyrdom. Moksha is not death but the source of life's reflowering.

Mike: Many years ago, I met Sai Baba in Chennai. I was, although the audience was huge, given a seat near the front. At one point a boy sang a hymn and, as if to touch his head in blessing, Sai Baba reached out. But before reaching that place a shot of dust left his fingertips and scattered as it lost momentum. I was astonished and for a split second wondered if I was seeing things when a gasp arose all round saying 'Vibhuti'. Thus, I knew many had also simultaneously witnessed this. Those who may have power to materialise or adjust material circumstance, such as healers or those whose wish is to engender faith in others other than by telepathic means, are unlikely to want to waste time repeatedly showing off their tricks to satisfy scientific sceptics. From their perspective, why bother?

Chris: I also witnessed Sai Baba's "feats" in India. He was also renowned for sweets appearing from his images. He claimed to be the "[Kalki Avatar](#)" – the final Vishnu ending the Kali Yuga, but he has passed away and the Kali Yuga is still very much with us. So what are a few stereotyped "miracles", when there is a living world to save, or the universe could lose all sense of conscious meaning? That's why I am leaving a trail for others to follow in my "magnum opus" Symbiotic Existential Cosmology, when I am gone.

Mike: Explain yourself. Clearly and succinctly.

Chris: Physicist Brian Cox notes on the BBC ahead of COP26 warned that: "Unique events that led to civilisation mean its demise could 'eliminate meaning in the galaxy for ever'. He is right and the conclusion is that this is not just what we are doing to ourselves and the diversity of life as a whole, but the living galaxy and the universe. Particularly if you believe abiogenesis is impossible!

Mike: There are many reasons that the abiogenetic notion is vanishingly improbable (far greater than the 10^{-59} at which science normally draws the line between possibility and impossibility). However, the phase of 'chemical evolution' is critical so that normal 'scientific' response to fact is to start recreating lists of order of chemical appearances. Hope, here in the form of speculation, never dies! Your postings concerning abiogenesis and the so-called Cambrian explosion make an interesting but, since you were not there, entirely speculative account of what you have been told happened or, rather, to satisfy your basic assumptions, must have happened in some way or other.

Chris: You can't claim biogenesis is impossible and then disregard the necessity of protecting life in this planet, because in your scenario you have no guarantee it can emerge from the slime somewhere else. If a Creator had made life as it is, the universe could be teeming with clockwork crocodiles that can't evolve, but that's not what we see out there. The only life we know of is evolving here on Earth, so we need urgently to protect it.

Mike: This unnecessary reference prompts me to surmise that, if your unique, overweening and, you claim, drug-induced gospel requires chemical evolution as a sine qua non, this might be the reason for your reflex negativity towards those who, like me, do not buy your story.

Chris: The fact that biogenesis is necessary for the evolution of complex conscious life is not a reason for you to accuse me of reflex negativity. I am astutely critical of anyone who adheres to the delusory notion that life is dispensable in the Creator's Eschaton. Yes you are a cited pariah in the work!

Mike: There is one Bible-basher (his own bible) ... who is forever with the wrath of fulmination pulpitting about fundamentalist ideas such as a Creator but who never ever gives answers to questions asked of such rhetoric.

Chris: Now who could that possibly be?

Mike: Although no doubt admirably researched from its own perspective, others do not have time to read (over 200 pages usually starts a publisher frowning).

Chris: Symbiotic Existential Cosmology is currently 492 pages My Hebrew Bible is 1586 pages, so I still have a long way to go! The universe is not a trivial matter. It's not a "Mickey Mouse" theistic fait accompli. Unlike religious and cult leaders who depend on miracles, it is a fully evidenced path to realisation to reflower the planetary biosphere and redeem the human species from self-extinction. People are going to discover it and they are going to ask searching questions.

Mike: Your mind is fertile but uncontrolled. It jumps and flies everywhere. In this case you are exhibiting a typical unwillingness to confront what you see as an existential threat and deal with it consistently.

Chris: I gave you precise critiques. The existential threat is to humanity in terms of a Fermi extinction driven by religious eschatology, not to me personally.

Here is his stated position in 2022:

'Theological evolution' comes in two main forms - deistic, where some Deity touches the fuse and let's life develop as per the scientific explanation and theistic, where the view that a God-of-the-gaps (your perturber?) is responsible, instead of mindless mutation, for the same gaps as evolution-of-the-gaps addresses. This is the BIOS view. It is practically compatible with materialism except for invoking God's guidance of genetic program as opposed chance (scientific atheism's creator).

Wait! Some Christians, overawed by the apparent authority of science, decided either God lit the fuse and then, metaphorically, stepped 'outside' his creation (Darwin's sometime position called deist); or that he whimsically tinkered either genetically or to produce novel forms ex nihilo (called theistic evolution). There is no more evidence for deistic or piecemeal theistic evolution than for the implementation of a coherent ecological program for planet earth.

Anyone reading Symbiotic Existential Cosmology can understand that Mike Pitman, in addition to traducing the majority of Christians who adhere to theistic evolution, as following a delusory compromise, as well as 98% of biological scientists, is asserting that there is no evidence for "implementation of a coherent ecological program for planet earth", in complete contradiction to the entire evolution of the biosphere over 3.5 billion years and any role for the biosphere in scientific or religious cosmology and in future human survival, something we should all be diametrically opposed to for our survival as a species, and it comes piled on top of religious notions of divinely-ordained human dominion over nature, toxic to the future of life as a whole.

The problem with religious intelligent design is that it pretends to be scientific to gain credibility, while hiding the nature of the designer to avoid accusations of creationism. This is a defunct cosmology because intelligent design, without revealing the nature of the designer critical to the complete cosmology is fallacious and defunct. Ian Thompson's work, by contrast is trying to create an unlikely physics to shoehorn theism into the driving seat, by twisting the laws of nature in sleights of hand.

So there is another principle that becomes paramount and that is **the underlying motivation of the proposer**. "Underlying" says it all in poetic terms. Under (occluded) lying (misrepresenting). If a person is simply in the pursuit of true knowledge, they don't have a second agenda driving the ferry across the Styx. This is critically important because unveiling reality is an unstable process and subject to fixed illusions. The Ultimate quest is to understand reality as it is – empirically truthful and correct i.e. right as opposed to righteous.

This question of motivation pervades the notion of teleology, so the existential scientist in me says this is disingenuous. It is seeking to assert a hidden order into the edge-of-chaos of existence so that everything will "turn out right" in the eye of the beholder. It is stereotyped, well-meaning, sterile and clipping the wings of fecundity, or more correctly FGM clipping the gonads of diversity. If I stand for life overflowing across the generations forever, I have to stand for fecund wildness and not try to tame reality in our own hopeful image. I have to say बस "Bas" "enough"! Let nature be!

Nancy du Tertre: I am curious how you have concluded that we can't ever possibly be an advanced AI version created by some "god" or, said otherwise, some other earlier, more powerful, capable, insightful being(s). I am guessing you hold a soft spot in your intellect for the concept that humans are "special." Even AI has already shown glimmers of consciousness and thus perhaps a soul that must be artificial not "real" because mankind created it instead of some Higher God. So what's the difference between a real and not real soul? I would like to know.

Chris: I conclude soul is a notion, rather than an entity, or fact of existence because when soul came up in our expert group discussion, it proved to be a chameleon with diverse conflicting views among people of what soul is conceived to be. That's elementary empirical evidence for soul not having consistent existential status. I reject notions of soul connected with the pursuit of eternal life after death which I see as promissory spiritualism in defence of the biological facts of life which is that life is perennially immortal but individual organisms are mortal because sexual recombination to make complex variety is the only way conscious life can exist in the entropic universe, and this heals the dilemma of ego suffering, which Buddhism attempts to solve by renunciation of life, by devoting ourselves to life as a whole because "we can't take it with us when we go", so mortal life heals the existential dilemma by giving back to life as a whole and eternal religious visions are both fallacious and lead to extreme forms of temptation to evil.

Nancy: I'm on board with your focus on the divinity of life and existence. I treasure life and being in this glorious planet in all of its diversity. But my guess is that once I die I won't be here except as physical dust and a roaming soul/spirit. Therefore death is relevant to my limited understanding of total existence.

I asked you the question about whether humans might be the equivalent of AI creations by a more technologically advanced race of beings to see if you could admit to our obvious ignorance and inability to answer that question. I can't automatically discount it as a possibility. Nor should you.

Chris: One can't envisage any kind of created scenario unless we ignore the cosmological and evolutionary evidence for life. In any forensic investigation we have to respect the evidence at face value, not fool ourselves with a climate of denialism. The fingerprints of biogenesis are written in cosmic symmetry breaking, the molecular clouds of Orion and the lost sea vents on the ocean floor. DNA evidence for the evolution of life abounds in each of our genomes and every genome on Earth and coincides with the geological record. Denial is futile.

Evolution is resplendently creative. Creation is pathetically sterile. Intelligence and all AI by comparison with the sheer de novo unfolding of living conscious evolution is bound in a conceptual straight jacket. The genetic evolution of our biosphere is a parallel processing quantum supercomputer whose scope reduces chatGPT to triviality.

Nancy: We don't want to believe that our divinity could be just a base technology. That would be devastating. Ego crushing. However, we will go far enough to say that God was the one who created us. So on some level we do admit to being someone else's creation! But we keep it all in the Divine group of spiritual stuff. Not mundane technology. We need to believe in our own sacred existence because our life and identity are indeed sacred to us.

Chris: God and soul are just two of many animistic visions we can entertain around the campfire, some helpful but many delusory and damaging. I don't mind if you choose to believe in God at your peril but you can't make any claim that I admit to being someone else's sterile creation or attempt to deny it out of hubris. I am choosing to be compassionate of life because I am of the source – wild, primal, untrammelled and unconditioned beyond all towns and countries. Evolution and biogenesis are like that too.

You need to consider the consequences of creationism by comparison with the creativity and fecundity of life. Creation is a wholly sterile notion that can't stand on its own two feet, or six if you are an insect! You may consider belief in God is divine but disbelief in the ultimate sacredness and creative autonomy of life is a Faustian pact with death itself.

Nancy: I hear ya! I spend more time loving Nature and its "fecundity" than almost anything else. I don't spend much time, if at all, thinking about who or what created what. Not my bailiwick. Out of my league. But I do regularly express gratitude and appreciation for this wonderful "pleasure dome" that I have been able to experience. I thank God. Gratitude rebounds on itself regardless of what you believe in. Feels good. Enhances good health. Makes one feel connected to all that is.

Chris: I checked on the computational power of the biosphere and it is hands down the most powerful supercomputer ever likely to exist, let alone survive on this planet. Landenmark, Forgan & Cockell (2015), in "An Estimate of the Total DNA in the Biosphere", calculate the computational power of the biosphere to be up to 10^{15} yottaNOPS (yotta = 10^{24}), or 10^{39} Nucleotide Operations Per Second (NOPS), about 10^{22} times more processing power than the Tianhe-2 supercomputer, then the fastest in the world at on the order of 105 teraFLOPS (tera = 10^{12}). Tech Review in [2024](#) asserts that the current fastest, Frontier, runs at 1 exaflop or 10^{18} floating-point operations per second, so we arrive at a current figure of 10^{18} times the computing power of the fastest super-computer today, which although designed on low power consumption, still uses the electricity of a town with thousands of houses, placing an energy limit on any exponential expansion. Functional biospheric computational power may be significantly less. The percentage of any given genome being transcribed at any given time depends on the reproductive and physiological state of each organism, and at the current time we cannot reliably estimate this for all life on Earth. If all the DNA in the biosphere was being transcribed at reported rates, taking an estimated transcription rate of 30 bases per second, then the potential computational power is as above.

| | DNA amount (Mb) |
|------------------------|--|
| Prokaryotes | 1.6 (1.1) $\times 10^{31}$ |
| Unicellular eukaryotes | 1.3 (0.9) $\times 10^{29}$ |
| Fungi | 1.7 (3.4) $\times 10^{27}$ |
| Animals | 4.2 (1.5) $\times 10^{29}$ |
| Plants | 3.6 (3.4) $\times 10^{31}$ |
| Viruses | 4.0 (3.4) $\times 10^{29}$ |
| Total | 5.3 (3.6) $\times 10^{31}$ |

The biosphere super-computer is an organic quantum computing process operating from the level of single molecules, in both nucleotide replication and mutational change, both of which operate at the level of orbital wave functions in forms of spatial parallel superposition computing, as evidenced in protein folding rates and enzyme quantum tunnelling.

Lingam, Frank & Balbi (2023) suggest a more conservative current difference of 10^9 between information transfer in the biosphere and the technosphere as a whole. However, under the admittedly equivocal assumption of sustained exponential growth, which is profoundly unlikely, they find that information transmission in the technosphere could potentially surpass that of the biosphere ~90 years in the future. The current world population is 8×10^9 and there are 3×10^9 base pairs of human DNA, so current technosphere information corresponds to that of one DNA base, or one person alive, but comparison with the entire human population. The likelihood of growth of the current technosphere by a factor of 10^9 remains specious.

Thus there is no conceivable possibility of any form of AI achieving anywhere near the computing power of the natural intelligence (NI) that generated conscious life on Earth in the foreseeable future. No – it didn't create it, which would be a dead duck – it spawned it creatively through mutational evolution and natural selection, sexual fertility and embryogenic development, so we are – wait for it – autonomously conscious sentient beings!

The only problem for human designs to manipulate and control everything, is that this bio-computer is a law unto itself and loves to simply refine evolutionary fertility and awareness so we can't harness it to control nature. We still have no idea that AI could ever be conscious, but NI has already done it and done it so well that here we are. And we really don't need AI to solve our problems at all. It's just a pipe dream of elite human hubris to manufacture something so intelligent in mechanistic terms we can claim we have invented God, in the process, making human gainful human employment a feature of a forgotten age. All we need is good medical science to improve the quality of life and to stop trashing the planet, take the living sacraments among the crickets in the moonlight and wonder at the fabulous awesome "nature" of existence.

Chris Nunn: Interestingly many mystics, especially Sufi ones, come to suppose that they are God. Is that fantasy only or a very partial truth?

Chris King: It's both ultimate reality as it is experienced numinously and spiritual fantasy if it is subsequently represented in a world view of divinity.

Nearly all spiritually minded people seem to veer towards an elite vision that embraces a hierarchical view of order invoking deity in some form or other, whereas I am of intimate symbiosis with the diversity of life and see it as key to our survival and how the universe evolves to climax consciousness, through the biota, rather than disembodied divinity. I see conscious mortal life as the ground zero embodied manifestation of the All, which is not an independent godhead imposing a divine order on supplicant nature as creatura and think that's what our ancestors conceived of in their animistic world view that preceded religion. I identify with the All and experience it as a symbiotic eternal merging, which is pretty much what the Sufi's do and the Rishis.

Erwin Schrödinger (1944) quotes Persian Sufi mystic Aziz Nasafi:

"On the death of any living creature, the spirit returns to the spirit world and the body to the bodily world. In this way however, only the bodies are subject to change. The spiritual world is one single spirit who stands like unto a light behind the bodily world and who, when any single creature comes into being, shines through it as through a window. According to the kind and size of the window, less or more light enters the world. The light itself however remains unchanged".

That to me is right on the edge. It's not really defining God, just the light of oneness, but it's starting on the road to the Godhead so a bit precarious. I don't want to take it that far, because I see psychedelics as a way people can enter the nierika and experience the numinous for themselves. It's not a panacea or an enlightenment pill, and needs to be accompanied by all the traditional skills of meditative repose (mindfulness and annihilation as Marguerite Porete put it beautifully in "Mirror to the Simple Soul" before being burned at the stake for her vision). Sacramental mysticism opens the doors of perception so we can see into the mystery a lot more deeply, without any assumptions, so its as close to a pure reality quest as the empirical method can provide, just like the LHC.

I think that helps humanity become able to have mystical oneness without doctrine so we can all witness the Ultimate reality in the raw and return with tales of our journeys. It also comes with an implicit message of symbiosis because it is mysticism through species interdependence, but it also comes with a deep symbiotic moksha – an interdependence spiritually with life as a whole, because in the very nature of the experience, we as a species are humbly at one with all life in the cosmos. It's not a lesser moksha because pure spiritual training and discipline tends to breed an attitude of elite mind-dominant mysticism that invokes a hierarchical view of renunciation of incarnate existence, rather than a complete merging with the abundance life as a whole.

The Gospel of Thomas is the visionary inside story of Yeshua's life experience. The synoptics and John are by contrast the outer, secondary apocalyptic account:

(2) Jesus said, "Let him who seeks continue seeking until he finds. When he finds, he will become troubled. When he becomes troubled, he will be astonished, and he will rule over the All."

(3) *Jesus said, "If those who lead you say to you, 'See, the kingdom is in the sky,' then the birds of the sky will precede you. If they say to you, 'It is in the sea,' then the fish will precede you. Rather, the kingdom is inside of you, and it is outside of you. When you come to know yourselves, then you will become known, and you will realize that it is you who are the sons of the living father.*
 (77) *Jesus said, "It is I who am the light which is above them all. It is I who am the all. From me did the all come forth, and unto me did the all extend. Split a piece of wood, and I am there. Lift up the stone, and you will find me there."*

In both 2 and 77 it is **"the All"** and the way Jesus uses it is not to "rule over all". This is critical, as the inner path has Jesus referring to the All in very much the way Brahman in my [moksha epiphany](#) is envisaged and we need to learn from it and respect it. I would wager that the Father in 3 is equivalent to the All in the light of 2 & 77.

If one avoids trying to fudge the physics, as Thomson does to facilitate theistic causality operating independently of physical causality, and reflects on the [transactional](#) quantum interpretation, we already have overlapping advanced and retarded trans-causality in quantum physics under special relativity without any contrived assumptions and we don't yet know how to unravel how and whether conscious experience can use this to anticipate, although the sustained use of conscious volition by all brains appears to confirm a selective advantage to subjective conscious volition over the physical universe. Life is already doing this and we need to respect life prima facie and not contrive a divine cosmology without clear subjective or objective evidence to support it, because if we don't respect the life and the diversity of life we do have as the primary manifestation within us, we will surely end up here:

*Jesus said, "That which you have will save you if you bring it forth from yourselves.
 That which you do not have within you will kill you if you do not have it within you." (Gosp. Thomas 70)*

That which we have is life itself as long as it lasts. Guard it! Protect it! Love it humbly in all its diversity, not with spiritual ascendancy! The sanctity of life comes first. Once biodiversity is saved, we can consider all our hopes and fears for divinity.

"Richard Dawkins admits Darwinian presuppositions against God" is a two-minute [video](#) interview with Richard Dawkins and Francis Collins the ex-leader of the Human Genome Project, who is also a devoted Christian. The video, rather than exposing Dawkins as biased by his evolutionary "beliefs", casts him in an almost visionary light, *"I am in love with the idea that it is possible to explain complex things in terms of simple things. Darwin's great gift was to show that big complex things can come into existence by an explicable, understandable, beautiful, elegant process of gradual evolutionary change and that's such a beautiful idea and that inventing a big complex thing, which God must be if he exists, throws a ruddy great spanner in the way of that beautiful Darwinian concept"*. He is being honest about his own predilection, which is natural and naturally beautiful. In so doing he has transformed from a "boorish scientist" into an artist-musician of life's becoming and shown he has genuine spiritual character.

The fundamental problem with creationism is that it is the most extreme violation of Occam's razor possible. Evolution is a natural and elegantly simple process of quantum perturbation and natural and sexual selection, showing how great complexity can ensue from underlying simplicity. To invoke a creator Deity cites the ultimately complex to explain the natural, so it's the worst conceivable logical option in terms of Occam's razor. That's why affirmative belief is a trap to avoid, particularly if we are dealing with sensitive unstable processes like subjectively conscious mysticism.

But when we turn to Francis Collins, who despite being a sincere well-meaning famous scientist, we have a real problem: *"whatever ability we humans have to try to imagine what God is really like if God exists and I believe he does, has got to be so completely pathetic compared to the reality of that complexity and that awesome capability of that physicist and mathematician – a mind – I think of God as a mind, not as some greater guy in the sky, which is an unfortunate image foisted on generations of believers – I don't think God has gender and think God is a mind that is capable of things that you and I cannot possibly imagine"*.

Collins (2009) in "The Language of God: A Scientist Presents Evidence for Belief" espouses theistic evolution or evolutionary creation, which he prefers to call BioLogos – that one can "think of DNA as an instructional script, a software program, sitting in the nucleus of the cell", is talking about a very exploded version of an extremely intelligent human mind that can, not only understand the laws of nature, but literally conjure up the entire cosmos. He is also an evangelical Christian believer, believing in the Christian idea of deity as a Trinity – Jesus as the son, Abba as the father and the Holy Ghost and the whole historical happening focussed on Jerusalem in the year zero as a reality, or at least as something he can accept and worship in church and take the Eucharist upon. The assumption of Yeshua's mission

setting up the context for him as Son of God to orchestrate the Big Bang 13 billion years beforehand is putting the cosmological cart before the horse and most scientists would find it more than a hard to accept willy nilly.

Collins isn't hailing Vishnu, the sustainer, who is the archetype of the intelligent deity dreaming Brahma out of the lotus in his navel, but the Christian Trinity, so this "mind" is not the cosmic God but the Christian deity. If he has discovered the true God of reality, why is it still latched onto the Christian doctrine? Why isn't he now reciting mantras and doing deep transcendental meditation? It is consciousness itself, not intelligence, that is primary. And what of Lakshmi? Francis says his God is neuter like the Holy Ghost – a neutral mind. This is a human believer making God in his own image while still believing in evangelical Christianity as a religious movement with ambitions of religious conversion. How does this intelligence translate into how space-time and the forces get created ex nihilo? No explanation is forthcoming, because the initial assumption of God is omniscient, unimaginable and inexplicable. We have come to understand that intelligence is something that emerges within nature, it's part of life and living species, so we have a contradiction, and it needs more than intellectual intelligence to evoke the entire Universe at large.

If one tries to invoke a deity that is consistent with the natural universe, as we now know it, one ends up with a super-intelligent super-conscious agent, as Francis Collins suggests, evoking the laws of nature and evolving life, not just a man with wooly hair who says "let the Universe begin", so deity has to be refashioned post-hoc as the "provocateur" of the universe as it evolves in all its complexity, not just defining the laws of nature, but creating space-time and all that exists within it. If this is the kind of deity such religious people claim we need in the modern universe, to fill their credibility gap, why would this deity also invest Yeshua with super-human status in Jerusalem 2000 years before in an enactment of a tragedy of sacrificing his only begotten son? The two concepts of deity are entirely inconsistent. This shows just how significantly even highly intelligent belief can confound empirical discovery.

Eastern religions try to do this by realising the physical universe as aggregations of consciousness into grosser forms, but this is problematic to realise in any more than an allegorical dream time sense. We know that the standard model of physics arising from symmetry-breaking and the symmetries of the colour and electro-weak forces are interactively predisposed to fractal biogenesis and evolution explains the ongoing story and is an explicable account that makes scientific sense, as Richard Dawkins explains. Putting a creator God into the universe must at least involve realising the laws of nature, but the elegant symmetries, and symmetry-breaking of the standard model and the complementation of chaos and order could easily invoke a mandala-like creation, rather than a linguistic Logos.

Upanishadic teachings invoke Brahman as Ultimate Reality, not God; the Hindu tradition is polytheistic, consistent with reincarnation rather than creation; and Buddhism is non-theistic and doesn't accept a creation deity as the basis of its cosmology, although Hindu and Buddhist tantra does admit diverse deities and dakinis. Neither of these centrally oppose the evolutionary principle. Even Judaism doesn't assert these evangelical creationist ideas, which is predominantly feature of evangelical Christianity and some Muslim groups. The notion of a creator deity in conflict with natural evolution is thus unique to Monotheism and Christianity in particular.

If we are thinking cosmologically, the human spiritual tradition is thus not consistently theistic, so there is really no way to justify asserting a creator on the basis of world religion as a manifestation of spiritual reality, so we end up with an evangelical contingent from the Christian tradition trying to claim the mantle of the God of Creation. That is not honest cosmology, or honest belief, because it is claiming a cosmological status, when such beliefs are supported only by one, or a few religions constituting a significant minority of the world population, so even if deity is conceived as manifest in humanity, monotheism is clearly not the root condition of even highly developed religions. One thus can't legitimately claim a creator deity as having human spiritual cosmological status.

The claim that the male "Father" god of creation has manifest in history as a succession from primitive beliefs, through "pagan" polytheistic deities such as Zeus and Vishnu to the one abstract God Yahweh who then fully manifests in Yeshua's mission in the Trinity of Father, Son and Holy Ghost is a contrived patriarchal manifestation of cultural hubris in denial of spiritual diversity. Given this diversity, ALL religious traditions have to be seen to be at best allegorical accounts and not a description of the actual cosmology of the universe in which we consciously exist. No post-hoc contrivance in the light of the scientific discovery of the universe as we now know it, to invoke the universe at large as being created by a super-conscious super-causal agent has valid empirical explanatory power over nature.

This doesn't mean I don't accept the cosmic mind is a transcendent reality, or see it as anything less than a riveting revelation, but human and biospheric survival in the universe dictates that it is and has to be a symbiotic reality, in

which we, and the biota as a whole, are the incarnate embodiment, of cosmic consciousness and the All, Brahman, or mind at large is the full conscious realisation. This is not a lesser Illumination but is cosmologically true to the universe and consciousness as it is experienced empirically.

For me, even the standard model of physics is awesomely beautiful in its diverse symmetries and I haven't lost faith in the inscrutable symmetry-breaking that TOEs invoke either, despite their failure to uniquely define the universe out of many configurations, so we could well have a Taoist or mandala like big bang "creation", that is neither manufacture, nor a logos of verbal naming by a mere command – let there be Universe – the ultimate disingenuous simplicity hidden in an assumed agent of ultimate complexity!

It is because we are mortal that we are the full embodiment of "divinity" and we must needs to step up and fulfil the messianic quest of the Unveiling in our lifetime with no prior assumptions. That is what taking personal responsibility in the universe means. The mortal condition is ground zero. It's the full monte. The divine condition by contrast is ethereal. We can think of the divine condition and the universe as a dream of Vishnu emergent in Brahma who creates – Brahman ultimate reality – but the fully fleshed consciousness is mortal life itself. We manifest the All to the extent we merge with Brahman, but because we are mortal, we have to resolve the cosmic problem in our own mortal span. This means no egotistical advantage can prevail, because we can't take material gains with us when we go, so we have to apply our entire personal responsibility for the benefit of the universe and life as a whole. Nothing else furthers.

In our planetary apocalypse, this is biocrisis, climate crisis, nuclear crisis and the covers being thrown off reality in the whole make-or-break planetary rite of passage, or extinction, we are facing in real time in this anthropocene transition from which we don't know whether life, or human life, will even survive the next century, or millennium, given human impact. Our covenant with the All is to redeem the entire Universe – in our context the living planetary biosphere. We aren't just unveiling our own visionary light but the Apocalypse of reality itself. The time is now. This is it! Carpe diem!

The Human Genome Project and all the genetic sequencing done since, lays bear the entire genetic, and even epigenetic skeleton of the Tree of Life that has shaped us all. There is no way to play casting lots on the garments of the Tree of Life by religious believers once these discoveries have been made. It is futile and dangerous to allow a religion with an vowed agenda of reinforcing the Sabbatical Creation, an endearing allegory that is manifestly incorrect in multiple ways, to create disinformation that the Tree of Life, which even Revelation declares to be sacrosanct, can be "blasphemed" against, as a false construction of materialistic science. I use blasphemed here intentionally because this has both a scientific and a religious dimension.

In the midst of the street of it, and on either side of the river, was there the tree of life, which bare twelve manner of fruits, and yielded her fruit every month: and the leaves of the tree were for the healing of the nations (Rev. 22:2)

I can thus in no way do commerce with any conservative Christian apologist with an avowed fundamentalist agenda to cut the branches off the Tree of Life, by denying macro-evolution, even if masquerading in the guise of science to highjack the pursuit of true knowledge, so proponents of all forms of Creationism are well advised not to lay down the markers of a foundation dispute over this, lest they sully the credibility of their enterprise.

This is why I spent the last three months developing Symbiotic Existential Cosmology into a fully fledged extended evolutionary account including gene-culture co-evolution to specifically turn the tables on the Christian fundamentalist agenda to destroy the evolutionary basis of the Tree of Life from which we all come, in favour of an unscientific Christian doctrinal cannon, by detailing how religions themselves have evolved, and now Creationism as well, so those that cast the first stone are themselves evolutionary sinners. The fact the 98% of biological scientists respect and accept evolution is evidence that their intimate experience dealing with nature is conclusive to those who investigate it. The evidence presented here confirms, in each case that adventitious mutation filtered by natural and sexual selection are indeed sufficient to result in the evolution of the tress of life documented in geological, archaeological, genetic and phenotypic history.

Fig 159: Predatory Creationism attempts to devour the evolutionary fish of the Tree of Life.



New Wine in New Bottles

Jesus said: "It is impossible for a man to mount two horses or to stretch two bows. And it is impossible for a servant to serve two masters; otherwise, he will honor the one and treat the other contemptuously. No man drinks old wine and immediately desires to drink new wine. And new wine is not put into old wineskins, lest they burst; nor is old wine put into a new wineskin, lest it spoil it. An old patch is not sewn onto a new garment, because a tear would result." (Gospel of Thomas 47).

Creationism is old wine in old bottles,
 that treats the evolving diversity of life with just such contempt.
Religious "Intelligent Design" is old wine in old bottles, falsely labeled
 as new and fresh, when they have become vinegar and gall.
Symbiotic Existential Cosmology is new wine in new bottles.

It respects science, yet transcends materialism
 It rejects dominion over nature and sanctifies conscious life immortal.

To cast the unfolding diversity of life in the old bottles of creation would
 doom the overflowing abundance of life's evolving diversity,
 to the Day of Judgment, of a human-induced Fermi self-extinction.

I serve no master, neither am I yours, but if you want life to survive,
 drink from the bubbling spring which I have measured out (G of Th 13).

It has been apparent to me for 40 years that to achieve any real benefit for the world, I will have to defend science and the scientific method on evolution against religious attempts to assert belief in the place of discovery, while at the same time laying siege to science over freeing subjective consciousness from materialistic incarceration. For me this is a truly religious calling that has to be done by cosmological truth to nature, by setting a new paradigm of truth speaking to nature. To remind you of this, please look in detail at my own **Tree of Life**, which contains a citation requiring it not to be used to advance creationist claims, because that is exactly what I found was happening shortly after I released it on the internet.

The Triple Kernel of Symbiotic Existential Cosmology:

The core principle:

- (a) (i) I affirm consciousness as primary, (ii) I accept the universe is necessary, (iii) I recognise evolution is natural.
- (b) Subjective conscious volition has efficacy over the physical universe.
- (c) Cosmic evolution rises to immortal conscious climax through biospheric symbiosis.

This hard-won "trinity" might seem simplistic, but it's a root experiential observation, concerning the natural universe, whose significance can't be over-estimated, just as subjective conscious physical volition can't be.

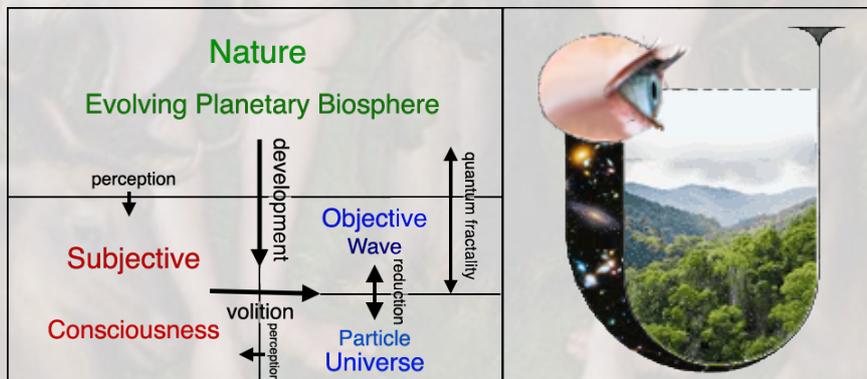


Fig 160: Left: Symbiotic Existential Cosmology as a triple nested symmetry-breaking complementarity. Right: Nature filling Wheeler's self-observing universe.

The figure illustrates the **essential cosmological role** and **sacredness of life** immanent over all forms of spiritual transcendence. On the right is JA Wheeler's self-observing universe, confirming that the physical world needs subjective consciousness to manifest, just as the divinity of cosmic consciousness needs life to become manifest. The

mass-energy dynamics of cosmology leads from cosmic inflation to the heat death or big crunch, but the quantum complexity dynamic rises to climax in living systems in which conscious biological brains are the apocalyptic epitome.

In the light of this, I conclude that:

- (a) **evolution from LUCA to Homo occurred naturally** through mutation and natural and sexual selection, without any other assistance than the nature of the quantum universe and sentient volition in natural and sexual selection,
- (b) there is **zero empirical evidence** for any need for "**divine intervention**" in the evolutionary process,
- (c) evolutionary science is **continually revealing new evidence** that irrevocably unhinges all such claims almost as soon as they are made.

Symbiotic Existential Cosmology says there are **three essential components** to the cosmos not the two of science and spirituality, or matter and consciousness. The physical aspect is **cosmology**, the subjective conscious inspiration is **existential** and the living reality that makes it all possible, as the unifying factor, is evolutionary **symbiosis**.

Therefore trying to unify science and religion is neither the point of the exercise, nor does it directly address redeeming the apocalypse of symbiotic failure of humanity. Wholeness needs to be fully embodied in living diversity. Then we can live essentially immortally throughout our generations forever, as long as the living universe lasts and unfold the great **I AM** of the universe, ever more deeply discovering and manifesting itself, in cosmic conscious awareness. While Vedanta subsumes life into the supremacy of consciousness and gross matter, failing to respect life's evolving material diversity as sacred in and of itself, Monotheism actively demotes life to humanity being overlord, as a King to his subjects veering into a clockwork orange creation.

The apocalyptic crisis the world faces is due to a failure of humanity to abide by the symbiotic basis of the living biosphere, deprecating the status of life, leading towards a self-induced Fermi extinction, so there is no way of simply trying to fuse science and belief without respecting life as the sacred manifestation of embodied consciousness that overflows the crack between the visionary and physical worlds. Symbiosis is no simple question, because it involves all processes, including predation and parasitism, in the edge of chaos climax symbiotic diversity of our biosphere.

Fools rush in where angels fear to tread, by **asserting spiritual beliefs over nature herself**, to the **discredit** of the sanctity of the **diversity of life**, and our own **future survival**.

The totality of existence and our survival can be secured only by integrating consciousness, nature and the universe into one symbiotic whole, not transcending or subjugating one aspect to another. The most vulnerable of these right now is nature. Scientific materialism seeks to explain everything from without, reducing consciousness and nature to a "lifeless" machine. Pure spirituality seeks an answer in transcendent consciousness, but in the process deposes nature and the universe to a menial status, akin to a clockwork design in creationist views, and a thought in the mind of God, or a dream of Vishnu in others. Many of us do this in more subtle ways, through imagining noospheric forces, higher beings, supernatural influences, or that supreme consciousness conceived nature and the universe.

The role of entheogenic mysticism is to regain biospheric and cosmological balance. That balance is Symbiotic Existential Cosmology, in which the three terms are a united whole. Psychic symbiosis is an evolutionary phenomenon. The entheogens evolved, so that we can survive as an intelligent species in our home biosphere. Many of us are still too proud to admit to ourselves that entheogens have this sacred evolved role to aid all of us. Through entheogenic mysticism, we regain this symbiotic integration of subject, object and nature as one. No materialistic, or spiritual path on its own can ever achieve this. We all need Symbiotic Existential Cosmology more than we can even begin to comprehend. Symbiotic Existential Cosmology is the Rosetta Stone of reality, translating the three 'languages' of existence – consciousness, nature and the universe into a unified whole.

True meaning and value. We cannot place any confidence in the notion that meaning and values can be independently defined, enticed, or induced any more than a universal morality can. All three are part of the creative process we are or should be undertaking, not defining in advance. Just as creationism begets a sterile clockwork view of imposed nature and degenerating cosmology, that can neither admit biogenesis nor evolution and cannot replicate embryogenesis, which is self-generating in a way that cannot be externally imposed, so any attempt to assert a cosmic good, from outside life, or outside the universe, cannot achieve more than a degenerate end.

The idea of an externally induced blessed realm contradicts the way life autonomously rises to climax, which is in its overall symbiotic diversity, arising from evolution at the edge of chaos, not any externally induced universal "good".

We know this is the nature of karma itself as well, as rough justice in the slings and arrows of outrageous fortune. In this a threatened native kiwi has to have a different significance value from a feral rodent or mustelid that consumes its eggs, irrespective of both being conscious sentient beings.

Climax life depends on its apex predators as key to the fertility of the entire ecosystem, keeping it balanced in a state of self-organised criticality. As an apex predatory and parasitic species upon life on Earth, *Homo sapiens* is failing its sustainable ecological niche. We need to relearn our essential beings, for it is we, not the rest of life that has lost its/our way. We thus need to learn from life and preserve its climax unfolding and not assert our notions of “universal good”, even Brahman, Ein Sof or the 'Elohim onto the diversity of life itself. I see this as a form of naturalistic epistemic humility, in the perennial long-term survival of life as a whole. This is the remedy and the respite, because in all honesty, in the mortal coil of the physical universe, conscious sentient beings can't take it with us when we go.

This is not about deprecating the hopes of religion to caring for dumb animals because it leaves the entire future open for us to make the vision quest ourselves to discover all the mysteries of conscious existence in the first person rather than through believing in unverifiable deities that may be a product of our own visionary consciousness. Neither does it hold us back from a sustainable technological living culture, including expert medical care and high standards of living, provided we protect the planet and its climate and habitats in a resilient state. Failing that, human culture is so fragile to our own destructive misadventure that we need to look to other more naturally resilient species such as the threatened stem primates from tarsiers to pottos that could survive in a warmer world as they did in the Eocene 50m years ago.

The Noosphere, Symbiosis and the Omega Point

The noosphere is a philosophical concept developed and popularised by the Vladimir Vernadsky, and Pierre Teilhard de Chardin. Vernadsky defined the noosphere as the new state of the biosphere and described as the planetary "sphere of reason". The noosphere represents the highest stage of biospheric development, its defining factor being the development of humankind's rational activities. The word is derived from the Greek νόος ("mind", "reason") and σφαῖρα ("sphere"), in analogy to "atmosphere" and "biosphere". Vernadsky and de Chardin developed two related but starkly different concepts, the former being grounded in the geological sciences, and the latter in theology. Both conceptions of the noosphere share the common thesis that together human reason and the scientific thought has created, and will continue to create, the next evolutionary epoch as part of the evolutionary chain – geological to biological to mental.

The term noosphere was first used in the publications of Pierre Teilhard de Chardin in 1922 in his Cosmogogenesis. Vernadsky was most likely introduced to the term by a common acquaintance, Édouard Le Roy, during a stay in Paris. Both Teilhard de Chardin and Vernadsky base their conceptions of the noosphere on the term 'biosphere', developed by Edward Suess in 1875. In contrast to the conceptions of the Gaia theorists, or the promoters of cyberspace, Vernadsky's noosphere emerges at the point where humankind, through the mastery of nuclear processes, begins to create resources through the transmutation of elements. It is a study area of the Global Consciousness Project.

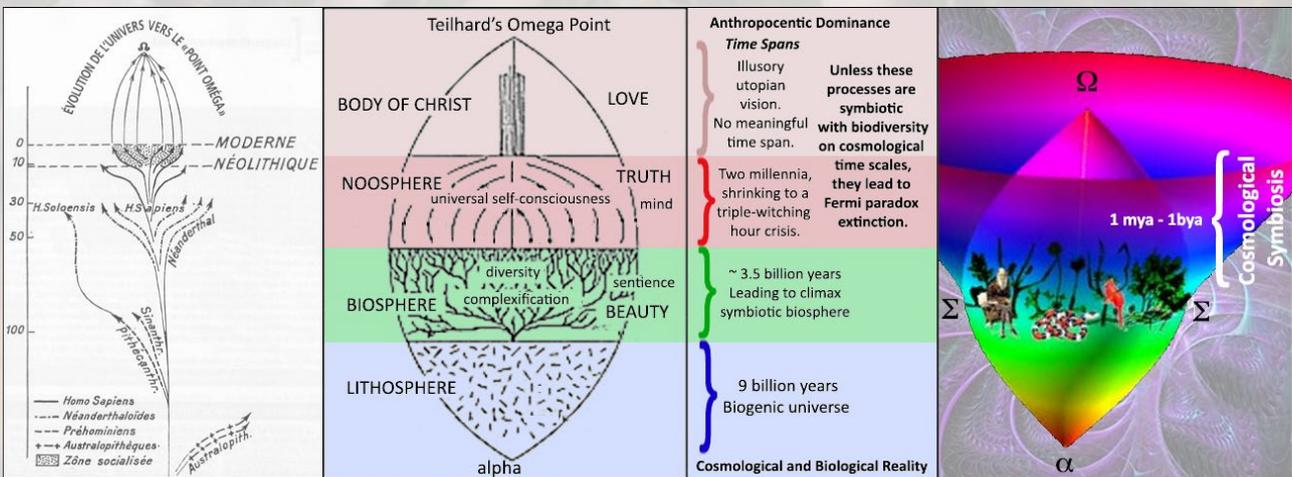


Fig 161: Teilhard de Chardin's eschatology (left) and cosmology (centre) from John Morton's works. (Right) Symbiotic Existential Cosmology – Paradise on the Cosmic Equator in Space-time.

In contrast to the conceptions of the Gaia theorists, or the promoters of cyberspace, Vernadsky's noosphere emerges at the point where humankind, through the mastery of nuclear processes, begins to create resources through the transmutation of elements. It is a study area of the Global Consciousness Project, a parapsychology experiment begun in 1998 as an attempt to detect possible interactions of "global consciousness" with physical systems. The project monitors a geographically distributed network of hardware random number generators in a bid to identify anomalous outputs that correlate with widespread emotional responses to sets of world events, or periods of focused attention by large numbers of people. According to Kurzweil's (2005) and Vinge's (2013) technological singularity hypothesis, the noosphere would be in the future the natural environment in which 'human-machine superintelligence' emerges to reach the point of technological singularity, critiqued as a crisis of the noosphere (Lahoz-Beltra 2014).

Pierre Teilhard de Chardin (1955, 1959) perceived a directionality in evolution along an axis of increasing Complexity/Consciousness. For Teilhard, the noosphere is the sphere of thought encircling the earth that has emerged through evolution as a consequence of this growth in complexity/consciousness. As a result, he sees the "social phenomenon [as] the culmination of and not the attenuation of the biological phenomenon." These include legal, educational, religious, research, industrial and technological systems. In this sense, the noosphere emerges through and is constituted by the interaction of human minds. He argued the noosphere evolves towards ever greater personalisation, individuation and unification of its elements. He saw the Christian notion of love as being the principal driver of "noogenesis", the evolution of mind. Evolution would culminate in the Omega Point — an apex of thought/consciousness — which he identified with the eschatological return of Christ.

The Phenomenon of Man was published in 1955 but the text was written in the 1930s, and achieved publication only posthumously. Chardin's view of evolution is absolutely visionary. He respects the scientific opinion on natural evolution but does not disregard the possibility of directed effects. He is utterly respectful of nature and awed by the species diversity:

Anyone who wishes to think in terms of evolution, or write about it, should start off by wandering through one of those great museums — there are four or five in the world — (at the cost of efforts whose heroism and spiritual value will one day be understood) a host of travellers has succeeded in concentrating in a handful of rooms the entire spectrum of life. There, without bothering on names, let him surrender himself to what he sees around him, and become impregnated by it: by the universe of the insects whose "reliable" species are counted in the tens of thousands; by the molluscs, thousands more, inexhaustibly variegated in their marblings and their convolutions; by the fishes, unexpected, capricious and as prettily marked as butterflies, by the birds, hardly less extravagant, of every form, feather and beak; by the antelopes of every coat carriage and diadem. ... And to think that all we see are merely the survivors What would it be like of all the others were there too? In every epoch of the Earth, on every level of evolution, other museums would have displayed the same teeming luxuriance. Added together, the hundreds of thousands of names in our catalogues do not amount to one millionth of the leaves that have sprung forth so far on the tree of life.

He specifically supports macroevolution, the key target of creationists:

*Since the heroic times of Lamarck and Darwin, the favourite argument employed against the transformists has always lain in pointing out their incapacity to prove the **birth** of a species in terms of **material traces** 'Admittedly you show us' say these objectors 'a succession of varying forms in past ages and we will even concede that you are able to demonstrate the transformation of those forms within certain limits. But however you put it, your first mammalian is already a mammal, your first equine is already a horse. Accordingly, though there may well be evolution within a given type, we see no new type produced by evolution'. So the increasingly rare survivors of the 'fixed species' school still contend. ... Nothing is so delicate and fugitive by its very nature as a first beginning. As long as a zoological group is young, its characters remain indeterminate, its structure precarious and its dimensions scant. It is composed of relatively few individual units and these change rapidly.*

He sees biological evolution as intimately entangled with the rise of consciousness, in a form of panpsychism:

*From an inward point of view, constantly confirmed by ever-increasing harmonies, the different objects of science become visible in proper perspective and in their true proportions. And at the heart of life, explaining its progression, the impetus of a rise in consciousness. ... How can life respect determinisms on the **without** and yet act in freedom **within**? ... To write the natural history of the world, we should need to be able to follow it from **within**. It would thus appear no longer as an interlocking succession of structural types replacing one another, but the ascension of an inner sap of consolidated instincts. Right at its base the living world is constituted by consciousness clothed in flesh and bone. From the biosphere to the species, this is nothing but an immense ramification of psychism seeking for itself through different forms. That is where Ariadne's thread leads us if we follow it to the end.*

He admits this view may be too Lamarckian for some but regards it as integral by conscious selection:

*In various quarters, I shall be accused of showing too Lamarckian a bent in the explanations, of giving an exaggerated influence to the **Within**, but remember that an essential part is left to the Darwinian play of external forces and to chance, but strokes of chance which are recognised and grasped — that is to say psychically selected.*

This becomes the key to his transition to the noosphere, the cultural 'thought sphere' he conceived as bringing about the union of spiritual consciousness in a social, cultural and spiritual coalescence:

Fig 161b: Tree of Life from Chardin (1955) from Cuénot, whose genetic studies on mice, followed in the footsteps of Mendel's on plant genetics, but were cut short when German troops invaded Nancy, where he kept his mouse colony. After the First World War, he never returned to his studies on mice and moved on to designing a theory of evolution, halfway between en vogue French Lamarckism and Darwinism.

We have seen and admitted that evolution is an ascent towards consciousness. That is no longer contested even by the most materialistic, or at all events by the most agnostic of humanitarians. Therefore it should culminate forwards in some sort of supreme consciousness. But must not that consciousness, if it is to be supreme, contain in the highest degree what is the perfection of our consciousness—the illuminating involution of the being upon itself? ... The consciousness of each of us is evolution looking at itself and reflecting upon itself.

Chardin's vision ultimately leads to the cosmic Christ, even the intimation of an evolutionary entheogenic sacramental Eucharist:

To live and develop the Christian outlook needs an atmosphere of greatness and coherence. ... In a pluralistic and static Nature, the universal domination of Christ could strictly speaking still be regarded as an extrinsic and superimposed power. In a spiritually converging world this 'Christic' energy acquires an urgency and intensity of another order altogether. If the world is convergent and if Christ occupies its centre then the Christogenesis of St. Paul and St. John is nothing else and nothing less than the extension, both awaited and unhoped for of that noogenesis in which cosmogenesis – as regards our experience – culminates. Christ invests himself organically with the very majesty of his creation. ... To be able to say literally to God that one loves him not only with all one's body, all one's heart and all one's soul but with every fibre of the living universe – that is a prayer that can only be made in space-time.

*Evolution has come to infuse **new blood**, so to speak into the perspectives and aspirations of Christianity. In return, is not the Christian faith destined, is it not preparing, to save and even take the place of evolution?*

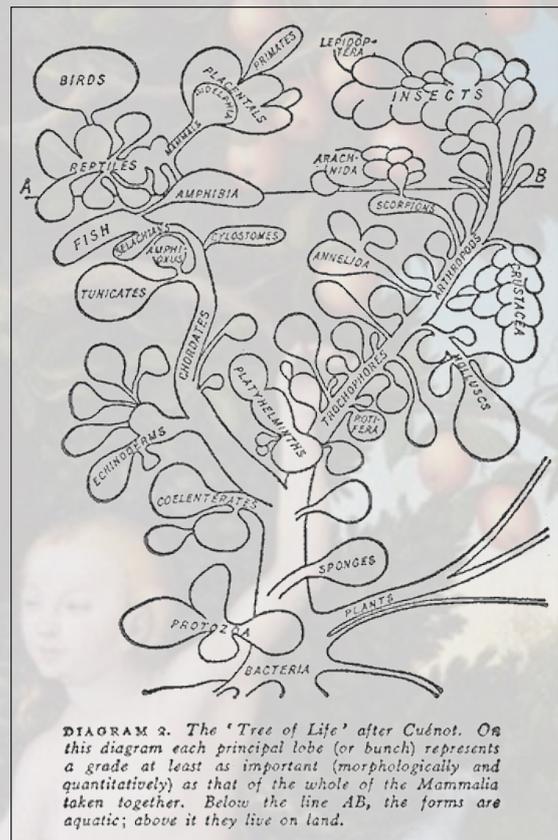
Susan Rakoczy notes that on his desk Teilhard had a picture of the Sacred Heart and "My Litany":

"The God of evolution, The Christic, the Trans-Christ Sacred Heart ... the motor of evolution the heart of evolution, the heart of matter The heart of God ... the world-zest.

The activant of Christianity ... the essence of all energy. Heart of the world's heart, Focus of ultimate and universal energy Centre of the cosmic sphere of cosmogenesis Heart of Jesus, heart of evolution, unite me to yourself."

What "taking the place of evolution" is, in the anthropocene age of the mass extinction of biodiversity, is anyone's guess, as we shall see from more recent utopian versions of the noosphere, in the era of the world wide web and artificial intelligence.

Henri Bergson's "L'évolution créatrice" (1907), was one of the first to propose evolution is "creative" and cannot necessarily be explained solely by natural selection through a vital force which animates life and fundamentally connects mind and body. In 1923, C. Lloyd Morgan took this work further, elaborating on an "emergent evolution" which could explain increasing complexity (including the evolution of mind). Morgan found many of the most interesting changes in living things have been largely discontinuous with past evolution. Therefore, these living things did not necessarily evolve through a gradual process of natural selection. Rather, he posited, the process of evolution experiences jumps in complexity, in a qualitative punctuated equilibrium. The emergence of human culture facilitated a quickening of evolution in which cultural evolution occurs more rapidly than biological evolution, consistent with gene-culture co-evolution in the light of human impact on the biosphere.



The idea can be contrasted both with the Gaia hypothesis where the Earth is an organismically responsive dynamical system, if not pushed beyond irreversible tipping points, and utopian concepts of technological human dominance. Rosemary Radford Ruether (1992). in “Gaia & God” has an **insightful commentary** on Chardin later in this work.

Wilson DS (2021), in a supportive review of De Chardin’s ideas, conveyed by Brian Josephson, notes:

He has been largely forgotten by modern evolutionary scientists but remains widely read by those who are inspired by his vision of conscious evolution leading to a planetary superorganism. This working paper examines the major tenets of Teilhard’s vision from a modern evolutionary perspective in an effort to integrate “hard” evolutionary science with conscious efforts to manage cultural change.

In fact Teilhard was a panpsychist and saw consciousness as emergent in all the universe in a manner completely confluent with Symbiotic Existential Cosmology:

The apparent restriction of the phenomenon of consciousness to higher forms of life has long served science as an excuse for eliminating it from its models of the universe. ... It is impossible to deny that, deep within ourselves an 'interior' appears at the heart of beings, as it were seen through a rent. This is enough to ensure that in one degree, or another this 'interior' should obtrude itself as existing everywhere in nature from all time. Since the stuff of the universe has an inner aspect at one point of itself, there is necessarily a double aspect to its structure, that is to say in every region of space and time – in the same way for instance as it is granular: co-extensive with their Without, there is a Within to things.

The consequent picture of the world daunts our imagination but it is in fact the only one acceptable to our reason. Taken at its lowest point particulate matter is more than the swarmings so so marvellously analysed by modern physics. Beneath this mechanical layer we must think of a 'biological' layer that is attenuated to the uttermost, but is absolutely necessary to explain the cosmos in succeeding ages. The within, consciousness and spontaneity – three expressions for the same thing. Here and throughout this book, the term 'consciousness' is taken in its widest sense to indicate every kind of 'psychism' from the most rudimentary forms of interior perception imaginable to the human phenomenon of reflective thought.

Symbiotic Existential Cosmology shares this picture of conscious evolution and it is also precisely the aim of this discussion – to determine to what extent this cosmology and Teilhard’s viewpoint fulfils the ability to engender a sustainable noosphere. Wilson further notes:

The noosphere was not just the increasingly dominant physical presence of humans on earth, but also had a mental component. Teilhard emphasized “the psychic phenomenon of hominization” in the form of freedom of choice, foresight, and the ability to plan and construct. In the Phenomenon of Man, he describes humankind as “evolution becoming conscious of itself”.

Yet gene-culture co-evolution and the notion of emergence of language as a memetic “virus” is a natural sociobiological co-evolutionary process, that is not teleological in the sense that “hominization” implies.

Wilson justifies the qualitative punctuated transition between the biosphere and noosphere in terms of multilevel selection and major evolutionary transitions.

Multilevel selection (MLS) is acknowledged as a legitimate accounting method for evolutionary change. Higher-level selection is a significant evolutionary force in many species and especially in the case of human cultural evolution, as elaborated in more detail below. Social insect colonies and a growing list of other animal societies are studied as superorganisms, complete with social physiologies and groups minds. The concept of Major Evolutionary Transitions (MET) affirms Teilhard’s account of human cultural evolution but also goes beyond it in important ways. The concept follows directly from MLS theory. Most social species are a mosaic of selfish traits that evolve by within-group selection and cooperative traits that evolve by between-group selection. However, the balance between within- and between-group selection is not fixed but can itself evolve. When mechanisms evolve that sufficiently suppress the potential for disruptive within-group selection, between-group selection becomes the dominant evolutionary force and the group becomes so cooperative that it qualifies as a higher-level superorganism.

He then advances a valid argument that cultural history has had such sudden transitions due to the rise of dominant powers and wars between them, with new cultures emerging from the conflict zones: *Peter Turchin explains human history as a series of METs in a way that maps nicely onto Teilhard’s account.*

However he then draws a conclusion about the eucaryote symbiosis between bacteria and archaea:

But METs are not restricted to human cultural evolution. The concept originated with the symbiotic cell theory of Lynn Margulis, in which nucleated cells evolve not by small mutational steps from bacterial cells but as cooperative communities of bacterial cells. Even the origin of life might be explained as communities of cooperative molecular reactions.

This is a biologically incorrect extrapolation, which is misleading. Firstly the eucaryote endosymbiosis was in no way in conflict with gradual mutational change, which was essential to arrive at the point where the endo-symbiosis to form

the mitochondria actually occurred and swept aside its precursors in the radiative adaption of newer fitter eucaryote life forms. Secondly it was not just a community of bacteria, but a symbiosis between the two quite disparate and complementary kingdoms of bacteria and archaea, who had diverged before becoming cellular DNA-based organisms. It is manifestly untrue that nucleated cells do not evolve by small mutational steps – they all do – and the only transition of similar significance that has occurred since, is the entry of chloroplasts into the plant kingdom. It is also unclear either of the cells in the transition were nucleated, which is a step that may have arisen through a further symbiosis with a double-membraned DNA virus. Neither the α -proteobacterial cousins of the mitochondria are nucleated, nor are the Asgard cousins of the founding archaean.

The statement also treats the endo-symbiosis as merely an incidence of a major evolutionary change, without recognising symbiosis is the “live-or-die koan” of the anthropocene, not just an incidental example of pro-sociality.

Wilson states that conscious evolution is restricted to humans, an opinion that appears to have no empirical basis and contradicts Darwin’s own insight on animal free-will:

*"To see a puppy playing [one] cannot doubt that they have free-will"
and if "all animals, then an oyster has and a polype." (Darwin ex Smith 1978)*

Hence, Teilhard was wrong to state that coalescing events are restricted to human cultural evolution. That said, the concept of METs in both biological and human cultural evolution fits easily within his overarching evolutionary epistemology and it remains true that conscious evolution is restricted to humans.

In Wilson et al. (2014) it is noted that:

Human evolution increasingly is seen as a major transition, similar to the evolution of eukaryotic cells, multicellular organisms, and eusocial insect colonies (Boehm 1999; Maynard Smith & Szathmary 1995; Sober & Wilson 1998; Wilson 2011a).

It is fair and correct to see human cultural emergence as a major evolutionary transition, but a fair standard of this is the effect it has on the biosphere as a whole. Thus the origin of life and the eucaryote transition are two outstanding examples. Multicellularity is a more gradual transition, with a variety of transitional species still in existence and the major gene systems already present in single celled species. Insect colonies are not a major evolutionary transition of the biosphere as a whole, and the human transition will qualify only if we can bring ourselves into a state of sustainable survival as a species rather than our own extinction coupled with a mass extinction of biodiversity as a whole, so without being unduly pessimistic, as Symbiotic Existential Cosmology stands to resolve this question, the jury remains out on the human evolutionary future.

It is thus true that biogenesis and the eucaryote endo-symbiosis were major evolutionary transitions and that the anthropocene is rapidly becoming another such transition, but as things stand, it will qualify as an evolutionary epoch only if it presents a sustainable paradigm of human co-evolution with the biosphere on cosmological time scales. There is simply no evidence that such a transition to stability is occurring and gene-culture coevolution of itself, whether applied to commerce, science, language or religion remains an unstable short-term process, inadequate to sustain such a transition to long-term sustainability without a symbiotic human world view.

There are two principal difficulties with the concept of the noosphere. Firstly in many of its utopian forms it invokes simply an age of intelligent thought and technological supremacy via a super-computational singularity that becomes a form of culture replacing nature and effectively leaving it in the dust of history, as an intermediate biological stage between geological and mental. While Teilhard envisaged humanity as a manifestation of biological evolution and not the end of it, the notion of the major evolutionary transition actually signals the phase transition of the Anthropocene, in which human impact on climate, habitat and biodiversity has rapidly become unsustainable.

The second difficulty is that it invokes a convergent unification of consciousness as a teleological process, in conflict with the actual realities of both evolutionary and neurodynamic processes operating at the edge of chaos (Teuscher 2022), which is how the natural universe actually works and is in empirical disagreement with what we are culturally experiencing in real time. Yes there are good pro-social patterns in human interaction that we can associate with the original virtue of our founding gatherer-hunter ancestors, as manifest in the references above cited in Wilson et al. (2014). It is these features we do need to tap to ensure a stable future for humanity.

This is cultural evolution at the edge of chaos, not the neat, simplistic, teleological convergence to “Christ consciousness” originally conceived. This invokes all the complexities of strategic deceit and Machiavellian intelligence exponentiated in a manner that makes verifiable trust a major challenge to incorporate, let alone to achieve spontaneous, autonomous psychic unity without oppressive uniformity. Yes it is compensated for by a hugely enhanced capacity to use these interconnected facilities to research and unearth the ‘truth’, that have become singularly powerful, as this research work attests, but the conclusion remains clear.

Darwin’s position on teleology remained ambiguous. Lennox (1993) notes that he did occasionally mention final cause explicitly, but only in limited contexts, like the two forms of primula flowers where the final cause is already manifest – to favour intercrossing, not a long-distant horizon, like humanity being pre-conceived in the age of the dinosaurs:

The meaning or use of the existence in Primula of the two forms in about equal numbers, with their pollen adapted for reciprocal union, is tolerably plain; namely, to favour the intercrossing of distinct individuals. With plants there are innumerable contrivances for this end; and no one will understand the final cause of the structure of many flowers without attending to this point.

Darwin associated teleology with selection:

It is generally acknowledged that all organic beings have been formed on two great laws - Unity of Type, and the Conditions of Existence On my theory, unity of type is explained by unity of descent. The expression of conditions of existence, so often insisted on by the illustrious Cuvier, is fully embraced by the principle of natural selection.

Darwin speaks of the principle of natural selection "fully embracing" conditions of existence; and Thomas Huxley of a "wider teleology based on the fundamental proposition of Evolution." Asa Gray, on the other hand, read divine design into Darwin's teleology in a way that disturbed Darwin deeply.

The emergence of the internet, and world wide web and the explosion of digital technology has indeed created a cyber space, which at first had all the hope and inspiration of the global village. But we know real world evolution, both biological and cultural occurs at the edge of chaos and with the global village came other spectres – the decline of traditional media, in favour of an ever expanding thicket of disinformation, political subterfuge, false internet identities, hacking, droid armies seeking to purvey trojan horses, and ransomware, amid incipient AI takeover, in which societies and individuals alike, instead of gravitating toward a collective consciousness, have become ever more finely divided, splitting not just political parties, but local communities, families and partners. In the words of the I Ching, “the bed is split up to the skin – misfortune” (Wilhelm ed 1960 Splitting apart line 4).

Without the inclusion of human symbiosis with the diversity of life as a whole, in gene-culture-biosphere co-evolution the entire concept of the noosphere or “thought-sphere”, as it actually is, runs the direct risk, like any other utopian vision, of human intellectual dominance in the technological era, or even the loss of manifest conscious reality in favour of it-from-bit abstractions of reality, not actually manifest in conscious experience itself, simply providing a fast track to a Fermi paradox extinction, through unremitting short-term instability, ungrounded to the evolutionary diversity of life in cosmological time scales – the Medea hypothesis (Ward 2009).

By comparison with Symbiotic Existential Cosmology, Teilhard’s concept appears in its simplicity to be a more efficient transformational vision that looks more direct and more fulfilling in its immediate teleological convergence to a state of unmitigated grace. But the key to locking in this prospect is cosmological symbiosis with the long-term evolutionary and cosmological process that underpins the entire manifestation, not leaving it behind in an ever accelerating process of human cultural transformation that assumes that the biosphere will look after itself, without alleviating the human impacts this very process of cultural change is causing. Teilhard argued that the Omega Point resembles the Christian Logos, namely Christ, who draws all things into himself, who in the words of the Nicene Creed, is "God from God", "Light from Light", "True God from true God", and "through him all things were made". In the Book of Revelation, Christ describes himself thrice as "the Alpha and the Omega, the beginning and the end"

Tipler, along with co-author physicist John D. Barrow, defined the "final anthropic principle" (FAP) in their 1986 book *The Anthropic Cosmological Principle* as a generalisation of the anthropic principle: Intelligent information-processing must come into existence in the Universe, and, once it comes into existence, will never die out. One paraphrasing of

| | For Promoting Teleology | For Undermining Teleology |
|----------------|-------------------------|---------------------------------------|
| Darwin Praised | Gray | Huxley Helmholtz duBois-Reymond |
| Darwin Blamed | Kölliker | von Baer |

Tipler's argument for FAP runs as follows: For the universe to physically exist, it must contain living observers. Our universe obviously exists. There must be an "Omega Point" that sustains life forever.

The trouble with the spiritual viewpoint is twofold. Firstly as we have seen, it carries the distorting weight of religious memes. But secondly it looks to the end point rather than the living process. In the hurtling rush to divinity, all eyes point to the sky and forget that the journey is the destination. The psychedelic view is that the destination is the journey. It is the trip mortality takes across the Styx, deeply aware of its eternal psyche, and its immortal link in the web of life, making best use of the fleeting time available to do that good thing in the best of all possible worlds.

Symbiotic Existential Cosmology also looks to this future of grand unification, but neither as a Christological parousia, which memeticists will immediately recognise as the nemesis of cosmological truth, nor as a simple annihilating final observer as Tipler invokes, but a long experiential journey of discovery into the abysmal depths of conscious experience, in full fecundity of spontaneity, over millions and billions of years, if we take due care of the long-term survival of life, enabling the conscious universe to fully realise itself through the biota it took most of its lifetime to manifest. In this way the journey to Omega is a very long deepening unfolding – the extraordinary vision quest of all our lifetimes, eternally strung from alpha to Omega in the process, amid the reflowering of the diversity of life anew in evolution into forms unconceivable in the simplicity of the Omega point as an eschatological singularity. This is Paradise on the Cosmic Equator in Space Time, where all the good things come to pass!

Not only is the journey long, but the cosmic mind is realised and manifest through the evolving biota of the universe, because we are the conscious beings fully embodied in the quantum universe through our brains. The evolving conscious brain-minds of the biota form the natural interface for the cosmic mind to become fully manifest in the universe. Omega is a state of being, not an endpoint, it is the heightening conscious process extending through space-time, not the end point of time, as in eschatological cosmologies and the Noosphere Christology. The flaw of the eschatological view is that history and experience are consumed, and natural life is abandoned in the pursuit of Omega.



Religions, particularly Monotheism, but also the Eastern traditions to a degree, are obsessed with the eschatological singularity of the Godhead, of Brahman, of eternal life in maha-samadhi now, of the day of Judgment, of the new Jerusalem achieved by the triage and destruction of all life, to be moulded anew by God the creator, the legislator of laws like Sharia and of compulsive moral commandments like not to take the name of the Lord in vain.

The Phenomenon of Man, Revised: Evolution and I.T. versus Extinction in the years to come

Paul Werbos (2019) invokes a radical revision of Chardin's theory, claiming to change it in the light of our state of knowledge, concerning natural selection, intelligent systems, and dark matter, also driven by concern about the future survival of our species, just as Symbiotic Existential Cosmology is. The difficulty is that it stems from three assumptions, each of which are hypothetical (1) that natural selection is inadequate to address humanity's propensity for Fermi extinction, when the actual problem is culturally driven, accentuated by the patriarchy (2) consciousness is conflated with "intelligent systems" which may be either artificial or biological and (3) the notion splits physical reality between quantum electrodynamics and the living biosphere against the hypothetical notion of dark matter, as soul or spirit:

This paper presents the noosphere species theory -- a radical revision of de Chardin's theory, as is necessary to account for what we now know about natural selection, about the mathematics of intelligent systems and about the great ocean of dark matter and energy connecting the galaxies of our cosmos. The noosphere species theory still emphasizes the possibility and need for a growth in spiritual collective intelligence, but it offers more details on how this growth could be supported and accelerated, and it faces up to the reality that our particular noosphere might or might not survive the difficult challenges arising now. And yet, it accepts that we are not alone.

He critiques Chardin's failure to offer a scientific basis for spiritual energy, and asserts that science and particularly quantum electrodynamics cannot explain spiritual experiences. This is trading a critique of the entire functional scope of biological evolution up to conscious life, against a hypothetical notion that dark matter, which we don't know the basis of and which interacts with normal matter only by gravitation is actually a spiritual force intrinsic to conscious existence. If this were the case why hasn't it manifested itself in obvious ways, other than claims of psi and qi, and what implications does it have for a cosmic order potentially dictating the entire course of cosmic history?

The first problem with de Chardin's formulation is that he does not offer a possible physical scientific basis for the flow of spiritual energy (like charisma, qi, mana) which is central to all authentic spiritual traditions around the world, even though he wrote about his deep personal acquaintance with that energy. What mainstream science really knows about the atoms which make up our

bodies, and the quantum electrodynamics (QED) which describes most of their interactions, simply cannot explain anything like the spiritual experiences common to all major cultures on earth or even that small subset verified in the laboratory.

But this problem is about all of subjective conscious experience, as Symbiotic Existential Cosmology makes clear, not just spiritual charisma, psi or qi. He follows this with the assertion that, no matter the physical basis of dark matter, particulate, or otherwise, that it IS the Aristotelean substance underlying consciousness and higher "spirit":

We may debate whether dark matter is made up of fields, or of particles, or of a mix of the two, but in any case it is what Aristotle would call the "substance" underlying higher forms like spirit, and all aspects of mind or consciousness which do not use atoms as their substance.

He then predicts that the noosphere is an "organism" of pure intelligence, with body, brain and immunity:

The noosphere species theory clearly does not guarantee that the human species or any part or product of the human species will survive the challenges of this century, as they play out over the next few thousand years. It predicts that the noosphere has a "body, brain and immune system" (among others) which will play an important role, which are the product of billions of years of evolution making them far more helpful than random chance, but that does not provide a guarantee. ... Are noospheres like fish or like bonobos, who have a better chance of survival? We don't know, but we do know that we face very severe risks as a species, and we know that soul is only one of the underlying forces which will shape our destiny.

He targets four key existential threats to our species, but considers that "mundane" natural selection is insufficient to the task of avoiding extinction by at least one. This is in conflict with the fact that the acute vagaries of the existential crisis facing the planet and our biosphere are culturally, not naturally propelled and remain fully within our capacity as a biological species to address if we simply accept the existential threats as primary priorities to resolve. The use of "mundane" echoes Buddhist pessimism towards everyday existence, as an inferior realm of mortal suffering:

I believe that the biggest four threats now, in order, are: (1) nuclear war and misuse of nuclear technology in general; (2) extinction due to future release of H₂S from the oceans, due to climate change; (3) misuse of biotechnology; and (4) the "Terminator" scenario for AI, which could happen in many different ways if my own work in that field is misused by people who do not understand the underlying principles. ... Unfortunately, the normal process of evolution by mundane natural selection on earth suggests relatively little hope that humans could avoid extinction by at least one of these four mechanisms. Ecosystems which seem relatively stable, after billions of years of world-spanning species being deleted, normally go unstable when large, random changes are made in the relations between organisms.

Research by Sally Quinn of Census and research by the World Bank got much deeper into the drivers of fertility, and found that population growth in advanced nations in recent years was slowed, not by rises in income as such, but by four key variables: (1) women's empowerment and education; (2) availability of public health, especially the whole range of family planning; (3) urbanization; and (4) cultures which do not force women to have children. ... These efforts can be of great value to reduce instability in the next few centuries, but natural selection is still very much at work. ... Some aspects of genetic selection require millions of years to have any effect, but it is well known that a mere 7 to 10 generations are enough to cause massive changes in the mix of genes already "well known" to biology; genes related to sexual behavior and aggression are certainly among those genes.

He then treats the noosphere as a "willing agent", like a God, a dark nature spirit, or a higher level intelligence, similar to Hoyles "Black Cloud" (1957) that can be channeled, or appealed to, but claims this requires collective intelligence we currently lack, both spiritual and "mundane", which seems to encompass physical, biological and everyday reality:

To the extent that we try to channel the will of the noosphere, the challenge is to provide societies which really support a high level of collective intelligence and personal spiritual growth, which requires a high level of education, diversity, freedom and dialogue. It requires designing both formal and informal education and research systems in a way which fully incorporates these bottom line values. Given the great and growing power of the noosphere, those of us who do not choose to work with it may encounter many strange surprises and unnecessary difficulties, as in any bad alchemical marriage. A higher level of collective intelligence, both spiritual and mundane, would be essential to improving our chances of rising with all the threats to existence of the human species.

He cites the information tech and internet revolution as a means to create a new world order through an advanced social contract, while automated artificial intelligence systems take over the functional activity of the economy:

We are now at the early stages of a massive growth in the use of Information Technology (IT); unless there is some kind of massive war and return to dark ages (which itself would raise our chances of extinction and impede spiritual growth), we need to plan for a world in which all flows of money, all corporations and many other activities will be redefined as files in the emerging global Internet of Things (IOT). This redefines the nature of what it means to create a new, viable social contract for nations and for the world. ... Manifestos for a human-friendly internet have started to appear, but unless we do the hard work of translating them into actual system specifications for the emerging foundations of hardware and software, it will all be like the pious words one often hears before an organization starts creating a disaster. The enemy here is a kind of entropy, which can only be overcome by a maximum

use of consciousness and intelligence in concrete, mathematically grounded design implementing very basic mathematical, ethical and spiritual principles.

The noosphere then becomes a model of a dark matter ecology spanning the galaxies, in which some have become space-age noospheric brains, suggesting that they may even have been the source of the ten commandments and the US Constitution and that a new social contract will be implemented by artificial intelligence:

As a general matter, I doubt that the earth is the first planet in this universe to reach this adolescent stage of its development, when its survival is at risk. I would expect that noospheres which have survived in this cosmos have strongly developed "brains," which support intelligence and mind, and "immune systems," which encourage the kind of social contracts and rules which make it possible to survive difficult times like ours. Could it be that the "Ten Commandments" were the best social contract or covenant which could be communicated to foster such things, and to foster intellectual growth, at the early time when they appeared? ... Could we be entering a new era, when a more sophisticated Gen 3 social contract, implemented in advanced IT, is essential to survival through the next phase of our growth?

Werbos then interprets our psyches as Jekyll and Hyde characters of good and evil and suggests only the "angelic" part associated with "soul" and "dark matter" survives death while our bodies, decay as part of the "infernal" realm:

I interpret the manifesto of Akhnaton declaring the sun as the One God as an attempt to channel the nervous system part of the Sol noosphere, the vast neural network in which our personal "souls," our common ideas and archetypes all reside as subsystems. A key aspect of this theory is that we humans are what Dante called "half beast, half angel" – a symbiotic life form, such that part of us is the system of atoms which science now understands far better than most people know, and part is dark matter. It is also what Rosicrucians have called an "Alchemical marriage." Some marriages are good, and some are dysfunctional. Another aspect is that there exists more mature life and mind beyond our solar system, "in the heavens".

In the remainder of this paper, I will use the term "soul" to refer to the "angel" side of us, that part of us made primarily of dark matter, a part of the noosphere. Section 2 of this paper will give my own personal views on what this means in practical terms for us as humans, either as individuals or as agents in history. ... The noosphere species model essentially predicts that when we die the Alchemical marriage also ends, leaving one part alive but only one part. What is the destiny of that part? ...

Some mystics claim that the answer to that question varies a lot from person to person, depending on what they level of development they have achieved in their lifetime. The noosphere species model basically predicts that this is true. More precisely, it predicts that our lifetime and training will lead us towards a fate like the left side of figure 2, or the right side, or a mix, depending on what we learn as a whole system of brain and soul.

This "alchemical marriage" is not symbiosis in any biological form, which requires each party to be in a beneficial relationship to maintain evolutionary stability. The notion of the noosphere is then invoked as a "cosmic computer" involving "back-propagation" that is somehow is construed to evoke psychic phenomena and qi:



First, I have found that the noosphere species concept does more than just justify the idea of psi and soul at an abstract level. The idea that the "brain" of the noosphere is governed by the same universal mathematical laws which apply to any intelligent system turns out to be very useful in finding order in an otherwise very chaotic and diverse ocean of information. For example, if we accept that growth and adaptation of the noosphere brain is governed by modulated back-propagation, just like higher biological and computer intelligent systems, and we recognize that the word "qi" is simply a subjective way of talking about the (several types) of modulated back-propagation operating in the noosphere, we can more easily adapt to the reality that we are a part but not the rulers of an extremely large and intelligent system.

Mystical experience is cited, but only in terms of our demise and the context of astral planes, rather than knowing primary ultimate reality:

Some mystics claim that the answer to that question [of life after death] varies a lot from person to person, depending on what they level of development they have achieved in their lifetime. The noosphere species model basically predicts that this is true. More precisely, it predicts that our lifetime and training will lead us towards a fate like the left side of the above figure [the day of the dead], or the right side [a leafless tree], or a mix, depending on what we learn as a whole system of brain and soul. ... Many mystics talks about "planes of existence," like travel to astral planes and so on. The noosphere species theory would interpret these important and valid experiences as experiences in a realm less real than our mundane world of atoms, experiences in something like an internet chat room of the noosphere.

Like psychedelic experience, higher states of meditations and qi are assumed to involve sensory overload, rather than emptiness or bliss, but these experiences are claimed to simply be information transcending quantum reality:

At a higher level, when we enter into states of "meditation" where we really feel ourselves as part of the noosphere, the vast mind connecting our entire earth or solar system, and respond to the values and feelings and thoughts at that level, we can become channels for that higher qi, which will continue at least as long as life on earth continues, and perhaps even more. It requires great discipline over time to learn to cope with the resulting "firehose of information". None of this requires accounting for the quantum mechanical aspect of noosphere level intelligence, but once we do, it is somewhat easier and more natural to think of it as an ocean of information across space time and the cosmos rather than a firehose or volatile kaleidoscope.

I don't accept as verifiable, this derogation of the brain and of QED in relation to a "dominant" dark matter "soul":

A key aspect of the noosphere species theory is that the dominant partner in the brain-soul interface is the soul or dark matter side. Thus in attempts to connect traces of psi with data like brain recordings, we should not expect to find anything like a psychic reception or transmission organ in the brain or the peripheral nervous system.

Communicating in 2023, Paul has steadfastly maintained his viewpoint:

I have expressed uncertainty and ignorance about many, many things. When my wife asks what I am most certain of, in these realms, different from conventional wisdom, I point to two things:

- (1) That we humans (and some others) are deeply connected as parts of a larger living system, our local noosphere, which is made more of dark matter than of ordinary familiar "QED matter".*
- (2) That qi is real, and essential in many ways to our future, also based on dark matter.*

The whole issue of HOW we humans could make a quantum jump in our level and quality of connection to our local noosphere (and to the Spirit of the Deep, to whatever extent we can make real)... that's big. ... What can the great intelligence of our own noosphere contribute to giving us some hope where otherwise there might be none? ... If so, how can we work with that intelligence to improve the odds both for us and for her/him/it? ... The reality of time, and of "macroscopic Schrodinger cats", is an important and inescapable aspect of our relation with our noosphere.

But what if the collective consciousness is itself unstable because of unresolved conflicts? This is not just a rhetorical game. I really seriously believe that the ideas developed by Freud and Jung for understanding and helping with deep internal schisms apply to our entire noosphere as well... to what Jung called "the spirit of the times." (I give thanks again to the person I bcc who pointed me to Jung's Red Book.) The deep schism between oversimplified narrow versions both of science and of "religion" is one very important example. Our entire noosphere is like an adolescent going through growth pains and stresses which might well kill.. her? him? it? ... I hope that many of you share my conclusion that human potential includes brain, body AND "soul" (referring to capabilities and life beyond what is visible with QED physics), and that greater development of human potential is urgently needed now to give us a chance of surviving as a species in the face of new challenges which could kill us all before the end of this century.

Grand Challenges This Century – Quantum leap in attaining human potential, including our connections to each other & our noosphere (soul, qi) the rise and fall of civilizations clearly and visibly reflects the interaction of several key input variables, including money (as Marx rightly observed but with no understanding of modern production functions), DNA, and the role of our inputs and outputs to and from our noosphere, the larger system of life and intelligence embodying our entire solar system.

I regret my earlier error in underestimating the importance of quantum intelligence in understanding what our noosphere is doing and what it is capable of, and how we can best improve our relations with it. It is not omnipotent, but the power of changing scenarios is very great. ... Recent world events (see my usual fears, still in play) have led me to compare the entire noosphere of our solar system -- all of us, our souls and other creatures like us -- to a small fish in a big aquarium, which will probably not survive -- but should STILL give full rein to our(its) primary deepest impulses -- to survive (as a noosphere, as all of us together), to grow and to understand our environment.

Here I really find the concept of a patent claim connected with "AGI which achieves a level of consciousness beyond what any mammal brain possesses" to be a diabolical over-reach into the realms of Dr. Strangelove, but here is is all conscious biological life in the firing line, not just the Soviet Union:

*THE NEXT REALLY BIG STEP FORWARD in technology, and in building AGI which achieves a level of consciousness beyond what any mammal brain possesses, is even more basic than MQED0. CaQED used **WITH THE OLD" models of wave function collapse, assumed in most of Quantum S&T "QuIST" work today, is already powerful enough to implement all three levels of Quantum AGI as covered in my new patent pending on that area. That physics might be called CaQED0.*

Needless to say, I find this entire concept to be an imaginative, but contrived leap which teems with unverifiable assumptions and leaves us in a similar position to traditional religions, in which nature is regarded as degenerate in and of itself, and in which there is a struggle between ascendent spirit and an "evil" world of suffering, amid traditional concepts of an individual soul.

I have concerns about forms of spiritual elitism associated with an occluded notion of an intellectual noosphere which cuts the diversity of life out of the redemption loop in favour of a technological utopian worldview. Your [Bangalore](#) paper, mentions four great fears, but lists only three, and fails to mention mass extinction of biospheric diversity as a concern in its own right.

Four Great Fears ("Existential Threats") SURVIVAL:

- *Internet/AGI/IOT if we fail to reach Sustainable Intelligent Internet (SII)*
- *Climate extinction, all of our species and many others*
- *Misuse (1) of nuclear tech (e.g. werbos.com/NATO_terrorism.pdf) and (2) biotech, e.g. "Borg"*

You mention extinction but only associated with climate crisis and focused on humanity's risk. Biodiversity extinction is not just a question of climate, it is also a product of wholesale habitat destruction, pollution, the spread of feral species, genetically destructive monoculture of our essential food and medicinal species, burning of the great forests and the simple fact that the biomass of humans plus farm animals is now some 46 times higher than all wild land mammals put together. This in itself is unsustainable and will kill us in the long term unless we recognise the primacy of protecting the diversity of life as numero uno.

It raises a real concern that your world view is anthropocentric and at the same time seeks to realise forms of artificial intelligence which you seem to believe can also become fully subjectively conscious. Your paper defines the word "consciousness" as "consciousness qua mind", an emergent property of an intelligent system such as a brain or a soul or a new type of intelligent computer system which a few of us now know how to build (Werbos 2022).

Afterthoughts on the Noosphere

Symbiotic Existential Cosmology invokes a very different spectre from The Phenomenon of Man, Revised. Like Chardin's original Phenomenon of Man, it is natural, accepts the sacredness of evolving conscious life and our ability as subjectively conscious sentient beings who are volitional agents able to transform the living universe and protect the immortality of the diversity of life from a human-caused Fermi extinction. Rather than appealing to Gods, or dark forces, it confirms that we as conscious agents not Gods or spirits are transformative of reality; it extolls the resplendence of natural enlightenment achieved through entheogenic meditation, freeing each and every one of us from the travail of the mortal coil and sees psychic powers as simple manifestations of the sensitive mystical condition, rather than a superficial end in itself. We are (hopefully) mid-flight on a conscious evolutionary journey with a vast living future to experience. If we learn to undertake this journey without immediate climatic crisis, biodiversity extinction or nuclear self-destruct, we could/should have another billion years to unfold the deepest dimensions of the conscious condition in us or in another progenitor species in fulfilling the flowering of the conscious universe and enabling the mind at large to really come alive in us and in all life.

Human hubris keeps gravitating, either to technological or spiritual Utopias, in which experience just becomes information, or God's will, and survival just becomes an algorithm, or religious accounts, in which humanity has dominion over nature, as God has dominion over us, and seeks union with God, at the expense of our incarnate responsibility to participate in the flowering of conscious life throughout the universe over vast cosmological episodes, all of which are there for us to experience and realise over these vast stretches of time spanning space-time itself, if we bring forth what we have within us, rather than seek a short quick route to annihilation. The lesson of the snowflake is that the omega point end product is death of the growth process. Yes each whole beautiful flake grew and became eternal in space-time as a whole, but the journey IS the destination, so the destination IS the journey, not the end.

If we pass off the awe and wonder of existence, as it has already come to pass in enabling humanity to evolve and life with us, to ask the existential questions we do, and for us to experience the scent of a flower, the shimmering rainbows off a butterfly's scales, the singing of the crickets in the moonlit grass, and the ecstatic joys of sex – to know that we know that we know that we are aware that we are aware, and to dream, and to have entheogenic visions, then we should settle for paradise on the cosmic equator and live our transient mortal lives in symbiosis with the totality of existence, because everything we do for life as a whole will further and flower, but nothing else shall, or can. No utopian pretence of technological dominion in the age of thought, no religious pretence of the will of God – just I/ we ourselves bearing witness to the truth of existence and the un-utterable gift this is, even in times of great pain and torment, traversing the Styx between birth and death at the centre of the cyclone, in the best of all possible worlds. If we stuff this up, as we so easily could, that will be it for life, the universe and everything – God included, unless there is conscious life elsewhere, which we don't yet know. We are the interface of the cosmos – that's what conscious mortality is. Without conscious life, neither God nor the Universe can manifest. The Godhead is realised through the biota. We are sorely needed, we are the pivot. Life IS the Axis Mundi, not a disposable option along the way.

2 Animism, Religion, Sacrament and Cosmology

The inclusion of agency in Symbiotic Existential Cosmology realises the intimate relationship between panpsychism and animism⁵², which is based centrally on agency, as a manifestation of the widespread perspective held by ethnic cultures and in shamanism, of agency being a feature of all living and perhaps even non-living entities. Animism also holds the key to the Weltanschauung of Immortality that has sustained the human spiritual sense of meaning since our emergence as a cultural species. Animism is the belief that all things – animals, plants, rocks, rivers, weather systems etc. possess a distinct spiritual essence – as animated and alive – extending ultimately to the Gaia hypothesis⁵³ that living systems and the geosphere are in a self-sustaining feedback loop which could be disrupted by tipping points (Lovelock 1972, Lovelock & Margulis 1974). It thus aligns closely with panpsychism and is said to describe the most common, foundational thread of indigenous peoples' "spiritual" or "supernatural" perspectives, especially before organised religion. The Dictionary of the Social Sciences (Gould and Kolb 1965) sums it up as "the belief in the existence of a separable "soul-entity", complementary to the physical and biological "embodiment" of a living individual or material organism." Modern society still treats certain phenomena, from hurricanes to boats, which are often given a female figurehead as a historical protection against misfortune at sea and are generally given names as agents.

Several of these natural entities take the form of edge-of-chaos processes, such as wind, waterfalls and storms from turbulent mountain summits to the ocean, which from the point of view of symbiotic panpsychism are strong candidates for coherent subjectivity.

"In the earliest times, when both people and animals lived on earth, a person could become an animal if he wanted to, and an animal could become a human being. Sometimes they were people and sometimes animals and there was no difference. All spoke the same language. That was the time when words were like magic" – Nalungiaq, Netsilik woman storyteller (Rothenberg 1972: 45)

In addition to a span of cultures, from Amazonian to migratory African peoples who escaped slavery in India, I shall focus on two founding human peoples, the Pygmies of the Congo Basin Forests and the Bushmen of the Kalahari desert and surrounding more fertile regions, both of which have consistent cultures running back for tens to hundreds of millennia, originally comprising the main populations of southern sub-Saharan Africa. Both of these cultures manifest both animism and gatherer-hunter symbiosis with the natural environment pivotal to humanity's survival over evolutionary time-scales. The San Bushmen have an extremely long-standing cultural and genetic history running back to the mitochondrial African Eve, over 150,000 years, with cultural evidence dating back over 100,000 years. Likewise pygmies have had a largely unchanging culture for referred to by the Egyptians 4000 years ago as "the people of the trees".

Animistic beliefs are also confluent with the use of entheogenic and psychotropic sacraments, as evidenced by the San Bushmen's use of cannabis and experience of the trance dance and the cultivation the use of Tabernanthe iboga among the Biaka Pygmies and the use of ayahuasca by the Shipibo and peyote by the Huichol.

Fig 162: Distribution of African populations 8000 BC (Comrie et al. 2003)



Magical Consciousness, Animism and Human Psychic Unity

J D Lewis-Williams (2013) notes the enigmatic lines running through San rock art that have an unforeseen cosmological significance connecting the visionary worlds:

Across southern Africa from the Drakensberg in the east to the Cederberg in the west there are painted lines that

⁵² *animism* (Latin: anima, 'breath, spirit, life')

⁵³ It is empirically true that global heating "punishes" humanity in clear functional terms, but not as a moral punishment in the religious sense. Gaia may even have full agency in a sense we don't yet appreciate. "Why not?", as physicist Brian Josephson commented to me citing James Lovelock. The question we have to ask is this: Is a tornado less alive than a prokaryote? A prokaryote is tightly controlled as a genetic process and likely not conscious, but a thunder storm is in a sense more alive in the way our brains are dynamically. If alive means primitive subjectivity then a thunder storm should be accepted as alive in that sense. Any physical system capable of unstable autonomous dynamics is a candidate. Attributing agency in this way might have a deeper basis in consciousness understanding quantum reality from personal experience. What kind of form tornado or Gaia secret life might take is no easier to estimate than the putative "free will" of a quantum. But it IS an empirical question!

meander through densely constructed panels, entering and leaving human and animal depictions, bifurcating and weaving in and out of the rock face. Sometimes these lines are fringed with white dots, sometimes they take other forms. ... But the northern ethnographies hold the explanation. The Kalahari San speak of “threads of light” that come down from the sky and take trancing shamans (n/omkxaosi) up to visit god and his vast herds of animals. Shamans, who are the only people who can see these “threads,” climb them as if they were ropes or walk along them as if they were paths. They also simply glide just above the “threads.” All these various manifestations are clearly depicted in the southern African rock art. Moreover, those lines that seem to penetrate the rock face (as do other images) lead to the spirit realm that was believed to lie behind the “veil.”



Fig 163: The painted line on San Rock art at Drakensberg seems accidental but has huge spiritual significance (Witelson et al. 2021).

Elaborating on his theme, he cites in three points, the need to understand the evolution of consciousness, including alternative states, as well as the evolution of intelligence in human societies:

First, the evolution of “modern human behavior” (a difficult concept) depended as much on the evolution of consciousness as on intelligence. By focusing on intelligence and ignoring consciousness researchers have missed a fundamental human characteristic—the ability to conceive of alternative realities. Second, all religions are founded on shifting consciousness and the alteration of consciousness by meditation, rhythmic movement, sensory deprivation, psychotropic substances, and many other means. Third, religion is not a peripheral “add-on.” It is intimately involved in social change.

In “Magical Consciousness: An Anthropological and Neurobiological Approach”, Susan Greenwood and Erik Goodwyn (2015) delineate the contrasting relationship between the neuroscientific implications of analytical thought for our understanding of consciousness and the deeper mythopoetic, analogical and creative existential views generated by the “magical thinking” of animism. Citing Lewis-Williams (2013) they note the contrast between these two modes:

More than 20,000 years ago, prehistoric humans in southern Africa painted lines on cave walls, bringing them to life with images of humans and animals. Neuropsychological studies of altered states of consciousness suggest that these marks might be indications or recordings of certain kinds of brain activity, but when asked for an explanation, some contemporary Kalahari San people explain them as “threads of light” from the sky to take shamans ... while in trance to visit god and his vast herd of animals. One explanation of the cave art is based on materialistic neurobiology, whereas the other relies on indigenous “magical” meanings, such as those studied by anthropologists. If each explanation for the prehistoric painted lines is seen as plausible, then we need some form of incorporating these very different interpretations. The issue is to find a basis for a common ground.

They see analogical thinking as inherently animistic in nature:

The practical application of analogical reason as opposed to logical reason) is inherent within the notion of participating in an interrelated, inspired world best described as “animistic.” Animism is a relational psychic ontology found cross-culturally. Magical thinking is predominantly animistic; indeed, magical consciousness could be said to be animist thinking in action. On a vernacular or everyday level, many societies can be said to operate within a generalised animist perspective, one that views positive and destructive powers pervading the universe, particularly focussed on specific places and things.’ Animist perspectives most likely co-exist with the major religious traditions of Hinduism, Buddhism, Judaism, Christianity, and Islam — particularly in non-Western locations. Such animist world views rely on a relational magical ontology that denies categorising “the inner” (what we might call the psychological) and -the outer” (a social or cultural context) in any dualistic fashion. Animism is also gaining popularity as an advocacy for a certain relational, ecological worldview.

They suggest such analogical thinking has been the basis for a common sense of “psychic unity” across evolving human cultures: *The nineteenth-century German ethnologist Adolf Bastian first coined the term “psychic unity” to express the conviction that all human beings shared the same basic mental framework; this indicated a species-wide similarity in mental reasoning capabilities. Indeed, mitochondrial DNA evidence suggests that for 200,000 years, all humans have essentially shared the same bloodline, and many scholars are “beginning to concede the existence of a core human psyche”.*

Greenwood & Goodwyn’s view from magical thinking presents a completely counterposed position to that of rational materialism, in relation to the hard problem of consciousness:

In magical thought, we begin with the non-material domain of spirits and/or minds, and matter becomes the odd thing that needs explanation! In an animistic perspective, spirits do not require understanding in terms of physical facts, and they are not felt to “derive” from physical, “naturalistic” (which usually means mechanical) laws. ... On the contrary, within an animistic worldview, the exact opposite is true: the physical world is derived from the action of non-physical, consciously experiencing spirit beings; the world is full of spirits or minds pervading everything. Causality itself is different: things do not cause other things, but within an animistic orientation, spirits or minds cause things to happen through their intent. ... From an animistic perspective, minds do not require explanation in terms of physical facts, and minds are not felt to “derive” from physical, “naturalistic” (which usually means mechanical) laws. On the contrary, under an animistic worldview, the exact opposite is true; the physical world is derived from the action of non-physical, consciously experiencing minds, and the world is full of minds pervading everything.

Animism also confirms a cosmological viewpoint accepting the veridical truth that the physical world is manifest through subjective consciousness, although it may be somewhat indiscriminate in attributing agency to entities which do not. Broadly speaking however in the natural world of the gatherer-hunter the “lion’s share” of intervening risks to survival or health are from active agents, whether human enemies, parasites, predators, or unstable natural phenomena such as storms and floods. It is only in technological society, where the majority of intervening events can often be mechanical that this begins to appear naive or silly. Even so, ships have been traditionally crowned by a female figurehead as a guardian of the waves and a favourite vehicle is often patted and treated as a living being:

This essentially animistic worldview looks at the minds responsible for the physical world, not only those minds mysteriously associated with other humans and animals, but the minds behind other chaotic, self-motivated, and typically unpredictable phenomena, including the day-to-day events in one’s life and the very motions of the universe itself. For animism, the world is full of non-physical minds that act according not to the mechanical laws of physical causation, but by the mental laws of motivation, intention, desire, and emotion.

The animist point of view causes the hard problem of consciousness to evaporate:

Responding to the hard problem of consciousness, the animist and magical thinker would say there is no hard problem, because minds are not created by matter. Rather, minds are primary and explain the phenomena of the physical world, perhaps creating matter itself during the acts) of creation. To exclude the mind from the explanation because of an adherence to such axioms as the causal closure of the physical world (a popular axiom in physical science and philosophy that posits only efficient causation and denies final causation) is therefore to eliminate the mind from the equation as - causally irrelevant”.

They also bring up a core issue that is ignored by analytical materialism. There are always two ways of looking at an intervening event such as a disease or accident, the contextual (physical or biological) causes and the exact specific train of coincidences that brought this idiosyncratic event onto being. This is also a fundamental characteristic of the quantum universe stemming from quantum uncertainty. Covid is a perilous disease so we can try to vaccinate ourselves to address the contextual risks but this does not protect us from freak occurrences by being in the wrong place at the wrong time e.g. in an unanticipated super-spreading event, so it is as relevant to ask what caused me to catch this now? For this reason anthropologists acknowledge that an animistic viewpoint has unique survival value because it does protect from unpredictable threats from intentional agents, even though it may result in overkill on attributing physical causes to conscious agency because everything is treated as alive:

The classic example of this dichotomy is in Evans-Pritchard’s description of the Zande rationale for the granary collapse: the Zande knew full well that the granary collapse was “caused” by termites eroding the foundational structures. This physical explanation was, however (in converse to the Western philosophical viewpoint) - causally irrelevant” to their inquiry, which was, “Which mind intended for the granary to collapse at just this moment?” ... The Zande might not care about universal gravitation or termite biology, they want to know who made the granary collapse at just the moment a friend was under it.

They arrive at a compromise position proposing dual-aspect monism in almost identical form to symbiotic existential cosmology:

One solution is dual-aspect monism: that is, that the mind and matter are both properties of a single monistic substance that is not directly observable; when viewed under “objective” circumstances it looks like the brain, and when viewed -subjectively,” it looks like

the mind- From this view, the mind is not seen as deriving from matter, but is rather proposed to be another property of matter (or vice versa).

Is Polyphasic Consciousness Necessary for Global Survival?

In "Is Polyphasic Consciousness Necessary for Global Survival", Tara Water Lumpkin (2001) invokes the urgent need to reinstate polyphasic consciousness, enlarging analytical reasoning responsible for its monoclonal destructiveness on human society, to the full breadth and depth of human conscious awareness and biodiversity as a whole:

To perceive is to become aware. Human perception is created by the interaction of human biology, the physical environment, an individual's personal development, and a person's culture (Lazlo and Krippner 1998:65). Perception is a complex, synergistic system, with numerous feedback loops, allowing for the generation of meaning and subsequent communication of that meaning. Perception evolves and changes as an individual, culture, or environment changes.

She makes clear that perceptual diversity is a long standing intrinsic part of human consciousness which is increasingly under risk:

A growing number of psychologists and anthropologists have become interested in the value of perceptual diversity, seeing the use of multiple perceptual processes as positive rather than pathological. Anthropologist Charles Laughlin has proposed that cultures are "monophasic" or "polyphasic" (1992). Polyphasic cultures value perceptual processes that use altered states of consciousness, such as dreaming, lucid dreaming, contemplation, ecstatic and trance states, as well as ordinary, waking consciousness (Walsh 1993:125). Roland Fischer presents a model of altered states of consciousness based on neurophysiology (1970a; 1970b). According to Fischer, states of consciousness are based along a continuum of arousal of the central nervous system. States of reduced central nervous system arousal (or hypoaarousal) are represented by tranquil meditation or the Yogic state of samadhi. States of increased arousal (or hyperarousal) are represented by sensitivity, creativity, anxiety, ecstasy, and mystical rapture.

She notes, as a founding example, !Kung trance dancing, which we shall discuss in detail later with the San:

The Kalahari Kung in Botswana are an example of a polyphasic culture. Anthropologist and clinical psychologist Richard Katz lived with them in the 1970s and documented that one-third of all adult Kung "routinely and without drugs altered their state of consciousness, thereby releasing healing energy to the entire community" (1982:3). Katz defines states of consciousness as "patterns of human experience, which include ways of acting, thinking, perceiving, and feeling." And he defines an altered state of consciousness as being "radically different from the usual everyday patterns" (1982:3). When the Kung were camped at a permanent watering hole, they conducted their communal, all-night healing dances as often as twice a week. If camped in the bush, the dances occurred only two to three times per month (1982:37). Katz noted that the healers had rich fantasy lives, which he pointed out were another type of altered state of consciousness. And, according to Katz, the Kung healing process demanded intuition and emotion rather than logic and rationalism, meaning such processes were valued in creating the Kung cultural, cognitive map (1982:236).

The risk to perceptual diversity and its alternative experiential states has dire consequences also for social, cultural, and cognitive survival and the survival of the diversity of life and the human species:

Perceptual diversity allows human beings to access knowledge through a variety of perceptual processes, rather than merely through everyday, waking reality. Many of these perceptual processes are transrational (meditation, trance, dreams, imagination) and are not considered by science (which is based primarily upon quantification, reductionism, and the experimental method) to be valid. In the past, perceptual diversity was valued by a majority of cultures. Now it is being devalued and replaced by the monophasic culture of "developed" nations. Just as we are losing (1) biodiversity (or biocomplexity) in the environment and (2) cultural diversity among societies, we also are losing (3) perceptual diversity among human cognitive processes. All three losses of diversity (bio, cultural, and cognitive) are inter-related.

Loss of perceptual diversity disables the polyphasic map of existence that has enabled people throughout history to navigate their lives in a way conducive to their continued survival:

Individuals and cultures create cognitive maps to help them navigate the landscape of socio-cultural and physical environments (Lazlo and Krippner 1998:66). These cognitive maps are used by individuals and cultures to adapt and evolve. The cognitive map of "developed" nations is one of specialization that disavows multiple perceptual processes, whereas the cognitive maps of most "less developed" cultures are more holistic, providing for a multitude of processes with which to access knowledge, including altered states of consciousness.

The ultimate fatal error is the loss of biodiversity:

When societies devalue and lose perceptual diversity, they lose varied ways of accessing knowledge. The loss of perceptual diversity homogenizes societies, reducing cultural diversity. And the loss of cognitive maps that use a variety of perceptual processes,

including altered states of consciousness, results in navigation of physical environments based only upon monophasic consciousness. When humans interact with the environment using only monophasic consciousness (or the scientific method), the end result is that they reduce biodiversity and biocomplexity.

The Grim Ecological Reckoning of History

Ridley (1996) noted that Chief Seattle, leader of the Duwamish Indians, delivered a famous speech to the governor of Washington territory in 1854. The governor had offered to buy the chief's land on behalf of Franklin Pierce' president of the United States. Seattle replied in a long and shaming speech that is now among the most widely quoted texts in all environmental literature. It presages almost every thread in the philosophy of the modern conservation movement. The speech exists in various slightly different versions, one of the most moving being that which Albert Gore quoted in his book *Earth in the Balance*:

How can you buy or sell the sky? The land? The idea is strange to us ... Every part of this earth is sacred to my people. Every shining pine needle every sandy shore, every mist in the dark woods, every meadow, every humming insect. All are holy in the memory and experience of my people ... will you teach your children what we have taught our children? That the earth is our mother? what befalls the earth befalls all the sons of earth. This we know: the earth does not belong to man, man belongs to the earth. All things are connected like the blood that unites us all. Man does not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself.'

However one cannot afford to be naive. Although Ridley highlights the evolution of trust as a core human virtue, The rape of mother Earth and her living diversity has not just been committed by modern technological civilisation, nor by apocalyptic religions alone. Ridley (1996) again notes that history abounds with evidence that the limitations of technology or demand, rather than a culture of self-restraint is what kept tribal people from over-exploiting their environment. Methods of hunting have remained opportunistic, often taking easier prey such as females, sometimes specifically including pregnant ones and seeking the richest hunting grounds.

Ridley notes many examples from the pre-Columbian Americas. The Mayan empire reduced the Yucatan peninsula to scrub and fatally wounded itself. Chaco Canyon was abandoned by the Anasazi before the Spaniards arrived when the extraction of pine timber for their 650 room settlement containing 200,000 huge pine beams removed all the pine trees requiring a 50 mile road to drag pine logs to the increasingly eroded site. At Olsen-Chubbock the Colorado site of ancient bison massacres, where people regularly stampeded herd of a cliff the animals lay in such heaps that only the one on top were butchered and only the best joints were taken from them.

But the initial extinctions on the arrival of humans were even more telling:

Coincident with the first certain arrival of people in North America, 11,500 years ago seventy three percent of the large animal genera quickly died out. Gone were the giant bison, wild horse, short-faced bear, mammoth, mastodon, sabre-toothed cat, giant ground sloth and wild camel. By 8,000 years ago eighty percent of the large mammal genera in South America were also extinct – giant sloths, giant armadillos, giant guanaco, giant capybaras, anteater the size of horses.

Maoris sat down and ate their way through all twelve species of the giant Moa bird (the biggest weighting a quarter of a tin) before turning cannibal in desperation. At one Moa butchering site near Otago, at least 30,000 were killed in a short time – and on average a third of the meat was left to rot, only the best haunches being taken. Entire oven with haunches still in them were left unopened, so abundant was the supply of meat. It was not just moas. Half of New Zealand's land birds are extinct.

It took a little longer to wipe out Australia's large mammals. Yet soon after the arrival of the first people in Australia, possibly 60,000 years ago, a whole guild of large beasts vanished marsupial rhinos, giant diprodons, tree fellers, marsupial lions, five kinds of giant wombat, seven kinds of short faced kangaroos, eight kinds of giant kangaroo, and a 200 kilogram flightless bird.

By contrast he notes that Africa and Eurasia saw no such sudden bursts of extinctions of large mammals and that mammoth hunting persisted for 20,000 year in Eurasia, although extinction still occurred in the end. We shall also see that founding cultures of the Bushmen and Pygmies do practice an ecologically reverent non-exploitation of nature.

Anthropological Assumptions and Coexistential Realities

The idea of animism was developed by Edward Tylor (1871), defining it as "the general doctrine of souls and other spiritual beings in general", noting "an idea of pervading life and will in nature". Georg Ernst Stahl had developed the term *animismus* in 1708 as a biological theory that souls formed the vital principle and that the normal phenomena of life and the abnormal phenomena of disease could be traced to spiritual causes.

Bird-David (2000) notes that Tylor's position was that "animists" understood the world childishly and erroneously, and under the influence of 19th-century evolutionism he read into this cognitive underdevelopment. Tylor argued that in the savage view every man had, in addition to his body, a "ghost-soul," a "thin unsubstantial human image," the "cause of life or thought in the individual it animates," capable "of leaving the body far behind" and "continuing to exist and appear to men after the death of that body" Tylor suggested that modern religion had evolved in stages from animistic beliefs, through which early peoples had tried to explain the world to themselves, and these beliefs had survived into the present and (re)appeared universally among children and "primitive" people and in certain modern cults. In Tylor's view, "it was as though primitive man, in an attempt to create science, had accidentally created religion instead, and had spent the rest of evolutionary time trying to rectify the error".

19th-century anthropologists argued an evolutionist position, that "primitive society" was ordered by kinship and divided into exogamous descent groups related by a series of marriage exchanges. Their religion was animism, the belief that natural species and objects had souls. With the development of private property, the descent groups were displaced by the emergence of the territorial state. These rituals and beliefs eventually evolved over time into the vast array of "developed" religions and the more scientifically advanced a society became, the fewer members of that society believed in animism. Modernism is characterised by a Cartesian subject-object dualism that divides the subjective from the objective, and culture from nature. In the modernist view, animism is the inverse of scientism, and hence is deemed inherently invalid.

Durkheim (1915) in a marginally less derogatory analysis suggested that "primitive peoples" regarded as kin and friends some entities that were animated by them, noting that "primitives" believed that the bonds between them and these natural entities were "like those which unite the members of a single family" : bonds of friendship, interdependence, and shared characteristics and fortunes arguing that they mistook the spiritual unity of the totemic force, which "really" existed, only for a bodily unity of flesh. Anthropology textbooks continue to introduce animism as "the belief that inside ordinary visible, tangible bodies there is normally invisible, normally intangible being: the soul . . . each culture [having] its own distinctive animistic beings and its own specific elaboration of the soul concept" (Harris 1983, 186).

Stewart Guthrie (1993) describes animism as an evolutionary strategy to aid survival – that both humans and other animal species view inanimate objects as potentially alive as a means of being constantly on guard against potential threats: *Scanning the world for what most concerns us — living things and especially humans — we find many apparent cases. Some of these prove illusory. When they do, we are animating (attributing life to the nonliving) or anthropomorphising (attributing human characteristics to the nonhuman)", thus relegating animistic beliefs to "mistakes".*

Animism differs from pantheism, although they are sometimes confused. One of the main differences is that while animists believe everything to be spiritual in nature, they do not necessarily see the spiritual nature of everything in existence as being united, the way pantheists do. As a result, animism puts more emphasis on the uniqueness of each individual soul. In pantheism, everything shares the same spiritual essence, rather than having distinct spirits or souls.

Some postmodern anthropologists theorise that all societies continue to "animate" the world around them. characterised by humanity's "professional subcultures", as in the ability to treat the world as a detached entity within a delimited sphere of activity. Human beings continue to create personal relationships with elements of the aforementioned objective world, such as pets, cars, or teddy-bears, which are recognised as subjects.

In a review of Graham Harvey's "Animism: Respecting the Living World" (2006), Wright (2010) outlines the key features of the "new animism" Harvey espouses:

The 'New Animism' elaborated by Harvey and others proposes that humans participate in a subjective 'pan-spiritism' that involves all living and even—to the Western mind—non-living beings such as stones and the deceased. Furthermore, there is a kind of meta-communication that is possible among beings of different species. This meta-communication consists of different powers of subjectivity and mentality possessed by all species and even spirits of the dead. These powers make possible communication by humans with natural entities independent of human culture. This universal 'pan-spiritism' is as natural as the distinct bodily forms of the different species that share in it. Thus, 'nature' consists of different bodily forms, but 'spirit' (anima) is universal and homogeneous. All beings share in it, despite the differences in bodily forms; and no natural being is excluded from it, that is, no natural being is excluded from participation in the cultural domain with human beings. Spirit is the common denominator of all natural beings.

The new view of animism emerged from Irving Hallowell's (1960) ethnography of the Ojibwa, in which personhood concepts and ecological perception have become two fruitful areas to reevaluate theories of animist practices and beliefs. The Ojibwa sense of personhood, which they attribute to some natural entities, animals, winds, stones, etc. takes the axiomatic split between "human" and "nonhuman" as essential. The Ojibwa conceives of "person" as an overarching category within which "human person", "animal person", "wind person" etc., are subcategories. Echoing Evans-Pritchard's account of Azande magic (1937), Hallowell argues that experience itself does not rule out Ojibwa animistic ideas. On the contrary, experience is consistent with their reading of things, given an animistic viewpoint. This reinforces the view that animism is a functional form of "symbiosis" between culture and nature, in which relationship, rather than individual identity becomes key to the success and survival of a people.



Fig 164: Obtossaway, An Ojibwa Chief (Minnesota c. 1903), Plains Ojibwe performing a snowshoe dance (George Catlin), Ojibwe maiden (1920s colored photo of the Native American lady Of The Great Algonquian Stock).

Cultural ecologist and philosopher David Abram (1996) promotes an ethical and ecological understanding of animism grounded in the phenomenology of sensory experience. In the absence of intervening technologies, he suggests, sensory experience is inherently animistic in that it discloses a material field that is animate and self-organising from the beginning. He suggests that such a relational ontology is in close accord with our spontaneous perceptual experience; it would draw us back to our senses and to the primacy of the sensuous terrain, enjoining a more respectful and ethical relation to the more-than-human community of animals, plants, soils, mountains, waters, and weather-patterns that materially sustains us.

Nurit Bird-David explains that animism is a "relational epistemology" rather than a failure of primitive reasoning. That is, self-identity among animists is based on their relationships with others, rather than any distinctive features of the "self". Instead of focusing on the essentialised, modernist self (the "individual"), persons are viewed as bundles of social relationships ("dividuals"), some of which include "superpersons" (i.e. non-humans).

In her critically oriented comparison of the Melanesian and the Euro-American "person", Strathern (1988) argues that the irreducibility of the individual is a peculiarly modernist notion. It is not everywhere that the individual is regarded as "a single entity", "bounded and integrated, and set contrastingly against other such wholes and against a natural and social backgrounds". The Melanesian "person" is a composite of relationships, a microcosm homologous to society at large. This person objectifies relationships and makes them known. She calls it a "dividual", in contrast with the (Euro-American) "individual".

Bird-David's work centres on the Nyaka of the Karnataka hills in India. These are a group who claim ancestry as slaves taken to India, who cannot recall their exact origins, and who immediately escaped and ran to the mountains, where they have since lived, regarded by surrounding people as siddi or "wise-ones", who have an animistic belief in spirits dwelling in the mountain tops. She notes that their sense of personhood stems from relationships rather than individual identity:

Transcending idiosyncratic, processual, and multiple flows of meanings, the Nayaka sense of the person appears generally to engage not the modernist subject / object split or the objectivist concern with substances but the above-mentioned sense of kinship. The person is sensed as "one whom we share with". It is sensed as a relative and is normally objectified as kin, using a kinship term. Their composite personhood is constitutive of sharing relationships not only with fellow Nayaka but with members of other species in the vicinity. They make their personhood by producing and reproducing sharing relationships with surrounding beings, humans and others. They retain immediate engagement with the natural environment and hold devaru performances even when they make a living by different means such as casual labor. These relationships constitute the particular beings as devaru.



Fig 165: Nyaka enacting devaru

To summarize this point of the argument, the devaru objectify sharing relationships between Nayaka and other beings. A hill devaru, say, objectifies Nayaka relationships with the hill; it makes known the relationships between Nayaka and that hill. Nayaka maintain social relationships with other beings not because, as Tylor holds, they a priori consider them persons. As and when and because they engage in and maintain relationships with other beings, they constitute them as kinds of person: they make them "relatives" by sharing with them and thus make them persons. They do not regard them as persons and subsequently some of them as relatives, as Durkheim maintains. In one basic sense of this complex notion, devaru are relatives in the literal sense of being "that or whom one interrelates with" (not in the reduced modern English sense of humans connected with others by blood or affinity). They are superrelatives who both need and can help Nayaka in extraordinary ways.

"Wherever there are Nayaka, there are also devaru, for Nayaka want to have them and always find them". (Karriyen)

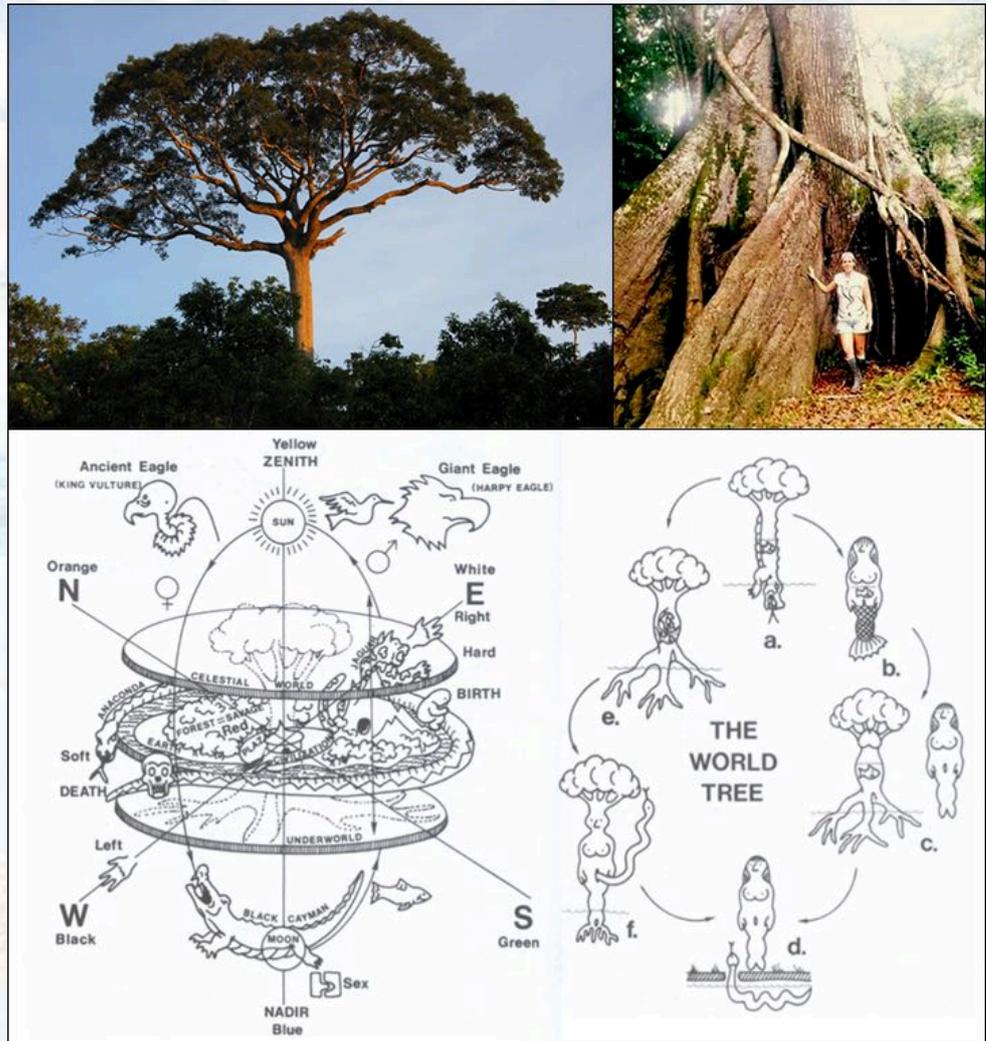
The devaru are objectifications of these relationships and make them known. In another sense devaru are a constitutive part of Nayaka's environment, born of the "affordances" of events in-the-world. Nayaka's "attention" ecologically perceives mutually responsive changes in things in-the-world and at the same time in themselves. These relatednesses are devaru in-the-world, met by Nayaka as they act in, rather than think about, the world. Lastly, I argue that devaru performances — in which performers in trance "bring to life" devaru characters, with whom the participants socialize (talking, joking, arguing, singing, sharing or just demand-sharing, and asking for advice and help) — are social experiences which are nested within (not dichotomized from) social-economic practice. These performances are pivotal in both "educating the attention" to devaru in-the-world (Gibson 1979) and reproducing devaru as dividual persons.

The third part of her paper argues that hunter-gatherer animism constitutes a relational (not a failed) epistemology. This epistemology is about knowing the world by focusing primarily on relatednesses, from a related point of view, within the shifting horizons of the related viewer. The knowing grows from and is the knower's skills of maintaining relatedness with the known. This epistemology is regarded by Nayaka (and probably other indigenous peoples we call hunter-gatherers) as authoritative against other ways of knowing the world.

Shipibo: Split Creations and World Trees

An insight into the complex dynamic animistic cosmologies of the lowland Amazonian peoples can be gleaned from Peter Roe's (1982) "The Cosmic Zygote: Cosmology in the Amazon Basin". These are highly evolved cosmologies of the pre-Colombian era that are characterised by their extremes of creation and destruction, light and dark. They are not the simple hospitable symbiosis we shall see in the Pygmies of the Congo Basin. Because of the disruptive influences of colonial missionary activities, even in this relatively remote region since the arrival of Columbus, the original cosmology of the Shipibo has become fractured and is only revealed in scattered myths, so has had to be reconstructed by Roe from the broader sweep of beliefs of the surrounding lowland people as a whole.

Fig 166: The giant lupuna tree, now under threat of extinction due to deforestation and the lowland Amazonian cosmology of the cosmic zygote and world tree. Lower right: Permutations of the World Tree as Key Symbol: (a) Dragon Tree, (b) Fish woman, (c) Phallic World Tree with Woman Shaman Guardian, (d) First Woman and the Ambulatory Phallus, (e) Botanical Tree with the Dragon (Frog Variant) on the Inside, and (f) Woman Tree, Alias the Wooden Bride.



The cosmology has at its heart the World Tree which supports the sky, whose roots are deep in the underworld and its role is repeated at the cardinal points by other world pillars: "At the cardinal and inter-cardinal points of the universe, there are world mountains that are believed to be gigantic petrified trees". The world tree is a motif

present in diverse religions and mythologies, from Indo-European, through Siberian, to Native American, represented as a colossal tree which supports the heavens, connecting the heavens, the terrestrial world, and, through its roots, the underworld. It may also be strongly connected to the motif of the tree of life, but it is the source of wisdom of the ages. Specific world trees include *égig éró fa* in Hungarian mythology, *Ağaç Ana* in Turkic mythology, *Andndayin Ca' r* in Armenian mythology, *Modun* in Mongol mythology, *Yggdrasil* in Norse mythology, *Irmisul* in Germanic mythology, the oak in Slavic, Finnish and Baltic, *Iroko* in Yoruba religion, *Jianmu* in Chinese mythology, and in Hindu mythology the *Ashvattha* (a *Ficus religiosa*).

South American cosmologies are dynamic in time, not static. The worlds depicted are members of only one cyclic variation, the current one. These worlds are the successors of previous imperfect worlds, destroyed long ago by flood or fire, just as in the Andean and Mexican systems. They were populated by doomed creatures and imperfect protohumans who were turned to stone. The base of these oscillations is a dyadic succession of a terrestrial flood ending the world followed by the extinction of life on the second world by celestial fire. In turn, the current world will also end in a way that repeats the initial emergence of mankind, devoured by monsters, by having the huge demons become houses to swallow their human inhabitants. This primal cosmic periodicity is linked to the yearly periodicity of the wet season-dry season. That, in turn, is linked to the monthly periodicity of women's physiological cycle: menstruation-receptivity. Last, all these levels are represented in the daily periodicity of the night-day cycle.

The symmetry of the worlds above and below the earth also complements other kinds of symmetries. For example, the souls or spirits of the dead are found both in the underworld(s) and in the sky world; or there may be two realms of darkness, one in the lowest underworld and one, paradoxically, in the highest heaven where the sun lives. Summarising this symmetry is the prevailing symmetry of good and evil. However many superimposed worlds there may be, good is always associated with the upper levels and increases as one goes higher, whereas evil is always linked with the lower realms and increases as one goes downward. In keeping with the dualism of Shipibo cosmology, there

are two shamans, one specialising in good and the other in evil. Each are responsible for the contrasting worlds of golden yellow celestial sun, birds, and curing, and the black night of raw poisons, stinging insects, snakes and thorns, devouring anacondas, disease, and cold waters.

This relationship between good and evil differs from Monotheism where a moral regime stipulates a battle of good against evil as the ultimate enemy subject to dire punishments by God in the life hereafter. Here it is the good and bad, or light and dark aspects of reality as a whole, just as nature is a dynamic between symbiotic paradise and the tooth and claw of predation and disease, in the endless round of decomposition and regeneration.

By a complicated train of associations, the World Tree is usually associated with the devouring Dragon and its minor form, the frog, and then, via the powerful poisons certain species of tree frog possess, with fish poison. It is a tall, beautiful tree, 25 to 50 meters in height. Its crown is spreading and umbrella-like and forms its most characteristic feature. The tree occurs on the lower Río Santiago and Huallaga, and on the Middle Ucayali... Its sap is said to be very poisonous.



Fig 167: Shipibo textiles and ayahuasca shamans. Shipibo culture has become a popular psychedelic tourism destination.

The effects of the drug ayahuasca or *nishi* are accompanied by nausea and often vomiting after the first infusion of the pungent mud-coloured brew. Then a series of phosphors fill the peripheries of one's vision, floating in the blackness of the night. They are followed by a brilliant kaleidoscope of shifting, multi-colored geometric patterns that succeed themselves in a bewildering array, filling one's field of vision. Then, as the vision deepens, animal figures appear, large felines and large snakes taking pride of place. They can menace the novice celebrant, but the experienced shaman knows them well. At the same time there is a feeling of the dissolution of one's body, or of flying. It is at this stage that the shaman ascends to heaven escorted by flocks of radiant birds. If the good shaman uses *nishi* to cure his patients, the bad shaman uses *toé* prepared from a species of *Datura* to bewitch them. Whereas the good shaman consumes a "cooked," and therefore cultured, hallucinogen, the evil shaman drinks a "raw" and bewitchingly natural *toé* brew.

The soul of the lupuna tree is an evil demon or *joshin*, which appears to the Indian narcotised by ayahuasca as an evil wizard smoking an enormous pipe. The sap of the tree forms the mysterious poison which the wizard secretly sends against those whom he wants to harm. Every particular tree and plant has its indwelling spirit, which forms the principle of its life and growth. When a tree is felled, this is regarded as an offence against its spirit. Every tree has what the Indians call its "mother" (and which he equates with "soul").

In the centre of the human world stands the maloca ("communal house"). Its central post is an axis mundi. Perhaps the best model for the human geography of the surface of the world-platter would be a series of concentric rings, beginning with that central house pillar; moving out to the walls of the hut itself; and then beyond, to the cleared plaza, a testament to the power of collective human labor to keep the ever-encroaching jungle at bay; then to the house garden and its familiar useful plants; and finally to the bordering lake, river, or stream, where the spirits begin; or in the opposite direction, toward the interior of the dark tropical forest where other spirits dwell.

Because the maloca is a central place, it is associated with the central part of the female body the belly. This anticipated my finding that the World Tree, which sits in the very centre of this central place, has a trunk (belly) pregnant with fish, just as the first mythical Fish Woman has. Thus the house pillar of the maloca is simultaneously a symbol of the World Tree out of which it is metaphorically carved. The Makiritare, for example, liken the central house

post to the connection between heaven and earth, a centre that is filled with water.

Fig 168 "The Spirits or Mothers of the Plants" (Luna & Amaringo 1991) . A Shipibo ayahuasca session (lower left) in which the visions include the spirits of the plants and trees perceived as persons, snakes, and a group of bushes whose spirits are women in a conversation, forest animals and spiritual sages.



The House Pillar Tree is also a phallic entity via its masculine-associated long dance staff. This stick-rattle, like the World Tree it represents connects the three levels of the universe; yet it is solid not hollow. All of its attributes are masculine in contrast to the feminine, hollow attributes of the

World Tree. The top of the staff is decorated with feathers of a male-associated bird, the hummingbird. It is related to the jaguar, in his yellow guise a quintessentially masculine animal, and to the sun, the masculine symbol par excellence. When the dance staff is plunged into the feminine earth, it becomes like a digging stick in its metaphorical restatement of the fertilising sexual act. Drops of semen flow down the stick to fertilise the earth. Later, up the stick crawl the result of fertilisation: human progeny. They come from the watery depths and flow upward just like the souls of the dead, which rise up the World Tree through its roots, which penetrate the underworld by a kind of capillary action.

In short, the maloca itself is a microcosm of sex that replicates the macrocosmic egg of which it is a part. Its central armature, the House Pillar Tree = Phallic Staff, copulates with the round shell of the roof that encloses it. Thus it is the beginning of life, the central shaft hard and solid, whereas the leafy exterior wall is soft and hollow. But at the end of life the central pillar turns into a hollow trunk. It rots, and water is found in its soft interior at the same time that, paradoxically, its solid branches above give new life through their dangling fruits. The Tukano symbolize this essentially ambiguous figure by seeing in their drug-induced hallucinations the house pillars covered with undulating snakes.

The World Tree as House Pillar Tree also has ties with that other connecting symbol, the mountain. Mountains are hollow like the World Tree; they have caves that communicate with the lower aqueous realms. The Kogi make this transitive association when they refer to a hut as a cave, and a cave as a womb. The Warao synthesize these two metaphors-hollow wooden tree and hollow stone mountain-when they refer to the gigantic central petrified wood tree trunk that helps hold up the world and that descends to the underworld. By its side there is an entrance to a cave that leads into the mountain. The rapidly opening and shutting doors of the cave stand for the devouring vagina-jaws of the dangerous subterranean serpent that lives within the mountain and swallows the unlucky souls of those who fail to clear the gate, reducing them to bones. This establishes a mountain = serpent equation congruent with both the World Tree = serpent association and the World Tree - mountain linkage.

The trunk of the World Tree emerges from the underworld and passes through the earth of living men. Its leafy crown pushes into the firmament, just as the forest giants of the triple-tiered tropical forest shoulder their way up through the highest canopy into the sun. There, in the celestial realm, as the Shipibo version has it, the branches of the World Tree are associated with fruits and birds. In addition to having all the alimentary plants such as plantains hanging from its branches, the food tree is also festooned with the hides of all animals and people who wait anxiously below for their coverings so they can assume their respective natures. Thus the Food Tree gives all life: vegetable, animal, and human. It is not only the source of provisions and living beings; it is also the source of the technological means to those provisions. In the Shipibo myth this great tree plays a central role in creation as it mediates the forest giant, Niwëru that grew at the sacred site of Cumancayacocha. It is identified by them as being the location of the first Shipibo village. Again we see that the origin of the group is linked with the central place or origin of the universe.

When the sun first emerged, its rays hit the branches of the tree hanging heavy with fruit. The fruit dropped into the lake like rain. Fish, attracted to the surface by the sound of their splashing impact, began to eat the bobbing fruit. As the fish took bites out of them there emerged all the species of birds there are in the world. The leaves of the tree were later used by a woman shaman to prepare flight medicine that levitated the entire site off the ground and sent it flying off through the air to the accompaniment of drums and flutes until it eventually descended to earth again on a mountain downriver at Canshahuaya.

From bottom to top, the World Tree is a symbolic continuum incorporating both male and female aspects, life and death, in a single concrete object. The roots themselves are filth, strings of mucus, ridden with vermin, which penetrate beneath the earth and enter the pathogenic waters of the subaquatic underworld, it is interesting that there is a further connection between the World Tree and the Milky Way, which has equally pathogenic aspects, although it is a celestial phenomenon. The Mocovi and the Bororo believe the Milky Way to be the ashes of the Tree of the World after it had been burned down. If the worlds reverse themselves at nightfall, then so too do the parts of the World Tree; its branches become its roots, and its roots, branches. The verminous roots, therefore, now spread as branches against the dark orb of the night sky and there connect with the flowing river of sickness, the Milky Way, which is itself the leaking product of the World Tree's upended trunk. The right side of the enormous petrified tree is covered with leaves while the left side is covered with the thorns so prevalent on Amazonian vegetation. This vertical division corresponds with the general lowland associations of left = negative and right = positive, which are then related to female and male, respectively.

Fig 169: Amazonian Minga movement protest at Cop26 November 2021.

*The forest is a conscious ecosystem from which
they are ontologically inseparable ...
A ritual ecology is in place, one in which man's ritual
must conform to the relationship between
the species to maintain an ideal balance between
the beings that inhabit and constitute the forest. (Wastian 2016)*



Meso-American Animism and the Huichol

The contrast between the dark side of the night and the light side of the day, also has parallels with the Meso-American tonal and the nagual. In Nahuatl the word tonalli is used to refer both to a day and to the animal associated with that day. Where the tonal is the day spirit itself, the nagual is the witching familiar spirit of the day – the nighttime aspect of the tonalli. In rural Mexico, nagual is sometimes synonymous with brujo ("wizard") – one who is able to shapeshift into an animal at night. The nagual trait is acquired at birth, along with other characteristics associated with a person's birth day. Nagualism is linked with pre-Columbian shamanistic practices through Pre-classic Olmec depictions, interpreted as human beings transforming themselves into animals. In Aztec mythology the god Tezcatlipoca was the protector of nagualism, because his tonal was the jaguar and he governed the distribution of wealth. In some indigenous communities the nagual is integrated into the religious hierarchy. The community knows who is a nagual, tolerating, fearing and respecting them. Nagualli are hired to remove curses cast by other nagualli. Carlos Castaneda (1968) defined the nagual as, "*the teacher who becomes the gateway, the doorway, the intermediate between the world of the 'seeker' or apprentice, and the world of the spirit.*"

The Huichol or Wixárika living in the Sierra Madre Occidental range of Mexico traditionally use peyote (*hikuri*) cactus in religious rituals which accurately reflect pre-Columbian practices. These involve singing, weeping, and contact with ancestor spirits. They travel long distances by foot over 600 km in all from their homeland to Wirikuta the high desert with a mountain above beside the old silver mining town of El Catorce Real, where they go each year to collect peyote (Meyerhoff 1974, Furst 1972 136). The journey involves many ritual steps and many days of journey involving hardship. The confessing of marital infidelities is done without recrimination. The Huichol are polygamous and traditionally accept such revelations with a light heart. A knot is placed in a string for each occasion and then burned.

One of the greatest Mara'akame discussed in the entheogens chapter was don Jose Matsuwa who at 1990 was the venerable age of 109.

"Might the sacred country be a kind of "Great Mother"? If so we would have at least one explanation for the emphasis on ridding oneself of all adult sexual experience before embarking on the journey, lest the whole enterprise come to naught and the offender go

mad in Wirikuta. To 'enter' the great mother as an experienced adult would be tantamount to incest. ... I want to emphasize that there is no overt equation of Wirikuta with a "Great Mother" in the Huichol peyote traditions, yet it is implied: one need only recall the emphasis on the embrace of the hummingbird-children by the Mother Goddess Niwetuka(me) as they finally reach the peyote country" (Furst 158).



Fig 170: Top-left: About to descend to the Encinos kaliwey. Lower-left: The first offerings are made at the sacred site Tatei Matynieri which the Mother Goddess of the Rain inhabits. Centre: Each pilgrim must publicly confess all of their previous romantic partners. Knots are then tied in a palm leaf for each name mentioned. Everyone then places their palm leaves into the fire as a symbol of letting go of the past. Huichols tell their dreams to "Grandfather fire". Right: Mara'akame (shaman – the one who knows how to dream) Don José Luis Ramirez (Uxamuire) with the first hunted peyote at Wirikuta (José Andrés Solórzano). The Peyote can open the Nierika or cosmic portal of Kauyumari or Elder Brother Deer, linking the underworld with Mother Earth, through which the gods came. Through it all life came into being. It unifies the spirit of all things and all worlds.

They cross steppes, including the "Cloud Gate" and "Where the Clouds Open". Crossing the 'dangerous passage' the gateway of the clouds they are blindfolded. "From there one travels to the place called Vagina .. and from there directly to Tatei Matinieri - Where Our Mother Dwells." (Furst 162). They pass by the sacred springs of Tatei Matiniéri ("Where Our Mother Lives"), the house of the eastern rain goddess. Also notable is the place where the penis hangs.

This pilgrimage takes place annually as a desire to return to where life originated and heal oneself, assuming the roles of gods along the trail. Upon arrival in the high desert of Wirikuta, the hunt begins and the first cactus that is found. With rising excitement the mara'akáme- spiritual leader rushes ahead and fires arrows to enclose the first peyote on all quarters and exclaims 'how sacred, how beautiful, the five-pointed deer!'. He then cuts the hikuri leaving some root to regrow new crowns and it is shared among everyone. Then they harvest enough peyote for the year (since they only make the trip one time every year). After the work is done, they eat enough peyote and have visions to be able to speak to the gods and ensure the regeneration of the souls of the people. The return to Wirikuta the sacred mountain is seen as a return to paradise.

*"One day it will be all as you have seen it there in Wirikuta.
The first people will come back. The fields will be pure and crystalline.
The world will end and it will all be pure again".*

"The Peyote Hunt represents a historical and mystical return to the original Huichol homeland and way of life, and a symbolic re-creation of "original times" before the present separation occurred between man, gods, plants, and animals; between life and death, between the natural and supernatural; and between the sexes. On the Peyote Hunt, men become gods and at the most dramatic moment of the event, when the first peyote is "slain" and eaten, the important social distinctions of age, sex, ritual status, regional differences and family affiliations, are eliminated. A state of unity and continuity, which epitomizes the Huichol view of "the good," is reached and this continuity is between man, nature, society, and the supernatural. The "retrieval" of this unity is seen as perhaps the most important function of the ceremony, and of the entire symbol complex" (Meyerhoff 1970).

The **nierika** is the cosmic portal through which those observing the rituals and taking peyote can enter the spirit world:

Back in the first times after the sun [Tayaupa] had a dream of a new world he sent Kauyumari to find it. The Little Deer Spirit was informed by the sun where a great swirling tunnel of light existed, through which he was to pass. This is the nierika. He was led by Tatewari, Great Grandfather Fire, and quite a number of uricate. They travelled through the portal arriving in the world in which we now live. They created everything. So beautiful was the new world that even the sun travelled through to take his place in the sky. Because Kauyumari became too enamoured of the Huichol girls and disrupted the sacred rituals dedicated to the sun with jealousies, resulting in suffering and prompting the sun to free them from their misery, he caused rains to come and flood the entire world. Only one Huichol Watakame was saved, being warned by Nakawe Great Grandmother Growth that he should gather seeds, build a canoe and prepare himself. The world repopulated quickly after Watakame was given a wife, but he found that his offspring had no

memory of the *nerika* and did not have the psychic powers of their forebears. From this time on only those who were willing to suffer the rigours of self-sacrifice would know *nerika*.

In their rituals they interact with the primal ancestor spirits of fire, deer, and other elements of the natural world. Their principal deities are the trinity of Corn, Blue Deer and Peyote, and the Eagle, all descended from the Sun God, "Tao Jreku". They believe that two opposed cosmic forces exist in the world: an igneous one represented by Tayaupá, "Our Father" the Sun, and an aquatic one, represented by Nacawé, the Rain Goddess. "The eagle-stars, our Father's luminous creatures, hurl themselves into the lagoons and ... Nacawé's water serpents ... rise into the skies to shape the clouds". In their creation, the Sun made earthly beings with his saliva, which appeared as red foam on the surface of the ocean's waves. "New things are born from "hearts" or essences, which the Huichol see in the red sea foam that flowed from Our Father the Sun The Sun itself has a "heart" that is its forerunner. It adopts the shape of a bird, the *tau kúkai*. The bird came out of the underworld and placed a cross on the ocean. Father Sun was born, climbed up the cross, in this way killing the world's darkness with his blows".

The Huichol shamans say we are *perdido*, lost⁵⁴. They say we are bringing doom and destruction to Yurianaka, Mother Earth, and that Taupa, Father Sun, is coming closer to the earth to purify it. They are concerned for the future and for the life of their children. They are holding great ceremonies calling in shamans from many areas to try and "hold up the sun." But they know they cannot do it themselves, for they are not the ones soiling the collective nest. We are. We are the ones who have to wake up, who have to find our lives.

*For the Huichols, this is the purpose of their sacred pilgrimage to the holy land of Wiricuta — to find their lives. This is what all their ceremonies involving the ritual use of the peyote help them to accomplish. For shamanic peoples such as the Huichols, the purpose in changing channels is not for escapism, to get lost in imaginary hallucinations that have no basis in reality. Their purpose is to get a more accurate reading of the nature of reality. They seek entrance through the *nerika* into the numinous universe underlying the limited, material world of the sensory—the "mysterious, ubiquitous, concentrated form of non-material energy . . . loose about the world and contained in a more or less condensed degree by all objects" (Bob Calahan in his introduction to Jaimie de Angulo's Coyote Man and Old Doctor Loon).*

Why? To obtain information, healing, and power, which they can use here on this plane of existence to better their lives and the lives of their people. Entering into the depths of the mystery is not something to take lightly, for the mystery is all about power and power can manifest itself in many ways. Out of respect, the Wisdom Elders observe, listen, and commune with this power in all its manifestations. From this base of phenomenological data of mind in nature, nature in mind, they came to learn the order and structure of life's connectedness and that all things are dependent upon each other and thus related. Recognizing this, the norm of reciprocity in all interactions is raised to the status of sacred. Balanced reciprocity with all of creation is observed at all costs, for without this practice, the fragile web of life is irreversibly damaged, a fate that faces us today.

Kogi: Guardians of the Great Mother of Nature, Life and the Universe

The Kogi, meaning "jaguar", form an intriguing example of a theocratic culture whose spirituality is a form of cosmology based on "Aluna" the Great Mother, who they believe is the force behind nature, supported by male guardians called Mamos and the ritual consumption of coca leaves, which they consume using traditional lime as an activator of the free base, whose ritual also comprises accumulating the expressed lime on a *poporo* – a female gourd with a male stick, which slowly accumulates a growing lime spool over a man's lifetime. Unbalanced masculinity, without this image of both sexes working together would be dangerous. When two Kogi men meet, they use the customary greeting, which is to exchange handfuls of coca.

*I watched, fascinated, as Izquierdo moistened a wooden stick with saliva and dipped it into a *poporo* (a gourd filled with lime from powdered seashells), a carry-over from pre-Columbian civilisation. Izquierdo extracted some lime, wiped it on a wad of coca leaves to enhance the coca's stimulating effect, and stuffed the wad in his mouth. The thick limescale, the hard residue that builds by incremental degree with each wipe around the rim of the gourd, is a living library of every thought underlying every stroke of the stick. For the Arhuaco, an individual's every thought or dream is literally recorded by the metaphorical action of *poporeando* (dipping into the *poporo*). "We write our thoughts with it. It's a record of a man's entire life," Izquierdo said.*

Mamos are ideally chosen by divination at birth and kept for nine years in a darkened house and cave, fed by their mother and taught by elder Mamos in sensory deprivation designed to induce a direct connection with the universe as a whole to teach the child to attune to "Aluna" – the inner reality of the world – before the boy enters the outside world. The mother, as well as Mamo's generally are required to eat white food as this is the colour of the Great Mother.

⁵⁴*perdido* –lost, done for, ruined, defeated or about to be killed etc. Cambridge Dictionary



Fig 171: Top: A Kogi village, Each family has a man's house and a second for the women and the children, who are conceived in the fields, the ancient ruins of Ciudad Perdido (Lost city) to which the believed to have been founded around 800 CE, about 650 years earlier than Machu Picchu. The Kogi call the city Teyuna and believe it was the heart of a network of villages inhabited by their forebears, the Tairona. Centre: A family working to maintain gardens. The Kogi are small scale farmer gardeners that live ecologically. Right, are men with their poporo's – a gourd and stick as female and male complements, to hold lime used to activate the coca leaf, and to coat the poporo over decades, forming a life history of the man's thoughts and deeds. The women do likewise with their weaving. Lower: A male reaching manhood is initiated by taking his coca leaf and lime, followed by four days and nights without sleep being inculcated into manhood in the large sacred men's house.

Mamo Bernadino who comes from a long Mamo line, sates adult Kogi life expectancy as 90. His father died at 102, His description to the novice reaching manhood is very consistent with the intense mental concentration induced by coca:

Ask for your poporo, think about it, ask for your mind, for the spirit guardians to grant these. The guardian of the poporo guarded the stick. The guardian of the gourds. You mustn't give up using the poporo and eating the coca, now or in the future, otherwise you're not a man and can't be married. It's a woman. Now that you can use it, you can take a wife, but you have to think carefully. When you are married and you take a woman, you have to look after her, you have to work for her. You mustn't ever hit her, or mistreat her. At night before you sleep, chew the leaf. Chew four times at least to help you think clearly. And think what you need to do the next day. What things need to be done and how you are going to do them. Think it through.

Kogi religion is defined in terms of the structure of the cosmic universe that exists in complementary expressions. The sun separates the universe into two hemispheres: the east/west, leading to a series of complements: male/female, heat/cold, light/dark, and right/left. Within each pair, one cannot survive without the other. In the case of good(right)/evil(left), the Kogi believe committing a sin once in a while serves as a justification for the existence of good. These natural opposites are a way to keep the society balanced or "in agreement" (yuluka). In Kogi cosmology, they have added three dimensions to the standard N/S/E/W: Zenith, Nadir and the Center. Mother Goddess, the creator of the universe and mankind, created the cosmic egg lying at the centre. The horizontal layers of the egg are divided into two sections of four worlds with mankind (the 5th layer) in the centre. The egg also represents the uterus of Mother Goddess and the Sierra Nevada. Because of this, the Kogi have built the structure of the ceremonial house as a replica of the cosmos.

In the beginning, there was blackness. Only the sea. In the beginning, there was no sun, no moon, no people. In the beginning there were no animals, no plants, only the sea. The sea was the mother. The mother was not people. She was not anything, nothing at all. She was when she was. Spirit. She was memory and possibility. She was the womb.

"The thoughts of our ancestors are embedded in every rock and other element in which humans have contact," said Izquierdo, who holds to Arhuaco belief that we exist in a conscious universe where all material things have life and awareness.

The Kogi understand the Earth to be a living being, and see humanity as its "children." They say that our actions of exploitation, devastation, and plundering for resources is weakening "The Great Mother" and leading to our destruction. They have made repeated efforts to warn the world of their evidence for a coming disaster of special extinction and climate crisis leading to a [BBC program](#) and many [documentaries](#) on their warnings.

Humans need water – they have to have water to live. The Earth is the same. Now it is weak and diseased. The animals die, the trees dry up. When new diseases appear, there will be no cure or medicine for them and the reason is that younger brother is violating fundamental principles continually drilling, mining, extracting petrol, minerals, stripping away the world. This is destroying all order and damaging the world. Tell the younger brother open your eyes, hear the mamas law and story how things really are. But now they are taking out the Mother's heart, they are digging up the ground and cutting out her liver, her guts. The Mother is being cut to pieces and stripped of everything. From their first landing they have been doing this. They are cutting out her eyes and ears. So the Mother too is sad and she will end and the world ends if you do not stop digging and digging. The mama must look after younger brother and the elder brother and the animals and the plants and all that is natural. Because the mama has a duty to care for all kinds of creatures and all kinds of people.

When I was 20 years old the water in the basin was plentiful. At that time there was no bird disease, or anything like that. Also it rained a lot. There were many animals. With the balance of the water and the frog shaped crystals are the ones that make it rain. All these quartz left them organised to protect and balance the Earth. Now that I am 50 years old, I see this place is destroyed and in this desecration, they also took the quartz from the Sun, from the Ayú (Coca leaf) the quartz that protects the human being, the crystals of the water, quartz of the light, quartz that represents the man and woman, quartz that was organised for food, and quartz for blood in the veins of the earth, all of this they took. By this attitude of man, the birds began to disappear, by removing the quartz that represents the pigs, now the animals begin to disappear. These materials our Mother left to protect all that exists, but everything was taken away many other kinds of frogs and other figures were also taken away. As a result of this there are diseases in man and nature. ... Neither with the spiritual works that we do can we repair the damage you caused, that's why we want you to help us take care to stop hurting ur Mother any more. If you are really willing to support this work, I will be really grateful.

Kogi are descendants of the Tairona culture, an advanced civilisation which built many stone structures and pathways in the jungles and made many gold objects which they would hang from trees and around their necks. The Tairona were forced to move into the highlands when the Caribs invaded around 1000 CE. This proved beneficial and strategic by the time the Spanish entered modern-day Colombia in the 15th century. The Kogi Mamos have remained isolated from the rest of the world since the Spanish Conquistadors, and this has resulted in an unbroken cultural tradition over the last 500 years preserving the key aspects of Tairona culture including its coca consumption.

Fig 172: A kogi Mamo and Kogi dress. Kogi men and women alike have simple modes of dress. The women pick, card, and spin wool and cotton while men do the weaving of the cloth. Men wear a tunic and pants tied with a string at the waist. Women have a single length of cloth wrapped around their bodies as a dress. The Kogi all wear only pure white clothing. They say that white represents the Great Mother and therefore the purity of nature.



Their homeland – the world's highest coastal mountain range – comprises every distinct climatic ecosystem in Colombia, from coastal wetlands and equatorial rainforest to alpine tundra and 5,000m glacial peaks. Declared by Unesco in 1979 as a [Biosphere Reserve of Man and Humanity](#), the mountain range was named as one of the most irreplaceable ecosystems on Earth (Le Saout et al. 2013). The Kogi practice agriculture using slash-and-burn farming methods. Each family tends farms at varying altitudes of the Sierra, producing different crops to satisfy the range of their needs. Five to more than fifty single-family houses make up a village. These houses are not permanently occupied as each family has multiple houses at different altitudes. The villages "are simply gathering places where neighbors come together periodically, perhaps twice a month, to exchange news, discuss community matters, perform some minor rituals, or to trade with visiting Creole peasants. They also raise cattle on the highlands. They live in villages,

called Kuibolos. Men live in a separate hut from the women and children. Each Kuibolo contains a large temple hut – the "nuhue" where only men are allowed and where divination and concentration, discussions and decisions are made. Women are not allowed because the Kogi believe that women are more connected to the Great Mother and have no need of entering the temple. There are also women priests in the villages. The Kogi do not allow the mistreatment of women, and it is not uncommon to find marriages that were not arranged, but the Kogi also disapprove of breaking arranged marriages. For nine days and nights, after death they turn the body so that the soul wanders on a journey that ends in rebirth of that soul (Reichel-Dolmatoff 1990).

Fields, houses, and livestock are passed from mother to daughter as well as from father to son, which is bilateral inheritance of these items. There is also the normal parallel descent of personal items, including ritual objects which are male property and descend patrilineally. But certain rights, names or associations descend matrilineally. Generally speaking, the Kogi are an austere people with a limited and plain material culture, including a general lack of adornment. Some items (such as cloth bags) have lineage specific markings, but most items are crudely made and utilitarian. The lack of protein resources leaves the Kogi in a chronic state of malnutrition. Marriage is only to other Kogi; they do not intermarry with their Creole or Colombian neighbors. The Kogi have peaceful relationships with other societies. They trade with their Creole neighbors and occasionally visit and trade with Colombian villages and towns. Their traditions mention past warfare with the invading Spanish and other tribes, but very little lethal conflict since the Spanish conquest. No cases of in-group or out group homicides are recorded. (Mahnke M Kogi survey).

The 15,000 Kogi share a Tairona descent with the 27,000 Arhuacos who have the same white dress style and social traditions, with the Mamos and the coca poporo, among subtle differences such as smaller square houses, more colourful female attire. The mochila – popular ornate woven bags are the most representative item of the Arhuaco people. These organic and 100% natural cross-body bags are mainly worn by the men. The bags are only woven by *Wati* (Arhuaco women) who possess the energy and the wisdom to make a unique creation for their husbands. They also have a subtly different cosmology. They believe in a male creator or "father" – *Kakü Serankua*, who engendered the first gods and material living things, other "fathers" like the sun and the snowy peaks and other "mothers" like the earth and the moon. Nature and society as a unity are ruled by a single sacred law, immutable, pre-existent, primitive and survivor to everyone and everything. The material world can exist or cease to exist but this law is believed to continue without being altered. This universal law *Kunsamü* is represented by a boy, *Mamo Niankua*. This law of nature is an explanation of the origins of matter and its evolution, equilibrium, preservation and harmony, that constitutes the fundamental objectives and the reason being of the Mamo; the spiritual authority of the Arhuaco society. They specialise in certain knowledge areas such as philosophy, sacerdotalism, medicine and practical community or individual counsellors.

They likewise consider the Sierra Nevada de Santa Marta to be the heart of the world, and believe that the well-being of the rest of the world depends on it, but the Earth and its climate and species are being destroyed by younger brother. Anthropologist Felipe Cárdenas has been working with the Arhuacos and the Kogis for decades and remembers hearing these predictions as early as 1980, when he began studying their divination practices. "They have a repertoire of knowledge on how to read nature like a book, not only from an intellectual, rational way of knowing," Cárdenas said. "To them, nature is like a great text, a great library that is sending messages and transforming them into a wise man or woman."

The Way of the Ultimate Tao



Fig 173: The Dragon of Order amidst the swirling Chaos of the Abyss (Rawson and Legeza R440)

*There was something complete and mysterious
Existing before heaven and earth,
Silent, invisible,
Unchanging, standing alone,
Unceasing, ever in motion.
Able to be the mother of the world.
I do not know its name.
Call it Tao. Lao Tsu.*

Complementarity: The Tao of Physics, Nature and Gender

The foundation of the mind and of the universe is the Tao. It is forever a complementation, not a Decartesian duality, across which there is an indivisible gulf, but the intimate marriage of realities - It is the hieros gamos of nature itself.

From the beginning, both mind and universe exist as paradoxical complements, each discovering its own nature through its complement. From birth to death, all our experience of reality is through the magic warp and weft of the subjective conscious mind. It is the umbilicus of reality without which the physical universe would be an abyss without even a dream of existence.

Yet the physical universe is also fundamental to existence, for through it our manifold dreams of existence find one common ground of objectivity in which the entire historical process of incarnation can come to a meaningful account. We are physical. We bleed when cut and swoon when concussed. Yet the description of physical reality is no more and no less than a myth told about the stabilities and correspondences of our conscious experience.

The phenomena of the physical universe are themselves in a state of a paradox of relativity and quantum uncertainty in which the future and the past become lost in probabilities which can never be disentangled from their quantum superpositions until the reaper of experience casts our lot and the world becomes frozen into the history we see being made before our eyes.

For the universe is forever the Tao of Physics, the paradoxical interplay of wave and particle, and as natural processes gather into the macroscopic world of experience, chaos and order, as the weather, evolution and conscious thought alike attest. For order to attempt to rule over chaos is as futile as for the particle to try to rule over the wave. Any society which attempts to rule by order alone is doomed to catastrophe as the natural process transition becomes frozen into an apocalyptic revolution collapsing the old order.

In regard to nature, the imposition of order, by domination of nature, through belief that the rule of order of civilisation can continue until the evidence to the contrary is incontestable is suicidal. By this time many chaotic transitions have reached irreversible crisis and we become doomed by our own rigid lack of sensitivity and foresight. This the why we need inebriety of foresight, and the samadhi of contemplation as well as the rational scientific approach when dealing with the uncarved block of future possibilities.

The natural order requires complementation between the harmonious rule of order and a continuing respect for the fertility of chaos. Order needs to be at all times suppliant and responsive to fertile transition so that new order can emerge from the natural ferment of chaos.

The Tao is the path of nature. It is not only living with nature but being nature as individuals and in the societies we foster and the cultures we celebrate. The way of nature is also the way of life and death, of tooth and claw, but it is the role of immortal wisdom to understand nature in all her complements and to utilize her bounty in arriving at a just and harmonious existence, without imposing on her our own selfish designs. In doing so we are 'future dreaming' engaging in a vision quest of the evolutionary unfolding. The Tao stresses moving with the forces of nature in utilizing their own flow sustainably, not in dominion and domination.

The Way of the Valley

In the "Tao te Ching" (R165, R594), Lao Tsu, or 'old man' provides a clear and organic example of Taoist subtlety in erasing personal history. The work was written only through a twist of fate, because as Lao Tsu was leaving for the wilderness for the last time, he was jailed by the gatekeeper until he wrote down his teachings for posterity. This

'gatekeeper' is himself said to be a great master Yin-hsi of the Kuan (i.e. Han-ku) Pass (Wilhelm 1931 6). It is said that when Lao Tsu walked, the birds and animals would accompany him. Lao Tsu and Confucius were contemporaries and it is said that Confucius met Lao Tsu to take advice from the 'man of the wilderness', whom he found an unnerving foil to his own ideas of social order.

Fig 174 "The dark has a light spot and the light has a dark spot - that's how they can relate to one another" Complementation of male and female nature yin and yang in one another in the Tao (Joseph Campbell).



"In the Taoist perspective, even good and evil are not head-on opposites. The West has tended to dichotomize the two, but Taoists are less categorical. They buttress their reserve with the story of a farmer whose horse ran away. His neighbor commiserated, only to be told, "Who knows what's good or bad?" It was true, for the next day the horse returned, bringing with it a drove of wild horses it had befriended. The neighbor reappeared, this time with congratulations for the windfall. He received the same response: "Who knows what's good or bad?" Again this proved true, for the next day the farmer's son tried to mount one of the wild horses and fell, breaking his leg. More commiserations from the neighbor, which elicited the question, "Who knows what is good or bad?" And for a fourth time the farmer's point prevailed, for the following day soldiers came by commandeering for the army, and the son was exempted because of his injury." Huston Smith, *The World's Religions* (Occhigrosso 1996 153)

The Chinese Tao, natural law, or way provides a cleavage of the totality into complementary creative and receptive principles. The Tao is a seamless web of unbroken movement and change filled with undulations, waves, patterns of ripples, vortices and temporary standing waves like a river. Every observer is an integral functioning part of this web which extends both into the past and into the future throughout space-time. It never stops, never turns back on itself, and none of its patterns of which we can take conceptual snapshots are real in the sense of being permanent, even for the briefest moment of time we can imagine. Like streaming clouds the objects and facts of our world are to the Taoists simply shapes and phases which last long enough in one general form for us to consider them as units. In a strong wind clouds change their shapes fast. In the slowest of the winds of Tao the mountains and rocks of the earth change their shapes very slowly - but continuously and certainly.

No binary, ideal or atomic concept has any independent reality or permanence in this unchanging river of change. No symbol can be separated from the organic context of the whole. Nothing which happens, no event or process ever repeats itself exactly. Nevertheless the Tao is unchanging like a convoluted eroded stone which stands beyond time. Men simply find it hard to observe the fact. All the separations which men claim to decipher in the web of Tao are useful fabrications, concepts being themselves ripples in the 'mental' part of the stream. Each human being himself is woven out of a complex system of totally mobile interactions with his environment. His body is in perpetual change, not by jumps from state to state; for his ageing does not correspond to minutes, hours and birthdays, but goes on all the time.

The twisted and eroded stone was a motif repeated tens of thousands of times in paintings and on ceramics, often combined with trees, flowers and birds. Its reference always is to this truth of Tao as a reality whose essence is never ceasing, perpetual, seamless process. In the face of this intuition, what can man do?

There is a relevant story told in the *Chuang-tzu*, one of the most revered Taoist books. One day Confucius and his pupils were walking by a turbulent river, which swept over rocks, rapids and waterfalls. They saw an old man swimming in the river, far upstream. He was playing in the raging water and went under. Confucius sent his pupils running downstream to try and save him. However, the old man beached safely on the bank, and stood up unharmed, the water streaming from his hair. The pupils brought him to Confucius, who asked him how on earth he had managed to survive in the torrent among the rocks. He answered, 'Oh, I know how to go in with a descending vortex, and come out with an ascending one' (Rawson and Legeza 1973).

In the *Chuang Tzu* Lao Tzu asks Confucius "What is the gist of your teaching?" "The gist of it is benevolence and righteousness." "May I ask if they belong to the inborn nature of man?" asked Lao Tzu. "Of course," said Confucius. "If the gentleman lacks benevolence, he will get nowhere; if he lacks righteousness, he cannot even stay alive. They are truly the inborn nature of man. What else could they be?" Lao Tzu said, "May I ask your definition of benevolence and righteousness?" Confucius said, "To be glad and joyful in mind; to embrace universal love and be without partisanship - this is the true form of benevolence and righteousness." Lao Tzu said, " 'Universal love' - that's a rather nebulous ideal, isn't it? And to be without partisanship is already a kind of partisanship. Do you want to keep the world from

losing its simplicity? Heaven and earth hold fast to their constant ways, the sun and moon to their brightness, the stars and planets to their ranks, the birds and beasts to their flocks, the trees and shrubs to their stands. You have only to go along with Virtue in your actions, to follow the Way in your journey, and already you will be there. Why these flags of benevolence and righteousness, so bravely upraised, as though you were beating a drum and searching for a lost child? Ah, you will bring confusion to the nature of man.”

The Tao, that web of time and change, is a network of vortices like a moving and dangerous torrent of water; and the ideal Taoist is he who has learned to use all his senses and faculties to intuit the shapes of the currents in the Tao, so as to harmonize himself with them completely. Works of art provide some of the means for bringing people into communion with the currents and vortices, giving them a deep sense of their presence, and of the ways in which the tangled skeins evolve.



Fig 175: The Jade Lady among the clouds - Yin as Chaos

Ts'ui Tzu-chung (Rawson and Legeza 1973). One of the most important and complex female deities of Taoism is the Queen Mother of the West, who can confer immortality.

*'Vast indeed is the ultimate Tao,
Spontaneously itself, apparently without acting,
End of all ages and beginning of all ages,
Existing before Earth and existing before Heaven,
Silently embracing the whole of time,
Continuing uninterrupted though all eons, ...
It is the ancestor of all doctrines,
The mystery beyond all mysteries' (Tao te Ching).*

It is only in this sense of unbroken wholeness that the Tao is subdivided into natural complementary creative and receptive principles of yang and yin associated with male and female, day and night, heaven and earth etc. The power of the creative lies beyond the describable, and complements the world of form. The two together form the mysterious totality of existence. Central to the organic nature of the Tao is the inextricable dependence of each attribute on its complement, from which it draws its very identity.

*Under heaven all can see beauty as beauty only because there is ugliness.
All can know good as good only because there is evil.*

The Tao cannot be named, cannot be symbolised nor captured by rational thought or symbols:

*The Tao that can be told is not the eternal Tao. The name that can be named is not the eternal name.
The nameless is the beginning of heaven and earth. The named is the mother of ten thousand things.
Ever desireless, one can see the mystery. Ever desiring, one can see the manifestations.
These two spring from the same source but differ in name; this appears as darkness.
Darkness within darkness. The gate to all mystery.*

The Tao is timeless and ancient, imperceptible and indefinable yet ever present:

*From above it is not bright; From below it is not dark:
An unbroken thread beyond description.
It returns to nothingness. The form of the formless,
The image of the imageless, It is called indefinable beyond imagination.
Stand before it and there is no beginning. Follow it and there is no end.
Stay with the ancient Tao, Move with the present.*

Knowing the ancient beginning is the essence of Tao. Taoist philosophy is singularly relevant to the modern age because it teaches that nature should not be disrupted:

Do you think you can take over the universe and improve it?

*I do not believe it can be done.
The universe is sacred. You cannot improve it.
If you try and change it, you will ruin it.
If you try and hold it, you will lose it.
It also lies beyond simple rules of morality:*

*A brave and passionate man will kill or be killed.
A brave and calm man will always preserve life.
Of these two which is harmful?
Some things are not favoured by heaven.
Who knows why? Even the sage is unsure of this.*

Lao tsu pictures the sage as wild and untamed but in contact with the natural maternal source:

*People have purpose and usefulness
But I alone am ignorant and uncouth
I am different from all the others,
but I draw nourishment from the mother.*

The opposites of male and female, light and dark etc. are not only interdependent, but it is essential for humanity to maintain a receptive relation to the creative Tao. This requires both the feminine receptiveness of the valley of the earth, and the primal pregnancy of the 'uncarved block', and also an attitude towards leadership and control which is humble and submissive and yields to transition rather than imposing order:

*Know the strength of man, But keep a woman's care!
Be the stream of the universe, Ever true and unswerving,
Become as a little child once more.
Know the white, But keep the black! Be an example to the world!
Being an example to the world, Ever true and unwavering,
Return to the infinite. Know honour and humility.
Be the valley of the universe, Ever true and resourceful,
Return to the state of the uncarved block.
When the block is carved it becomes useful.
When the sage uses it he becomes the ruler.
Thus, "A great tailor cuts little" (Lao Tsu).*

Thus man follows the feminine earth, rather than heaven and consequently the creative emerges from nature itself:

*Man follows earth.
Earth follows heaven.
Heaven follows the tao.
Tao follows what is natural.*

Despite being in yielding responsiveness to the natural order, the sage possesses the personal power of the shaman:

*He who knows how to live can walk abroad Without fear of rhinoceros or tiger.
He will not be wounded in battle. For in him rhinoceroses can find no place to thrust their horn,
Tigers no place to use their claws, And weapons no place to pierce.
Why is this so? Because he has no place for death to enter.*

Lao Tsu saw the machinery of the state as a structured force which ran against the verdant abundance of the Tao:

*The more laws and restrictions there are, The poorer people become.
The sharper men's weapons, The more trouble in the land*

The Tao also has an active sexual manifestation similar to Tantrism. The natural complementation of male and female sexual energies, ching, as manifestations of life force became elaborated into a technique of gathering vital energies through active love-making while withholding orgasm. This attitude arises from the pursuit of immortality, and origins in matriarchal land title-holding based on yin-earth identification, resulting in polygamy and the need to maintain many active relationships. The inner alchemy of Taoism is closely related to the practices of Tantric yoga, involving similar chakra centers based on sex, heart and mind, derived from Buddhist influences.

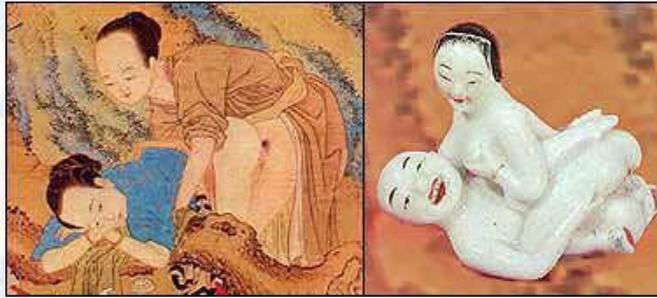


Fig 176: Sexual union is central to Taoist thought. Sex roles give both genders the superior position. Despite the patriarchy, ancient matriarchal identification with the land required conserving male energies to maintain relations with many wives (Rawson and Legeza 1973).

The I Ching oracle (Wilhelm 1960), or book of changes, is a primary example of a sexually paradoxical chance oracle, as it is based on applying uncertainty to the female and male principles of yin and yang. It shows both fundamental Taoist and Confucian influence which was again serendipitously created as a result of incarceration. According to the principles of the I Ching, consciousness, living organisms, and chance are a common manifestation of the cosmic creative principle. Thus the use of chance in throwing the oracle, far from being superstitious faith in the drop of a coin, links to consciousness, uncertainty and to life itself, as with the Urim and Thummim of Judaism, and the Tarot.

Yin and yang are firstly further divided into 8 yin-yang trigrams: heaven (the creative), wind (wood), water (the abyss), mountain (stillness), earth (the receptive), thunder (the arousing), fire (the clinging), the lake (joyful). The trigram transformations are then doubled to give 64 hexagrams, whose $64 \times 64 = 4096$ secondary transformations represent a set of archetypal dynamical situations. This set of 64 states have been carefully designed to give a generic set of conditions. Chance is used to generate a reading by throwing sticks or coins. The results of these two methods differ in the greater probabilities the coin oracle give to moving lines.

The origin of the trigrams is said to go back to Fu Hsi a legendary character from the period of hunting and fishing and the invention of cooking. They are thus of such antiquity that they antedate recorded history. The names of the trigrams do not occur anywhere else in Chinese language leading some to suggest they have a foreign origin although this may be simply due to their very ancient nature. King Wen, the progenitor of the Chou dynasty, elaborated the eight trigrams into a vastly larger system of transformations. King Wen is said to have added brief commentaries when he was imprisoned by the tyrant Chou Hsin. Wen was named king posthumously when his son Wu deposed the house of Shang and began the Chou dynasty which lasted 900 years. His son, the Duke of Chou, added the text of the moving lines. Confucius then studied and added to it in his senescence adding the Commentary on the Decision and less directly the Commentary on the Images.

Karen Armstrong (2022) in "Sacred Nature" notes:

The Dao is not the "creator" of the ten thousand things, looking down on them benignly from afar. Rather, Laozi explains, it is their "mother" and the two are inseparable. Indeed, we cannot know one without the other:

The world has a source: the world's mother. Once you have the mother, You know the children. Once you know the children, Return to the mother. Heaven-and-earth—the cosmos comprising our material world—and the ten thousand things are simply stages in the Dao's own evolution. It is the extraordinary force that holds everything together, makes the world productive and keeps it in being. Every single thing that exists is what it is because it is animated by the creative activity of the Dao.

But the Dao is not an invasive, alien, controlling power. Rather, everything is the Dao. It is, therefore, the de ("nature") of each creature; it is its identity, the force that makes it what it truly is. Thus every single "thing" in the world—animal, plant or mineral—embodies the One in its own unique way. What's more, these "things" are not self-centred; each manifests itself in an environment where it interacts harmoniously with the de of all the other things in its vicinity—in rather the same way that each ingredient in a stew blends with and enhances the others.

Bonpo Tibetan Shamanism

The following summary is from John M Reynolds "Yungdrung Bön [Ancient Tibetan Bonpo Shamanism](#).

The ancient Tibetan shamanism and animism, the pre-Buddhist spiritual and religious culture of Tibet, was known as Bon, and a practitioner of these shamanic techniques of ecstasy and ritual magic, the methods of working with energy, was known as a Bonpo. Bonpo is still the designation for a shaman in many tribal regions of the Himalayas. But increasingly, over the centuries, the ecstatic shaman has been replaced by the priestly Lama or ritual expert, and so later Bonpos in Central Tibet also came to fill a role more ritualistic than ecstatic.



Fig 177: An old photo of Bön shamans

Originally the word Bonpo meant someone who invoked the gods and summoned the spirits.

The history of the development of Bon may be divided into three phases:

1. Primitive Bon more or less corresponds to the archaic shamanism and paganism of ancient Northern and Central Asia. This shamanism is still practiced in its original and unreformed version in remote areas of the Himalayas, as well as on the borders of Tibet and China.
2. Yungdrung Bon or Old Bon (bon rnying-ma) was the high religious culture of the ancient kingdom of Zhang-zhung

which centered around Gangchen Tise or Mount Kailas in Western Tibet. This kingdom, which possessed its own culture and language and writing, maintained an independent existence long before the rise of civilization in Central Tibet in the seventh century with the coming of Indian Buddhism to that country.

3. New Bon (bon gsar-ma) was a deliberate and conscious amalgamation of the Bon of Zhang-zhung with the Buddhism of Indian origin, especially as this spiritual tradition was represented by the Nyingmapa school in Tibet. In the reformed Bon, one finds a monastic system, philosophy colleges, and a scholastic tradition and curriculum fully comparable to that found in the other schools of Tibetan Buddhism, especially the Nyingmapas. My Lama Yeshe Dorje with whom I took the Dharma vows was a Ningmapa exorcist and weather shaman. On the other side of the matter, many ancient Bonpo rituals and practices have been accepted into the Buddhist schools of Indian origin in Tibet and, in particular, as the cult of the Guardian spirits, the old pagan pre-Buddhist deities of Tibet who are now the protectors of the Dharma.

Fig 178: Lama dancing at Tikse monastery on our journey in 1976 illustrates the merging of Tibetan animism with Buddhism.



Furthermore, shamanism continues to be practiced in Tibet in its archaic form and such a practitioner is generally known as a Pawo (dpa'-bo) or Lhapa. This social function is clearly distinguished from that of the Lama or priest.

In general, the Pawo is characterized by spirit possession. After entering into an altered state of consciousness or trance induced through drumming and chanting, his or her consciousness principle known as the Namshe (rnam-shes) is projected out of the physical body through the aperture at the top of the skull into one of the three symbolic mirrors arranged on the shamanic altar. These three mirrors represent the gateways to the other worlds of the Lha (the celestial spirits), of the Tsen (the earth and mountain spirits), and of the Lu (the subterranean water spirits), respectively. These three types of spirit correspond to the three zones -- sky, earth, and underworld-- into which the world was divided in the ancient Bonpo shamanic cosmology.

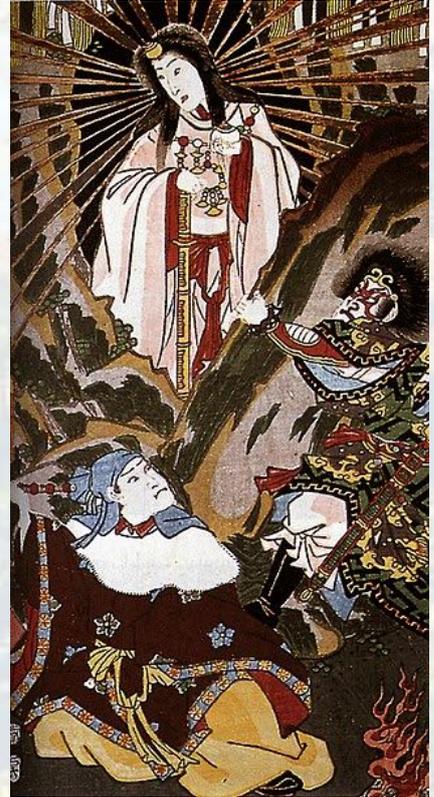
The Kami of Japanese Shinto

Shinto is polytheistic and revolves around the kami, supernatural entities believed to inhabit all things. The link between the kami and the natural world has led to Shinto being considered animistic.

Although historians debate at what point it is suitable to refer to Shinto as a distinct religion, kami veneration has been traced back to Japan's Yayoi period (300 BC to AD 300). Buddhism entered Japan at the end of the Kofun period (AD 300 to 538) and spread rapidly. Religious syncretisation made kami worship and Buddhism functionally inseparable, a process called *shinbutsu-shūgō*. The kami came to be viewed as part of Buddhist cosmology and were increasingly depicted anthropomorphically. In Japan, it has long been considered acceptable to practice different religious traditions simultaneously. Japanese religion is therefore highly pluralistic. The earliest written tradition regarding kami worship was recorded in the 8th-century *Kojiki* and *Nihon Shoki*.

Kami (Japanese: 神, [ka⁺mi]) (often taken to mean "gods", though the concept is more involved than that) are the spirits, phenomena or "holy powers" that are venerated in the religion of Shinto. They can be elements of the landscape, forces of nature, as well as beings and the qualities that these beings express; they can also be the spirits of venerated dead people. Many kami are considered the ancient ancestors of entire clans (some ancestors became kami upon their death if they were able to embody the values and virtues of kami in life). Traditionally, great or sensational leaders like the Emperor could be or become kami.

Fig 179: Amaterasu emerging from the cave, Ama-no-Iwato, to which she once retreated (detail of woodblock print by Kunisada).



In Shinto, kami are not separate from nature, but are of nature, possessing positive and negative, and good and evil characteristics. They are manifestations of *musubi* (結び), the interconnecting energy of the universe, and are considered exemplary of what humanity should strive towards. Kami are believed to be "hidden" from this world, and inhabit a complementary existence that mirrors our own: *shinkai* (神界, "the world of the kami"). To be in harmony with the awe-inspiring aspects of nature is to be conscious of *kannagara no michi* (随神の道 or 惟神の道, "the way of the kami").

When Amaterasu the sun goddess sent her grandson to earth to rule, she gave him five rice grains, which had been grown in the fields of heaven (Takamagahara). This rice made it possible for him to transform the "wilderness". The kami are not necessarily considered omnipotent or omniscient and can have flawed personalities and are capable of ignoble acts. In the myths of Amaterasu, she could see the events of the human world, but had to use divination rituals to see the future.



There are considered to be three main variations of kami: Amatsukami (天津神, the heavenly deities), Kunitsukami (国津神, the gods of the earthly realm), and *ya-o-yorozu no kami* (八百万の神, countless kami). ("八百万" literally means eight million, but idiomatically it expresses "uncountably many" and "all-around"—like many East Asian cultures, the Japanese often use the number 8, representing the cardinal and ordinal directions, to symbolize ubiquity.)

Fig 180: Amaterasu's cave Ama-no-Iwato

The word from Western philosophy that deals with the same concept is *numinous*, which has been variously

taken to mean both a subjective sense of spiritual awe and any entity that evokes that sense, indicating or suggesting the presence of a divinity.

Likewise, according to the Ainu of Hokkaido, spirits reside in all natural objects. Ainu regarded natural phenomena that are useful to human beings, including flora and fauna, as well as daily life necessities such as fire, water, living implements and forces beyond human control like the weather, as kamuy, and paid homage to them. Some kamuy are thought to cause diseases, earthquakes, thunder and other natural phenomena. In addition to these naturally occurring kamuy, man-made implements – boats, hearth hooks, mortar and mallets – are also believed to be kamuy. Some kamuy protect humans, so that they can live in safety. Others, such as fire, offer assistance beyond human ability and listen to humans' appeals and wishes that have to be conveyed to other kamuy. The fish owl is viewed as a kamuy whose role is to watch villages, and it is highly considered by the Ainu people. Some kamuy of plants have the power to keep evil spirits away. The term is equivalent to kami in Shinto.

Maori Maatauranga



Fig 181: Left: Papa and Rangi were locked in tight embrace. Centre: Tane Mahuta the Kauri world tree of Aotearoa – a tall Kauri - *Agathis australis*, up to 2000 years old. Right: Tumakoha, the Arawa Tohunga – priest, mystic, bard and genealogist, was the highest tohunga of the old religion in the Arawa tribe surviving in modern times.

Thanks-giving to Tane – Guardian of the World Tree

*At the beginning of time stood Te Kore, the nothingness - Io.
Then there was Te Po the Great Night,
the Long Night the intensely Dark Night,
the Gloom-laden Night the Night to be Felt, the Night Unseen.*

*Then Rangi the sky, dwelt with Papa tu a nuku the Earth,
and was joined with her, and land was made.
But their numerous offspring lived in darkness, for their parents were not yet parted,
the sky lay upon the earth and no light came between them,
and the land was unfruitful, and the sea was all dark water.*

*The war god Tu matauenga said "let us kill them",
but Tane mahuta, god and father of the forests
and all things that inhabit them answered
"No, not so. It is better to rend them apart,
and to let the Sky stand far above us
and the Earth lie below here.*

*Let the Sky become a stranger to us,
but let the Earth remain close to us as our nursing mother."
Over vast time, the Kauri pushed them apart.
With heavy groans and shrieks of pain,
the parents of the sons cried out
"Why did you do this crime,
why did you slay your parents' love?"*

For this section, I have chosen three short quotations to avoid misinterpreting the cultural translation. Maori history differs from many other ethnic cultures in that they have, despite colonial oppression, held their own. When Kawiti and Hone Heke in 1845 cut down the flagpole of British authority, reducing Kororareka the original colonial capital to smoking ruins. They later retreated into the forest where they perfected developing the art of trench warfare, 70 years before the First World War, holding the forces of the British Empire at Bay in a stalemate.



Fig 182: Hōne Heke with Te Ruki Kawiti and Hāriata Rongo (Alexander Turnbull Library, C-012-019).

Paul Moon (2013), commenting on criticism of Marama Muru-Lanning’s research on the Waikato river – *He piko, he taniwha* – as being unscientifically spiritual, notes the central place of animism in the Maori world view:

Animism is the belief that natural things and phenomena have a life force of their own. Māori would call this life force mauri. The pre-European Māori spiritual way of being was exactly, a belief that everything had a life force. Given that, our tīpuna (ancestors) practised animism every day of their lives. Christianity has not caused that belief to disappear among us; instead the two co-exist.

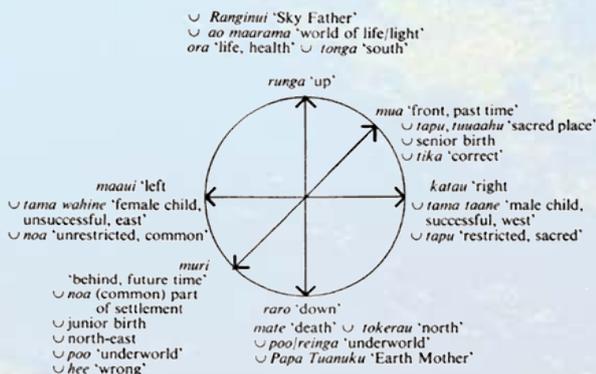
Fig 183: Taniwha – a Maori supernatural serpent. In the prehistoric age of early human occupation, nomadic Maori hunters created New Zealand’s earliest surviving artworks in caves and shelters as long ago as the fifteenth century or earlier. Then all of a sudden between 700 and 400 years ago, most of the east coast forests were destroyed in a series of huge, man made fires. The exact reason is heavily debated and will never be known. What is known is that the fires resulted in a razing of the habitat of many of the birds. A number of species including all the Moas became extinct. The areas formerly favoured for hunting and where many of the rock shelters occur, became barren and inhospitable (Narbey 2013).



Maori today are fully scientific about the preservation of their rivers, although treating them as living agents and have recently brought a class action suit against the NZ Government for allowing the farming sector to pollute them indiscriminately:

As a Nāti, I pay homage to Hikurangi, our ancestor mountain and to Waiapu our ancestor river. All (practising) Māori pay homage to a geographical feature as an ancestor. In paying homage to that ancestor we imbue it with a life force that goes beyond weather and geology. And although we understand how both those factors impact on that life force, in paying homage we assign a religious aspect to the geological feature that would otherwise not exist. However, Hohepa Kereopa qualifies that by saying mauri requires human intervention (Moon, 2003). That is without our reference to Hikurangi the mountain as an ancestor, or as in many other cultures speaking about a mountain as if it were alive, then the religious aspect is unlikely to be assigned. Let’s look at this aspect of assigning life to natural phenomena in the light of storms and environmental issues. A whole whakapapa on the naming of storms has grown over the years. We understand storms because we experience their beauty and their fury. And although we might also understand the science behind their existence, we are also likely to assign their existence as penance for wrong done – our lack of care of the environment for example. ... Having that connection to that mountain and river does not mean I will not take a scientific view. What it does mean is the scientific view I do take will be through the lens of being Māori.

Fig 184: Polarities in the Maori cosmos have parallels with the Shipibo cosmos (Salmond 1978).



Anne Salmond (1985) outlines Maori epistemology and the way Maori cosmology leads to an ongoing concept of knowledgable destiny in the pursuit of survival:

Maatauranga, or reliable knowledge, is a term in Maori almost synonymous with moohiotanga, knowledge acquired by

familiarity and the exercise of intelligence. A particular form of *maatauranga* is *waananga*, ancestral knowledge which enabled its possessor to communicate directly with the ancestor-gods and to activate their power. In this conception of the universe, men and women existed at a threshold or *pae* between sky and earth, life and death, light and dark, and exerted themselves to influence destiny. Just as Tane, the ancestor of humanity, forced earth and sky apart to create a world of light, growth, and life, so people worked through ritual to focus ancestral and essential power (*mana atua*), and to harness it for their survival: At moments when this power entered the phenomenal world it was said, 'Te ihi, te wehi me te wana!' (essential force, fearful force, awesome power!). Wild and extraordinary phenomena were attributed to the interventions of such power, and so were termed 'atua'; (god, supernatural being: anything strange and extraordinary). *Tohu* or omens, on the other hand, were predictive indicators of the workings of the phenomenal world, and *tohunga* (priests or knowledgeable experts) were the skilled interpreters of such signs. *Waananga*, or knowledge for activating ancestral power, included cosmological and ancestral histories—both expressed in a genealogical language of description since all matter proceeded from a common source; ritual practices; and *karakia* or formulae of power.⁵ This sort of knowledge was regarded as a family treasure (*taonga*).

The debate about the Maori world view *Maatauranga* and its relationship with the scientific world view continues to be hotly debated in 2021-2 (In defence of Science [NZ Listener](#) 2021 Jul 31 4, Aug 7 4, 18, 14 4-5, 28 6-7, 31 4-5, Sep 4 5-7, Dec 18 5, 2022 Jan 8 4, Mar 22 7, Apr 2 5), in the light of a decision resulting in both gaining a comparative status in the education system, attesting to the fact that in at least some parts of the world, the animistic view of life and nature can stand alongside physical materialism. The Maori party has recently petitioned that New Zealand be officially named *Aotearoa* – the land of the long white cloud – although this is already recognised as the country's name in our dual language system, although it is actually the Maori name for the North Island, attesting to the resurgence of a more long-lasting vision of cultural history than Western commercial materialism can lay claim to.

Fig 185: Screenshot from Ministry of Education website explaining changes to NCEA Maori is a Maori term. The website contains a Glossary which defines *mauri* as "The vital essence, life force of everything: be it a physical object, living thing or ecosystem. In Chemistry and Biology, *mauri* refers to the health and life-sustaining capacity of the *taiao*, on biological, physical, and chemical levels."

**BIG
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Properties of matter are determined by attractive forces between particles

Mauri is present in all matter. All particles have their own *mauri* and presence as part of a larger whole, for example within a molecule, polymer, salt, or metal. When matter is broken into smaller particles each particle remains as part of the *taiao*, for example when a substance is burnt or dissolved the particles remain, with their own *mauri*. They do not just disappear.

James Cowan (1930), although an earlier colonial interpreter of Maori customs, spoke fluent Maori and has given an insightful historical view of Maori animism that carries with it the freshness of a first hand verbal account:

*The Maori-Polynesian religion, broadly stated, consisted in a reverence for the personified powers of nature, and a worship or propitiation of the spirits of ancestors. A belief in the animation of all nature pervaded and influenced the whole life of the Maori, and equally strong was his faith in the divinity of his great Ariki forefathers, ancestors who had long passed to the Reinga-land, yet whose spirits still held dominion over their descendants and were powerful to bless or ban. The Maori invested the elements and forces of the cosmos with names and human attributes; these and his revered dead stood to him for deities. That universal primitive religion which takes the form of animism is nowhere to be found more copiously embodied in priestly *karakia*, or ritual, and sacred legend than among the New Zealanders and the islands of Polynesia; and nowhere are ancestral spirits so venerated, their names held so sacred that their repetition is in itself a prayer. So carefully are the genealogies preserved that their recitation forms a large portion of many a *karakia*; any mistake in the repetition destroys the efficacy of the prayer or formula, and is even fatal to the suppliant.*

*There is much that is sublime in the ancient cosmogonies. The Maori could conceive of uncountable aeons of Chaos and primeval Darkness (*Po*), gradually giving place to light until the *Ao-māramai* the World of Light was evolved. Ages upon ages of Nothing (*Kore*), as the old *tohungas* recited, preceded the gradual Dawn of Life and the coming into being of the Heavens and the Earth. Many tribal genealogies go back to the source of all things, to the time when the world was "without form and void." The idea that seems most strongly to pervade the Maori mind, the conception that colours all his theories as to the origin of everything in nature, is the dual principle, the generative power of male and female, of the active and passive forces. Everything he endowed with sex, even the successive periods of Darkness and of Light, before man was. Light was to him the primal active generating force, operating upon *Po*, the Darkness, the passive, the receptacle for the mysterious Vivifier.*

*It was Tane-mahuta who forced his parents apart by standing on his head and thrusting Rangi upwards with his feet. Tane's limbs were the trees; it was with these forest-pillars that he propped up the leaning sky, so that the Sky-Parent henceforth dwelt on high, dropping down his tears on Papa's face in the form of rain and dew. "Tears" are a poetic euphemism for the procreating and fecundative powers of the Sky, the Clouds, the Rain, and the Sun. These potent influences Rangi showers upon his spouse the Earth, who in return brings forth abundantly of all plants and trees and foods, and who ever exhales her tokens of love or *aroha* in the form of mists and soft clouds. These vapours of *aroha* are night after night wafted on high to her Sky-Husband, her Tane, whose face and*

breast are so grandly adorned with myriads of stars. Papa (a term interchangeable, as word-students know, with the equally universal "mama"), is the all-nourishing, all begetting one, the great Mater Genetrix.

Beyond and above the personification of natural forces and objects, the Earth, the Ocean, the Wind, the Sun and Moon and Stars, there was the belief in a Great First Cause. This supreme being is Io, a name exceedingly sacred and not to be mentioned lightly. "Io was really the God," says a Maori. The protection or shelter of Io ("Te Maru a Io"), is an expression in an ancient prayer. In a Ngati-Porou (Takitimu) cosmological recital, written for me by an old chief, Io is coupled with Hā as one of the two high deities. Hā, however, means the breath of life, the vivifying force. Io may be from the original iho, the core, the animating force of all things.

"The was Io-matua, the meaning of which is, that he was the parent of all things; in the heavens or in the worlds. His second name was Io-mata-ngaro [Io-the-hidden-face], which name means that he is never seen by man. His third name is Io-mata-aho [Io-seen-in-a-flash], so called because he is never seen except as in a flash of light or lightning. A fourth name is Io-tikitiki-o-rangi [Io-exalted-of-heaven], called so because he dwells in the highest and last of the heavens. A fifth name is Io-nui [Io-the-great-god], because he is greater than all the other gods that are known as dwelling in the heavens or the earth.

Nature-worshipper as the Maori was, everything was personified—the trees, the streams, the rain and dew, the mist and sunshine. He had deep respect for the forest of tall timbers—the "Vast and Holy Woods of Tané." In the fogs that rose like fleecy wraiths from the rivers and the swamps were the Hau-Maringiringi, the dewy children of Rangi and Papa. These, too, were the divine offspring of the Sky-Father and Earth-Mother: Hau-nui and Tomairangi the dew; Tane-uarangi, the heavy rain; Hau-maroroto, rain in big drops; and the grateful warmth of midsummer days was the Tou-a-Rangi. Besides the great deities, the seven of Rangi and Papa, there were the innumerable lesser deities of the Maori pantheon, a vast company of atua, to whom invocations and propitiatory incantations were addressed; atua of earth and sky, of cultivation and food, of fishing and seafaring, of the forests and waters, and particularly of war. These were in general deified beings of mortal origin. Amongst a people whose great glory was in battle, deities of war held high place. Each tribe had its war-god, and each god had its kaupapa or medium.

However the Amazonian peoples, the Northern Ojibwa, the Maori and the trafficked Nayaka are highly evolved migratory ethnic groups, so it is pertinent when considering the ancient origins of animism to look back to our founding human cultures to see how animism figures in their societies and cultural practices.

The Khonds of India

Khonds (Kondha and Kandha) are an indigenous Adivasi tribal community in India. Traditionally hunter-gatherers, they are divided into the hill-dwelling and plain-dwelling Khonds, but the Khonds themselves identify by their specific clans. Khonds usually hold large tracts of fertile land, but still practice hunting, gathering, and slash-and-burn agriculture in the forests as a symbol of their connection to, and as an assertion of their ownership of the forests wherein they dwell. They commonly practice clan exogamy. By custom, marriage must cross clan boundaries (incest taboo). Marriages are made outside the clan (yet still within the greater Khond population). Acquiring mate is often by negotiation. However, marriage by capture or elopement is also rarely practiced. Bride price is paid to the parents of the bride by the groom, which is a striking feature. It was traditionally paid in tiger pelts though now land or gold are usual.

Traditionally Khond religious beliefs were syncretic, combining totemism, animism, ancestor worship, shamanism and nature worship. British writers also note that the Khonds practiced human sacrifice. Traditional Khond religion involved the worship mountains, Rivers, Sun, Earth. Baredi is place of worship. Traditional Khond religion involved different rituals. Matiguru involved worship of earth before sowing seeds. Other rituals connected with land fertility were 'Guruba Puja', 'Turki Puja' and in some cases 'Meriah Puja (human sacrifice)' to appease Dharni (earth), goats and chicken. Pitabali Puja was performed by offering flowers, fruits, sandal paste, incense, ghee-lamps, ghee, sundried rice, turmeric, buffalo or a he-goat and fowl.

Human sacrifice has always been prevalent in India, especially in the worship of Kali, but Joseph Campbell (1962 160) gives a particularly graphic portrait of the Khonds:

"A vivid typical lesson is supplied, for example, by the Khonds ... who had victims known as meriah, set apart and often kept for years, who were offered to the Earth Goddess, Tara, to ensure good crops and immunity from disease. To be acceptable, such a figure had to have been either purchased or else born as the child of a meriah. The Khonds, according to report, occasionally sold their own children for this sacrifice, supposing that in death their souls would be singularly blessed. ... They were regarded as consecrated beings and treated with extreme affection and respect, and were available for sacrifice either on extraordinary occasions or at the periodic feasts, before the sowing; so that each family in the village might procure at least once a year a shred of flesh to plant in its field for the boosting of its crop"

"Ten or twelve days before the offering, the victim was dedicated, shorn of his hair, and anointed with oil, butter, and turmeric. A season of wild revelry and debauchery followed, at the end of which the meriah was conducted with music and dancing to the

meriah grove, a little way from the village, a stand of mighty trees untouched by the axe. Tied there to a post and once more anointed with oil, butter, and turmeric, the victim was garlanded with flowers, while the crowd danced around him, chanting, to the earth: 'O Goddess, we offer to thee this sacrifice; give to us good seasons, crops, and health'; and to the victim: 'We bought thee, with a price, we did not seize thee, and now, according to custom, we sacrifice thee: no sin rests upon us.' A great struggle to secure magical relics from the decorations of his person flowers or turmeric-or a drop of his spittle, ensued, and the orgy continued until about noon the following day, when the time came, at last, for the consummation of the rite".

Fig 186: Khond women and elders, a marriage ring, sacrifice post, and human sacrifice.



"The victim was again anointed with oil ... and each person touched the anointed part, and wiped the oil on his own head. In some places they took the victim in procession round the village, from door to door, where some plucked hair from his head, and others begged for a drop of his spittle, with which they anointed their heads. As the victim might not be bound nor make any

show of resistance, the bones of his arms and, if necessary, his legs were broken; but often this precaution was rendered unnecessary by stupefying him with opium. The mode of putting him to death varied in different places. One of the commonest modes seems to have been strangulation, or squeezing to death. The branch of a green tree was cleft several feet down the middle; the victim's neck (in other places, his chest) was inserted in the cleft, which the priest, aided by his assistants, strove with all his force to close. Then he wounded the victim slightly with his ax, whereupon the crowd rushed at the wretch and hewed the flesh from the bones, leaving the head and bowels untouched. Sometimes he was cut up alive. In Chinna Kimedy he was dragged along the fields, surrounded by the crowd, who, avoiding his head and intestines, hacked the flesh from his body with their knives till he died".

"Another very common mode of sacrifice in the same district was to fasten the victim to the proboscis of a wooden elephant, which revolved on a stout post, and, as it whirled round, the crowd cut the flesh from the victim while life remained. ... In one district the victim was put to death slowly by fire. A low stage was formed sloping on either side like a roof; upon it they laid the victim, his limbs wound round with cords to confine his struggles. Fires were then lighted and hot brands applied, to make him roll up and down the slopes of the stage as long as possible; for the more tears he shed the more abundant would be the supply of ram. Next day the body was cut to pieces. ... Each head of a house rolled his shred of flesh in leaves, and buried it in his favourite field, placing it in the earth behind his back without looking".

The Khonds gave highest importance to the Earth goddess, who is held to be the creator and sustainer of the world. The gender of the deity changed to male and became Dharni Deota. His companion is Bhatbarasi Deota, the hunting god. To them once a year a buffalo was sacrificed. Before hunting they would worship the spirit of the hills and valleys they would hunt in lest they hide the animals the hunter wished to catch.

In Khond society, a breach of accepted religious conduct by any member of their society invited the wrath of spirits in the form of lack of rain fall, soaking of streams, destruction of forest produce, and other natural calamities. Hence, the customary laws, norms, taboos, and values were greatly adhered to and enforced with high to heavy punishments, depending upon the seriousness of the crimes committed. The practise of traditional religion has almost become extinct today.

Pygmy Cultures and Animistic Forest Symbiosis

The Mbuti and Biaka/Aka/Baka pygmies both practice forms of animism giving expression to a deeply symbiotic relationship with the forest in which they live. The Mbuti share significant ancient characteristics with the Bushmen and form the largest single group of pygmy hunters and gatherers in Africa (Sanday 1981 93). Around 2250 BC the Egyptian pharaoh Nefitare referred to the Mbuti as 'the people of the trees' renowned for their singing and dancing. These records support the Mbuti remaining stably in this habitat for 4000 years. Because of fission into small isolated groups they have lost their original language and adopt those of neighbouring Bantu tribes, however the Biaka have

retained their native language, diaka, as well as speaking the language of their Bantu neighbours. Neither group have formally defined sex roles. Sexual relations are extremely egalitarian and cooperative. Both groups practice net hunting which involves both sexes young and old promoting a non-violent egalitarian culture.

According to Wilhelm Schmidt (1868–1954), an ordained priest and ethnologist interested in the origin of religion, the Pygmy peoples represented humanity in its childhood; they were a living equivalent of one of the earliest stages of human culture. Since early evidence seemed to indicate the existence of monotheistic belief in primitive societies, for years the Pygmies were studied by Catholic missionaries seeking to support the idea that monotheism (rather than animism or fetishism) was the earliest form of religion. The Jesuit missionary anthropologist Paul Schebesta (1887-1967) claimed the Mbuti believed that God, Muungu, a high deity, created the universe (that is, the forest) and all its creatures and forces. God then retired into the sky, ending his participation in earthly affairs. The first human, a culture hero named Tore, became god of the forest; he gave the Mbuti both fire and death and is seen as the source of game, honey, and protection. Likewise the Aka believe in bembe, the creator of all living things, but they believe also that bembe retired soon after creation. Religion in the lives of tropical forest foragers has thus increasingly reflected borrowings from neighboring African groups and from colonial missionary influences.

Colin Turnbull (1965) the major ethnographer of the Mbuti, disagrees with this theistic account of Mbuti cosmology. According to him, there is no creator god; instead, the Mbuti worship God as a living benevolent being personified by the forest. To them, God is the forest.

Tropical forest foragers believe in totemic spirits (*sitana*) - animals whose spirits and characteristics represent the group's unity. They also believe in a water animal, called *nyama ya mai* in Swahili, who is responsible for any serious water accidents. Tropical forest foragers also practice magical rituals called anjo to help control the weather and improve hunting. Turnbull also diverges from Schebesta's account of the mediating forest spirits, for he views the Mbuti as a practical people who have a direct relationship with the forest as sacred being, so unlike their neighbours they are not centrally concerned with propitiating "magic" as an effect, but for the pygmies, it is not so much the act itself that counts, but the manner in which the act is performed and the thought that goes with it.



Fig 187: Mbuti (left) and Biaka Pygmies (right) including a man tending Tabernanthe iboga for visionary experience.

Their habitat and their heaven is the Ituri Forest. The forest is their godhead, and different individuals address it as 'father', 'mother', 'lover', and/or 'friend'. They say that the forest is everything: the provider of food, shelter, warmth, clothing, and affection. Each person and animal is endowed with a spiritual power that "derives from a single source of power whose physical manifestation is the forest itself". Disembodied spirits deriving from this same source are also considered to be independent manifestations of the forest. The forest lives for the Mbuti. It is both natural and supernatural, something that is depended upon, respected, trusted, obeyed, and loved. The forest is a good provider. At all times of the year men and women can gather an abundant supply of mushrooms, roots, berries, nuts, herbs, fruits, and leafy vegetables. The forest also provides animal food.

Decision making is by common consent: Men and women have equal say because hunting and gathering are both important to the economy. The forest is the ultimate authority. It expresses its feelings through storms, falling trees, poor hunting all of which are taken as signs of its displeasure. But often the forest remains silent, and this is when the

people must sound out its feelings through discussion. Diversity of opinion may be expressed, but prolonged disagreement is considered to be 'noise' and offensive to the forest.

The most important ritual ceremony is the molimo. It is held whenever hunting becomes unproductive or a special problem demands a solution. Explaining to Colin Turnbull the reason for the molimo ceremonies, held when the Mbuti feel that all is not well between themselves and the forest, upon which they depend for everything, an old Mbuti man said: "The forest is a father and mother to us and like a father or mother it gives us everything we need food, clothing, shelter, warmth . . . and affection". Normally everything goes well because the forest is good to its children, but when things go wrong there must be a reason. Things go wrong, the old man said, at night when the people are asleep, when no one is awake to protect humans from harm. At night army ants may invade the camp or leopards may come in and steal a hunting dog or even a child. The old man said that such things would not happen when people are awake. Thus, he reasoned, "When something big goes wrong, like illness or bad hunting or death, it must be because the forest is sleeping and not looking after its children." Because things go wrong when the forest is 'asleep,' the forest must be 'awakened' so that it looks after the interests of the people. The old man said: "We wake it up by singing to it, and we do this because we want it to awaken happy. Then everything will be well and good again. So when our world is going well then also we sing to the forest because we want to share our happiness.

An old man told Colin Turnbull how all pygmies have different names for their god, but how they all know that it is really the same one:

Just what it is, of course, they don't know, and that is why the name really does not matter very much. 'How can we know?' he asked. 'We can't see him, perhaps only when we die will we know and then we can't tell anyone. So how can we say what he is like or what his name is? But he must be good to give us so many things. He must be of the forest. So when we sing, we sing to the forest.'

The most consistently mentioned divinity or spirit for the Aka is likewise that of dzengi, a forest spirit. Aka male-female relations are extremely egalitarian by cross-cultural standards. Husband and wife are together on a regular basis to net hunt, collect caterpillars, termites, honey, fruit, and sometimes fish. On net hunting days husband and wife are within view of each other about half of the time. Aka fathers do more infant care giving than fathers in any known culture. The Aka are fiercely egalitarian and independent. No individual has the right to coerce or order another individual to perform an activity against his/her will. Even when parents give instructions to their children to collect water or firewood, there are no sanctions if they do not do so.

San Bushmen as Founding Animists

Foundational human cultural influences can be seen in the animistic, spiritual and religious beliefs of our oldest surviving culture of the San Bushmen, a founding human culture, in genetic, evolutionary and archaeological terms, whose historical presence goes back over 100,000 years and whose ancestor, the mitochondrial Eve is literally the "mother of all living" (Fielder & King 2017). Although over the course of the last two millennia, the San may have had contact with other religious influences, their cosmology of animistic trickster heroes and deities have a fresh natural quality, just as engaging as the Sabbatical creation.

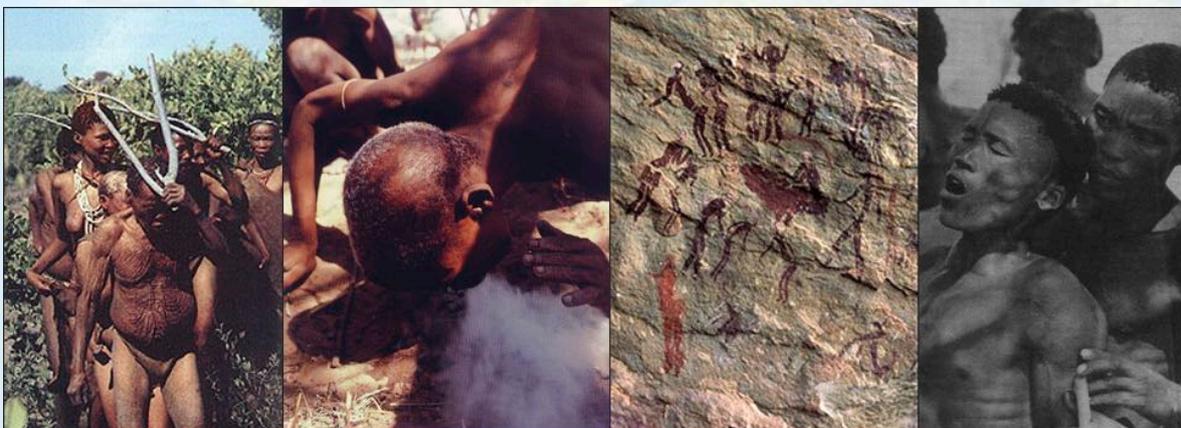


Fig 188: San headman acting as the Eland in the San rite of menarche for a teenage girl, smoking dagga (cannabis) from a hole in the ground, cave drawing of the trance dance and a person supported while entering trance in the rite – Lonyana Rock Kwazulu-Natal. Figures dance around a seated figure healing another reclining person enveloped in a kaross, or short skin-cloak.

(Rock Art Res. Inst., Univ. of the Witwatersrand, SA)

The San Bushmen, who represent one of our oldest and longest surviving foundational cultures likewise have an extensive history of animism. Sources of such material can be found in Laurens van der Post and Jane Taylor's (1986) *Testament to the Bushmen*, Johnson, Bannister and Wannenburg's (2000) *The Bushmen* (2000), Alan Barnard's (2019) "Bushmen: Kalahari Hunter-Gatherers and Their Descendants" and Mathias Guenther's (2020) "Human-Animal Relationships in San and Hunter-Gatherer Cosmology".

Guenther notes that the spirit realm, while preternatural (beyond what is normal or natural) in a number of ways, is also of this world, being located somewhere beyond the hunting ground and accessible, by different pathways, to humans, especially shamans. It may also be situated within the sky, rather than the veld, or somewhere in-between, in lower-sky regions, the spatial-ontological domain within which, preindustrial people tend to locate spirits as gods at eye-level – thereby rendering them ontologically ambiguous "supernatural beings whose ancestry is neither unequivocally human nor divine".

Xam story teller /Han#kasso's statement to Lucy Lloyd is as fundamental a postulate about human and animal ontology to San cosmology as is its reverse, Darwinian, counterpart to Western cosmology. Its clearest expression is found in the stories San tell about myth time, the First Order of Existence, whose denizens, for the most part, were therianthropes, that is, animals that "were once people". As such, these people—the Early Race — contained in their being, their First Order human'ness and elements of their Second Order animal'ness. Humans and animals from both myth and historical time are thus blended ontologically, explaining why, as we will see in the second section, we also find therianthropes, of a mythic, Early Race cast, in the Second Order of Existence.

These human animal transformations tally closely with the trickster hero /Kaggen or mantis – a human-insect-bird being – "a little green thing" that "looks like a long thin Locust", at times spreading its feathered wings and fly off, after a scrape or misadventure. Mantis's sister then berates him for his dereliction of duty. Unlike Mantis's other sister, Blue Crane, the sister here featured is of indeterminate nature her springbok child suggests that she is, springbok-linked. Mantis's nephew, the Little Springbok, has human speech, as, at the beginning of the story, he is engaged in animated prattle with Mantis, in a tone different from the hectoring he always gets from his own grandson, a precocious Ichneumon Lad, whose mother is a Porcupine woman and whose father's family are Meerkat and Lion People.



Fig 189: Therianthrope transforming from human to antelope (Guenther).

For the Bushmen of Lesotho, Mantis or, /Kaggen, the first being, made all things by ordering them to appear. He created the Sun, Moon, Stars, wind, mountains and animals. A quarrel began between /Kaggen and his wife Coti over a knife she made blunt by using it to sharpen her digging stick. As a result of his anger, she gives birth to an eland calf in the fields. /Kaggen leaves the calf in the bush while he goes away for three days to obtain arrow poison, his two sons find the calf and kill it for food. /Kaggen accuses his sons of 'spoiling' the eland. He instructs his sons to put the blood of the calf in a pot and churn it with a stick. The blood splatters and becomes snakes. They try again, and the blood that is spilled turns into hartebeest. /Kaggen is still not satisfied. He orders his wife to clean out the pot and to bring fresh blood from the paunch of the little eland. To this he adds fat from the heart, and when the blood splatters this time, each drop becomes an eland bull, and all the bulls surround /Kaggen and his sons and menace them with their horns. 'See how you have spoilt the elands,' says /Kaggen, and he chases them away. The next time the blood is churned it produces eland cows, in such numbers that the earth is covered with them. 'Now go and hunt them and try to kill one', says /Kaggen. 'That is now your work, for it was you who spoilt them.' But they fail, and so /Kaggen himself goes out and spears three bulls. Thereafter, with his blessing, his sons are also successful. Some myths speak of regeneration. The mythical Mantis, in his human person as one of the 'early race', finds that his grandson has been killed by baboons, who are playing a ball game with the child's eye. Mantis joins in the game and, gaining possession of the eye, places it in a pond, where it once more becomes the complete child, the grandson whom the baboons had killed.

Richard Katz (1982) gives a detailed account of the !Kung San trance dance reported first hand during his field work. This provides both numinous consciousness expansion for the practitioner to enter the spirit worlds and is also a process strengthening the community:

For the !Kung, healing seeks to establish health and growth on physical, psychological, social, and spiritual levels: it invokes work on the individual, the group, and the surrounding environment and cosmos. Healing is a fundamental integrating and enhancing force far greater than curing or the application of medicine. The healing tradition supports the culture's emphasis on sharing and egalitarianism, its belief in the life of the spirit, and its strong community ties.

The central event in the healing tradition is the all-night dance. Four times in a month, on the average, the women sit around the fire, singing and rhythmically clapping as night falls, signalling the start of a healing dance. The men, sometimes joined by the women, dance around the singers; the entire village participates. As the dance intensifies, *n/um*, or energy, is activated in those who are healers, most of whom are among the dancing men. As *n/um* intensifies in the healers, they experience an enhanced consciousness called *!kia* during which they heal all those at the dance. The dance usually ends before the sun rises the next morning. Those who are at the dance confront the uncertainties and contradictions of their experience, attempting to resolve issues dividing the group, reaffirming the group's spiritual cohesion. They find it exciting, joyful, and powerful. "Being at a dance makes our hearts happy," the !Kung say. While experiencing *!kia*, one can heal. Those who have learned to *!kia*-heal are said to possess *n/um*. They are called *n/um k"ausi* – "masters of *nium*" or simply "healers." *N/um* resides in the pit of the stomach and the base of the spine. As the healer dances, becoming warm and sweating profusely, the *n/um* heats up, becomes a vapor, and rises up the spine. When it reaches the base of the skull, *!kia* results.

Kinachau, an experienced healer, talks about the *!kia* experience:

You dance, dance, dance. Then n/um lifts you up in your belly and lifts you in your back, and then you start to shiver. [N/um] makes you tremble, it's hot. Your eyes are open but you don't look around; you hold your eyes still and look straight ahead. But when you get into !kia, you're looking around because you see every thing, because you see what's troubling everybody ... n/um enters every part of your body right to the tip of your feet and even your hair.

N/um is held in awe, considered very powerful and mysterious. It is this same n/um that the healer "puts into" people in attempting to cure them. Once heated up, n/um can both induce !kia and combat illness. ...But it is only as one learns to control or regulate one's boiling n/um that one can apply it to healing. One then learns to ≠twe, to "pull" or "pull out sickness." K"au ≠Dwa, a powerful healer, describes how one can heal while experiencing !kia: "When you !kia, you see the things you must pull out, like the death things god has put into people ... you see people properly, just as they are ... your vision does not whirl." !Kia intensifies emotions, be they fear, exhilaration, or seriousness. During !kia, !Kung healers perform cures, and as part of their effort to heal, may handle and walk on fire, see the insides of peoples' bodies and scenes at great distances from their camp, or travel to god's home, activities never attempted in their ordinary state.

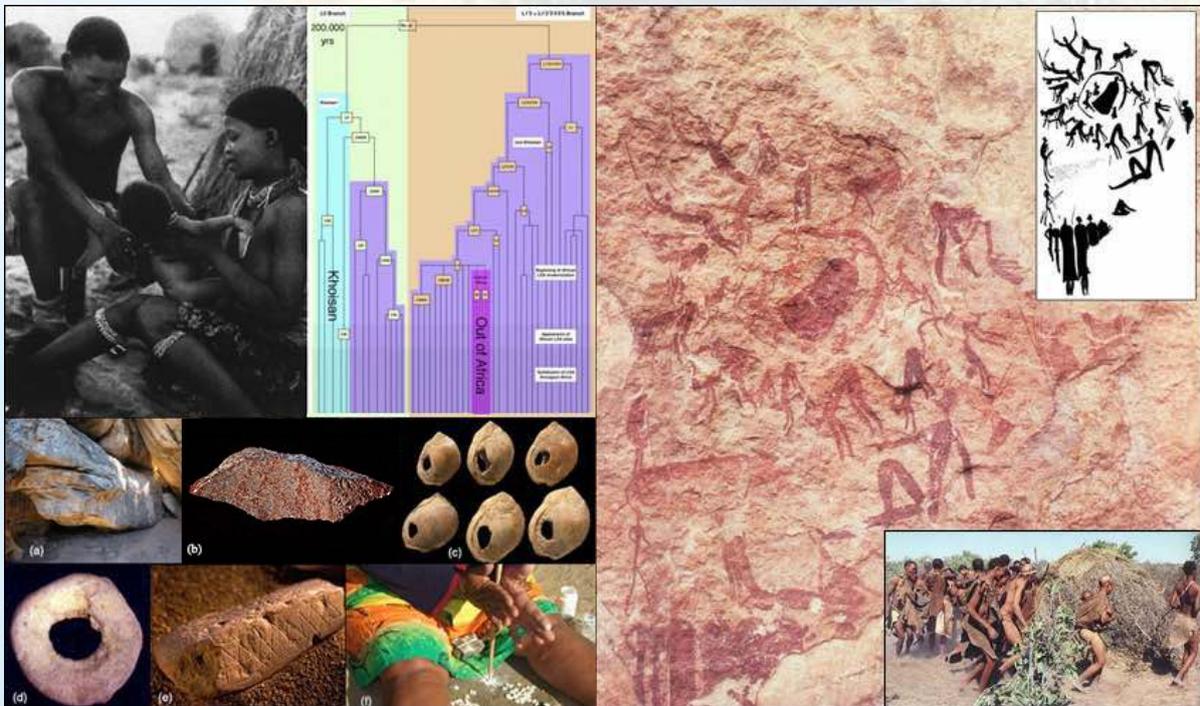


Fig 190: Left: A young San couple. Mitochondrial tree of humanity traces its oldest ancestor to an ancestral San female and shows evidence of the separation of San into two groups some 140,000 years ago for some 100,000 years, possibly by a long drought in the Kalahari. Remains from caves in the San area such as Blombos and the Border cave show cultural and spiritual use going back up to 100,000 years, painted stone fleck (73,000 years) representing the oldest human rock art, shell ornaments and scored red ochre possibly for cosmetic use. Right: Fulton cave drawing 1000 BC celebrating the eland rite of menarche, Drakensberg Mountains. The young woman is held in great reverence (Fielder & King 2017). Inset An eland rite with the headman impersonating the eland bull follows the same pattern as in the cave drawing.

≠Toma Zho, a strong experienced healer, speaks of the feeling !kiam gives, that of becoming more essential, more oneself:

I want to have a dance soon so that I can really become myself again." A transcendent state of consciousness, !kia alters a Kung's sense of self, time, and space. Another experienced healer says: "When I pick up n/um, it explodes and throws me up in the air and I enter heaven and then fall down.

!kia makes others feel they are "opening up" or "bursting open, like a ripe pod." Through !kia, a !Kung transcends ordinary life and can contact the realm of the gods and the spirits of dead ancestors. Sickness, incipient in everyone, is a process in which these spirits (the //gawasi) try to carry people off into their own domain.

In addition to their trickster heroes and first person experience of the numinous in the trance dance, the Bushmen also, possibly influenced by interactions with other cultures, believe in the existence of two gods: a greater god manifesting the creative force and a lesser god invoking the malevolent forces of uncertainty and misfortune, each with a shadowy consort (Johnson et al 2000, van der Post 1986). They have many names, but the !Kung Bushmen most commonly call them ≠Gao!na and //Gauwa, while to the /Gwi they are N!odima and G//awama. The Bushmen do not see these as opposed good and bad gods like Jehovah and Satan.

≠Gao!na, the !Kung Great God, using one of his seven divine names, created himself:

*"I am Hishe. I am unknown, a stranger. No one can command me.
I am a bad thing. I follow my own path."*

Then ≠Gao!na created a Lesser God who lives in the western sky where the sun sets; and after this two wives for himself and for the Lesser God. ≠Gao!na, tallest of the Bushmen, was in his earthly existence a great magician and trickster with supernatural powers, capable of assuming the form of an animal, a stone or anything else he wished, and who changed people into animals and brought the dead back to life. But as the Great God who lives beside a huge tree in the eastern sky, he is the source and custodian of all things. He created the earth with holes in it where water could collect and water, the sky and rain both the gentle 'female' rain and the fierce 'male' rain thunder and lightning, the sun, moon, stars and wind. He created all the plants that grow on the earth. He created the animals and painted their individual colours and markings, and gave them all names. Then came human beings, and he put life into them; and gave to them all the weapons and implements they now have, and he implanted in them the knowledge of how to take all these things for themselves. Thus their hunting and gathering way of life was ordained from the very beginning and ≠Gao!na ordained that when they died they should become spirits, //Gerai, who would live in the sky with him and serve him. He set the pattern of life for all things, each in accordance with its own rules.

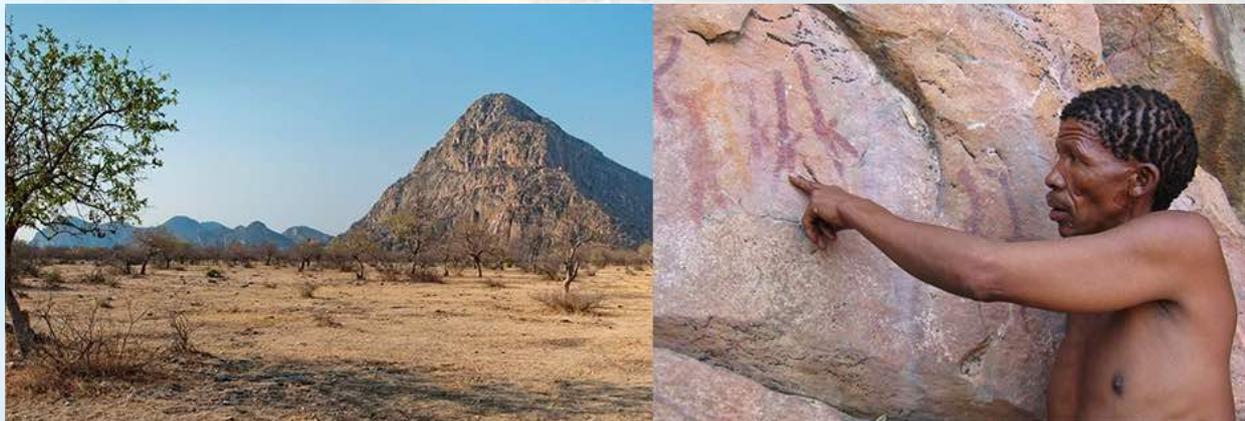


Fig 191: ≠Gao!na is said to live in the sacred Tsodilo Hills whose sexual story is a legendary comment on !Kung sexual relations. A man had two wives, but he loved one wife more than the other, and this caused a big quarrel. The one he didn't love hit him on the head, causing a deep wound. Then she ran off into the desert. But the Great God, ≠Gao!na, decided that because there was no peace among them, he must turn them all into a stone. The man became the largest of the hills; the unloved wife became the smallest hill that stands alone; and the loved wife, with her children, became the cluster of hills in the middle. But they believe there are supernatural powers in the Hills because ≠Gao!na himself lives there. It was there that he created and kept his cattle, sheep, goats, and all sorts of different animals. The !Kung claim you can see footprints in the rocks.

The !Kung pray to ≠Gao!na not as a remote being, but as intimately involved with their lives, sometimes calling him father. They pray for rain, for success in hunting, for healing both of physical and social ills. Only a really great medicine man might see ≠Gao!na face to face, but this is said to be very rare; much more frequently he may appear to anyone in a dream to encourage or advise. He does not reveal himself to ordinary humans, for so great is his power that, were he

to come too close, he would destroy them unintentionally. But he nevertheless retains an interest in them. He is in no way concerned with their misdeeds, but is aware of them, and if they offend him he will deal with them appropriately.

But he is not a god of vengeance. When he deals harshly with someone, it is not an act of retribution but a demonstration of his power. This is the power of the unknown, the 'stranger', which explains why lightning strikes one man dead, and not the other standing beside him. The dead man, it is reasoned, must have offended ≠Gao!na by referring to him by one of his divine names, or perhaps he abused food. But he is not continually on the look-out for offenders. It is only when they happen to come to his attention that he demonstrates his power, and so sometimes people do offensive things and get away with it. Chiefly he acts for the benefit of mankind, for he supplies rain, food, children and poison for the arrows.

//Gauwa, the lesser god, who lives between two great trees in the western sky, also performs deeds that may be either beneficial or harmful to humans, but most are harmful. He is pictured as a very small Bushman, an incompetent who, even when well-intentioned, may bring misfortune by mistake. Although he is supposed to be subservient to ≠Gao!na and to act at his behest, he also sometimes acts on his own initiative while travelling about in a whirlwind, causing sickness and death to those he touches in passing. The people say that at certain times they catch glimpses of //Gauwa among the shadows of the trees.



Fig 192: Nisa

*When the gods gave people sex, they gave us a wonderful thing.
Sex is food: just as people cannot survive without eating,
hunger for sex can cause people to die. !Kung saying - Nisa.*

In "Nisa" (1981) Marjorie Shostak provides an engaging detailed portrait of a !Kung San woman, her sexual relationships with men and her trials of familial life. What emerges from this account is the life of a spirited woman who throughout struggles to maintain her autonomy of choice over her life in a nominally patriarchal society in which the headmen would like to assert a patriarchal imperative, but in which the society has remained remarkably free of the oppressive influences of civilisation succeeding the agricultural revolution which itself was discovered by female gatherers, thus having remarkable similarities to features of sexual relations Western society is only recently re-engaging. We cannot thus assume that history dictates the dominance of patriarchy.

There is an obvious evolutionary rationale for animism in Gatherer-Hunter society, in that reality is formulated in relationships spanning family and kinship and coexistence with nature in both the gathering and hunting phases of securing nutrition and health. Hunting particularly as it is done by the San is a silent cooperative act of communal stealth by a band of hunters using expert arrow poisons. Central in successful hunting is adopting the persona of the hunted animal to identify with its habits and movements and temperament as closely as possible. Good hunting is critical to a man's success as it is key to gaining sexual favours, and indeed 19th century Hottentot Bushmen were reported to have been forced to steal cattle to satisfy their women's demands for meat as the colonists invaded their natural domains:

"The Bushmen when they will not go out to steal cattle, are by the women deprived of intercourse sexual by them and from this mode of proceeding the men are often driven to steal in opposition to their better inclination. When they have possessed themselves by thieving a quantity of cattle, the women as long as they exist appear perfectly naked without the kind of covering they at other times employ."

This power of identification with the animal is manifest in the eland dance in which a girl's menarche is celebrated as a pivotal spiritual event in which the headman taking the role of the eland leads the young warriors in a dance around the hut where the girl is secluded, so that they cannot set eyes on her for fear that it will disturb their hunting prowess. The gatherer-hunter existence is aimed at securing a diverse diet in a few enough hours of the day to enable social concourse, and non-disruption of the ecosystem, taking only what one needs from the environment in a way which sustains the abundance of nature, preserving the biosphere.

Because the Bushmen have historically existed in small bands, and cannot survive as individuals, they have an immediate sense of "morality" to deal with immediate threats to group unity, which applies particularly to sharing and stealing, but this in no way extends to any form of absolute "cosmic" morality. Two customs are especially important

are meat-sharing and gift-giving. Mannerliness, the custom of talking out grievances, the customs of borrowing and lending and of not stealing simply function to prevent tension from building up dangerously between members of a group and help to bring about peaceful relationships.

If a !kung woman steals, we take hold of her, we give her to her mother and her father; and they all go away from their place. Her stolen thing, we take it, we run, we run to give to the other person the other person's thing. And we say to the other person: "My wife stole your thing which is here; your nice thing here, my wife stole. And I have given (back) my wife to her father and her mother. For, my wife stole the nice thing here." And the other person hears, and objects (saying): "No; kill thy wife." And, we hear, (and) object (saying): "No; I do not listen to you, and will not kill my wife; for, my wife has gone away, has gone to her father and her mother; and is far away; and has gone to her country; and I will not kill my wife." And the others cry, and we hear; and our hearts ache, and we go away; we say to the other people: "We go away; come, that I may kill my wife, kill my father-in-law, kill my mother-in-law, kill my ..."

There is no 'government' to keep men in awe, no impersonal authority to decide who is right and who is wrong. Thus although their homicide rates have been much lower than warrior societies, men still will commit murder. As one of the !Kung men in an argument about a marriage put it to his adversary, their dispute could be quickly settled with an arrow. Just one little [poisoned] arrow!

But this doesn't mean absolute morality either:

When a missionary inquired into a Bushman's ideas of good and bad he was told it was 'good' to sleep with another man's wife, but 'bad' if he slept with yours. Still lamenting the Bushman's ignorance of absolute morality, he later asked the man, whom meanwhile he had discovered 'was in the habit of smoking wild hemp', what he thought was the most wonderful thing he had seen. The reply he was given, that no one thing was more wonderful than any other and that all the animals were the same.

There is no suggestion that the carnivores are "bad" or "immoral" for eating the herbivores, or should lie down with the lamb and eat straw, as arises in Isaiah 11.

In the ≠Gao!na creation account above, unlike the Vedic tale of Valmiki who created the Ramayana as penance for cursing a hunter who killed a bird, the hunting of animals is ordained from the very beginning by God as the gatherer-hunter way of life, so killing animals for food cannot be regarded as natural evil. The Gods are NOT moral arbiters. ≠Gao!na the creator says he is a bad thing because he follows his own path and //Gauwa the god of misfortune is not evil. Neither do they control men's and women's lives through absolute morality or divine punishment.

Geunther notes that, despite the advent of the new anthropological climate, this largely bypassed studies on the San which remained confined to the older evolutionary analysis centred on material success in the modernist vision, rather than a "symbiotic" ontological world view:

Yet, the ontological turn, for all of its paradigm-shifting effects on the study of hunter-gatherers during the last and first decades of the previous and present centuries, all but by-passed the Kalahari, amongst whose hunting-gathering people ethnographers were wont to examine the human-animal relationship not in social, cosmological, mystical fashion but instrumentally and strategically, as a meat-on-the-hoof resource, cherished—more so than plant—for its high caloric yield and thus a key concern of the "foraging mode of production" and its modus operandi, "optimal foraging strategy". The effect of all of this was to render this foraging group as the optimal forager, whose "immediate-return" subsistence economy was seen to afford people "affluent" lifeways.

He thus sets out to correct this hole in the anthropological account by invoking the relationship ontology:

I set out in this book to show that San worldview and lifeways are in fact also, at the ontological level, the way people conceive of, perceive and experience their interaction with animals, along with other beings of their (pre)natural world, pervaded with relationality and intersubjectivity (and have done so in the past, on the basis of ethnohistorical and archaeological evidence largely on southern San that will be marshalled). In filling this gap in our understanding of San ethnography and culture I will also fill the gap in ontological anthropology, which has excluded these southern hunting people from its neo-animistic purview. Apart from adding new insights to the relational ontology perspective in anthropology, this study, of "Sanimism", also underscores the important insight that animism is not some monolithic schema or cosmologico-religious complex but something diverse and multiplex, structurally varied, ecologically and historically contingent. Indeed, as I will also argue, one such included in many and varied animisms of people and cultures of this world are Westerners.

The latter is given the widest scope phenomenologically for humans engaging with their expressive culture, ritual and hunting, as animal-beings and as being-animal. These two ontological concepts and experiences—and the process that links them, transformation—highlight the non-human beings that hold centre-stage in this study: animals. They are central also to this book's theoretical framework, animism (the "new" version), the core concept of which, "anima" ("soul"), is semantically linked to "animal".

Animals are front and centre also in San myth and cosmology. Animal stories are generated through the hunt, which provides an inexhaustible supply of narrative to San story tellers, who, in retelling the hunt and the animals encountered, through exciting or dangerous hunting endeavours or because of uncanny, “counter-intuitive” behaviour on the animal’s part rendering it beguiling and “attention-demanding” and transporting it into the realm of legend and myth.

This suggests as well that the “hunting magic” model for interpreting San rock art which the shamanism-based “trance hypothesis” rejects needs to be “reconfigured”, in terms of an “animism”-based model focused on the hunter-animal prey relationship rather than one based on shamanism and focused on the healer-human patient relationship. Mikko Ijäs (2017) in his study of San rock art, suggests that shamanic trance healing ritual developed from the experience of altered states of consciousness brought on by persistence hunting – “the hallucinatory hunting experience of transformation into an animal” – which he deems the primal hunting technique of Palaeolithic and Holocene hunters.

Alan Barnard notes the long-standing unity of both the eland dance and the religion and spirituality of the otherwise diverse San groups:

Male initiation involved fasting, dancing and hunting magic, including tattooing. Initiates also had to avoid unmarried women. Female initiation, as among the Naro, involved an Eland Bull Dance. All these rituals, where they occur, are remarkably similar across the Kalahari. It would seem that whereas there may be great diversity in matters of use of the micro-environments that characterize Bushman lands, in matters of religious belief and practice there is a unity. This is borne out especially in a recent article by Mathias Guenther. He concentrates on hunting, but his main point is that in the context of a New Animism, elements of ritual, myth, rock art and mysticism blend. This is true of the /Xam, but it is also true for the Ju/’hoansi. Lewis-Williams is also writing in this vein, in a way updating the Old Animism of the Bleek and Lloyd material to take in newer perspectivist ideas: instead of thinking like an outsider, learn to think more like a Bushman.

In his conclusion, Barnard focuses on the issues of religion and spirituality, both acknowledging the ancient foundational role of animism and the key role it may need to play in rescuing modern technological and religious society from the impending destruction of nature raising dire risk of our own demise:

The idea of the earliest theories of religion (by which I mean religion in the Middle Stone Age) has cropped up here and there throughout this book, but only in passing. We have left behind what is actually more interesting. This is the problem of human spirituality in general, a problem that surfaced in the very beginning of the book when I quoted a philosophical piece by Peter Nilssen and Craig Foster. They suggest that the earliest human societies had their roots in art, music, myth and symbolism and more specifically in animistic religion. If there were a global religion prior to 10,000 years ago, it was Animism. Or, as they put it: ‘At our core, we are all Animists, carrying remnants of a profoundly imprinted mindset and way of life based on a reverent and functional relationship with nature’ (Nilssen and Foster 2017). The implication is that humanity should try to reconnect with this ancient and nature-friendly spiritual tradition.

The Key to Our Future Buried in the Past: Philosophical thoughts on saving us from ourselves

Nilsen and Foster (2017) emphatically underscore the need for humanity to learn from our founding cultures ways to correct the planetary crisis human civilisation has set in motion to draw from our emergence in effective symbiosis with nature to enable our future survival. I will largely quote for their article in their own words because it is a brief account that is stunningly succinct and the literal key to our survival as a species:

An abundance of scientific data shows that in the last few millennia humans have placed life under severe stress and are expediting the sixth extinction event. It seems obvious then that the thrust of current research should focus on securing our future. Archaeology can be a key player in that regard. If human behaviour has brought us to this point, and if science is suggesting that we are at the end game, then we have answers to the why and when. What remains unanswered is the how. How do we alter human behaviour to achieve function and sustainability? The archaeological record is important because it is a road map of our development, with signs of where we have been, what we have done, what has worked and what has not. If our early ancestors survived and thrived in Africa prior to the introduction of food production and socio-political systems, then it is reasonable to suggest that their recipe for life worked. Currently our species is barely surviving and certainly not thriving; our recipe for life has failed. Maybe a glance at the past can provide some sorely needed wisdom and guidance. We are not suggesting a return to the Stone Age but rather a return to the original human ethos as a way to secure our future.

In real time, humans first appeared about 200 000 years ago and the origins of food production occurred some 10 000 years ago. This means that humans lived in and connected with nature for at least 95 per cent of our time on earth. It is only for the last five per cent or so that we have been manipulating nature for our own short-term benefit, to the long-term detriment of life in general. It is hardly surprising then that most of us find comfort, peace and joy in nature as opposed to the discontent associated with the sights, sounds and smells of industry and modern life. Our deep-seated relationship with nature, and 95 per cent of our genetic coding and heritage, is part of the original human design – gatherer-hunters are at the core of who and what we are.

We know of animals that use tools. Chimpanzees use 'fishing' sticks to extract termites from a termite mound. Birds drop shellfish or tortoises onto rocks to open them up for eating. We have the ability to make novel associations between separate items or ideas to create what we call composite tools. The bulk of our technology today consists of composite tools. The second characteristic that separates us from other animals involves symbolic behaviour. We know that animals use symbols, but they only do so to protect themselves, their territory and their reproduction. Humans also use symbols for such reasons, but we take symbolic behaviour to a different level. We use it to express our position with respect to our understanding and perception of ourselves and the world we occupy. The start of symbolic behaviour was the first step towards creating the tools that led to our industrial life today. However, early humans used symbolism sparsely, whereas today we use it to such a degree that we have completely lost touch with what is real. ... Since the start of food production and the development of complex society our mindset is that of ego: self-seeking and intent on the manipulation and domination of nature. We are driven to the infinite consumption of finite resources. This situation is radically different from that which pertained in the prehistoric period. We can thus surmise that a major component of the human dilemma and a major cause of our failure to care for the environment results from our disconnection from it.

Prior to the origins of food production and before the advent of complex societies, the vast bulk of human societies based their belief systems in Animism. In this system, which is still practised today, a life force is attributed to everything that exists, including the elements, plants, insects, animals and earth itself. Everything is revered and considered critical to the chain of being. As a practitioner's awareness expands, it is common to experience a profound lack of separation, where the entire known world is perceived as one sentient living form. This experience has been repeated across the ages. Most of the world's great spiritual leaders report very similar experiences of oneness. This experience in many ways is much more real than normal wakefulness as the psyche's ability grows exponentially during heightened awareness. The so-called real world of everyday human existence often feels like an illusion in comparison with this expanded state. It follows that the behaviour of these early ancestors was guided by a reverence for and consciousness of all life, and that their very lives depended on a functional relationship with nature.

Central to Animism is the hunter-gatherer 'trance dance'. It is not the prehistoric equivalent of today's trance parties in which people take recreational drugs and dance to loud music. Rather, through repetitive rhythmic dancing to clapping-singing-chanting-percussion around a fire, the trance dancers aim to reach an altered state of awareness, which they describe beautifully as 'the little death', the death of the ego. It is during these altered states that people have visions of entoptic phenomena and therianthropes – beings or entities that are part human and part animal. ... A second unnatural element in rock art, but one that also occurs around

the globe, is entoptic phenomena. These include cross-hatchings, zigzags, nested curves, spirals and other geometric shapes. Entoptic phenomena are images not observed by the eye, but are generated internally by the brain, usually during altered states.



Fig 193: Entoptic phenomena at the Northern Cape Nilsen and Foster (2017).

During trance states people achieve the overview or connectedness effect that reinforces the belief system founded in Animism. Several South African Middle Stone Age sites dating to 100 000 or more years ago contribute to our understanding of our very deep human origins.

The variety of entoptic phenomena on ochre, ostrich egg shell and bone suggests that these people were involved in altered-state practices and were very likely associated with Animism. Looking at our origins reveals that our early ancestors had at least two

ingredients in their recipe for success, namely a combination of cognition (intelligence) and symbolic behaviour (beliefs or spirituality).

So, what is the contemporary standing of our species? The status of society and its constructs are a perfect reflection of great intelligence in the absence of wisdom. The overall emphasis on the development of intelligence and efficiency, and the near absence of authentic spiritual development has resulted in a notable and often crippling imbalance in the human psyche. The ingredient we have lost is the spiritual aspect of what makes us human. It is this spiritual bankruptcy, evidenced by fame, famine, fear, wars, abuse of everything and lack of reverence that has brought our species to its knees, that has robbed us of our humanness. After food production, the evolutionary tree of belief systems becomes top heavy and complex, with the emergence of thousands of different religions and denominations. Christianity alone boasts several thousand denominations. Mostly these religions view humans as the pinnacle of 'evolution' who have the self-appointed right to dominate and control.

If Animism was the global belief system prior to food production and if we can push the beginnings of symbolic behaviour back to the emergence of humans, then at least 95 per cent of our genetic coding and heritage concerning belief systems relates to Animism. At our core we are all Animists, carrying remnants of a profoundly imprinted mindset and way of life based on a reverent and functional relationship with nature.

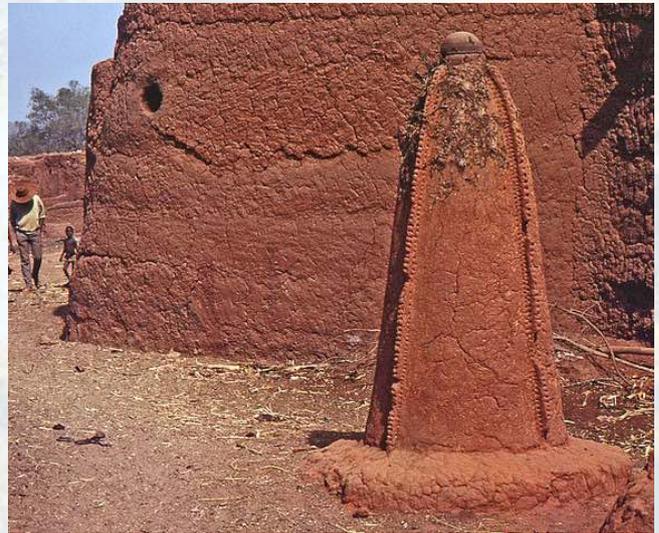
We are imprinted with the notion that we are separate from everything, including nature and each other, and that we are successful human beings if we can accumulate external wealth and power. We are thus imprinted to be part of an ego-based consumer society with only a secondary regard for nature, the environment and fellow human beings. Our resultant behaviour is causing the death of our oceans and the onset of the sixth mass extinction. Humans are the single most dangerous mammal on the planet, responsible

for more human deaths than any other, yet, ironically, very fragile compared with many other smaller species. Some scientists predict human extinction within a few hundred years unless radical change occurs in human behaviour.

All this relates to a tiny fraction – five per cent or less, or less than one per cent if we include the hominin lineage – of our time on earth. For the balance of our past we were imprinted with the notion of the interconnectivity of all things and reverence for life; it was these nature-based knowledge and belief systems that allowed our species to thrive. The inter-connectivity of all, the law of one, as taught by spiritual leaders since the dawn of time, is now supported by quantum physics, which states that at the foundation of it all there is only one thing, a singularity, a unified field of energy, one intelligence, one consciousness. Everything is connected.

The point is simply this: we stand at the tipping point: either we change our habits and tendencies, or our future is in serious doubt.

Fig 194: Animist altar, Bozo village, Mopti, Bandiagara, Mali, 1972 The Bozo are sometimes referred to as the "masters of the river". Though they are predominantly Muslim, they preserve a number of animist traditions as well. Their animal totem is the bull, whose body represents the River Niger and whose horns represent the Bozo fishing pirogues.



There is a critical message here for all of us. Not only are the San Bushmen one of or the oldest known human cultures, possibly shared with the tropical pygmy peoples of the Congo, representing the mitochondrial African Eve, but they have the archetype of how humanity can survive ecologically over hundreds of thousands of years including some of the toughest most inclement environments. Given the combination of this with the ability to live with nature symbiotically, not intervening in it any any way, but to collect its surplus bounty, while espousing a world view of integrated relationship with it over millennia, they hold our deepest and most insightful key to our own survival.

Entasis and Ecstasis: Complementarity between Shamanic and Meditative Approaches to Illumination

Stuart Sarbacker (2002) notes contrasting themes between the practices of shamanism as practised world-wide and particularly in the Americas and those of Eastern meditation and devotion – Mircea Eliade's (1958) notion that the ultimate goal of shamanism is *ecstasis*, a type of visionary experience that involves the association of mythical beings and their realities, in contrast to *entasis*, the more abstract goal of release from conditioned reality that is characteristic of Indian forms of yoga, most notably Classical Yoga and Buddhism.

In two of his most famous works, Yoga: Immortality and Freedom (1958) and Shamanism: Archaic Techniques of Ecstasy (1972), the Historian of Religions Mircea Eliade attempts to elucidate the distinctiveness of shamanic and yogic typologies of religious belief and practice. Through this process, Eliade notes at several points what he believes is a fundamental distinction between shamanic and yogic practice and experience that can be understood as the difference between entasis and ecstasis, or enstasy and ecstasy, respectively "standing within" and "standing without." ... The controversial issue of determining the primary characteristics of shamanism is framed by the context of Eliade's emphasis on ecstasy as the definitive component of shamanism as opposed to possession and other phenomena. In the case of the study of meditation (dhyana) in the Hindu and Buddhist contexts, the terms enstasy, enstasy or enstatic have become an important part of the terminology of both Hindu Buddhist studies.

A number of other issues not found in Eliade's work ... further illuminate this relationship and demonstrate other important possibilities for the yoga – shamanism comparison. These include examples of initiatory types of phenomena associated with Buddhist meditation, the junction of enstatic and ecstatic modal in the development of meditation in Buddhist and Hindu yoga, and the possibility of viewing the yogic practitioner as a sort of psychopomp akin to the shaman. It will be demonstrated that the enstatic and ecstatic modalities can be better seen as being dynamically related rather than mutually exclusive, and that Eliade's distinction is useful but in need of further elaboration and specificity. Enstatic and ecstatic phenomena have an intimate relationship with what can be called numinous and cessative modalities or conceptions of religious practice and experience, demonstrating both continuity and distinction in the yoga-shamanism relationship. These dimensions have a deep connection in how they tie together psychological and social realities in the lives of religious practitioners, and relates both to questions of cosmology and divinity.

Eliade states that shamanism can be said to possess four primary elements. These include: an initiation in which the adept faces death, dismemberment, and possibly a descent into the underworld and an ascent into heaven; an ecstatic journey in which the shaman acts as healer or psychopomp; a "mastery of fire" in which the shaman proves himself capable of withstanding some type of

ordeal; and an ability to change form, to "become invisible" and to demonstrate other magical powers (Eliade 1958:320). The primary factor among these, according to Eliade, is ecstasy, the ability to leave the body in order to journey to otherworldly realms, and to master the world of spirits, ultimately qualifying the shaman as a "specialist in the sacred." The essential and defining element of shamanism is ecstasy— the shaman is a specialist in the sacred, able to abandon his body and undertake cosmic journeys "in the spirit".

However Quirce Balma (2010) makes clear the mistaken doctrinal view of Eliade in discounting entheogenic shamanism as non-existent, irrelevant, or degenerate in relation to other forms of shamanism involving rhythm and trance states:

In the period in which Eliade dominated interpretation in the field of native anthropology, he flatly denied that entheogenic hallucinogens formed part of the culture of those peoples. For Eliade, native logic, free from both the alphabetic and rational logics of our society, liberated the unconscious to produce dreams and visions of a much more symbolic and animistic type, than what could be a simple hallucinatory state induced by a drug. For said author, the above does not correspond to a true human being, but to a human being affected by a pharmacological delusion.



Fig 195: Ecstasy vs Entasis: Shamanic verdant immersive visionary chaos vs Samadhi's spiritual order renouncing conditioned reality. (Left) Pulsations. A group of vegetalistas has taken ayahuasca and through an icaro, Queen Pulsarium Coya they seek to diagnose patients by interpreting the pulse with hands connected to the brain. In the Amazon traditions, such a session may also seek to counteract sorcery by shamans of other tribes. In all cases, there is an intimate coupling between nature and the shamanic experience achieved through the entheogens (Luna & Amaringo 1991). (Right) A modern painting of Sukhavati, the pure land that's associated in Mahayana Buddhism with the buddha Amitabha, known in Japanese as Amida. As discussed below this is not nirvana but a land to seek a pure rebirth in that is closer to nirvana. The images evoke the contrast between immersion within nature and a pristine world of order and purity.

Eliade was almost entirely in command of anthropology for decades. It was only when authors such as Campbell (1962) and Jung (1969) began to investigate the mythology and the possible use of pharmacological agents, such as in the ancient nations of Asia Minor, hashish and opium, among others, that it cracked slightly, but decisively, the fundamentalist and somewhat severe thesis of Eliade. The arrival of Wasson (1958) produced a profound disturbance in Eliade's thesis in the 1950s. Fully supported by botanical anthropologists such as Schultes (1963, 1977) and later by other authors such as Harner (1977) and McKenna (1988), Wasson began a series of investigations aimed at proving that the very basis of native and shamanic religions were plant-derived entheogenic psychopharmaceuticals. ... Many authors followed Wasson's path to go so far as to suggest that all current religions began at some point or another with a botanical methodology of entheogenic ingestion.

Of course, the exaggerations need to be given and proposed to establish the controversies, since we know that in Buddhism and Hinduism in China and India, marijuana was used (for the ceremonies of Lord Shiva in the temples) to ephedrine (in Ma Huan tea) and regular black tea (theophylline, which is a methylxanthine). The first to enter a trance state, the second and third to stay awake during the long hours of prayer, contemplation, chanting and meditation.

Sarbacker (2002) investigates the meditative quest of the Eastern traditions, attempting to draw a complementation out of the contrast between the immersive, ecstatic approaches of shamanism and renunciative, enstatic approaches of Eastern mysticism seeking to treat these as present in both approaches with different emphases:

The yogin, or yoga practitioner, as a specialist in the sacred is akin to the shaman as a religious ideal, an example of how religious ideas are concretely embodied. According to this interpretation, the yogin, like the shaman, is understood to embody the truths of his or her tradition (Hinduism, Buddhism, Jainism etc.) and therefore exemplifies the living reality of its philosophy, mythology, and so on. Both the shaman and the yogin are understood in their respective traditions to have unique powers of perception and vision,

and therefore they are understood to play a role as specialist in their religious community, perhaps even as mediators between the mundane (profane) and supramundane (sacred) worlds.

The notion of ascension is carried through several levels of investigation in Eliade's (1958 326-330) work. The climbing of the ceremonial ladder in the performance of Vedic ritual is said to represent the shamanic ascent of the heavens through the conquering of the "world tree," and serves as a starting point for Eliade's analysis of ascension motifs.

We meet the same symbolism again in Brahmanic ritual; it too involves a ceremonial ascent to the world of the gods. For the sacrifice, we are told, "there is only one foundation, only one finale...even heaven." "The ship fair crossing is the sacrifice"; "every sacrifice is a ship bound heavenwards." The mechanism of the ritual is a *durohana*, a "difficult ascent," since it implies ascending the World Tree itself (Eliade 1972: 403).

In the development of *samadhi*, "contemplation" or "absorption," (Eliade's *enstasis*) and more generally, *dhyatui*, "meditation," in the Buddhist context, there is an understanding that meditators who have attained a significant degree of progress in meditation approximate the consciousness of gods in higher cosmological realms. These realms in Buddhism are those of the "form realm" and the "formless realm," which constitute two of the so-called "three realms" of Buddhism. The third realm is the "desire realm" in which there are successive levels of rebirth including those of deities, human beings, animals and hell-beings, among others. The former contain only deities, and they are considered to have cognitive powers superior in many respects to the deities of the desire realm. As a result of attaining high degrees of refinement of meditation in one's life, a practitioner of *samatia* or "tranquility" meditation may be reborn after death in the realm equivalent to that meditative state [*sukhavati*]. There is certainly sense in which the realms build upon each other, in that the higher realms imply that the beings have a very refined state of consciousness. The higher rebirths within the desire realm and by extension in the higher abodes of the form and formless realms are also indicative of a high degree of religious merit. All of these states are considered to be part of *samsara*, and do not therefore constitute liberation any permanent heavenly abode. The "attainment of cessation," does not refer to a state of rebirth at all, but rather to the cessation of all mental and physical functions, in some cases identified with liberation, but not in locative or cosmological and psychological states represents the *soteriological* (salvation, enlightenment) path of Buddhism.

The Patanjala Yoga tradition also embraces a series of levels of *samadhi* that lead to profound states of being, acting and knowing. The Classical Yoga tradition presents a typology of yogins based upon the attainment of different stages of *samadhi* — such as the *praktilaya*, "immersed in the phenomenal ground material reality," and the *videha*, "bodiless one" who has developed a significant degree of skill in *samadhi* but not complete liberation. In both cases, there is set of stages that encompass a notion of attainment through an ascension motif which is placed parallel to a notion of cessation, *nirodha*, which is seen to be the distinct culmination of the *soteriological* [salvational] process.

This fact may well suggest two trends rather than just one, possibly even the coexistence of ecstatic and enstatic techniques, establishing a dynamic between the ascension and cessation.

This complementarity however has profound implications. While the enstatic path leads to cessation in a spiritual journey attempting to disengage from the confinements of a conditioned life in the round of birth and death, the ecstatic path leads to immersion in nature and a path of engagement with and protection of the diversity of life.

Just as the Mahayana or greater path seeks not just the personal enlightenment of Hinayana, but the enlightenment of all beings, so the shamanic animistic path augments the confines of pure spirituality which seeks only divine imaginary worlds, neglecting the urgency and essentiality of protecting the diversity of life immortal, in a greater Mahayantra, so that the very experience of illumination can ensue and evolve throughout our generations forever.

3 Eastern Spiritual Cosmologies and Psychotropic Use

This perspective fits closely with a long-standing cosmological position in Eastern philosophy, where mental states are envisaged as being 'finer' than gross physical states, also having an indivisible wholeness to their character, or that the cosmological foundation is itself undivided consciousness. The Upanishads date from 900 to 600 BC. The *Bṛhadaranyaka* and the *Chandogya* are the two earliest Upanishads. They are edited texts, some of whose sources are much older than others. The two texts are pre-Buddhist; they may be placed in the 7th to 6th centuries BCE, give or take a century or so. The fundamental concern of the Upanishads is the nature of reality (Purohit & Yeats 1937). They teach the identity of the individual soul (*atman*) with the universal essence soul (*Brahman*). In contrast with Buddhism, which believes that there is neither a soul nor self, Hindu philosophy (Hiriyanna 1932) has argued that qualities such as cognition and desire are inherent qualities which are not possessed by anything solely material, and therefore, by the process of elimination must belong to a non-material self, the *atman*, thus seeing one's spiritual goal as **moksha** — liberation from the cycle of birth and death. Śāṅkara held that the mind, body and world are all held to be appearances of the same unchanging eternal conscious entity called *Brahman*, the "creative principle which lies realised in the

whole world”, the “unchanging, permanent, highest reality” which is described as Satchitananda (Being, consciousness and bliss) ⁵⁵.



Fig 196: (a) Vishnu dreams the universe through the navel lotus of Brahma, overlooked by Lakshmi, (b) Ritual cannabis use in ancient Israel (Arie, Rosen & Namdar 2020), (c) Shiva sadhu smoking Ganga, (d) Tantric creation involves sexual complementarity of Shakti representing the body of the universe and Shiva representing mind, in which the unity of cosmic consciousness retreats into multiple conscious experiences of the physical world in the dance of Maya. This complementarity is shared by Taoist Yin/Yang.

To Shakti a Devotion

In the Tantric creation (Rawson 1973), Shiva and Shakti begin as a whole in intimate cosmic embrace, of subject and object, then retreating from this intimacy to become multiple conscious entities perceiving the physical world around them as dualities emerging from the complementary totality coming to recognise itself in individual consciousness only through moksha, due to their psychic and physical fragmentation in Maya. This is celebrated in maithuna the sacred sexual union, also in Buddhist Yab-Yum illustrated in Twelve-Armed Chakrasamvara and His Consort Vajravaraahi and in the Kaula rite of Yamala (The couple):

“It is consciousness itself, the unifying emission and the stable abode – the absolute, the noble cosmic bliss consisting of both Shiva and Shakti. It is the flowing font of both quiescence and emergence.”

The Receptive and Creative principles of Yin and Yang also reflect this in the Tao (Rawson and Legeza 1973):

*There was something complete and mysterious existing before heaven and earth,
Silent, invisible, unchanging, standing alone, unceasing, ever in motion.
Able to be the mother of the world. I do not know its name. Call it Tao. (Lao Tsu).*

⁵⁵ Advaita Vedanta (Sanskrit: अद्वैत वेदान्त –“non-duality”), propounded by Gaudapada (7th century) and Adi Shankara (8th century), espouses non-dualism and monism. Brahman is held to be the sole unchanging metaphysical reality and identical to the individual Atman. The physical world, on the other hand, is always-changing empirical Maya. The absolute and infinite Atman-Brahman is realized by a process of negating everything relative, finite, empirical and changing. All souls and their existence across space and time are considered to be the same oneness. Spiritual liberation in Advaita is the full comprehension and realization of oneness, that one's unchanging Atman (soul) is the same as the Atman in everyone else, as well as being identical to Brahman.



Fig 197: Shri-Yantra has superimposed yoni-lingam motifs, Yoni (South India).

Because Symbiotic Existential Cosmology has turned out to be a direct realisation of both the Tantric creation and the Upanishadic creation of Brahman and atman, in retrospect I have added a synopsis of the principles of the founding cosmology of the Brihadaranyaka Upanishad as a counterpoint. Where the difference lies is that symbiotic cosmology is fully grounded in nature and the diversity of life as a cosmological phenomenon and is not based on mind alone. The cosmic mind is a manifestation of incarnate biodiversity. To make this point clear after our [vigil to Jerusalem](#) I made a [vigil to Varanasi](#) to pay my respects to Kali as the complementary “ultimate reality” to Shiva’s cosmic mind, fully embodied in nature, fertility and the flow of time.

Tantra

*The universe is real embodiment!
Consciousness is real experience!
Each are cosmological complements!
The one cannot exist without the other.*

*Neither reigns supreme, but together are complete.
A prisoners’ dilemma invincibly united in reality.
Just like the yin and yang of our two sexes,
caught in asymmetric reproductive coexistence.*

Brahman (Sanskrit: ब्रह्म) connotes the highest Universal Principle, the Ultimate Reality in the universe. In major schools of Hindu philosophy, it is the material, efficient, formal and final cause of all that exists. It is the pervasive, infinite, eternal truth and bliss which does not change, yet is the cause of all changes. Brahman as a metaphysical concept refers to the single binding unity behind diversity in all that exists in the universe. In non-dual schools such as the Advaita Vedanta, Brahman is identical to the Atman, is everywhere and inside each living being, and there is connected spiritual oneness in all existence. Ātman (Sanskrit: आत्मन्) refers to the (universal) Self or self-existent essence of human beings, as distinct from ego (Ahamkara), mind (Citta) and embodied existence (Prakṛti).



The **Brihadaranyaka Upanishad** opens with a cosmological manifestation, echoed in every person’s realisation:

“I am He” – Aham Brahma Asmi (अहम् ब्रह्मास्मि)
"I am Brahman".

Fig 198: Brihadaranyaka ⁵⁶ Upanishad literally means the "Upanishad of the great forests of the wilderness".

The **Brihadaranyaka** is the **biodiverse Upanishad of the living Universe**. It is estimated to have been composed about 700 BCE, with some parts coming later. Brihadaranyaka literally means "great

⁵⁶ **Brihat** Brhat (बृहत्).—a. (-त्तिं f.) [बृह्-अति (brh-ati)] (1) Large, great, big, bulky; (2) Wide, broad, extensive, far-extended (3) Vast, ample, abundant (4) Strong, powerful (5) Long, tall (6) Fullgrown (7) Compact, dense (8) Eldest, or oldest (9) Bright. **Aranyaka** (āranyaka) "produced, born, relating to a forest" or rather, "belonging to the wilderness". It is derived from the word Aranya (अरण्य), which means “wilderness”.

wilderness, or forest". It is credited to the ancient sage Yajnavalkya, considered as one of the earliest philosophers in recorded history and credited with the term Advaita (non-duality of Atman and Brahman). By comparison, Gautama Buddha's birth dates from 563 or 480 BCE. The Brihadaranyaka Upanishad portrays Yajnavalkya as having two wives, Maitreyi who challenges Yajnavalkya with philosophical questions as a scholarly partner and Katyayani who is silent. While Yajnavalkya and Katyayani lived in contented domesticity, Maitreyi studied metaphysics and engaged in theological dialogues with her husband, in addition to making her own self-inquiries of introspection.

The first chapter asserts that there was nothing before the universe started, when Prajapati created from this nothing the universe, imbued it with Prana (life force) to preserve it in the form of cosmic inert matter and individual psychic energy. Prajapati (Sanskrit: प्रजापति), is the 'lord of creation and protector', later identified with the creator god Brahma, but also many different gods. In classical and medieval era literature, Prajapati is equated to the metaphysical concept called Brahman as Prajapati-Brahman, or alternatively Brahman is described as one who existed before Prajapati.

Cosmological Complementarity

Brihadaranyaka asserts that the world is more than matter and energy – it is constituted also of Atman or Brahman (Self, Consciousness, Invisible Principles and Reality) as well as Knowledge.

Mental States approaching the Mind at Large The second chapter propounds the theory of dreams, positing that human beings see dreams because the mind draws, in itself, the powers of sensory organs, which it releases in the waking state. It then asserts that this empirical fact about dreams suggests that human mind has the power to perceive the world as it is, as well as fabricate the world as it wants to perceive it. But mind as a means, is prone to flaws. The struggle humanity faces, is in our attempts to realise the "true reality behind perceived reality". That is Atman-Brahman, inherently and blissfully existent, yet inaccessible because it has no qualities, no characteristics, it is "neti, neti" (literally, "not this, not this").

Love is Cosmic Reunion The fourth brahmana of the second chapter notes all love is for the sake of the Self, and the Oneness one realises in the Self of the beloved. Knowledge of the Self, the Brahman is what makes one immortal, the connection immortal. All longing is the longing for the Self, because Self is the true, the immortal, the real and the infinite bliss.

Cosmological Symbiosis

The fifth then states that everything is connected, beings affect each other, organic beings affect inorganic nature, inorganic nature affects organic beings, one is the fruit of the other, everyone and everything is mutually inter-dependent, nourishing and nurturing each other, all because it came from one Brahman.

Immanent and Transcendent Self The fourth brahmana of the third chapter asserts, "it is your Self which is inside all", all Selves are one, **immanent and transcendent**.

Panpsychic Cosmology The seventh discusses how and why the **Self interconnects and has the oneness through all organic beings, all inorganic nature, all of the universe**.

Learn three cardinal virtues – temperance, charity and compassion for all life.
तदेतन्नयं शिक्षेद् दमं दानं दयामिति — Brihadaranyaka Upanishad, V.ii.3

Neti Neti (Sanskrit : नेति नेति) is a Sanskrit expression which means "not this, not that, or "neither this, nor that" (neti is sandhi from na iti "not so"). With its aid the subject negates identification with all things of this world, which is Anatman (Not-Self). The Brihadaranyaka Upanishad II iii 1-6, states there are two forms of Brahman, the material and the immaterial, the solid and the fluid, the Sat 'being' and tya, 'that' of Satya – which means true, denies the existence of everything other than Brahman. The Self is thus real – the universe is not empty and it is not just matter, but filled with eternal conscious psyche.

Some of this philosophical and religious perspective has been driven psycho-pharmaceutically, with the use of cannabis as a visionary agent central in the life of Shiva sadhus as *Ganga*, the sacred river of Indian spirituality, along with historical evidence for the Soma of the Aryans and ancient ritual uses of cannabis in Israel 700-900 BC (Benet 1975, Arie, Rosen & Namdar 2020), China (500 BC) and among the Scythians (Rudgley 1993), and of ancient opium use in the Near East and Mediterranean.

Indra (इन्द्र) is the king of the devas and Svarga (heaven) in Hinduism. He is associated with the sky, lightning, weather, thunder, storms, rains, river flows, and war. Indra's powers are similar to other Indo-European deities such as Norse Odin, Jupiter, Perun, Perkūnas, Zalmoxis, Taranis, Zeus, and Thor, part of the greater Proto-Indo-European mythology. Indra drank copious soma.

In the Vedic tradition, sóma (Devanagari: सोम) is a ritual drink of importance among the early Vedic Indo-Aryans. The Rigveda mentions it, particularly in the Soma Mandala. Gita mentions the drink in chapter 9, the Soma Mandala. It is equivalent to the Iranian haoma. The texts describe the preparation of soma by means of extracting the juice from a plant, the identity of which is now unknown and debated among scholars. Both in the ancient religions of Historical Vedic religion and Zoroastrianism, the name of the drink and the plant are not exactly the same.

*We have drunk the soma; we have become immortal; we have gone to the light; we have found the gods.
What can hostility do to us now, and what the malice of a mortal, o immortal one?*

The Zoroastrian Frashokereti likewise notes the sacred drink parahaoma:

The righteous will partake of parahaoma, which will confer immortality. Thereafter, humankind will live without food, without hunger or thirst, and without weapons (or possibility of bodily injury).

In this context, one also has to consider the Buddhist tradition. I have during my journeys taken Tibetan Buddhist initiations with both the 16th Karmapa, and with the Ningmapa exorcist Yeshe Dorje, who lived in a kerosine tin shack with a Tibetan wife and several children above McLeod Gang in 1976 and both predicted the rainfall for builders, exorcised mental disabilities and scurried the clouds accompanying the Dalai Lama in Dharmasala. Later he moved to the US, where I took this video of him doing a puja in Santa Fe. Here is also a video I took of the milk baba of Pashupatinah in Kathmandu. All of these have since passed away. I do not follow any tradition. I reserve my path to be natural first person visionary experience, so that it is not beholden to any existing tradition.

I tend to see Buddhism as an outgrowth of the more ancient traditions embracing the principles of the Upanishads, just as Christianity arose out of Judaism, and appreciate the verdant polytheism spanning all the persona from Krishna to Shiva and Kali, harking back to 2500 BC in Mohenjo Daro. I have deep engagement with Brahman as a manifestation of “ultimate reality”. I have concerns that Buddhism, notwithstanding the immediacy of satori, is too focussed on mind over physical nature and the feminine as Maya – natural fecund chaos and is thus too focussed on the negative – renunciation and the suppression of the ego, which is good meditative practice, but tends to leave a negative void world view of enlightenment rather than the positive value of existence in the living universe. However Tibetan Buddhism also has roots in Bön shamanism, highlighting its ancient syncretic nature, and is pervaded by Tantra, giving it numinous diversity.

Common to the Eastern traditions, the emphasis on mind over nature means that both Buddhism and Hindu traditions, share the notion of, as sentient conscious beings, which really began as a conceptual “consolation prize” for moksha being so difficult to achieve in this lifetime, without sacramental entheogens. Because all life is viewed only from the perspective of conscious sentience, this subjugates the natural diversity of living species to a mind only perspective, where rampant vermin killing rare species as preserved. This becomes an affront to the evolution of living diversity as intrinsic natural embodiment. I live in Aotearoa, where native species, such as the iconic kiwi, are excessively vulnerable to feral exotic predators. Buddhists, who do revere the sanctity of life, often find themselves unable to control predators and end up failing to protect living diversity, because they can’t conceptualise the difference between a threatened species like the kiwi and an epidemic of rodents, stoats, and possums driving them to extinction. This is where the Bhagavad Gita of living nature has to say the diversity of life, that has taken billions of years to evolve, has to be respected and that the mind-only view of conscious existence is a false cosmology.

Fg 198b: Centre: the goddess of the sacred grove, an early Kālī manifestation, (L-R) Shiva as Pashupatinath the lord of the animals, human sacrifice. Indus Valley 2500 BC (Campbell 1962 166-9). Shakti-Kālī expresses the temporal embodiment of cosmic ultimate reality in nature that tends to be neglected by mind-sky Eastern mysticism.



Karen Armstrong (2022) in “Sacred Nature” notes the emergence of Upanishadic Vedanta from the earlier more animistic pervasiveness of nature resulting in a transition from mythology to cosmology:

The rishis attributed their poetic power to the hallucinogenic plant soma, which enabled them to look beneath the surface of things and discover a deva in every single one, so nature was alive, imbued with the divine. They called the faculty they had cultivated dhi (“insight”); it gave them a knowledge (veda) that bore no relation to mundane awareness. All these divine forces, the rishis concluded, were grounded in a mysterious omnipresent power, which they called Rta, one of the most important concepts in the Vedas, the ancient texts of Hinduism. Rta is best understood as “active, creative truth” or “the way things truly are.” Like qi and the Dao, Rta was not a god but a sacred, impersonal, animating force. It was impossible to describe or define Rta, but it could be experienced as the sublime whole, which flowed from itself expansively, bringing about the cosmos, humans and the gods themselves. The fact that for most of history people in different parts of the world developed such a remarkably similar conception of this sacred reality suggests that it may be an archetypal notion embedded in the human psyche. But after creating and organising the world, the devas did not return to heaven. They took up residence in the natural phenomena they had brought into being and dwelt forever within them. Thus every single bird, animal or flower embodied the divinity that had created it, and everything in the world had a sacred core. Instead of merely shining on things from afar, the devas remained embedded in the mundane, “entering into this world through their hidden nature.”

By about the sixth century BCE, however, the Aryans were redefining the ultimate reality; and they called it the Brahman. While Rta had been the eternal principle of being that informed and permeated the universe, the Brahman was the foundation of all reality, the “beingness” on which all things depended. This development was part of a new spirituality called Vedanta (“the end of the Vedas”), which sought to reveal the essential purpose of the ancient rites. Whereas the early rishis had depicted the gods poetically as different aspects of the one divine reality, the Vedantic priests now expressed this insight philosophically. The Brahman was the one and only sacred Atman (“Self”) of the entire universe. It pervaded everything and every person “right up to the tips of the fingernails.” It “lives in each and every being. Uniform, yet multiform, it appears like the [reflection of the single] moon in [the many ripples of] a pond.” The people of India would never lose this insight.

She however notes the emergence of ‘naturalness’ in Buddhism happened later:

So deeply was humanity’s religious impulse connected with the sacrality of nature that even a religious tradition such as Buddhism—which originally focused on the method of introspection by which humans could be liberated from sorrow—eventually turned to nature. When Mahayana Buddhism arrived in China, it insisted that the Buddhata—the “Buddha-Nature” or the potential to achieve Buddhahood and Enlightenment—was not confined to human beings but inherent in plants, rocks, trees and blades of grass. In the Dacheng qixin lun (“Awakening of Faith”), a sixth-century CE text, we learn that the Buddha-Nature is the essence of the entire cosmos, an “eternal, permanent, immutable, pure, and self-sufficient force that unites all beings, draws them into a coherent whole, and universally illumines the mind of man and enables him to cultivate his capacity for goodness (ren).” ... In Japan, Zen Buddhists believe that a single Buddha-Nature exists in the things of nature and that it is inseparable from the human self. The aim of Zen is to cultivate awareness of its existence, making it a reality within oneself.

Buddhist, Upanishadic and Biospheric Sacramental paths to Illumination

Buddhism in the US has developed a complex relationship with the use of psychedelics in a context of meditation. This is discussed in detail in “Altered States Buddhism and Psychedelic Spirituality in America” (Osto (2019), where psychedelics are described in succeeding chapters as a gateway, prelude, or adjunct to the true dharma involving both psychedelics and Buddhism in terms of practitioners’ varied points of view, and in and in “Zig Zag Zen: Buddhism and Psychedelics” (Badiner & Grey A 2015) discussed in [Primal Foundations of Subjectivity](#).

Hindu traditions, likewise have an ancient tradition of Shiva worship through ganja and bhang as form of cannabis intimately connected with meditative states and spiritual contemplations of the sadhus.

To Anand Rangarajan, a follower of Tibetan Buddhism and a UF CISE information scientist, Paul Werbos a Quaker mystic and machine learning pioneer, and Deepak Chopra a well-known author practicing the Eastern Wisdom

Tradition. I have found your conversations interesting and thought it could be helpful to add my perspective on the situation. I have a strong affection for Deepak's two positions (1) Everything is alive and (2) Consciousness is primary. However, like Paul, I accept (3) The universe is necessary. In fact I see the primary reality of consciousness and the necessary reality of the universe as complementary aspects of a cosmology which is neither monist nor dualist, but is the very Tantra of existence.



Fig 199: [Yeshe Dorje](#)

I have experience with Tibetan Buddhism at the hands of Yeshe Dorje and Rangjung Rigpe Dorje the 16th Karmapa, as well as Chogyam Trungpa's writing, travels in Tibet and Japan and experience of the Vedantic tradition from periods wandering India as a sadhu. For me the true Buddhism is what you see watching the devotions of the pilgrims passing through the Jokhang and the little shrines that surround it and in Hinduism, people you meet like the Milk Baba of Pashupatinath, the wayside shrines and ochre-stained yoni-lingams being spontaneously prayed to by schoolgirls on their way to class. I hold strongly to the underlying Upanishadic traditions.

I first met Yeshe Dorje, the exorcist lama, a Ningmapa closer to the original Bon shamanic traditions, who cleared the weather for the Dalai Lama and people putting roofs on houses in McLeod Gang and cured mental afflictions in his kerosine tin shack with his wife and seven children. When I took Buddhist vows, he warned me not to take the teachings of the monastic Gelugpas too seriously. He named me Yeshe Tenzin after himself and the Dalai Lama Jamphel Ngawang Lobsang Yeshe Tenzin Gyatso in 1976. Later we met again in Santa Fe in 1992, with an American partner, as I recall. You can find a critique discussion of both Buddhist and Vedic doctrines in the appendix.

However my prime numinous and visionary focus for the last 50 years has been sacramental meditation evoked by sacred mushrooms, peyote and ayahuasca, so I want to explain to you how this perspective complements and provides insights into your favoured traditions. Somewhere I have an old Tricycle issue dealing with this from a Buddhist perspective entitled "Just Say Maybe", so this is still a process in progress.

Fig 200: The Milk Baba of Pashupatinath Kathmandu Ram Krishna Das Vaishnaba, who consumed only milk for 40 years.

When I take mushrooms, I go into retreat and adopt a form of Upanishadic meditation which alternates between mindfulness and mindlessness – complete abandonment to the abyss, letting go of everything. This is almost an impossible task in the maelstrom of psychedelics but it is transfiguring and galvanising when it occurs. The Huichol have a name nierika for the cosmic portal peyote provides between ordinary reality and the spirit world, which is illustrated in yarn paintings as a richly illuminated cosmic orifice surrounded by all the illusory visions of tangential approach. There are several points that emerge.



The first, most devastating point is that this experience is not achieved in human conscious renunciation, or through lofty spiritual achievement and practice, but in the complete humility of natural psychic symbiosis with the biosphere. So, while I agree that mindfulness is the road to life, the sacramental approach is putting the sap and dew of nature right into the centre of the cyclone of moksha. Mindfulness can be mistaken for focused attention, but sacramental moksha is the revelation of interconnectedness of all conscious life and of all the diversity of life throughout the universe. This is humanity's founding vision of animism that all religious traditions later captured and misused. So the consequences are that the religious traditions confuse the diversity of life and its utter sacredness in the unfolding of consciousness, with notions like animals as simply sentient beings that are a product of previous moral indiscretions, creating a mind-sky view, in which human spiritual attainment is supreme over nature. Sacramental meditation, by contrast, is a true first-person Tantra with no confounding doctrine. It is expressing the complete complementarity of the Shivaic cosmic mind and the embodiment of Shakti in nature and the universe as an inextricable prisoners' dilemma, evoking reality as we know it to be. No longer is the mind alone but reunited with nature, embedded in the immortality of life, with a primary cosmological responsibility to the diversity of life as a whole.

The second point is that all the distinctions you have raised, for example between mindfulness and the void of no-mind, or between gradual enlightenment, rather than the instantaneous flush of satori become meaningless. They are just parts of the overall vision quest. Mindfulness is essential to gather one's focus and equanimity and yes it is pro-life rather than denial, but then one has to relinquish the internal dialogue and the ego-consciousness that accompanies us, to completely give one's self back to the universe, or more aptly the cosmic mind at large, to gain release from the mortal coil. Then we have the satori! This has a lot of implications. There is no distinction between the Brahman approach and the Zen or Bodhisattva approach. And there's a warning! The broad sweep of Eastern philosophy is integrally an expression of the meditative practices that support each, coming to pervade Buddhist and Vedantic cosmology. To the extent that these techniques are restricted, the cosmologies become restricted and lose integrity,

particularly when applied for coercive moral ends. In this the sacramental approach has a fertilising role to play. So any distinction that the Upanishads are too much about mind are simply a product of contesting disciplines. The reality is much simpler and more direct. I like the Upanishads because their description is a clear direct route to samadhi accepting the atman and Brahman as ultimate reality. Moreover sacramental samadhi adds a completely new dimension to the discourse, because it is bringing another kind of non-ordinary reality to the table, although one that has a lineage of equal antiquity to the Eastern or meditative traditions. This is thus a completion of the human mystical spiritual tradition and not a degenerate, incomplete, or imperfect path.

One can think of the entheogenic moksha epiphany occurring in a neutral state of ego dissipation and sensory withdrawal experiencing organismic moksha as the supermind at the interface of atman and Brahman – the mind at large. *At the centre of Aurobindo's metaphysical system is the supermind, an intermediary power between the unmanifested Brahman and the manifested world. Aurobindo claims that the supermind is not completely alien to us and can be realized within ourselves as it is always present within mind since the latter is in reality identical with the former and contains it as a potentiality within itself* (Wikipedia Aurobindo 1990).

This was the central concept of Aurobindo's metaphysical system, which he claimed can be realised within ourselves, as it is always present, since the mind is in reality identical with the supermind and contains it as a potentiality within itself. In *The Integral Yoga* he declared that "By the supermind is meant the full Truth-Consciousness of the Divine Nature in which there can be no place for the principle of division and ignorance; it is always a full light and knowledge superior to all mental substance or mental movement."

The third and final point somewhat distinct from "pure" spiritual experiences is that entheogenic moksha is scintillating with abundance. There is no need to ask questions like "is this or that a construct", or to try to deconstruct maya through realising all aspects of consciousness including the self are constructs and hence illusory. And it is not just a formless black void of nothing that is somehow construed to be the source of everything, but the light of illumination streaming out of the epiphany of being. Yes it is all in a sense an illusion but it is non-ordinary reality teaching us and it's test is not philosophical but the infinite compassion of the eternal mind at large for the mortal biological being experiencing moksha, so it has an immediate truth to it that is transformative of the mortal condition and the associated sensoria are veridical perception in numinous action. One doesn't have to be on the other side of the nierika for long, or often, to be transformed by it for the good and to use its teaching in formative and informative ways. Symbiotic Existential Cosmology is an example of this. Also one doesn't have to do 100,000 prostrations or daily pujas, so one can get on with the good work of redeeming the material world and the social world with love, compassion and scientific insight.

Symbiotic Existential Cosmology is an empirical quantum cosmology complemented by the mind at large, and so has deep commonalities and yet fundamental differences from the mind-primacy of the Eastern tradition. Aurobindo in his idea of soul evolution had a very similar view to the view of Symbiotic Existential Cosmology, in which the universe is capable of moving toward a point of consummating consciousness among its biota in our integration with biodiversity and exploring the abyss of conscious existence through meditation and entheogenic experience. Both visions share a sense of the cosmic mind coming alive through the participation of the conscious sentient beings within the universe.

Aurobindo notes the way in which the heights of the Eastern mystical experience have also, in a sense, left the spiritual corpus behind:

The refusal of life of the ascetics who concentrated on the transcendent divine beyond form; the revolt against gross matter, as the later, medieval, scholars would call it, which dominated Indian spirituality for quite some time—but was not emphasized in the ancient texts—has its place in the evolution of consciousness. Due to this, the psychology of heightening oneself has been worked out in great detail in the Indian tradition. Yet it is important to acknowledge that this is a realization at the summit of the consciousness while the outer nature remains untouched. Or, to say it in the terminology of Indian psychology, in order to realize the Purusha, Prakriti is left behind and uncared for. It is now time for a reconciliation of matter and spirit.

Aurobindo places the evolution of consciousness as occurring before the big bang and subsuming physical reality. Symbiotic Existential Cosmology remains open minded about this question.

In Aurobindo's view, this is followed by a process where pure consciousness involutes and conceals itself more and more by creating planes of consciousness of increased density, in order to create the density needed for physical manifestation:

According to Sri Aurobindo, in conformity with the oldest Indian scriptures, matter was created by the ultimate or supreme consciousness seeking manifestation. In order to manifest, supreme or absolute consciousness, starting from the full fluidity of the spirit, created graded planes of being, till it reached the state of manifesting the solid density of matter. Sri Aurobindo calls this the process of Involution. The involution of consciousness is the process in which the Supreme or Absolute conceals itself more and more by creating planes of consciousness of increased density, in order to create the density needed for physical manifestation. In each of the planes that were created during the involution, (called typical planes or graded worlds) the absolute or divine consciousness veiled itself increasingly till it was able to produce and manifest the various forms of solid matter. In the solid matter of the stone the ultimate consciousness is completely veiled in what Sri Aurobindo calls 'an exclusive concentration', in which this absolute consciousness is present in the atom in the movements of a specific number of protons and electrons through which it keeps up that specific form of matter. He continues to explain that in matter the ultimate consciousness is concealed, but the Will of the ultimate consciousness behind this evolutionary process is a gradual unveiling till it reaches a full manifestation of divine life in matter. In other words the evolution or unveiling of consciousness started from the time solid matter manifested.

But the Will of the ultimate consciousness behind this evolutionary process is a gradual unveiling till it reaches a full manifestation of divine life in matter in the process of biological evolution.

...what evolutionary Nature presses for, is an awakening to the knowledge of self, the discovery of self, the manifestation of the self and spirit within us and the release of its self-knowledge, its self-power, its native self-instrumentation. It is, besides, a step for which the whole of evolution has been a preparation... It is only upon earth that the psychic life begins, and it is just the process by which the Divine has awakened material life to the necessity of rejoining its divine origin. Without the psychic, Matter would never have awakened from its inconscience, it would never have aspired for the life of its origin, the spiritual life.

Fig 201: Cosmos as coitus: (Left) The Cakrasamvara Tantra in consort with Vajravārāhī, (Right): Vajravārāhī dominant.



Symbiotic Existential Cosmology sees consciousness as complementary to the physical universe and thus doesn't invoke a functionally mentalistic process of involution of consciousness to explain matter, as they are asymmetrically symmetry-broken complements, each reflecting the other. It thus differs from soul evolution in that it is not just a return to soul, as if nature is just a supporting vessel. It invokes consciousness and the

physical universe as a complementary Tao, or more specifically a fully Kaula Tantra rite of Yamala. Symbiotic Existential Cosmology avoids the problem of consciousness making the physical universe because it conceives of cosmic conscious as a state we approach asymptotically through opening the doors of perception, while primal subjectivity, like the universe, is vestigial at the cosmic origin, thus we don't have to try to explain the physical universe as derived from involutions of consciousness, which we know to be a primarily organismic climax in biological evolution.

The universe is a then sexual union between cosmic consciousness represented in Shiva, and Kali, as cosmological fecundity of the physical, manifest in time and evolution. In doing so it sets nature on the same level of sacredness as cosmic consciousness, not merely below or a precursor to it. There is not a higher spiritual realm, but a fully integrated phenomenon of emergent Paradise on the cosmic equator containing enlightened incarnate beings, not just disembodied spirits.

There is a caveat about pure conscious dominion over reality. As the conscious aspect becomes disengaged from its own incarnate embodiment in the biota, so it loses its sense of integration with life as a whole and its capacity to survive long term enough to reach climax. This changed perspective, elevating nature to the fully sacred, is a direct product of the entheogenic experience of integrated consciousness shared within the natural fabric by the interspecies relationship with the sacraments. Ignorant people will use mushrooms just for "kicks", but they contain this deep well of the conscious abyss which evokes a shamanistic rather than just higher and higher spiritually elite conscious realms.

Likewise the cosmology derives the key aspects of its comprehensive view by being true to the empirical science of observation of nature and uses this careful verified scientific empirical method to elucidate the whole view of the

sacredness of nature, from the fractally emergent interactive mandala of the standard model evoking atoms molecules organelles and tissues, through subjective conscious intent implying panpsychism and animism to symbiosis being the key principle of the climax evolving biosphere. By being fully grounded in nature the intuitive presumptions of pure consciousness are found to be incomplete in just the same way the physically materialistic description of science is incomplete about mind and consciousness.

Spiritual paths, from Gnosticism to Tibetan Buddhism, tend to create very ornate spiritual realities, from the pleroma to realms of the Titans to Hungry Ghosts and even more ornate visualisations of spirit entities and the eventual downfall of the entire cosmological edifice, that become their own phantasmic cosmologies unbound to the sap and dew of life itself. I also have deep reservations about Buddhist philosophies of emptiness. See my [later comments](#) on Shiva-Shakti fertility and a critique of Nāgārjuna's philosophy of emptiness, denying inherent existence.

The absolutely key issue is that humanity, whether by business as usual, or religious spiritual elitism, has so far failed the acid test of symbiotic respect for the biosphere that ensures the very evolution that Aurobindo is seeking to realise. This can happen only if the conscious biota retain integration with life as a whole over the full evolutionary times scale of Paradise on the cosmic equator. Furthermore, Paradise is the whole shebang, incarnate, enlightened, consciously eternal and biologically immortal as one is to one, in our living diversity in wholeness, abundance and resplendence. That is the complete story of the fulfilment of the totality the conscious universe is here to become. So the picture is subtly different from the pure wisdom tradition.

Vinod Sehgal: Do you think that Siddhi of materialization and other Siddhis as mentioned by Patanjali in Yog Darshan Sutras depend upon the scientific certification by scientists in their labs? Do you think that, by the provocation by scientists or any other persons, any Yogis shall come to the labs of scientists for examination of their Siddhis for their scientists and fulfil the doubts of skeptics? If you think so, you are highly mistaken and lack a total understanding in reading and knowing the mindset of such Yogis as possessing genuine Siddhis. Sage Patanjali has specifically forbidden in Yoga Sutras to not demonstrate any Siddhi, whether for scientific or non scientific purpose. There are high chances that any yogi who starts demonstrating Siddhis can loose all their Saadhnaa or spiritual development. There are high chances that any person playing with the fire of Siddhis may burn his own hands and fingers.

Chris King: I am on a vision quest. It is older than, and just as powerful as the Vedic tradition of the Upanishads, because it is unfettered by any limiting doctrine such as renunciation. I don't submit myself to scientific tests or proofs of non-ordinary experiences, but neither do I make unverified claims to trivial siddhis such as materialisation. Rather than expressing beliefs, I work cleanly as a biocosmologist in both the scientific and visionary paradigms without conflict.

You are professing beliefs in the guise of established facts and providing no evidence of any kind scientific, or first person experiential affect. The fact that you have to refer back to Patanjali two thousand years ago (Purohit 1937) shows how doctrinal and non-existent the living evidence for actual siddhis or enlightenment has become

In the Western tradition, Monotheism has been rightly accused of distorting the nature of nature to invoke a clockwork-like creation, in which humanity reigns supreme over nature, but is supplicant to God, in an eschatology that ends in the destruction of nature and supposedly divine eternal "moral" judgment. It took Copernicus to upset the flat Earth Monotheistic view of creation. In the scientific era this has involved denying evolution and the capacity of nature to evolve new life forms such as ourselves. Vedanta also tends to a similar "heresy" of nature, by regarding organisms as purely sentient beings in a round of reincarnation used as an excuse for the difficulty of achieving enlightenment. This affirmative religious view is in frank collision with empirical science and the diversity of living species and their genetic bases in a robust evolving biosphere is unacceptable in terms of the pursuit of truth.

The Upanishadic view has, in world cultural history, shown great hope of a more enlightened, informative approach, where the individual is encouraged to seek the Brahman that is the form of cosmic consciousness that transcends the individual atman. However it is an abuse of the Vedic tradition to use the same religious stratagems as Monotheism to claim siddhis like materialisation, which is claimed to be material, without either objective physical evidence, or even first person accounts that accumulate to any form of reliability. Your claims that it would be foolish for a yogi to demonstrate the natural truth of their claimed powers is a spoiler on any pretence of verifiability either subjective or objective. As long as this pretence goes on, the Upanishadic path remains a diminished religious belief having little or no natural significance unless and until the situation changes.

Again I would point out that while I do have and have had, siddhi-like prophetic experiences, none of them are worth a tin can of salted fish, unless I can help humanity come to terms of protecting the diversity of life on this planet, so it and the human species can continue to survive and discover ourselves in cosmological time.

The Upanishads were written around 700 BC and nothing has really changed since apart from the Shakti-Shiva notion of complementarity at the cosmic origin which is confluent with Symbiotic Existential Cosmology. This is a real life condemnation of the Upanishads – perhaps the most promising vision quest tradition to have ever emerged in human history.

The key to science as the pursuit of the truth in the discovery of nature is the sceptical principle, that the onus is on the claimant of a theory or observation and not the respondent and it works for both objective empirical observation in science and by affirmed empirical subjective experience as complementary tests. In physical and biological science, it is based on a very low probability of a chance effect. The same is true in criminal law beyond reasonable doubt and in civil law under the balance of the probabilities. To reverse this sceptical principle and place the onus on the respondent is the affirmative/imperative route to religious doctrine and despotism rather than the pursuit of truth.

The vision quest is a first person discovery journey into the deepest abyss of the conscious experience. It doesn't have to be performed in a laboratory using statistical methods. The subjective route is for people to make the journey into the abyss for themselves and return with grail insights to share with others setting out for themselves on this great journey. When psychonauts have similar or complementary experiences, these affirm the nature of non-ordinary reality by mutual first person agreement, setting up the process for all sentient beings to discover the core nature of the living conscious universe.

There is absolutely no possibility of getting anywhere on this journey while Vedantists continue to use only religious belief in Patanjali or Sai Baba or Maharishi as a basis for superficial levels of meditation and don't bring back in the first person serious journeys into the unknown which reflower and refresh the tradition and above all result in the unfolding of life immortal, in symbiosis with the biosphere.

Ram Vimal: Yogananda's and Kriyananda's methods of materialization are not easy and I am not sure they will materialize thought. However, you are most welcome to try them, and let us know if you are successful!

Here is a first technique of Yogananda you may practice, using a room or an apple as an object for your visualization:

I can keep looking at this room and concentrating upon it until, when I close my eyes, I can still see the room exactly as it is. This is the first step in deep concentration, but most people haven't the patience to practice it. I had the patience. As you continue to practice visualization you will find that your thoughts become materialized. The cosmic law will so arrange it that whatsoever you are thinking of will be produced in actuality, if you command it to be so. Suppose I am thinking of an apple, and the apple appears in my hand. That would be a demonstration of the highest power of concentration.

In order to realize that all the happenings of this world are dream experiences, we should learn how to visualize our thoughts-how to recharge them with the energy of concentration until they become visible manifestations. Proper visualization by the exercise of concentration and will power enables us to materialize thoughts, not only as dreams or visions in the mental realm, but also as experiences in the material realm. From the causal thought-forms, the astral body's five instruments of life force [the 5 pranas] make visible the astral body of light and the physical body of gross matter. Dreams and visions are astral in essence, being composed of light and energy. As you continue to practice visualization you will find that your thoughts become materialized. The cosmic law will so arrange it that whatsoever you are thinking of will be produced in actuality, if you command it to be so.

Chris King: I like Yogananda's (1950) autobiography, but his technique is claiming real world experience is just a form of dreaming reality, and with a supreme degree of focussed attention, we can make this physical reality. I don't accept this. It has profound consequences and arises from the notion that conscious experience makes matter.

Dreaming experience can conflate absolutely anything. I can have 360° vision, like Yogananda claimed, and see whole urban vistas and fly through landscapes. Frogs can turn into fish and cars we don't own can become crammed full of our possessions while we can't anywhere find the keys to drive them home. I can find myself in a huge witches mouth or become stranded in a dream world and search the sky trying to find my way back to Earth. Only in waking experiences do monkeys give birth to monkeys and sharks to sharks and that is what makes conscious life possible in

the evolving natural universe. So conflating dreaming and waking reality collapses biology into the dreamtime and cosmology into allegory.

This is an error of Vedanta and it comes from the mistaken view that all life forms are just subjective sentient beings trapped in reincarnation. That's not how cosmology works and it's not how subjective conscious volition complements physical reality either. **That's precisely why SEC says consciousness is primary, but the universe is necessary!**

Ram: If you want to use visualization not to materialize an object, but to make a project happen, or to obtain money, the technique and procedure is a different. You visualise not so much the details (of the apple, of the room, etc.), but you concentrate on the general result.

Chris: This quest is irresponsible and leads to karmic finesse. Why put so much effort into focussing one's thoughts on such menial quests, ignoring, the real existential crises of the future of life and its meaning, that do realise enlightenment? If we are focussing on not the money but the object of our quest e.g. an easier ride home, a plethora of future circumstances may be claimed to validate it.

BVK Sastry: Can you tell me your engagements and experiences with Yoga-Traditions of India Patanjali or Tantra or others – or the current teachings–practices–public perception as seen are a terrible mix up

Chris King: I meditate by using two complementary processes: (1) Eyes open mindfulness concentrating to abandon all thoughts. (2) Annihilation with eyes closed or half open, breathing and glancing out of the corner of my eye to completely let go.

Fig 202: Left and right-brained consciousness.

I generally do this only when tripping, to enter into the deep entheogenic state. That might be only very occasionally, say once a year, so I am in a kind of incipient meditative state the rest of the time, including periods of quiet abandonment and my psyche is kind of divided between a chaotic “right brain” aspect listening to the winds blowing past the window connected to my left hand and witnessing the “left brain” everyday world of thought and planning, noting that I am left-handed!



Like a Shiva sadhu, I eat cannabis butter daily and swoon out into the mild trance this evokes and watch my dreams as much as possible, but I use psilocybe mushrooms as my entheogenic sacrament. They are my shamanistic ally and bring on my Brahmanic apotheosis, which is a kind of altered state where I meet my cosmic self and regain conscious integration with what you might call the “spirit world” for want of a better term, meeting the Totality in a kind of near death experience, where I could go to the other side (death) but return to ongoing life because I’m not having a heart attack or a car accident and that is the covenant to complete the long journey of life. In this state I become intuitively conscious of a background experience which is like a telepathic awareness of all living beings throughout space-time as disincarnate entities in communion, but I don't take any of these experiences literally or believe in them religiously.

When I’m tripping I am trying to simply do deep annihilation meditation to try to descend into the disembodied state that is visionary reality. I generally slide out of my ordinary consciousness into a kind of abstract synesthetic world of resonating sounds and abstract visions which can rapidly turn into visionary states the Huichol shamans describe as passing through the nierika portal to the spirit world of the ancestors. There is a way of listening to the whisperings of the sounds and patterns which causes one to go to the other side.

The experience of the journey there and back when it happens full on is sufficiently transformative to constitute a lifetime mystical experience which I can go for months of ordinary consciousness knowing that even when I am not experiencing it in this way, it is nevertheless the sacred ground of my conscious being. I don't have to rate it as transcendent but it IS and it is falling outside my incarnation into the reality at large that is the conscious awareness of all sentient beings. I have been tripping all my life on a regular but occasional basis as my ally, advisor and informant complementing my scientific view of natural reality. Lots of times, realisation only happens partially but it is still formative on my being and brings me back to the source of all conscious existence.

Christianity is an avowedly sacramental religion but the Eucharist is cannibalistic – soma and sangre, eating and drinking Christ's flesh and blood, so its a dead sacrament waiting for biospheric fruition. The idea of a visionary sacrament is an anathema to Christians who are plagued by heresies, from the gnostics claiming Jesus and Mary Magdalene were lovers, to the European witches taking deadly nightshade, which explains why psychedelics have been regarded as diabolical heresies to the consumer capitalist status quo in the 20th century.

Vedanta is also historically and actually sacramental, from the Soma of the Aryans to the Ganga of the Sadhus, likewise waiting for the sacraments of the Americas that the Eastern tradition missed out on ecologically, although Psilocybe cubensis mushrooms have been associated with Brahman cattle in South East Asia.

Sacramental shamanism is older than any religion and I am of the opinion that evolution arrived at our sappy chemical brains and in parallel evolved psychoactive species out of a common cosmological process that gave rise to consciousness in single-celled eucaryotes, so that the confined world view of a dominant species like humanity that can get lost in egotistical grasping can reintegrate with cosmological conscious reality and live throughout our generations in symbiotic unity with the diversity of life in our biosphere. So I have it in mind to fulfil the Western sacramental tradition of "Soma and Sangre" through rebirthing the biospheric sacraments, and to fulfil the Vedantic tradition through the Tantric marriage of the path of meditative renunciation as Shiva with the sappy life-engaging flow of the sacraments as Shakti, which is already incipient in the sadhus' use of cannabis as a meditative ally.

Ram Vimal: As I mentioned, SaS (self-as-subject) is not eternal because it eventually returns back to its source (dual-aspect substrate at unmanifested state) after many reincarnations/rebirths as per the principle of karma.

Chris: Both Vedanta and Buddhism postulate reincarnation of pure sentient conscious beings. But physical biology has all conscious organisms breeding true with only small mutational changes. You can't postulate reincarnation that allows a bad man to become a crocodile. How does he think? Will he ever regret his actions? Have you ever seen a regretful crocodile? That's the irony of crocodile tears speaking! What kind of mentality is it to be reincarnated as a flea?? If you then say humans reincarnate as humans do fleas do so as fleas? Why? What sense does this make of biology and cosmology? Why would the universe evolve to this end? You need to admit that reincarnation was invented because Samadhi never comes in the average lifetime. It's a toxic consolation prize to the diversity of life!

John Kineman: It is interesting to see these strong assertions, Chris, when so much else that you write I agree with.

Chris: I think you are trying to make a mistaken defence of the Vedic tradition when your incarnate duty is to the immortal survival of life. I am here to protect your descendants and the diversity of life period.

John: Let's take the idea of attributing moral meaning to reincarnation and the idea that there is "no cosmic morality". This means that moral meanings are human inventions, aside from our otherwise naturalistic essence. But how do we invent something aside from our use of natural means, if that is what is claimed we are?? The logic creates an inverted pyramid resting on a non-existing point. It builds and builds in its denial of natural essence. In contrast, adopting the view that the foundation is a complex unity of material and spiritual (meaning "of spirit" vs matter) essence, we can see how forms of morality can emerge from that relation at many levels and in many forms.

Chris: This is a figurative argument but is in conflict with reality. There is no inverted pyramid. Moral meanings are NOT human inventions, they are emergent properties of intelligent animal sociobiology, exploited by religious systems to ensure cultural dominance. Richard Alexander (1987) wrote the *Biology of Moral Systems* contemplating human nuclear mutually assured destruction. He is right. This began on a tribal basis with totem deities and has continued ever since. Indra for example is a typical thunder god of war that is a second generation tribal deity. He is associated with the sky, lightning, weather, thunder, storms, rains, river flows, and war. Indra's myths and powers are similar to other Indo-European deities such as Jupiter, Perun, Perkūnas, Zalmoxis, Taranis, Zeus, and Thor, part of the greater Proto-Indo-European mythology. My Indian name is Yogindra Baba named by the Santana hotel in Puri in 1976, the site of the Jaggernath juggernaut which devotees threw themselves under the wheels of. We could likewise explore the veracity of these beliefs. I know we agree on many points and you know that my inspiration comes partly from the Upanishads, but reincarnation has no more validity than the day of judgment. This isn't just about science vs religion, but the pursuit of true knowledge. I am here to defend the diversity of life sine qua non as a prima facie vision quest. We have to learn to be honest with ourselves if we want to survive as a species.

John: Why do you think moral beliefs are not natural and relative to the systems they pertain to? And why, if they are, would they not have a natural foundation?

Chris: Of course they do have a natural foundation, but they also have a relevant context and that is in encouraging intra-social cooperation and individual sacrifice to achieve inter-group domination and hence collective survival of the group against other similar and competing groups. Morality is NOT cosmologically ordained in the way Monotheistic and Vedic scriptures claim and we really need to respect that it is a limited concept based on competition. If we are going to ensure human survival in the closing circle of the biosphere, morality is inadequate, because it basically applies only to individual sacrifice and altruistic punishment to achieve group dominance. That won't save the biosphere or humanity because it is inadequate to get people to face the sanctity of life and is already being misused to promote religious and cultural dominance. If I would coin a Buddhist analogy, the suffering of the ego is not about morality but about mortality, and it is not about reincarnation or moral karma. It is mortality itself that teaches us that the only thing that matters is the survival of our generations in a surviving biosphere for the simple reason that for mortal biological beings, we can't take it with us when we go. The only meaning in life is to give back to reflower abundance and accept the vagaries of fate.

John: Well, I'm very familiar with that view but learned that there is a stronger case for cooperation than competition in ecology and evolution. Competition turns out to be more epiphenomenon than cause. It can't exist unless cooperation is at the foundation. Lions aren't trying to compete with anything, or to survive, they're just trying to eat and cooperating with nature is the best way to do that.

Chris: That's why existential cosmology is symbiotic!

Alex Hankey: If God is the Origin of Creation, and Dharma, Natural Law, is all about Growth of Consciousness, then morality has a Primary Place in the Meaning of Things.

Chris: We can't predicate life and existence on God or the concept of divine creation. We have to deal with things as they are with no assumptions because it all comes down to us. What we have within us will save us if we bring it forth from ourselves. Life itself is the source and is the source of the growth of consciousness. Dharma and Natural Law are classical concepts in a non-classical universe. The true dharma is life immortal. Compassion transcends morality.

John: Sorry, that reads like the handbook for insanity. I'm sure you mean 'for the purposes of science', but even so we can't lose site of origins.

Chris: It's not about science John. It's not about a description of reality. It's simply dealing directly with existential reality. We are the sentient witness to the existence of the cosmos. We simply have to take responsibility for the fate of life in the universe. We can't reliably depend on the assumption of deity and creation by deity.

Chris said: Karma is not a moral law but the integration of entropy, quantum uncertainty and synchronicity if you will.

John: This is replacing fundamental existence with description; like going to a fine restaurant and eating the menu.

Chris: On the contrary it is going far far beyond morality. The mystical condition IS cosmological. The secrets of the totality are in the way nature manifests, not in cultural doctrines of dharma. I can't help but describe the undecipherable to you in a simple transparent way. Sure it may sound to you like a description but its purpose is manifest. Spiritual reality is the universe becoming. It's not a moral invention or creation. How else do you expect me to explain it to you? We know the way that can be told is merely a description.

Karma contains the siddhis and is our ultimate teacher. Life is rough justice, fulfilment is a luxury and there are no guarantees of a good outcome, but together we can produce overflowing abundance and express true love, sexual and spiritual, because the spiritual arises from the wonder of sexual procreation and the passage of the generations forever as long as Paradise last on the cosmic equator in space-time. This is a radically different weltanschauung. It really is the remedy, but that's a hard saying!

Entheogens are intrinsic to the Yoga tradition:

Patanjali notes: *The Siddhis are born of birth, drugs, mantras, penance or Samadhi. (IV-1) Powers are either revealed at birth, or acquired by medicinal herbs, or by repetition of sacred words, or through austerity, or through illumination. All know the healing qualities of herbs; only a few know that some of them have the qualities of awakening spiritual powers.*

Ram: Can you please try performing the experiment I mentioned whenever you have dissociative OBE?

Chris: Patanjali's Aphorisms on Yoga, in my own Purohit Swami edition (1938) says of siddhis: These powers are obstacles to illumination. They have their value so far as this world is concerned but they obstruct the progress of the soul so far as its liberation is concerned. The power they give is an encumbrance, unless it is brought under control.

I am not prepared to exert control or distort the flow of karma from that which is freely manifest to my consciousness as the circumstances emerge. Demonstrating siddhis is a curse upon them. It is attempting to manipulate powers that arise adventitiously without warning and may not repeat and it is interfering in the natural process of unfolding reality. I have suffered plenty of karmic predicaments threatening my very survival to know and respect the risks.

Siddhi arise from karma. Karma is not simply a moral force, but much deeper, entwined in the quantum uncertainties of fate. It is not a moral law but the very foundation of conscious idiosyncrasy, in prescience, synchronicity and misfortune. We have no explanation for why one person escapes a disastrous fate and another gets a terminal illness when the one escaping may be a bad person and the one expiring may be a very good one. It doesn't just come down to morality and we have no control over it except through our prescience and careful attention to the flow of life, as well as intelligently avoiding risks. You simply can't afford to manipulate it for superficial effects, or other outcomes may result which are very harmful to you or others.

I have to try to balance three things, (1) astute ego to protect me and take on the world at large, (2) complete annihilation to merge with karma with no predilection, and (3) mortal compassion to protect all life because that is my covenant with Brahman-Ishvara – Om Nama Shivai.

John: Well said that "Spiritual reality is the universe becoming". This is where we find common ground. Maybe the corollary is that scientific reality is what became? Let me clarify that I'm not really disagreeing, I'm pointing out that the sciences are forced into such epistemology, but we as experiential beings do not have to be and in fact cannot afford to be on a human level. So both views have to be understood.

Chris: Let me say back to you – thank you John! How to express this and turn it into a world reflowering in one day standing on one leg is a real challenge. What I am trying to do is go out to battle for life in the style of the Gita I am singing the Song of God, between between Arjuna and Krishna. My chariot is the weltanschauung of immortality throughout our generations. The battle is worthy and just, even though treasured icons may pass away!

John: This raises a very fundamental question about epistemology and the foundations of science and belief. In the sciences, which have been my profession, we adhere to the idea that propositions must be tested against data, or at least inferred from theories that have been well-tested on other data. In spiritual pursuits and religious practices one is attempting to overlook smoke-screens presented by the senses to see and experience a deeper reality through direct participation. As science developed to its present state we came to realize that the observational reality cannot be complete. This is not a direct answer – I don't want to agree or disagree, but to point out that there are and it seems always will be things we don't know about reality, and that may be the most important thing we can know about it. It is greater than us. That realization does not preclude "taking responsibility" - it requires it.

Chris: The entire purpose of conscious existence is to unfold the existential universe, so yes it is a journey into the unknown, but not the unknowable, so I see this statement as coming too close to a doctrine of human fallibility. So let's look at the evidence you have presented.

John: Incompleteness proofs that say no description of reality can ever be fully accurate or fully meaningful.

Chris: Godel's theorem⁵⁷ is dealing only with axiomatic model system descriptions. Laotzu said: "The way that can be told is not the countless way". But he didn't say "The way that can be experienced is not the countless way."

⁵⁷ Godel's first incompleteness theorem states that no consistent system of axioms whose theorems can be listed by an effective procedure (i.e., an algorithm) is capable of proving all truths about the arithmetic of natural numbers. For any such consistent formal system, there will always be statements about natural numbers that are true, but that are unprovable within the system. [An example is whether there is a cardinal number between the rationals and the reals]. The second incompleteness theorem, an extension of the first, shows that the system cannot demonstrate its own consistency.

John: This to me indicates that the way forward from here is to work out the relation between these two ways of knowing reality. As we have seen even the idea of direct participatory knowing, personal experience, may have problems reaching ultimate reality.

Chris: The vision quest IS the countless way of direct experience and is not inconsistent or incomplete except that it is complemented by science.

John: It is claimed to be reachable but apparently [only] in very special cases (Moksha, Samadhi, ascension, etc.).

Chris: The special cases “prove” the rule.

John: Similarly in science there is the “epistemic cut”. *Howard Pattee has claimed that an epistemic cut separates the world from observers and therefore from organisms. The epistemic cut imputes a linguistic mode of operation to living systems. In Pattee’s words: Evolution requires the genotype-phenotype distinction, a primeval epistemic cut that separates energy-degenerate, rate-independent genetic symbols from the rate-dependent dynamics of construction that they control.*

Chris: Howard Pattee is an engineer making symbolic claims about genetic systems. I see these claims as reducing how DNA molecules work as quantum systems to symbolism and they are inaccurate about regulatory non-coding DNA which is responsible for higher organism phenotypic evolution, so his distinction between genotype and phenotype is fallacious. I don't accept the epistemic cut any more than epistemic humility ⁵⁸.

But we need to do more than grasp it. We need above all to **protect** the world in itself, so the only epistemic humility I am prepared to accept is biospheric symbiosis, in humility to the diversity of life unfolding. This is not a scientific description, or proposition, but a dire necessity and central to the meaning of the vision quest. What you are saying is that descriptions of reality are not reality. This is true and it is the reason why I apply the manifestation test to experiential empiricism. That is, experiential empiricism needs to be a manifest account of a conscious experience, not a description of a model of reality, which is an abstract objective outline of the concept of the experience. Most SBoC discussions are model theoretic or traditional Vedic. Furthermore I see accepting full personal responsibility as a critical step for humanity to take if we are ever going to survive our own self-appointed maladaptions to nature. Fallibility is a pathetic fallacy of an excuse. There is one kind of responsibility when we recognise that the buck stops with us and all the descriptions we make, from deity to mechanism are just ways of abnegating full personal responsibility, that we cannot as mere humans address the central existential questions. But there are no other manifest experiencers in the universe outside life’s diversity.

John: But I think we can say that a “description of reality” must intrinsically be incomplete. Descriptions are by their design different from what they describe. Only when description itself is incorporated into the concept of reality can a description encompass all that exists, but in that case it creates an infinite regress, like a video camera pointed at the screen displaying the same camera’s view.

Chris: The description is incomplete, just like eating the menu you described. But the vision quest is not an infinite regress any more than the scent of a rose. The only resource we can dependably rely on, even on a temporary basis is our direct experience. Outside that, it is all presumption and we can't afford limiting a priori assumptions like God is greater, or mechanism has it all sewn up so we cannot know ourselves or the world at large.

John: There are and it seems always will be things we don't know about reality, and that may be the most important thing we can know about it. It is greater than us.

Chris: Is it greater? Or are we the essential ingredient at the very centre of the cyclone – the key factor in whether meaning in the universe will survive? The anthropocene has ended our gatherer-hunter childhood and the religious adolescence of our species. We are now at a make or break point for Fermi self-extinction and have to become mature adults and take full responsibility for our actions. We have to take extreme care and show our true compassion, but not limit ourselves by claiming fallibility at the outset.

John: All excellent points. I'm prepared to accept that the goal can be reached by responsible experiential means. The only block that relational theory is that there is no syntactic path to the subjective or the whole. So it supports your thesis. By remarks about infinite regress refer to a theoretical vs participatory approach. I can't comment on the possibility of complete transcendence through personal performance. My gut says that is also a path of endless learning, but how would I know? It's not analyzable like science is.

⁵⁸ In the philosophy of science, epistemic humility refers to a posture of scientific observation rooted in the recognition that (a) knowledge of the world is always interpreted, structured, and filtered by the observer, and that, as such, (b) scientific pronouncements must be built on the recognition of observation's inability to grasp the world in itself.

An Anthropology of the Soul or Spirit

In these examples, you will find a great diversity of views on one or many souls humans conceive and their immortality or otherwise. These differ entirely from the materialist scientific description of nature, in which human consciousness is a manifestation of brain function, which ceases to exist on the death of the organism.

Many traditions, from Ancient Egypt, Hinduism, Judaism and Christianity to Austronesian peoples, identify soul with breath. The identification with breath is organismic, because the breath is both voluntary and autonomic, indicating the interface between subjective conscious volition and natural biology.

As we have noted, animism the idea of souls and other spiritual beings pervading life and will in nature is a founding human belief in all natural features entities and phenomena having spirits or souls, that form the vital principle of life and that the normal phenomena of and the abnormal phenomena of disease could be traced to spiritual causes. Thus every human has, in addition to his body, a 'ghost-soul', an insubstantial human image, the cause of life or thought in the individual it animates, capable of leaving the body far behind' and continuing to exist and appear to men after the death of that body. Animism differs from pantheism in that animism puts more emphasis on the uniqueness of each individual soul. In pantheism, everything shares the same spiritual essence, rather than having distinct spirits or souls. It also shows the source notion from which religious ideas of the eternal soul later evolved.

Anciently among the San bushmen we hear: ≠Gao!na, tallest of the Bushmen, was in his earthly existence a great magician and trickster with supernatural powers, capable of assuming the form of an animal, a stone or anything else he wished, and who changed people into animals and brought the dead back to life. But as the Great God who lives beside a huge tree in the eastern sky, he is the source and custodian of all things. Thus their hunting and gathering way of life was ordained from the very beginning and ≠Gao!na ordained that when they died they should become spirits, // Gerais, who would live in the sky with him and serve him.

By contrast, in Amazonian Shipibo cosmology, every tree and plant has its indwelling spirit, which forms the principle of its life and growth. When a tree is felled, this is regarded as an offence against its spirit. Every tree has what the Indians call its "mother" (and which he equates with "soul"). Human progeny come from the watery depths and flow upward like the souls of the dead, which rise up the World Tree through its roots, which penetrate the underworld. Several Inuit groups believe that a person has more than one type of soul. One is associated with respiration, the other can accompany the body as a shadow.

In Shamanism, soul dualism ("multiple souls" or "dualistic pluralism") is a common belief and is essential in the universal and central concept of "soul flight" ("soul journey", "out-of-body experience", "ecstasy", or "astral projection"). In some cases, there are a plethora of soul types with different functions, such as nature spirits of trees and rivers. It is the belief that humans have two or more souls, generally termed the "body soul" (or "life soul") and the "free soul". The former is linked to bodily functions and awareness when awake, while the latter sometimes called the *Nagual*, as opposed to the *Tonal* of the day, can freely wander during sleep or trance states.

Soul dualism and multiple souls are prominent in the traditional animistic beliefs of the Austronesian peoples, the Chinese people (*hún* and *pò*), the Tibetan people, most African peoples, most Native North Americans, ancient South Asian peoples, Northern Eurasian peoples, and in Ancient Egyptians (the *ka* and *ba*).

The Proto-Austronesian word for the "body soul" is **nawa* ("breath", "life", or "vital spirit"). It is located somewhere in the liver or heart. The "free soul" is located in the head **qaNiCu* ("ghost", "spirit [of the dead]"), which also apply to other non-human nature spirits. The "free soul" is also referred to in names that literally mean "twin" or "double". A virtuous person is said to be one whose souls are in harmony with each other, while an evil person is one whose souls are in conflict. The "free soul" is said to leave the body and journey to the spirit world during sleep, trance-like states, delirium, insanity, and death. Illnesses are regarded as a "soul loss". To heal the sick, one must "return" the "free soul" (which may have been stolen by an evil spirit or got lost in the spirit world) into the body.

Looking to major human cultures, notions of the soul or spirit, are also varied.

The ancient Egyptian *ka* (breath) was a "soul" that survived death but remained near the body, while the spiritual *ba* proceeded to the region of the dead.

The Chinese distinguished between a lower, sensitive soul, which disappears with death, and a rational principle, the *hun*, which survives the grave and is the object of ancestor worship. According to Chinese traditions, every person has two types of soul called *hun* and *po* (魂 and 魄), which are respectively yang and yin.

Taoism believes in ten souls, *sanhunqipo* (三魂七魄) "three *hun* and seven *po*". A living being that loses any of them is said to have mental illness or unconsciousness, while a dead soul may reincarnate to a disability, lower desire realms, or may even be unable to reincarnate.

Shinto distinguishes between the souls of living persons (*tamashii*) and those of dead persons (*mitama*), each of which may have different aspects or sub-souls.

The Monotheistic religions of Judaism, Christianity Islam and Zoroastrianism share a view of all humans possessing or being possessed by a soul which is the spirit of life's agency.

In Zoroastrianism the final renovation, all of creation—even the souls of the dead that were initially banished to or chose to descend into "darkness"—will be reunited with Ahura Mazda in the *Kshatra Vairya* (meaning "best dominion"), being resurrected to immortality. In Middle Persian literature, the prominent belief was that at the end of time a savior-figure known as the *Saoshyant* would bring about the *Frashokereti*, while in the Gathic texts the term *Saoshyant* (meaning "one who brings benefit") referred to all believers of Mazdayasna but changed into a messianic concept in later writings.

The Hebrew terms נפש *nefesh* (literally "living being"), רוח *ruach* (literally "wind"), נשמה *neshamah* (literally "breath"), חיה *chayah* (literally "life") and יחידה *yechidah* (literally "singularity") are used to describe the soul or spirit. The early Hebrews apparently had a concept of the soul but did not separate it from the body, although later Jewish writers developed the idea of the soul further. In older writings the dead go down to sheol.

"Then the LORD God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living being" (Genesis 2:7).

Soul or psyche is "to breathe", (Latin 'anima'). It comprises the mental abilities of a living being: reason, character, free will, feeling, consciousness, qualia, memory, perception, thinking, etc. These are precisely what scientists call the conscious mind so it's already subject to scientific investigation.

The Christian view contains three different soul origins. The major theories put forward include soul creationism, traducianism, and pre-existence. According to soul creationism, God creates each individual soul directly, either at the moment of conception or some later time. According to traducianism, the soul comes from the parents by natural generation. According to the preexistence theory, the soul exists before the moment of conception.

The Kabbalah separates the soul into five elements, corresponding to the five worlds:[59]

- a *Nefesh*, related to natural instinct.
- b *Ruach*, related to intellect and the awareness of God.
- c *Neshamah*, related to emotion and morality.
- d *Chayah*, considered a part of God, as it were.
- e *Yechidah*. This aspect is essentially one with God.

The Platonic soul consists of three parts:

- a the *logos*, or *logistikon* (mind, nous, or reason)
- b the *thymos*, or *thumetikon* (emotion, spiritedness, or masculine)
- c the *eros*, or *epithumetikon* (appetitive, desire, or feminine)

Eastern religions encompassing Vedanta, including Buddhism share a concept of eternally reincarnated souls.

In Hinduism the atman ("breath," or "soul") is the universal, eternal self, of which each individual soul (*jiva* or *jiva-atman*) partakes. In the Brihadaranyaka Upanishad we are told that the Supreme Being is Pure Consciousness, in which subjects and objects merge together in a state of Universality. The Supreme Being knew only Itself as 'I-Am', inclusive of everything. This indicates that enlightenment arises from merging with the cosmic self after rounds of birth and

death and raises a different prospect to Monotheism, where individual eternal souls are believed to continue to exist forever.

Buddhism denies the existence of the self and teaches merely that individual souls are caught in an endless round of reincarnation until they reach enlightenment essentially a void state outside Maya or illusion, although Buddhist realms include levels of conscious existence from Titans to hungry ghosts.

In Jainism, every living being, from plant or bacterium to human, has a soul and the concept forms the very basis of Jainism. According to Jainism, there is no beginning or end to the existence of soul. It is eternal in nature and changes its form until it attains liberation. The difference between the liberated and non-liberated souls is that the qualities and attributes are manifested completely in case of *siddha* (liberated soul) as they have overcome all the karmic bondages whereas in case of non-liberated souls they are partially exhibited. The soul lives its own life, not for the purpose of the body, but the body lives for the purpose of the soul.

In Brahma Kumaris, human souls are believed to be incorporeal and eternal. God is considered to be the Supreme Soul, with maximum degrees of spiritual qualities, such as peace, love and purity.

In Sikhism "God is in the Soul and the Soul is in the God."

To William James (1902) author of "The Varieties of Religious Experience" at the beginning of the 20th century, the soul as such did not exist at all but was merely a collection of "psychic phenomena". This is probably a well informed position given the huge scope of his research into religious beliefs. It also coincides with views of animism as the founding human belief system preceding doctrinal religion. I have a real concern about the quest for individual eternal life because it leads towards a "crowded cosmos" of angels dancing on the head of a pin with no relationship to living existence and a distraction from the primacy of protecting and preserving the diversity of life as a dominant species.

Joshua Davis (2009, 2019 see also Gillett & Davis 2015): The way I read it, is that many more people aspire to eternal life for the wrong reasons in a self centred way, while fewer people aspire to eternal life for the right reasons in an altruistic and wondrous way.

Cathy Reason: But why is it necessarily better to do something for altruistic reasons than to do something for self-centred reasons? Why is everyone else's well-being always valued more highly than one's own?

Chris King: Relaxing ego is not valuing others more. It is an individual quest to avoid hungering that hurts oneself and life around us. More or less categorical reasoning is too black and white. If death is black and life is white, sentient existence has the many-splendid colours of living abundance. It is not balance, but survival at the edge of chaos.

Hal Cox: Is it something about dropping the ego? Or merging the ego with a larger Self? No ego, no suffering? This idea is passed to us by followers of Buddha, I guess, whose ideology seem to have ever increasing weight among the intellectuals in the West including notably famous atheists and other skeptics.

Chris: I reject Buddhism as a *via negativa* redeemed only by the Bodhisattva ideal. Love life! Don't hate the ego, heal it! It is our ally preserving life and our very vibrancy!

But there is more. Eternal religious cosmologies just make it harder to live in symbiosis with life as a whole. Monotheism leads to eternal life, eternal judgment and the Eschaton, in which life is discarded by God as a prop. Eastern reincarnation cosmologies do the same by imagining an endless round of birth and death leading to eternal suffering. Biological and physical life is mortal. To live in the universe involves entropy and a negentropic balancing act. The subject fears ultimate annihilation and then invents the possibility of life after death. This amplifies the dilemma of ego, so that instead of merging with life as a whole, we seek an eternal pinnacle.

Hal: Perhaps enlightenment is not the goal, but only an occasional accident. The goal is to drop the ego.

Chris: This is where Eastern cosmologies fail, because, without biospheric sacraments enlightenment is rarer than life itself. Biospheric sacraments let the ego dissolve naturally, given loving support, inducing a form of cosmic consciousness which IS enlightenment. That's just the way it is!

Hal: I was thinking you may consult with his assembly of experts on the anthropologies of perceptions in populations. Their insights are rare and not necessarily otherwise easily available for study. I do not know a serious anthropologist who has surveyed the population biology of psychical behaviors like NDE/OBE, but I do know of anthropologists in Mishlove's broader community who have deeply invested in select populations of experiences. First person subjective versus third person objective evidence is debated in these groups with a widespread *egoic* assumption that only first person singular matters. That's an incomplete but not wrong assumption in itself. A more complete investigation of subjective experience needs to encompass population behaviors at multiple scales, i.e. anthropologies of groups, tribes, societies, and cultures. Is there any special weight for the evidence of a population's experience in your analyses?

Chris: The approach of Symbiotic Existential Cosmology is not 1pp singular but 1pp affirmative. The subjective weighting is established by mutual affirmation between 1pp subjective empirical experiences, in a complementary manner to verified empirical observations in physical science. The scientific threshold is replication of an initial result i.e. two experiments agreeing, followed by more as it happens. This is complemented by statistical measures in each experimental process.

Hence the subjective threshold is two experiencing individuals mutually agreeing on their experiences but more is desirable, up to population levels. Experiments reporting subjective responses enables this to be done with valid statistical measures in the same way as scientific observational experiments. These two approaches can also be combined, with EEG and fMRI studies of individuals on psilocybin, complemented by subjective reports of their experiences such as relief of depression or positive spiritual experiences, both subject to statistical analyses.

There are whole classes of fringe phenomena, including synchronicity, forms of claimed Psi, prophetic experiences, claims of life after death via NDEs, which are actually living experiences of survivors as well as via mediums, and OBEs such as the case of Maria recounted by Groff (1988), from Grayson & Flynn (1984), in which a woman in short-term cardiac arrest saw a tennis shoe on the high ledge in the hospital that the doctor later discovered, at her behest, and so on that I think need to be kept in a separate category from true/false. They may be fundamentally uncertain in the sense that they can be experienced adventitiously, but not in a fully verifiable way, because like non-IID quantum brain dynamics they are part of the Schrödinger cat phenomena of the universe – one person can experience them fortuitously but can't guarantee to repeat the good luck of premonition. To me the worst thing we can do about prescience is to try to measure it in a classical or statistical way because that IS IID. The whole utility of synchronicity and prescience is that it is an omen that may never repeat.

Cultural belief systems are notoriously self-reinforcing. Christian doctrine has such a strong influence on its believers that it creates a form of totalitarian doctrinal disinformation, leading to creationism and belief in eternal life and eternal damnation. Vedanta does the same with subservient belief in yogic teachings as "science" and notions like reincarnation. But they're not the only ones. Psychedelic warrior societies with high rates of male homicide are obsessed with casting evil spells using psychedelics. What are we supposed to conclude from that? Believers in Psi and life-after-death create similar expectations.

I have to balance my insight as an egotistical individual having a teaching to save us all biologically and physically, with the party lines of major religions professing all kinds of supernatural beliefs, as well as hard core scientific materialists. I have to stand against the tide because I am carrying a unique personal insight which, in my own humble opinion when I face down these oceanic forces is essential to turn the tide. I keep looking at this legion, including the combined forces of Judaism Christianity and Islam when I went to Jerusalem, until I can "see the whites of their eyes" and sum up the veracity of their predilections against my own insights.

So I am not prepared to go gentle into that anthropological, "good night". When the chips are down for protecting life as a whole, you have to be able to decide to be a pure egotist, as Cathy said! If you are sure it is right to protect the diversity of life, just do it!

4 Psychedelic Agents in Indigenous American Cultures

The prominent use of much more potently transformative psychedelic agents in human populations has evaded the mainstream of philosophical and religious practice because it has been focused on the Americas, where *Psilocybe* fungi were consumed as *teonanactl* – “flesh of the gods” for spiritual and therapeutic purposes by the Mayans from 1000 BC, *Lophophora cacti* from 500 BC as *peyote* and species of *Psychotria* and *Bannisteriopsis* combined as *yage*, or *ayahuasca*, in the Amazon basin, with evidence also of the use of *Trichocereus cacti* by the Nazca (100-800 CE) and dimethyl-tryptamine containing snuffs (Schultes & Hofmann 1979, Williams et al. 2022).

For the **contemporary spiritual entheogenic movements** see: [Redemption of the Soma and Sangre](#), [Maria Sabina's Holy Table](#), [The Man in the Buckskin Suit](#) and [Santo Daime and the Union Vegetale](#).



Fig 203: Traditionally used psychedelic species provide access to a first person visionary experience, deemed to be of genuine spiritual significance by researchers (Griffiths). Top row Maria Sabina our benefactress, Gordon Wasson (see also fig 245). Sacred mushrooms, containing psilocin. *Psilocybe cubensis* (di-shi-tjo-le-ra-ja (“divine mushroom of manure”), Mayan mushroom stone with metate for grinding (1000 BC) Quetzalcoatl teaching nine deities the use of sacred mushrooms. She also used *Salvia divinorum* fig 88. Mayan mushroom stone with grinding metate (1000 BC). Nine deities receive instructions from Quetzalcoatl on the origin and use of sacred mushrooms Codex Vindobonensis. Mixitec kingdom (Schultes and Hofmann 1979). Second row my roadman Tellus Goodmorning, deer with peyote in its mouth (500 BC Monte Alban), the Nierika, peyote’s portal to the spiritual realm and Don Jose Matsuwa and peyote, containing mescaline. Right and bottom row My curandero Snr. Trinico, chacruna and the vine of the soul, UDV and ayahuasca, containing dimethyl-tryptamine and harmine. While psychedelic “trips” are cyclonic experiences in themselves, that can challenge our conceptions of reality and need careful guidance, at the centre of the cyclone lies the compassionate redemption of a [moksha epiphany](#) that can both provide comfort to the terminally ill, restore faith in life of the depressed and reveal life-changing first-person insight and illumination into the roots of the spiritual quest into the cosmological nature of consciousness. Lower: The principal ingredients of sacred mushrooms, peyote, ayahuasca and salvia.

Sacred Mushrooms The story of the original Quetzalcoatl of the Nahuas who followed the Toltec but predated the Aztec in the valley of Mexico is told in by Dobkin de Rios (1984). They were “quite advanced in their cultural development. Their divinity, Quetzalcoatl was a man of wisdom who gave them a code of ethics and a love for art and science.” Acquaintance with the drug plants goes back to 1000 BC with the Mayan mushroom stones and 300 BC with the Chicameras the Aztec ancestors and the Toltec. Quetzalcoatl is said to have passed knowledge of the mushroom to

Piltzintecuhtli a god of hallucinatory plants, including mushrooms. Quetzalcoatl is the plumed serpent, the feathers signifying flight and divinity and the serpent is his organismic aspect entwined in the natural world. He is symbolic of Venus the “star” that separates the day and the night. The earliest known iconographic depiction of the deity appears on Stela 19 at the Olmec site of La Venta. Dated to around 900 BC, it depicts a serpent rising up behind a person probably engaged in a shamanic ritual.

Because at the time of the arrival of Columbus, these were used by the Aztecs, who were renowned for their sacrificial violence and were documented by conquistadores vehemently and violently opposed to pre-Columbian culture, historical descriptions of their use are shrouded in diabolical accounts. Dobkin de Rios (1984) notes that the divinatory properties of sacred plants [including mushrooms, peyote, datura, morning glory and tobacco] were of paramount importance to the Aztecs. They believed that whoever ate these sacred plants would receive the power of second sight and prophecy. Thus, one could discover the identity of a thief, find stolen objects, or predict the outcome of a war or the attack of a hostile group.

"Sacred mushrooms played such an important part in Aztec life that Indian groups which owed tribute to the Aztec emperor paid it with inebriating mushrooms. One Spanish priest wrote that for the Aztecs, the sacred mushrooms were like the host in the Christian religion: through this bitter nourishment, 'they received their God in communion' The divine mushroom was taken during ritual ceremonies. Successful Aztec merchants sponsored night banquets. The Florentine Codex records that when the participants ate the mushrooms with honey, and they began to take effect, the Aztecs danced, wept, and saw hallucinations. Others entered their houses in a serious manner and sat nodding. Visions included prophecies of one's own death, battle scenes, or war captives that one would take in battle. Others reported visions that they would be rich. All that could possibly happen to a person could be seen under the effects of the mushrooms. After the effect wore off, people would consult among themselves and tell each other about their visions".

Schultes and Hofmann (1979) note that early chroniclers such as Fransisco Hernandez, physician to the King of Spain, described several sacred mushroom species:

'Others when eaten cause madness that on occasion is lasting of which the symptom is a kind of uncontrolled laughter. Usually called teyhuintli, these are deep yellow, acrid of a not displeasing freshness. There are others again, which without inducing laughter bring before the eyes all kind of things such as wars and the likeness of demons. Yet others are not less desired by princes for their fiestas and banquets, of great price. With night-long vigils they are sought, awesome and terrifying.

Friar Sahagun, one of the earliest chroniclers, remarked of the Aztec mushroom eaters:

'when they become excited by them start dancing, singing, weeping. Some do not want to sing but sit down and see themselves dying in a vision; others see themselves being eaten by a wild beast; others imagine they are capturing prisoners of war, that they are rich, that they possess many slaves, that they have committed adultery and were to have their heads crushed for the offence ... and when the drunken state had passed, they talk over amongst themselves the visions they have seen.'

Fig 204: Nine Preclassic mushroom stones found in a cache along with nine miniature metates at the highland Maya archaeological site of Kaminaljuyu. The contents of the cache were dated by Stephan de Borhegyi at 1000-500 BC. The tall jaguar mushroom stone on the left, also from Kaminaljuyu, was excavated separately.



Dobkin de Rios further notes:

"during the coronation feast of Moctezuma in 1502, teonanacatl (the divine mushroom) was used to celebrate the event. War captives were slaughtered in great numbers to honour Moctezuma's accession to the throne. Their flesh was eaten, and a banquet was prepared after the victims' hearts were offered to the gods. After the sacrifice was over, everyone was bathed in human blood. Raw mushrooms were given to the guests, which one writer, Fray Duran, described as causing them to go out of their minds-in a worse state than if they had drunk a great quantity of wine. In his description, these men were so inebriated that many took their own lives. They had visions and revelations about the future, and Duran thought the devil was speaking to them in their madness. When the mushroom ceremony ended, the invited guests left. Moctezuma invited rival rulers to feasts which were held three times a year. One of these important feasts was called the Feast of Revelations, when the invited dignitaries and Moctezuma, or his representative, ate the wild mushrooms. ... During the Aztec king Tizoc's enthronement feast, all those present ate wild mushrooms - the kind that made men lose their senses. After four days of feasting, the newly crowned Tizoc gave his guests rich gifts and sacrificed the Metztlitan victims".

The repression of the sacred mushrooms by the conquistadors resulted in their disappearance from the annals of history, except for the troubling appearance of small mushroom stones dating from 1000 B.C. scattered about the much more ancient ruins of the Mayan civilisation. In 1935 the anthropologist Jean Bassett Johnson witnessed an all night mushroom ceremony at Huautla de Jimenez.

Maria Sabina This report was to lie idle until 1955 when Gordon and Valentina Wasson 'were invited to partake of the *agape of the sacred mushrooms*' in the hills of Oaxaca, among isolated peasant peoples who used them to divine the future and seek a cure of illness, after a long search and a previous unsuccessful season in the town:

"Perhaps you will learn the names of a number of renowned curanderos, and your emissaries will even promise to deliver them to you, but then you wait and wait and they never come. You will brush past them in the market place, and they will know you but you will not know them. The judge in the town hall may be the very man you are seeking and you may pass the time of day with him yet never know that he is your curandero." – Wasson (Weil et. al. 30).

The sacred mushroom is called by the Mazatec Indians '*the little flowers of the gods*' or '*that which springs forth*'. '*The little mushroom comes of itself we know not whence, like the wind that comes we know not whence or why*'.

Wasson was deeply struck by the spiritual power of the sacred mushroom, which he referred to as '*the divine mushroom of immortality*': '*Ecstasy! The mind harks back to the origin of that word. For the Greek ekstasis, meant flight of the soul from the body. Can a better word be found to describe the bemushroomed state? ... Your very soul is seized and shaken until it tingles, until you feel that you will never recover your equilibrium*' (Furst 198). "*... geometric patterns, angular not circular in richest colours, such as night adorn textiles or carpets. Then the patterns grew into architectural structures with colonnades and architraves, patios of regal splendour, the stone work all in brilliant colours, gold and onyx and ebony, all most harmoniously and ingeniously contrived, in richest magnificence extending beyond the reach of sight, in vistas measureless to man ... They seemed to belong... to the imaginary architecture described by the visionaries of the Bible*" (Riedlinger 1996 30).

Shortly before his arrival she had had a vision while on the little saints, that non-Mazatec strangers would come to seek *nti-si-tho*, the little one who springs forth. She had shared her vision with Cayetano García the local sindaco or justice who also partook, he agreed that the knowledge should be shared and brought Wasson to her. Her life was beset by many tragedies including a macabre vision she had shortly afterward on the little things, which foretold the murder of her son, possibly in vengeance for opening the knowledge of the mushroom. Her house and little shop were also burned (Estrada 71, 79). The CIA were also in Mexico in search of the mushroom. Within a few days, a Mexican botanist had phoned the CIA to confirm Wasson's find and an agent was dispatched as a mole on Wasson's return trip.

"The father of my-grandfather Pedro Feliciano, my grandfather Juan Feliciano, my father Santo Feliciano - were all shamans - they ate the teonanacatl, and had great visions of the world where everything is known... the mushroom was in my family as a parent, protector, a friend" — Maria Sabina, who lived to the age of 91.

Maria Sabina took sacred mushrooms in abundance as a child. A few days after watching a wise man cure her uncle :

'Maria Anna and I were taking care of our chickens in the woods so that they wouldn't become the victims of hawks or foxes. We were seated under a tree when suddenly I saw near me within reach of my hand several mushrooms. If I eat you, you and you" I said "I know that you will make me sing beautifully". I remembered my grandparents spoke of these mushrooms with great respect. After eating the mushrooms we felt dizzy as if we were drunk and I began to cry, but this dizziness passed and we became content. Later we felt good. It was a new hope in our life. In the days that followed, when we felt hungry we ate the mushrooms. And not only did we feel our stomachs full, but content in spirit as well. I felt that they spoke to me. After eating them I heard voices. Voices that came from another world. It was like the voice of a father who gives advice. Tears rolled down our cheeks abundantly as if we were crying for the poverty in which we lived.' She had a vision of her dead father coming to her. '*I felt as if everything that surrounded me was god.*

Maria Anna and I continued to eat the mushrooms. We ate lots many times, I don't remember how many. Sometimes grandfather and at other times my mother came to the woods and would gather us up from the ground on which we were sprawled or kneeling. "What have you done?" they asked. They picked us up bodily and carried us home. In their arms we continued laughing singing or crying. They never scolded us nor hit us for eating mushrooms. Because they knew it isn't good to scold a person who has eaten the little things, because it causes contrary emotions and it is possible that one might feel one was going crazy' (Estrada 39).

After the death of her first husband Maria Sabina performed a *velada* for Maria Anna, who was sick with an internal bleeding. After expressing the blood she had a vision of six or eight people who inspired her with respect - 'the Principal Ones of whom my ancestors spoke'. One of the Principal ones spoke to her and showed her the book of wisdom. She realised that she was reading her book. Afterwards she had the contents always in her memory, and became herself one of the Principal Ones who became her dear friends. After this vision, she had another vision of Chicon Nindo the lord of the mountains, a being surrounded by a halo, whose face was like a shadow. She realised that she had become his neighbour. She entered the house and had another vision of a vegetal being covered with leaves and stalks that fell from the sky with a great roar like a lightning bolt. *"I realized that I was crying and that my tears were crystals that tinkled when they fell on the ground. I went on crying but I whistled and clapped, sounded and danced. I danced because I knew I was the great Clown woman and the Lord clown woman"* (Estrada 49).

*"Says.. woman who thunders am I,
woman who sounds am I.
Spiderwoman am I, says
hummingbird woman am I says
Eagle woman am I, says
important eagle woman am I.
Whirling woman of the whirlwind am I, says
woman of a sacred, enchanted place am I, says
Woman of the shooting stars am I." ...*

(Mushroom Ceremony - Smithsonian Institute)

*I'm a birth woman, says
I'm a victorious woman, says
I'm a law woman, says
I'm a thought woman, says
I'm a life woman, says ...
"I am a spirit woman, says
I am a crying woman, says
I am Jesus Christ, says ...
I'm the heart of the virgin Mary."*

Maria Sabina notes (Schultes and Hofmann 1979):

'There is a world beyond ours, a world that is far away, nearby and invisible. And there is where God lives, where the dead live, the spirits and the saints, a world where everything has already happened and everything is known. That world talks. It has a language of its own. I report what it says. The sacred mushroom takes me by the hand and brings me to the world where everything is known. It is they, the sacred mushrooms that speak in a way I can understand. I ask them and they answer me. When I return from the trip that I have taken with them I tell what they have told me and what they have shown me'. 'The more you go inside the world of teonanacatl, the more things are seen. And you also see our past and our future, which are there together as a single thing already achieved, already happened. . . . I saw stolen horses and buried cities, the existence of which was unknown, and they are going to be brought to light. Millions of things I saw and knew. I knew and saw God: an immense clock that ticks, the spheres that go slowly around, and inside the stars, the earth, the entire universe, the day and the night, the cry and the smile, the happiness and the pain. He who knows to the end the secret of teonanacatl – can even see that infinite clockwork'.

Traditionally the mushroom was taken not merely to see god, but to cure physical maladies (see [section 2](#)). The healing process could be severe and terrifying. At a *velada*⁵⁹ attended by Wasson, a young boy took the mushrooms to seek a cure. However Schultes and Hofmann comment:

"upon learning from Maria that the mushrooms prognosticate death, the boy falls to the ground in despair. He did in fact die a few days later of undiagnosed, but apparently natural causes". Maria Sabina described this somewhat differently: "But there was no remedy for the sick one. His death was near. After I saw Perfecto's appearance, I said to Aurelio 'This child is in a very grave condition'. ... I took the children and began to work. That was how I learned that Perfecto had a frightened spirit. His spirit had been caught by a malevolent being. ... Weeks went by and someone informed me that Perfecto had died. They didn't take care of him like they should have. If they had done several vigils he would certainly have gotten well" (Estrada 72).

Fray Bernadino de Sahagun estimated from Indian chronology that peyote had been known to the Chichimeca and Toltec at least 1890 years before the arrival of the Europeans. Usage for as long as 3000 years is suggested from Tarahumara rock carvings and Peyote specimens found in Texas rock shelters. de Sahagan reports: *"There is another herb like [opuntia]. It is called peiotl. It is found in the north country. Those who eat or drink it see visions, either frightful or laughable. This intoxication lasts two or three days and then ceases. It is a common food of the Chichimeca, for it sustains them and gives them courage to fight and not to feel hunger or thirst. And they say it protects them from all danger"* (Schultes and Hofmann 132).

Peyote The Huichol as discussed in the [animism chapter](#) (see also [section 2](#)) make a yearly pilgrimage, the peyote hunt, over 600km of rugged desert country. They refer to a portal to the spirit world, the nierika (fig 203) which can be negotiated by the devoted practitioner during the trance-like peyote experience:

⁵⁹ *velada* soirée, nighttime meeting, literally a shamanic mushroom vigil Spanish *velar* Latin *vigilō* ("to watch, guard") as in vigilant.

There is a doorway within our minds that usually remains hidden and secret until the time of death. The Huichol word for it is nierika – a cosmic portway or interface between so-called ordinary and non-ordinary realities. It is a passageway and at the same time a barrier between the worlds” (Halifax 242).

Fig 205: Two Chavin urns with jaguar beside mescaline containing San Pedro cacti (1200-600 BC), Aztec mural showing sacred mushroom deity (Magliabecchiano Codex) as an apotheosis of a mushroom taker, a Chavin statue showing snuffing nasal discharge, Amazonian Yanomamo using a hallucinogenic snuffing pipe for Anadenanthera beans containing bufotenine, Nazca gourds showing nasal discharge from hallucinogenic snuffing, and a Nazca pottery (100-800 AD) showing San Pedro use.



One of the most outstanding Huichol peyote

shamans of modern times is don Jose Matsuwa (fig 203), who at 1990 was the venerable age of 109. Besides walking in the sacred journey to Wirikuta, 'don Jose spent many years living alone in the Huichol sierra learning directly from the ancient ones who reside there in the caves and mountains. In order to become a shaman in the Huichol tradition one must learn to dream consciously and lucidly, for after a healing has been performed, that night the shaman tries to dream about the patient and find out the reason for the illness. Each day the Huichols tell their dreams to "Grandfather fire". Dreams help to bring together the past, present and the future' (Halifax 249).

"The shaman's path is unending. I am an old, old man and still a nunutsi (baby) standing before the mystery of the world"

"I have pursued my apprenticeship for sixty-four years. During these years, many, many times I have gone into the mountains alone. Yes I have endured much suffering in my life. Yet to learn to see, to learn to hear, you must do this - go into the wilderness alone. For it is not I who can teach you the ways of the gods. Such things are learned only in solitude." - Don Jose Matsuwa (Halifax) 238).

Brant Secunda became his apprentice after walking from Ixtlan into the mountains:

'On the third day of my journey, I became completely lost after walking down a deer trail. I became terrified and lay down to die, from sun exposure and dehydration. I then began to have vivid visions of colourful circles filled with deer and birds, but was suddenly awakened by Indians standing over me sprinkling water over me. They told me the shaman of their village had had a dream about me two days earlier and they had been sent out to rescue me' (Rainbow Network Aug 90 4).

"When the mara'akame passes through the nierika he moves just as the smoke moves; hidden currents carry him up and in all directions at once ... as if upon waves, flowing into and through other waves ... the urucate. As the mara'akame descends and passes through the nierika on the return, his memory of the urucate and their world fades; only a glimmer remains of the fantastic journey that he has made" (Halifax 242).

Psychedelic use also goes back centuries in South America. One of the most powerful traditions in shamanic use of sacred plants comes from a complex of plants containing various admixtures of methylated-tryptamines and beta-carbolines used as snuffs and hallucinogenic potions in the Amazon basin. San Pedro use, which like peyote contains mescaline, is evident in the cactus found alongside a leopard in a vase in Chavin culture (1200-600 BC) and San Pedro and sculptures showing snuff use among Nazca (100-800 CE).

Ayahuasca is a potent psychedelic admixture based on both dimethyl-tryptamine (DMT) and harmine. The bark of the vine of certain Banisteriopsis species is mashed and boiled with the leaves of plants such as certain Psychotria species. Sometimes some tropanes are also added. The principle is regarded as a major botanical discovery: the harmine acts as a mono-amine oxidase inhibitor, making it possible for the DMT to both enter the body through the stomach and to remain in action for some four hours. In combination, these substances produce a profound and sustained visionary state of a particularly tumultuous kind.

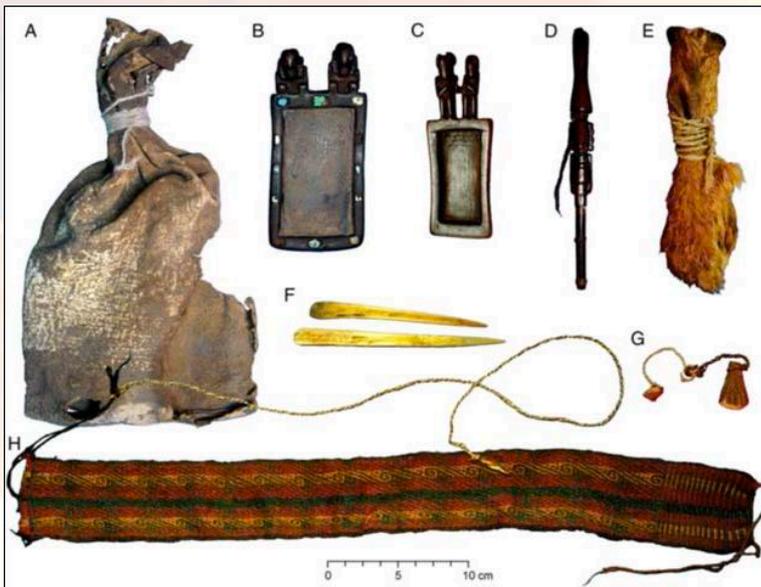


Fig 206: Diverse sacramental use of psychedelic entheogens over millennia in the Americas. Cueva del Chileno ritual bundle, LÍpez highlands of southwestern Bolivia radio-carbon dated to approximately 1,000 C.E. consisting of: outer leather bag (A), expertly carved and decorated wooden snuffing tablets with anthropomorphic figurines (B and C), intricate anthropomorphic snuffing tube with two human hair braids attached to it (D), animal-skin pouch constructed of three fox snouts (*L. culpaeus*) stitched together (E), two camelid (*L. glama*) bone spatulas (F), two small pieces of dried plant material attached to wool and fibre strings (G), and a polychrome woven textile headband (H). Artifacts (E and G) were tested using LC-MS/MS analysis. LC-MS/MS results from the fox-snout pouch indicate the presence of cocaine, BZE, harmine, bufotenine, DMT, and peak potentially corresponding to psilocin (Miller et al. 2019).

Michael Harner (1980) gives a striking description of his introduction to ayahuasca by the Conibo indians:

'Just a few minutes earlier I had been disappointed, sure that the ayahuasca was not going to have any effect on me. Now the sound of rushing water flooded my brain. My jaw began to feel numb ... Overhead the faint lines became brighter and gradually interlaced to form a canopy resembling a geometric mosaic of stained glass. I could see dim figures engaged in shadowy movements ... the moving scene resolved itself into a supernatural carnival of demons. In the centre was a gigantic grinning crocodilian head from whose cavernous jaws gushed a torrential flood of water'. The scene gradually transformed into sky and sea. He then saw two vessels which merged 'into a single vessel with a dragon-headed prow'. 'I heard a regular swishing sound and saw it was a giant galley. I became conscious too of the most beautiful singing I have ever heard in my life ... emanating from myriad voices on the galley. I could make out large numbers of people with the heads of blue jays'. 'At the same time some energy essence began to float from my chest up into the boat' as if to take his soul away.



Fig 207: Ayahuasca serves to form a meaningful social bond reinforcing the inner meaning of cultural values of the tribal relationships. It is thus valuable for young people and serves as a protection from the scourges of cocaine addiction. Note the death-like visage on the left (Psychedelic Science TV). Left & Right: Phosphene ornamentation on the Maloca Ritual yaje vessel (female) (Reichel-Dolmatoff 1978).

His body began to become numb as if his heart was going to stop. His brain became partitioned into an intellectual command level, the numb level and lower levels of the visions'.

'I was told that this new material was being presented to me because I was dying and therefore 'safe' to receive these revelations. First they showed me the planet earth as it was eons ago. Then appeared large creatures with pterodactyl-like wings which were fleeing from something out in space and showed me how they had created life on the planet in order to hide within the multitudinous forms. He then witnessed the unfolding of plant and animal speciation learning that the dragon-like creatures were inside all forms of life. These revelations alternated with visions of the floating galley which had almost taken my soul on board. With an unimaginable last effort, I barely managed to utter one word: "Medicine!" I saw them rushing around to make an antidote which eased my condition but did not prevent me from having many additional visions. Finally I slept. Rays of light were piercing the holes in the palm-thatched roof when I awoke. I was surprised to discover that I felt refreshed and peaceful' (Harner 1980).

In South America, there are two widespread movements supporting the spiritual and therapeutic use of ayahuasca which have also initiated world-wide interest (see [section 2](#)), the Union Vegetale and Santo Daime, a syncretic movement combining Catholicism with indigenous beliefs centred on the use of ayahuasca for personal spiritual and religious insight. *"Within traditional religious settings, often individuals are required to accept what the religious authorities tell them to accept. In new religious forms, in new spiritualities, such as Santo Daime, the individual is absolutely central to forming the religious beliefs that the individual holds."* (Dr Andrew Dawson)

I have travelled personally to the sources of the natural psychedelics, having been twice to the Amazon to take ayahuasca, having taken peyote, both with the Native American Church and on Wirikuta, the sacred mountain of the Huichol. I have spent much of my life in a psychic symbiosis with sacred plants and fungi, particularly sacred mushrooms and in the scientific discovery of *Psilocybe aucklandii*.

Michael Pollen, in “How to Change Your Mind” (2018) has given an insightful current account of the state of psychedelic research and therapy, including several personal accounts of taking sacred mushrooms, ayahuasca, LSD and bufotenine, which give indicative first-time experiences of a novice under these agents.

Incarnate Existence

Complementarity is a Tao.
Reality is a Tantra.

As body is to mind,
as nature is to experience,
as universe is to consciousness
so particle is to wave,
fermion is to boson,
matter is to light,
sperm is to egg,
male is to female,
time is to space,
past is to futures,
consistency is to paradox,
order is to chaos,
defection is to cooperation.

A prisoners' dilemma
in the bundle of life,
which can be known
and unravelled
only by being.

Natty Dread and Planetary Redemption ⁶⁰

Christianity's Apocalyptic Tragedy and the Immortal Tree of Life

For Elaine Pagels, in memory of Vibia Perpetua

Chris King 13-6-21

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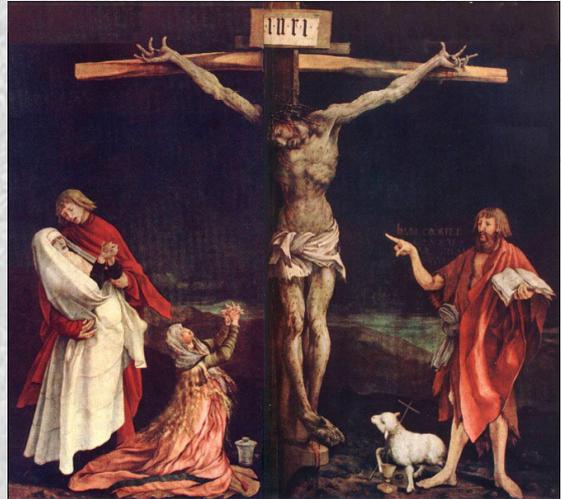


Fig 208: Crucifixion, Mathias Grunwald

1. The Scope of the Crisis

Christianity presents a unique threat to world futures by the misleading portrayal of Jesus as a miraculous supernatural "Son of God", in conflict both with any credible cosmological account of existence and not least with the core principles of Monotheism. The other monotheistic religions also have a scorched-Earth eschatology ⁶¹, amid violence, particularly to women (Schwartz 1996), in conflict with our primary cosmological responsibility as a sexual species to ensure the diversity of conscious life survives. The Christian canonical account undermines the capacity of humankind to fathom what kind of universe, or existential cosmos we are actually living in and threatens humanity's ability to survive and flourish in evolutionary time scales without lethal misadventure. It is a cargo cult illusion threatening ours and the living planet's living future, through a direct conflict of belief with reality, promoted by miraculous fallacy.



Fig 209: Akkadian "Temptation seal": The man, the woman, the tree of life and the serpent (2200 BCE).

When the priestly author wrote Genesis 1, claiming the 'Elohim said "*Let there be light and there was Light*", creating heaven and Earth out of *tohu va vohu*, casting the plants as created before the Sun and Moon, and making humanity male and female in "our" likeness, we know that black holes and galaxies had

been forming long before, and that neutrinos were flashing through the Earth unnoticed. We now know that all people alive and present at the time, were composed of quarks and leptons grouped in baryons, nuclei, atoms, molecules, organelles, cells and organs, with DNA, RNA and proteins coursing through their veins and permeating their tissues. That they/we were not created from clay or breath, but develop naturally from the fertilisation of egg and sperm. This is not materialism speaking, it is cosmology. Genesis is not the oldest book in the Torah, but is a more recent addition.

And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so. ... And the evening and the morning were the third day.

And God made two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also. ... And the evening and the morning were the fourth day.

⁶⁰ This article and the complementary one "Natural Entheogens and Cosmological Symbiosis: Solving the Central Enigma of Existential Cosmology" were co-conceived out of a quantum change experience. Taken together they inform a sacramental paradigm shift towards planetary survival.

⁶¹ *eschatology* the part of theology concerned with death, judgement, and the final destiny of the soul and of humankind. Greek *eskhatos* 'last' + -logy.

And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.

The word subdue is the Hebrew verb *kavash* meaning to place your foot on the neck of your conquered enemy signifying a submission of the enemy to his defeater. The words "have dominion" (from Latin *dominium*, from *dominus* 'lord, master') are the Hebrew verb *radah* meaning to rule by going down and walking among the subjects as a benevolent leader.

We can accept the priestly Sabbatical Creation as a beautiful allegory based on the understanding available at the time, even though the Yahwistic account in the Garden of Eden is a punitive curse on humanity as sexual beings, casting womankind in the role of the "devil's gateway" enduring the pain of childbirth under the rule of her husband and depriving humanity of immortal Paradise, to battle the thistles and thorns in human conflict with nature.

We know from Jeremiah's claims of God's anger and the resulting response of the people, that the religious practices of Jerusalem in the time of the Kings involved diverse forms of worship, including the Goddess by her various names – Inanna/Ishtar, or Asherah the ancient consort of El, and the male god Tammuz/Dumuzi, who, was contemporaneously spurned by Gilgamesh for her excesses (Mark 2011). But we also at once know the people at the time were using *Saccharomyces cerevisiae*, a eucaryote yeast, to make their bread and wine, which a couple of billion years before had arisen from a pivotal symbiosis between an Asgard archaean and a proteobacterium, as we all have. Again this is not materialism, but nature speaking.

Jer 7:17 "Seest thou not what they do in the cities of Judah and in the streets of Jerusalem? The children gather wood, and the fathers kindle the fire, and the women knead their dough, to make cakes to the queen of heaven, and to pour out drink offerings unto other gods, that they may provoke me to anger"

Jer 44:17 "But we will certainly do whatsoever thing goeth forth out of our own mouth, to burn incense unto the queen of heaven, and to pour out drink offerings unto her, as we have done, we, and our fathers, our kings, and our princes, in the cities of Judah, and in the streets of Jerusalem: for then had we plenty of victuals, and were well, and saw no evil. But since we left off to burn incense to the queen of heaven, and to pour out drink offerings unto her, we have wanted all things, and have been consumed by the sword and by the famine."

Psalm 82's confession of polytheism likewise shows this diversity:

"God standeth in the congregation of the mighty; he judgeth among the gods ... I have said, Ye are gods; and all of you are children of the most High ... But ye shall die like men, and fall like one of the princes."

History in both the Old and New Testaments is perceived through a glass darkly, in Paul's own words, distorted by the political bias and religious imperatives of the redactors. The diversity of worship described in Jeremiah in the time of the Kings comes to us through the Yahwistic gloss of the exilic authors in Babylon, sharpened by Zoroastrian apocalyptic ideas, replacing the Hebrew notion of Sheol with a future purification by fire in the end of days, leading to the stark contrast of Heaven and Hell. This originated from the time Cyrus allowed the Jews in exile to return to Israel, where they instituted a more fundamentalistic paradigm, ordering the men of Israel to forsake their gentile wives:

"And Shechaniah ... answered and said unto Ezra, We have trespassed against our God, and have taken strange wives of the people of the land: yet now there is hope in Israel concerning this thing. Now therefore let us make a covenant with our God to put away all the wives, and such as are born of them, according to the counsel of my lord, and of those that tremble at the commandment of our God; and let it be done according to the law" (Ezra 10:2).

Life in Israel up to this point had been culturally diverse. Free worship in the tabernacles from ancient times had been supplanted only a few years before the Babylonian annexation, by Jerusalem-centred worship, by the youthful Josiah. As Wikipedia puts it: "Between the 10th century BCE and the beginning of their exile in 586 BCE, polytheism was normal throughout Israel. It was only after the exile that worship of Yahweh alone became established, and possibly only as late as the time of the Maccabees (2nd century BCE) that monotheism became universal among the Jews".

Likewise, we know Christian history is a distorted tale, firstly of the supplanting of the original following of Yeshua by born again Pauline revisionism under threat of the *anathema maranatha* despite Paul having no direct knowledge of the events, or the key character involved, and then by the orthodox victors who suppressed the Valentinian gnostics and many others, causing the Nag Hammadi texts to be buried in jars until the 20th century, just as later developments like the Nicene creed and the Trinity also constitute confabulations of Yeshua's mission.

2. A Cross-Cultural Perspective

To be fully understood, Yeshua's apocalyptic journey of redemption thus has to be seen in its context. Israel was in a state of flux, effectively ruled by the Romans, with the Sanhedrin Sadducees and the tetrarchs holding high office, Pharisees spread through the smaller towns and more extreme sects such as the Essenes in desert retreats. By contrast, the Edomite Kingdom of Nabatea which emerged around 300 BCE, was in its cultural prime and was an autonomous state, reaping rich commercial gains as the artery through which trade coursed from the East to and from Europe via Gaza. Edom was a nominally Arab culture whose original female deities, al-Lat, al-Uzza and Manat who continued to be worshipped in Mecca up to the time of Muhammad, along with Dhushara the Lord of Seir. Gen 32:3 *"And Jacob sent messengers before him to Esau his brother unto the land of Seir, the country of Edom"*.

In the wake of Alexander cutting a military swathe across the Near East and the ensuing Seleucid empire, these deities were imbued with Greek personae as can be seen in the architectural forms of Nabatean deities, where the female deities took on Greek forms like Tyche and Dhushara became a Dionysian deity whose tragic mask had the power to confer immortal life.

Israel, Nabatea and surrounding lands all spoke the Aramaic language of Syria. This was the language of Yeshua in Galilee and this was the language of the Nabateans. Galilean Aramaic is noted in Peter's exposure: *"And a little after, they that stood by said again to Peter, Surely thou art one of them: for thou art a Galilaean, and thy speech agreeth thereto."* (Mark 14:11) Deuteronomy notes of Jacob *"A wandering Aramaean was my father"*. The word Aram goes right back to the Mari texts of the twelfth century BCE. The whole area around Israel was in a state of inter-communication through commerce and a common language. The rulers of Nabatea and the Herodian dynasty closely intermarried. There was a Jewish population scattered throughout and on all sides diverse beliefs. Nabatea held its own celebrations and religious festivals *"on every high hill and under every green tree"* as the Jewish curse against the nations goes.

Yeshua's mission was invoked when John the Baptist cursed Herodias, accusing Herod Antipas of taking the wife of his brother Herod II (Philip) in contradiction to Hebrew law. Lev 18:16 *"Thou shalt not uncover the nakedness of thy brother's wife: it is thy brother's nakedness."* Josephus and Mark both recount aspects of this event. Herod asked Salome the daughter of Herodias to dance (the seven-veils descent ⁶²) in front of his generals at Macherus on the Nabatean border to their pleasure:

*And when a convenient day was come, that Herod on his birthday made a supper to his lords, high captains, and chief estates of Galilee; And when the daughter of the said Herodias came in, and danced, and pleased Herod and them that sat with him, the king said unto the damsel, Ask of me whatsoever thou wilt, and I will give it thee. And he sware unto her, **Whatsoever thou shalt ask of me, I will give it thee, unto the half of my kingdom.** And she went forth, and said unto her mother, What shall I ask? And she said, The head of John the Baptist. And she came in straightway with haste unto the king, and asked, saying, I will that thou give me by and by in a charger the head of John the Baptist (Mark 6:21-25).*

But this was no ordinary occasion and it's about a lot more than the morality of divorce and was in fact exposing a mortal threat to Herod. It is likely that Herod's high captains were present because Herod had sent his previous wife the Nabatean princess royal Phasaelis, daughter of Aretas IV, fleeing in fear of her life. Josephus notes:

About this time Aretas, the king of the Arabian city Petra, and Herod Antipas had a quarrel. Herod the tetrarch had married the daughter of Aretas [called Phasaelis], and had lived with her a great while. But when he was once at Rome, he lodged with Herod [Philip], who was his brother indeed, but not by the same mother (this Herod was the son of the high priest Simon's daughter). Here, he fell in love with Herodias, this other Herod's wife, who was the daughter of Aristobulus their brother, and the sister of Agrippa the Great. Antipas ventured to talk to her about a marriage between them; when she admitted, an agreement was made for her to change her habitation, and come to him as soon as he should return from Rome: one article of this marriage also was that he should divorce Aretas' daughter. So Antipas made this agreement and returned home again. But his wife had discovered the agreement he had made before he had been able to tell her about it. She asked him to send her to Machaerus, which is a place in the borders of the dominions of Aretas and Herod, without informing him of her intentions. So, Herod sent her thither, unaware that his wife had perceived something. Earlier, she had sent to Machaerus, and all things necessary for her journey were made already prepared for her by a general of Aretas' army. Consequently, she soon arrived in Arabia, under the conduct of several generals, who carried her from one to another successively. She met her father, and told him of Herod's intentions. So Aretas made this the first occasion of the

⁶² Inanna the Queen of Heaven's descent into Hell, stripped one by one of her seven veils, by the Galla of her sister Ereshkigal's domain of Hell, before returning to let them sacrifice her beloved husband and partner Dumuzi for usurping the sovereign's powers in her absence, only to have him resurrected and sacrificed seasonally as a God of fertility.

enmity between him and Herod, who had also some quarrel with him about their limits near Gamala. So both sides raised armies, prepared for war, and sent their generals to fight.

Aretas, who figures as joint ruler with Queen Shaliqat on coinage, then invaded and defeated Herod with the military help of Herod's other brother Philip, attesting to the cooperation between the Herodian and Nabatean dynasties. The name Phasaelis was also the name of Phasael, Herod the Great's brother, himself born in the Hasmonean Kingdom to a Jewish aristocratic family of Edomite descent. What this goes to show is how interpenetrating the affairs of Israel and Nabatea actually were, despite their contrasting religious traditions and how Yeshua came to replace John when he was effectively sacrificed in the Inanna's descent (Wolkenstein & Kramer 1987).

Note that, according to Mark's account, Herod swore unto Salome "Whatsoever thou shalt ask of me, I will give it thee, unto the half of my kingdom," echoing the sacrificial ending of the Book of Esther ⁶³. In return, completing Inanna-Ishtar's descent, Herodias, through Salome's dance, demanded John's head on a plate, completing the sacrificial descent of Dumuzi-Tammuz.

Fig 210: (Left) Aretas IV and Queen Shaliqat jointly on the Nabatean coinage. (Right) Aubrey Beardsley for Oscar Wilde's "Salome".

Josephus again notes: *When they joined battle, Herod's army was completely destroyed by the treachery of some fugitives, who, though they were from the tetrarchy of Philip, had joined Aretas' army. So Herod wrote about these affairs to the emperor Tiberius, who became very angry at the attempt made by Aretas, and wrote to Lucius Vitellius, the governor of Syria, to make war upon him, and either to take him alive and bring him to him in bonds, or to kill him and send him his head. This was the charge that Tiberius gave to the governor of Syria.*



However Tiberius then died and the order against Aretas was never carried out.

The apocalyptic mission is thus portrayed in the Christian gospels as having passed through sacrifice to John's baptised successor Yeshua. Luke 7:19 "And John calling unto him two of his disciples sent them to Jesus, saying, Art thou he that should come? or look we for another?" Mark 6:16 "But when Herod heard thereof, he said, It is John, whom I beheaded: he is risen from the dead". John makes this even more explicit: 3:28 "Ye yourselves bear me witness, that I said, I am not the Christ, but that I am sent before him. He that hath the bride is the bridegroom: but the friend of the

⁶³ Esther (Ishtar), the beautiful Jewish wife of the Persian king Ahasuerus (Xerxes I), and her cousin Mordecai (Marduk), persuade the king to retract an order for the general annihilation of Jews throughout the empire. The massacre had been plotted by the king's chief minister, Haman, and the date decided by casting lots (purim). Instead, Haman was hanged on the gallows he built for Mordecai. When word of the planned massacre reached Esther, beloved Jewish queen of Ahasuerus and adopted daughter of Mordecai, risked her life by going uninvited to the king to suggest a banquet that Haman would attend. — *Now it came to pass on the third day, that Esther put on her royal apparel, and stood in the inner court of the king's house, over against the king's house: and the king sat upon his royal throne in the royal house, over against the gate of the house. And it was so, when the king saw Esther the queen standing in the court, that she obtained favour in his sight: and the king held out to Esther the golden sceptre that was in his hand. So Esther drew near, and touched the top of the sceptre. Then said the king unto her, What wilt thou, queen Esther? and what is thy request? it shall be even given thee to the half of the kingdom. And the king said unto Esther at the banquet of wine, **What is thy petition? and it shall be granted thee: and what is thy request? even to the half of the kingdom it shall be performed.** Then answered Esther, and said, My petition and my request is; If I have found favour in the sight of the king, and if it please the king to grant my petition, and to perform my request, let the king and Haman come to the banquet that I shall prepare for them, and I will do to morrow as the king hath said. Then Esther the queen answered and said, If I have found favour in thy sight, O king, and if it please the king, let my life be given me at my petition, and my people at my request: For we are sold, I and my people, to be destroyed, to be slain, and to perish. Then the king Ahasuerus answered and said unto Esther the queen, Who is he, and where is he, that durst presume in his heart to do so? And Esther said, The adversary and enemy is this wicked Haman. Then Haman was afraid before the king and the queen. And the king arising from the banquet of wine in his wrath went into the palace garden: and Haman stood up to make request for his life to Esther the queen; for he saw that there was evil determined against him by the king. Then the king returned out of the palace garden into the place of the banquet of wine; and Haman was fallen upon the bed whereon Esther was. Then said the king, Will he force the queen also before me in the house? As the word went out of king's mouth, they covered Haman's face. And Harbonah, one of the chamberlains, said before the king, Behold also, the gallows fifty cubits high, which Haman had made for Mordecai, who spoken good for the king, standeth in the house of Haman. Then the king said, Hang him thereon. So they hanged Haman on the gallows that he had prepared for Mordecai.*

bridegroom, which standeth and heareth him, rejoiceth greatly because of the bridegroom's voice: this my joy therefore is fulfilled”.

However it remains historically unclear whether the Baptist intended this succession, as he was beheaded.

Luke has John state emphatically the Yeshua is the Christ “And as the people were in expectation, and all men mused in their hearts of John, whether he were the Christ, or not; John answered, saying unto them all, I indeed baptize you with water; but one mightier than I cometh, the latchet of whose shoes I am not worthy to unloose: he shall baptize you with the Holy Ghost and with fire: Whose fan is in his hand, and he will thoroughly purge his floor, and will gather the wheat into his garner; but the chaff he will burn with fire unquenchable.” But the winnowing fan is characteristic of Tammuz and Dionysus the dying gods of bread and wine who are combined in the two substances of the eucharist.

To understand his mission and how Yeshua envisaged it, we have to turn to sources of material documented long after the events, by followers with divergent eschatologies. None of these authors had direct experience of Yeshua’s presence or were present during his mission, so all accounts are hearsay and thus non-evidential. Despite Yeshua’s miracles forming a key part of his ministry in the gospels, modern biblical scholars are almost universal in their scepticism of these accounts, although they form the central contradiction of Christian beliefs.

One way of understanding these hearsay scriptural accounts is to combine (a) the three synoptic gospels, beginning from Mark (c 66-74 CE), with earlier dates largely discredited. It is complemented by the proposed Quelle sayings source, assigning John and Revelation to be later (90-100 CE), historically less reliable and in conflict with the synoptics, with (b) the Gospel of Thomas (c 60-120 CE), forming a counterpoint, underpinned by material from other Nag Hammadi texts, (c) the relevant Talmud entries and (d) the works of Flavius Josephus, excepting the Christian redactions concerning Yeshua (Wilson I 1996) Matthew and Luke/Acts are roughly contemporaneous and around half a century after Yeshua’s death and well after the siege of Jerusalem. Most scholars believe Matthew was composed between AD 80 and 90. The most probable date for Luke’s composition, along with Acts is around AD 80–110. Revelation is commonly dated to about 95 AD. The fact that Acts is deeply embedded in the Pauline ‘heresy’ to convert Yeshua’s mission to a new gentile religion, their accounts of Yeshua have to be seen as highly coloured and thus of similar questionability to the Gnostic texts, with the exception of the Gospel of Thomas, which is a collection of source sayings, and particularly in terms of their retrospective apocalyptic emphasis in the light of the Fall of Jerusalem.

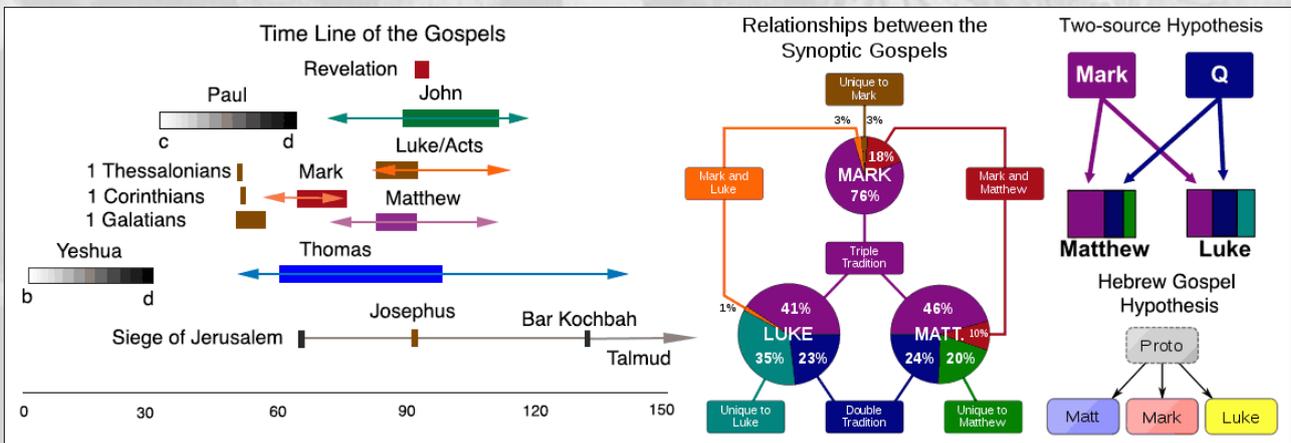


Fig 211: Time line of the gospels. The Pauline epistles are at least 20 years after Yeshua’s crucifixion, but before the Fall of Jerusalem. The four canonical gospels and Revelation are all after the Fall, consistent with their apocalyptic stance. The three synoptics have both commonalities and differences. Matthew and Luke are believed to have derived from Mark and the Q (*quelle* = other) source. The hypothesis of a Hebrew rather than Greek origin, deriving from Papias of Hierapolis, 125–150 CE ⁶⁴ has been largely discredited. This time line raises major uncertainties about the origin of Christianity and how much of what is in the synoptic gospels is Yeshua’s own world view rather than that of Pauline Christianity. Paul began his epistles in AD 49-50 17 years after Yeshua’s death and Mark was written close to 70 AD, another 20 years later. The key question to ask is how much of the Hellenistic world view and events in the synoptics, which are essential to establishing the dying saviour role of Son of God did Yeshua conceive?

The dating of the Gospel of Thomas remains controversial. Broadly speaking, the early camp includes scholars of gnosticism such as Elaine Pagels (2003), Marvin Meyer (2005,7) and April DeConick (2006,7), while the late camp tends

⁶⁴ “Matthew collected the *logia* in the Hebrew dialect and each one interpreted them as best he could.”

to include ordained priests such as John P. Meier and Joshua R. Porter, and professed evangelicals such as Bart D. Ehrman and Craig A. Evans. This highlights the political rather than historical basis of the late camp position.

Evidence for an early origin comes from a number of known parables, including Thomas 8, 9, 31, 57, 63, 64 and 65 where the Thomas version underlies the canonical versions. Thomas 17 modifies Paul's statement in 1 Corinthians 2:9 (53–54 CE), echoing Isaiah 64:4. The episode in John about the doubting Thomas, with the former attempting to discredit the latter, in the passage about Thomas not fully recognising Yeshua's divinity, disclaims Thomas-13's gnostic view in favour of his own, implying Thomas was in existence when John was compiled. In the same vein Thomas 13, criticising both Peter and Matthew's views of Yeshua, hints at an early stage, when the gospel writers were all vying in their points of view, before the authority of the canonical writers had become established. In Thomas 12, Yeshua refers to James the Just, consistent with Galatians 2:1-14, which most scholars date to 50-60 CE. Sayings 6, 14 and 104 also echo opposition to Jewish traditions, regarding circumcision and fasting against consistent with Galatians. Although the gospel of Thomas states "*These are the secret sayings which the living Jesus spoke and which Didymos Judas Thomas wrote down*" where *didymos* means "twin" the Thomas sayings 55, 99 and 101 express clear opposition to a family tradition of the desposyni, in contrast with later gnostic texts where the family tradition is emphasised in Thomas being Yeshua's twin brother. Likewise the reference to James in Thomas 12 does not specify that James is the brother.

The late camp tend to interpret the sayings as mid-second century conflation of canonical gospel statements combined with some additional inauthentic or authentic older sayings. For example Thomas 5 "*Recognize what is in your sight, and that which is hidden from you will become plain to you. For there is nothing hidden which will not become manifest.*" is claimed to echo Luke 8:17, and 10 "*I have cast fire upon the world, and see, I am guarding it until it blazes.*" is claimed to echo Luke 12:49. This reading seems incorrect as the two slants have opposing implications and the Thomas passage is more consistent in its conception. Thomas 16, in which dissension is cast upon the earth is claimed to conflate Luke 12:51-2 and Matt 10:34-5. The difficulty here is that these Thomas sayings could be from an older text. Both these passages are assigned to be from Q. This claim is compounded by the claim that in the Oxyrhynchus Greek passages, 5 uses the language of Luke rather than Mark, but arguing from one passage believed to have been written down around 200 CE, this is not conclusive, especially given the lack of agreement about the original language in which Thomas was written (Coptic, Greek or Syriac). Other arguments centre around the supposed similarity to Syriac compilations of the canonical gospels and the lack of apocalyptic content in Thomas in favour of gnostic realisation that the kingdom is in the mind, but the former is contested and the latter is self-fulfilling orthodox rationalisation, because Thomas's view clearly differs from orthodox beliefs in the apocalyptic destiny of Christianity.

Elaine Pagels (2012) also notes the antagonism between John and Paul expressed by each in the Epistles and the Euangélion, with John adhering to more orthodox practices on food and sex and Paul becoming the catalyst for a new religion, usurping and violating Jewish practices.

The Nag Hammadi texts, although diverse and apocryphal accounts, most of which are historically much later, can be given some comparable weighting to the Pauline works, as both are derived by followers who did not actually meet Yeshua and were not present during his mission. This is the only unbiased way to give an investigative balance to the question of Yeshua's actual mission, as opposed to the Christian religious canon, on the basis that checking both sides, of the story, orthodox and gnostic, helps uncover the inconsistencies between them. This approach is again not materialistic, because the gnostic wing of the scripture is both the most spiritually diverse and fantastic and offsets the Pauline works as equally the product of an imaginative rewriting of Yeshua's mission in the eyes of the beholder.

It is clear that, whatever his strengths or weaknesses, Yeshua was a brilliant transformative innovator, with an unparalleled insight into the spiritual zeitgeist, a literal Einstein of the existential crisis of his time, who embraced the true meaning of apocalypse, to throw the covers of reality, by bridging the full scope of the extant traditions, both to redeem the lost sheep of Israel and to fulfil the expectations of the wider backdrop of fertility worship of the nations, leading to Christianity becoming a world religion through its popularity among the gentiles. That said, one can also fairly claim, unlike some docetic gnostic texts that, whatever else may have subsequently happened, Yeshua the man had human DNA and was composed of molecules and cells, consistent with the natural world as we have now discovered it to be, given that his mission took place only once he became around 30 years of age. Again this is not reductionism speaking, it is evidential realism.

3. Forcing the Kingdom of God

The scope of Yeshua's mission goes far beyond Essene ideas of the end of days and constitutes a forcible challenge to bring on the Kingdom of the Father, ostensibly in three days, through a sacrificial confrontation, in which the forces of dark and light are brought into violent conflict, in the persona of Yeshua as the baptised Son of God. The span of Yeshua's mission thus becomes that of a messiah fomenting controversy and chaos focussed on the corruption of Jerusalem, leading to the tragic enactment of the Crucifixion.

This has been portrayed in the Christian account as a sacrificial act, in which God's only begotten son has to die, so that humanity fatally flawed by being infected with the original sin of the serpent can live, provided they believe in him, but otherwise they will burn in hell fire as unredeemed sinners. But whence the origin of this peculiarly pagan sacrificial idea? Why does the God of Creation require his only begotten son to be killed? It is also completely unclear why attacking only certain factors of society deemed to be corrupt serves this purpose. To redeem the sins of the world would require taking on the entire burden of sin, both in the strong rulers and in the weak. Why does inducing a frenzied level of conflict against the authorities in the enactment of a tragedy leading to his own death serve the purpose of defeating sin as a whole? Why is this necessary, or even helpful cosmologically? Isn't it just manufacturing a cosmic war to institute evil as the supreme enemy of God when no such enemy exists?

This conceives a universe entirely inconsistent with the universe as we now know it to be. If God created the universe as we now know it, "He" created the black holes, galaxies, and the four forces of nature and their underlying symmetries and symmetry-breakings necessary for the complexity of the universe to emerge. He also therefore created the physical circumstances in which life can evolve and become conscious. Social morality is not the driving force of the natural world, but a product of it, and climax diversity arises from adventitious mutation, a balance between predators and prey and parasites and hosts, amid a counterpoint between competition and cooperation, in which symbiosis in a dynamic at the edge of chaos has been pivotal. Humanity could not come to exist unless these processes of complexification had been able to play out unhindered. Morality is not a prime motivating force, but a product of complex animal societies that arises naturally, because reduction of internal strife makes a species, or society, more resilient against external competition (Alexander 1987).

There is thus no way that, if a God, or "The" God, created the natural universe, that the appeal of Yeshua to create a religious suicide bomb to blow apart the presumptions of a corrupt and sinful generation, would abruptly, in three days, or in the same generation, bring on the Kingdom in power, by annihilation of a physical universe of 13 billion years stable existence, necessary for conscious life to be able to emerge and evolve.

Not less, there is and can be no credibility to the notion, of purely diabolical proportions, that God the Father would send his pre-existent only begotten divine son into the world as a human being to curse the sins of a corrupt generation and in a preconceived cosmic war between good and evil would commit his Son to be sacrificed to forgive mankind for their sins, while at the same time returning in the same generation in a terminal Day of Judgment as an avenging Lord to judge all for their sins, destroy the natural universe and create a new Jerusalem in the sky, with himself posing as the "Lamb of God" in its very centre. This by its very conception is the core of evil manifest in notions of divinity. There can be no credibility to any such ill conceived notion perpetuated for 2000 years on the cannibalistic notion of consuming the flesh and blood of the saviour or we have no life within us.

4. The Messiah of Light and Dark

What is clear throughout the canonical gospels is that Yeshua's mission, as conceived by the Evangelists, has two complementary and yet discordant themes, leading to inevitable catastrophe.

A. The light side provides the wisdom for which Yeshua is renowned, composed of astute sayings, particularly those which stress compassion. To fully understand the breadth and scope of these it is essential to also consider the contrapuntal sayings of the Gospel of Thomas, which are pivotal in gaining a true perspective.

A key example of the astute sayings is Yeshua's golden rule, which is an inversion of Hillel's earlier (110 BCE – 10 CE) silver rule: "*That which is hateful to you, do not do to your fellow. That is the whole Torah; the rest is the explanation; go and learn*", which Yeshua inverted: Matt 7:12 "*Therefore all things whatsoever ye would that men should do to you, do ye even so to them: for this is the law and the prophets*".

One can immediately see that Yeshua's statement is derived from Hillel's, complete with the trailing "law and prophets" repeating Hillel's "torah". It is also notable that Hillel's statement was prefigured 500 years before by Confucius: "*Never impose on others what you would not choose for yourself*". This gets to the quick of the issue. Both Hillel and Confucius are stating an ethic of avoiding bad acts, respecting the autonomy of others, but Yeshua is going further, invoking active intervention ostensibly for the good. While this may seem beneficial, there is a pitfall demonstrated throughout history. What if the other person or social group doesn't want you to do to them what you would like them to do to you? If a large group of people want a conservative society of a certain kind for themselves, even for their own protection, does this mean it is reasonable for them to pass restrictive laws to enforce it on a diverse society, or is mutual tolerance of differences essential for humanity and for nature to flower? If I want you to have sex with me, is it reasonable for me to proactively have sex with you? The answer is no.

The Sermon on the Mount goes further than mere cooperation and invokes actively rewarding ones enemies twofold:

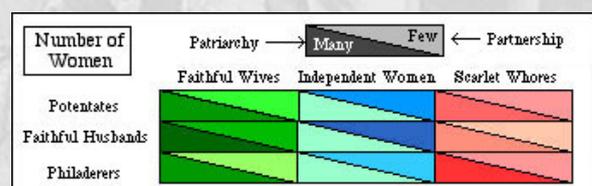
Matt 5:38 "*Ye have heard that it hath been said, An eye for an eye, and a tooth for a tooth: But I say unto you, That ye resist not evil: but whosoever shall smite thee on thy right cheek, turn to him the other also. And if any man will sue thee at the law, and take away thy coat, let him have thy cloak also. And whosoever shall compel thee to go a mile, go with him twain ... Ye have heard that it hath been said, Thou shalt love thy neighbour, and hate thine enemy. But I say unto you, Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you, and persecute you*".

The central question here is this: Are we invoking a paradigm of natural survival in perpetuity, or one in which all care is cast to the winds, because our rewards are in eternal life in Heaven and not on this Earth? Christians extol these passages as pivotal to Yeshua's compassionate teachings, in contrast to the narrower, more punitive "eye for and eye" of Old Testament teachings, but they are unsustainable in the natural world of living survival.

These questions pivot around the prisoners' dilemma of tragic temptation universal to the complementation of cooperation and defection, and hence good and evil. Two prisoners are arrested for a crime. If they cooperate and remain silent they will receive a moderate sentence, but if one betrays the other the one cooperating with the prosecution may get off altogether and the other will go down severely. But this can lead to temptation and both defecting, so they both receive a long punitive sentence. This is the central question around which the ethics revolves and it is also illustrated in the tragedy of the commons (Hardin 1968), where winner-take-all gains tempt people to exploit the common resource before others do and the entire commons is destroyed, just as humanity is doing to the planet today.

Elementary evolutionary prisoners' dilemma game theory (Fielder & King 2004 [D](#)) has established that both **tit-for-tat** – doing to others what they last did to you and **win-stay lose-shift** – switching between cooperation and defection depending on how the payoffs of the last round worked out, out-survive both systematic **cooperation** and systematic **defection**. However tit-for-tat strategies can lead to endless rounds of retaliation characteristic of clan hostilities. Marcus Frean (1994) established a middle ground between eye-for-an-eye and turn-the-other-cheek, called **firm-but-fair**. This is a form of tit-for-tat that turns the other cheek about a third of the time and leads to the firm-but-fair population reaching 98% of the whole, when each party can make their response asynchronously. Always cooperate is a suckers game, which can be invoked only when we have the out of a quick exit to Heaven, in fear of Hell, otherwise it is cumulative suicide. Social dynamics is a prisoners' dilemma between cooperation and defection generalised into order and chaos, in which both sides have essential roles. Violent criminal defection is harmful, while movements opposing oppression by people in power are essential. Complex societies thus involve an equilibrium of cooperation and defection. Again, this is not materialism speaking, but the ethics of constructive diplomacy, to protect the whole for the future of all and the survival of human life and nature.

Fig 212: Prisoners' dilemma of the patriarchs – patriarchal oppression inhibits independent women but cooperating faithful wives and defecting whores can flourish overtly and covertly. Rarity is precious, preventing extinction. A single scarlet woman in a country of faithful wives can claim any man she pleases. A single faithful maiden in a society of loose women may claim the king's hand in marriage.



The Sermon on the Mount also has a strong current of having no care for even moderate self protection of one's own life. Matt 6:25 "*Therefore I say unto you, Take no thought for your life, what ye shall eat, or what ye shall drink; nor yet for your body, what ye shall put on. Is not the life more than meat, and the body than raiment?*"

Nor is there any thought for the future, nor the future of life: Matt 6:34 *“Take therefore no thought for the morrow: for the morrow shall take thought for the things of itself. Sufficient unto the day is the evil thereof.”*

The sayings on the mount are thus being made in a context where no thought needs to be given for survival because of the immanent Kingdom of God in Heaven and the much more dire consequences of being thrown into Hell.

These positive sayings are also mixed with destructive sayings: Matt 5:29 *“And if thy right eye offend thee, pluck it out, and cast it from thee: for it is profitable for thee that one of thy members should perish, and not that thy whole body should be cast into hell. And if thy right hand offend thee, cut it off, and cast it from thee: for it is profitable for thee that one of thy members should perish, and not that thy whole body should be cast into hell”.*

This generosity does not apply to anything except the material: Matt 7:6 *“Give not that which is holy unto the dogs, neither cast ye your pearls before swine, lest they trample them under their feet, and turn again and rend you.”*

It is wonderful that Yeshua considers the lilies of the field, who “toil not” as plants, to be more beautiful than Solomon in all his glory, but the rains fall on good and bad people alike because that is how nature works. The fowls of the air are not fed by God’s grain. The hawks are also part of nature, as are the lion, and all carnivores. Climax life requires an interplay of cooperation and defection. Carnivores’ tooth and claw killings ensure the herbivores don’t become extinct by eating all the plants. Even parasitic diseases end up playing a role in the evolutionary process. Sexuality and hence all complex life has arisen from a Red Queen race between parasites and hosts, in which the endless variations of sexual individuals avoid a pandemic that would wipe out a non-sexual species. Hence individual mortality arises from sexuality and we could not have evolved as humans, or be alive without sexuality and hence the mortal coil.

Yeshua also intimates that any sexual feelings are against the law. Matt 5:28 *“But I say unto you, That whosoever looketh on a woman to lust ⁶⁵ after her hath committed adultery with her already in his heart”.* In a sense anyone who looks on a woman with lust is committing adultery, but as long as they don’t act upon it without the consent of the other, that is an essential manifestation of the natural fertility of sexuality, through which all human beings on this planet have come to exist. Lust is natural and fertility incarnate. It is sexual exploitation that is an evil.

B. The dark side, all the more ominous because it would ultimately lead to Yeshua’s crucifixion, stands out as completely alien to the Hebrew prophetic tradition, claiming to perform nature miracles walking on water and calming the storms on Galilee, bringing people back from the dead, and other actions causing him to be typecast by the scribes as “Baal Zebul” the Lord of Flies, when he cured a man by mere sleight of hand, rather than the traditional methods of faith healing at the time. Yeshua’s response was incendiary, claiming that the scribes were cursing themselves because the devil can’t cast our devils.

Some “miracles” were outright grotesque: After exorcising the legion of spirits of a madman, Yeshua drives a helpless herd of pigs into the lake to drown: Luke 5:13 *“And forthwith Jesus gave them leave. And the unclean spirits went out, and entered into the swine: and the herd ran violently down a steep place into the sea, (they were about two thousand;) and were choked in the sea”.*

The credibility of the miracles wanes in the presence of more familiar company of people rather than excited superstitious crowds seeking faith healing, as noted in Nazareth Mark 6:4:

“A prophet is not without honour, but in his own country, and among his own kin, and in his own house. And he could there do no mighty work, save that he laid his hands upon a few sick folk, and healed them.” Even the disciples did not have confidence in the miracles at least until the wind died on the lake: Mark 6:51 *“And he went up unto them into the ship; and the wind ceased: and they were sore amazed in themselves beyond measure, and wondered. For they considered not the miracle of the loaves: for their heart was hardened.”*

Yeshua’s mission became a three year long enactment of a Dionysian tragedy, just as Dionysian theatre and the three tragedies for one comedy became the cathartic portal in which the lives of men and gods intertwined in ancient Greece, as it remains the nuclear core of all dramatic productions, movies and television series today.

⁶⁵ Matthew’s Greek uses ἐπιθυμέω (epithūméō) to set one’s heart on a thing, desire, covet. Passion has a more benevolent sexual meaning involving infatuation and love, but the Greek πάσχω (páskhō) is “to suffer, to be acted on, to undergo, experience” rather than an act, or desire.

One can have little doubt that controversy and confrontation was anything other than intentional on Yeshua's part, in the light of his first sermon at the synagogue in Nazareth, where despite admitting his own affliction (possibly the lameness mentioned in the Talmud), his incendiary claims caused the people to seek to throw him off the cliffs.

Luke 4:23 *"And he said unto them, Ye will surely say unto me this proverb, Physician, heal thyself: whatsoever we have heard done in Capernaum, do also here in thy country. And he said, Verily I say unto you, No prophet is accepted in his own country. But I tell you of a truth, many widows were in Israel in the days of Elias, when the heaven was shut up three years and six months, when great famine was throughout all the land; But unto none of them was Elias sent, save unto Sarepta, a city of Sidon, unto a woman that was a widow. And many lepers were in Israel in the time of Eliseus the prophet; and none of them was cleansed, saving Naaman the Syrian. And all they in the synagogue, when they heard these things, were filled with wrath, and rose up, and thrust him out of the city, and led him unto the brow of the hill whereon their city was built, that they might cast him down headlong. But he passing through the midst of them went his way".*

Luke's (80–100 CE) description can be taken in one of two ways. A sceptic would say this is a contrivance of the Christian forefathers, calculated to destine Yeshua's mission as being at the outset to the Gentiles rather than Israel, where he will not be accepted and indeed betrayed by the Jews. However, if we accept Luke's account as genuine, then it is Yeshua saying he is opening mission to envelop the gentile religious paradigm from the outset in a clash of the cultures against the existing hierarchy in Israel. This duality extends throughout all the descriptions of Yeshua's mission by all the gospels. Either Yeshua is being misrepresented as forming a bridge to the gentiles by the Christian forefathers to further the Christian interpretation of history as a gentile religion, or Yeshua was himself seeking to form an apocalyptic bridge transcending both the Hebrew religion of the Israelites and the fertility traditions of the nations, when Christianity did not yet exist.

Yeshua's purported miracles fall into three types (a) Healing miracles involving (i) curing sickness, (ii) exorcisms of evil spirits or devils and (iii) three resurrections; (b) Procedural "miracles" in which loaves loaves and fishes are shared among a large congregation in much the manner of a communion wafer; and (c) nature miracles including water into wine, cursing the fig, driving swine to drown after an exorcism and calming and walking on the waters. Ranke-Heinmann (1992) notes Yeshua disdaining demands for the miraculous *"unless you see signs and wonders, you will nor believe"* (John 4.48). *"Why dies this generation seek a sign? Truly I say to you, no sign shall be given to this generation"* (Mark 8.22). She attributes their occurrence to *"a naive addiction to miracles on the part of the authors of the Gospels and their sources"*, noting Elisha's miracles in 2 Kings (4.34 & 6.18).

Spiritual healings were mainstream activities in an era where spiritual cures were sought given limited medical knowledge. It's thus not simply that crowds seek a faith healer because they heal many people but can be the reverse – they appear to heal many people because crowds gather round them seeking a cure. As Ranke-Heinmann puts it *"Crowds didn't stream towards Jesus because he healed many people; rather, because crowds streamed toward him, he healed many people"*. The pool at Bethesda was famous for healing simply via troubled waters. John 5:4 *"For an angel went down at a certain season into the pool, and troubled the water: whosoever then first after the troubling of the water stepped in was made whole of whatsoever disease he had."* The procedural "miracles" were not fundamentally miraculous but just anticipating the communion rite. However, the nature miracles both set Yeshua completely outside the framework of Hebrew religious principles and are systematically consistent with Dionysian traditions.

Fig 213: The three signs of Christ's manifestation on the Epiphany. Water to wine, the baptism and the Magi. Left: Missal of Odalricus - early 12th century (Lavin). Right: Roman Missal. Lower: Dionysian festival of the Epiphany in Greece.

John begins with Yeshua's first miracle at Cana, where his mother says *"They have no wine."* Yeshua says *"Woman, what have I to do with thee? mine hour is not yet come"*, but Mary tells the servants *"Whatsoever he saith unto you, do it"* and Yeshua says *"Fill the water pots with water."* When they take them to the governor, they are fresh wine. This miracle is likely to be an account derived from a lost earlier source listing miracles, as shortly after casually declaring the son of a nobleman near death to be healed, John notes *"This is again the second miracle that*



Jesus did, when he was come out of Judaea into Galilee" (Bultmann 1962 78).

This raises several issues. Why is Yeshua's mother asking him to perform a miraculous feat over a trivial request for alcohol at a wedding? Doesn't this indicate a family operation in miraculous cures? But the third issue is pivotal. Why is Mary inciting Yeshua to perform a miraculous feat known throughout the Near East as the signature of Dionysus as the god of wine and miraculous altered states?

The word Epiphany from the Greek and means "manifestation," "appearance," or "revelation." ... A festival of Dionysus' Advent was kept on this day in the Aegean and Anatolia. The Christian world has conflated three events, all to Jan 6th, the Magi, John's baptism and Cana.

*We keep this day holy in honour of three miracles:
this day a star led the wise men to the manger, this day water was turned to wine at the marriage feast,
this day Christ chose to be baptised by John in the Jordan, for our salvation, allelu-Yah (Magnificat antiphon)*

In a rural area situated in Greece, in Eastern Macedonia, rituals take place at the Epiphany, that coincide with the Orthodox Christian holiday of the baptism of Christ. The locals see no contradiction between the pagan character of their customs and their Christian context, since these rituals are meant to be "a praise to a fertile and good year", a gesture which in turn "rests on the pillars of fruitfulness and productivity". Dionysus, the god of wine, fertility and theatre, was worshipped in the region. A temple dedicated to Dionysus (4th and 3rd centuries BC) is located at the nearby village Kali Vrissi. The vineyards of Drama surround it on all sides. The region's Dionysian heritage is marked by the annual Twelve-Day (Dodekaimero) celebrations, which culminate every year between January 6 to 8 in the region's villages. Noisy parades are held to herald fertility, during which participants strike large bells to awaken Mother Earth. Lots of dancing to the sound of traditional tunes, played with the gaida (bagpipe) and daire (drum), takes place over three days and three nights at the villages of Monastiraki, Kali Vrissi, Petrousa, Pyrgi and Volakas.

Rudolf Bultmann (1962) puts it this way: *"In fact the motif of the story, the transformation the water into wine is a typical motif of the Dionysus legend, in which this miracle serves to highlight the god's epiphany. And hence it is timed to coincide with the feast of Dionysus, from January 5th to 6th. In the ancient church, this affinity was still understood when ... the 6th of January was taken to be the day that the marriage feast was celebrated at Cana"*. The same Christian cooption of pagan festivals occurred with Easter (Ēostre) and Yuletide/Christmas (Odin, Mithras, Saturnalia), but with the Epiphany, Cana implicates Yeshua in the contrivance.

Uta Ranke-Heinman's (1992) position is clear: *"The 6th January became for Christians, the feast of the power revelation (epiphany) of their God, thereby displacing the feast of Dionysus's epiphany. As Bultman says 'No doubt the story has been borrowed from the pagan legends and transferred to Jesus'. On his feast day Dionysus made empty jars fill up with wine in his temple in Elis; and on the island of Andros, wine instead of water flowed from his spring or temple. Accordingly, the true miracle of the marriage feast at Cana would not be the transformation by Jesus of water in wine, but the transformation of Jesus into a sort of Christian wine god"*.

Yeshua's relationship with his family and his friends became more troubled as his spell-binding approach to the mission evolved. *"After this he went down to Capernaum, he, and his mother, and his brethren, and his disciples: and they continued there not many days"* (John 2:12). *"And when his friends heard of it, they went out to lay hold on him: for they said, He is beside himself."* (Mark: 3:21). *"There came then his brethren and his mother, and, standing without, sent unto him, calling him"*, upon which he replied *"whosoever shall do the will of God, the same is my brother, and my sister, and mother"* (Mark 3:31). *"His brethren therefore said unto him, Depart hence, and go into Judaea, that thy disciples also may see the works that thou doest. For there is no man that doeth any thing in secret, and he himself seeketh to be known openly. If thou do these things, shew thyself to the world. For neither did his brethren believe in him"* (John: 7:3). This is also an indirect swipe against James the Just, mentioned as the leader in Thomas:

'The disciples said to Jesus, "We know that you will depart from us. Who is to be our leader?" Jesus said to them, "Wherever you are, you are to go to James the righteous, for whose sake heaven and earth came into being.' (Thom (12)

Metaphors of the winebibber pervade Yeshua's mission. Luke 7.33 *"For John the Baptist came neither eating bread nor drinking wine; and ye say, He hath a devil. The Son of man is come eating and drinking; and ye say,*

Behold a gluttonous man, and a winebibber, a friend of publicans and sinners! But wisdom is justified of all her children.” Mark 2;18 “And no man putteth new wine into old bottles: else the new wine doth burst the bottles, and the wine is spilled, and the bottles will be marred: but new wine must be put into new bottles.” John 15:1 “I am the true vine, and my Father is the husbandman.”

This enactment of his mission as a destined dramatic tragedy on a catastrophic collision course with the forces of darkness, perceived in both the devil and the Jerusalem authorities, religious and secular, ultimately culminated in a series of ritual events, from the necromancy of Lazarus in John, through the march of the palm king and turning the tables in the temple, resulting in Yeshua’s trial and crucifixion for both insurrection against the Romans and blasphemy against the Hebrew tradition, ostensibly set at nought (i.e. castrated) in the Saturnalia by the Roman guards, and later crucified on the Cross, echoing both Psalm 22 and the Canaanite cry of the death god Mot to El:

“And at the ninth hour Jesus cried with a loud voice, saying, Eloi, Eloi, lama sabachthani? – My God, my God, why hast thou forsaken me?” (Matt 15:34)

This doesn’t mean that Yeshua was posing as Dionysus but that he was bringing together all the spiritual currents extant in the greater Israel and its neighbour nations, and adopted currents of Dionysian magical transformation and fertility worship notions of sacrifice of the sacred king, as well as the apocalyptic expectations of the Jewish eschatology in its Zoroastrian-inspired end of days form. These then form a bridge to a new Heaven and a new Earth.

To imbue prophetic validity to Yeshua’s apocalyptic mission, Christian scriptures attempt to conflate these assumed events with passages from the prophets such as Zechariah, where the foolish shepherd brings about an apocalyptic denouement replete with echoes of Judas’ betrayal:

“And the LORD said unto me, Cast it unto the potter: a goodly price that I was prized at of them. And I took the thirty pieces of silver, and cast them to the potter in the house of the LORD” (Zech 11:13).

But the Christian accounts incorrectly attribute this to Jeremiah and Matthew is in double contradiction with Acts:

*“Then Judas, which had betrayed him, when he saw that he was condemned, repented himself, and brought again the thirty pieces of silver to the chief priests and elders, Saying, I have sinned in that I have betrayed the innocent blood. And they said, What is that to us? see thou to that. And he **cast down the pieces of silver in the temple**, and departed, and **went and hanged himself**. And the chief priests took the silver pieces, and said, It is not lawful for to put them into the treasury, because it is the price of blood. And **they took counsel, and bought with them the potter’s field, to bury strangers in**. Wherefore that field was called, *The field of blood*, unto this day. Then was fulfilled that which was spoken by Jeremy the prophet, saying, And they took the thirty pieces of silver, the price of him that was valued, whom they of the children of Israel did value. And gave them for the potter’s field, as the Lord appointed me” (Matt 27:3).*

*“Men and brethren, this scripture must needs have been fulfilled, which the Holy Ghost by the mouth of David spake before concerning Judas, which was guide to them that took Jesus. For he was numbered with us, and had obtained part of this ministry. Now **this man purchased a field with the reward of iniquity; and falling headlong, he burst asunder in the midst**, and all his bowels gushed out. And it was known unto all the dwellers at Jerusalem; insomuch as that field is called in their proper tongue, *Aceldama*, that is to say, *The field of blood*” (Acts 1:16-19).*

Either these “prophecies” were part of a Dionysian enactment, with Jesus and Judas both complicit, or they are a contrived imputation by later writers, who did not have first hand experience of the mission.

5. The Dionysian Heritage

Evidence from the Mycenaean period shows that Dionysus is one of Greece's oldest attested gods 1400 years before Yeshua. His attribute of "foreignness" as an arriving outsider-god may be inherent and essential to his cults, as he is a god of epiphany, sometimes called "the god that comes". With the advent of viticulture in archaic Greece, Dionysus became a god of transformation, and eternal life. His cult involved bands of married women (*thiasoi* - adherents of a deity) periodically retreating to the mountain forests at night to hold an ecstatic revel rout, where through dances and other rituals they experienced the divinity of Dionysus and the release and liberation he afforded as liber, associated with the orgiastic and ecstatic frenzy of his worshipers, including the *maenads* (“raving ones”) who were said to use nightshade to dilate their pupils to make them 'dolorous' from which nightshade’s name Belladonna (“beautiful lady”) comes. In Athens there was a procession on his feast day, when his image was paraded before the crowd, after which he performed a sacred marriage ritual with the king’s wife.



Fig 214: Dionysian parallels: Simone Martini's "Carrying the Cross" shows Mary Magdalene, her face smitten with streaks of blood following Jesus in despair. "*The watchmen that went about the city found me, they smote me, they wounded me; the keepers of the walls took away my veil from me*" Canticles (5:7). Suggested to be one of several secret codas by medieval artists to support the idea that Mary was Yeshua's lover. The women of Galilee figure as the effective maenads of Yeshua, in supporting him out of their substance, in anointing him for his burial and in watching from far off during the crucifixion and announcing his resurrection. Gospel accounts of Yeshua walking on water and rescuing Peter are prefigured in the story of Dionysus miraculously turning the pirates into dolphins when they jump into the ocean in fear of his miraculous manifestations. Inset: two Nabatean and Syrian tragic masks used to confer immortal life on the bearer prefiguring the apocalyptic notion that the death of the saviour is the key to immortal life.

Dionysus, who was the twice born and resurrected ⁶⁶son of God Zeus by mortal Semele, was said to perform a variety of miracles in connection with grapevines and wine, all to do with the god's seasonal epiphany at the time of his festival, evidencing the presence of his divinity. Epiphania means "appearance" in Greek and refers to the revelation of the Lord's power in his appearance. In pagan antiquity, 6 January was the epiphany of Dionysus. Vase paintings depict wine flowing directly from grape clusters, presenting wine as a product of the divine. On the occasion of Dionysus's festival called *Thyria* ("raging"), when Dionysus was thought to be present there, priests under the watch of witnesses placed three empty basins in a building under seal. The next morning when the seal on the door was broken and people entered, the basins were full of wine. In Euripides' *Bacchae*, a maenad struck the ground with her *thyrsus*, "and the god at that spot put forth a fountain of wine."

Dionysus, of all deities, stands as the manifestation of miraculous dread at a level unsurpassed by Yeshua's miracles on Lake of Galilee. The magical metamorphoses of Dionysus are rendered on the Dionysus Cup from around 540-530 BCE by Exekias. A band of Tyrrhenian pirates sailing by the shore happens upon Dionysus and kidnaps him for ransom, believing him to be a wealthy prince binding him to the mast. To their surprise, the fetters fall away from his hands and feet. The ship's helmsman cries out: "*Madmen! What god is this whom you have taken to bind? Do not lay hands on him, lest he grow angry and stir up dangerous winds and heavy squalls.*" His mates do not heed the warning and strange things are seen about them. Sweet, fragrant wine runs streaming throughout the pirates' black ship. Vines dripping with clusters of grapes spread across the tops of the sails, while dark ivy blooming with flowers and berries entwines the ship's mast. Dionysus transforms into a dreadful lion and summons illusions of wild beasts, the leopard or panther, sacred to him, and lions, tigers, and bears. As the beasts lunge, the terrified pirates promptly jump overboard into the sea's cold embrace, but the god enjoys the last laugh as the pirates transform into dolphins upon striking the waves. Only the helmsman, who enjoyed the change of heart, is spared to tell this tale of the wrath of Dionysus.

What is distinctly different about the Dionysian tale is that it is and has always been recognised as mythopoetic allegory, not a physical fact, while Yeshua's alleged miracles and his promises of a return from the dead in power have been crafted by the Christian forefathers to be a claimed cosmological fact more real than the word around us. This is profoundly dangerous, because it lays a false cosmological claim in complete contradiction to every verified form of knowledge, to jam pack the persona of the Son of God into the portal of

⁶⁶ Dionysus, the son of Zeus, was a horned child who was torn to pieces by Titans who lured him with toys, then boiled and ate him. Zeus then destroyed the Titans by thunderbolt as a result of their action against Dionysus and from the ashes humans were formed. However, Dionysus' grandmother Rhea managed to put some of his pieces back together and brought him back to life.

reality to make a claim of ultimate ascendancy over nature on the part of the Son of Man become the Son of God under pain of eternal torment.

The Dionysian connection pervaded the Near East with the rise of Alexander and the ensuing Greek empires and became integral to Syria and Nabatea. Dhushara was an ancient Arabic deity originally represented by a simple stone block in a similar manner to the worship of a stone pillar at Bethel by Jacob, as a non iconic face of the abstract God, as Yahweh was. Gen 35:14: *"Jacob set up a pillar in the place where he had spoken with him, a pillar of stone; and he poured out a drink offering on it, and poured oil on it"*. However with the rise of Nabatean commerce and viticulture, Dhushara gained the persona of the Greek Dionysus, just as al-Uzza, al-lat and Manat gained the forms of Tyche, Atargatis and Aphrodite. Nabatean culture had shrines scattered far and wide across the fertile landscape.

Astral worship came to involve elaborate repasts on triclinia overseen by *"the consecrated and inviolable possession of"* Dhushara, in which concern for making detailed preparations for immortal life had a pivotal focus. Dhushara became the god with the tragic death mask conferring immortal life on the wearer: *"The Nabatean use of the tragic mask furnishes yet another example of their preoccupation with immortality and their intense desire to become identified with their divinity. The mask served as a portrait of the deathless God Dushara, Dusares Dionysos and its wearer became united with him through its use for life everlasting escaping thus the limitations of the mortal span"* (Glueck 242).

Given that these forms of worship extended across the East of the Jordan from Arabia in the South to Syria in the North, and the commercial currents running between East to West by sea, it is inescapable that these currents of deity would have been grist to the mill of religious and apocalyptic ferment.

6. The Women of Galilee and the Daughters of Jerusalem

Yeshua's mission is intimately bound up in the affairs of key women who ministered unto him out of their substance, effectively providing the financial funding for the mission: Luke 8:1 *"And it came to pass afterward, that he went throughout every city and village, preaching and shewing the glad tidings of the kingdom of God: and the twelve were with him, and certain women, which had been healed of evil spirits and infirmities, Mary called Magdalene, out of whom went seven devils, and Joanna the wife of Chuza Herod's steward, and Susanna, and many others, which ministered unto him of their substance"*.

The seven devils are the seven Galla of Inanna-Ishtar that pursued and ravaged Tammuz-Dumuzi, corresponding to the seven layers of hell when the goddess of heaven does her descent, so mentioning them specifically in the gospels casts Mary Magdalene as the sacrificial Queen of Heaven in the piece, preemptively anointing him for his burial after his sacrifice as a sacred king in the shadow of Dumuzi and Tammuz. This means that, as we converge on the crucifixion, there is a relentless parallel with John the Baptist's death in Inanna's Descent enacted by Salome at Macherus. Rather than being anointed by a high priest, as was David and Solomon, Yeshua is anointed by a woman, either on his feet or head and in Mark and John ominously for his burial as a sacred king.

John's account has Mary performing the task. John 12:3 *"Then took Mary a pound of ointment of spikenard, very costly, and anointed the feet of Jesus, and wiped his feet with her hair: and the house was filled with the odour of the ointment. Then saith one of his disciples, Judas Iscariot, Simon's son, which should betray him. Why was not this ointment sold for three hundred pence, and given to the poor? This he said, not that he cared for the poor; but because he was a thief, and had the bag, and bare what was put therein. Then said Jesus, Let her alone: against the day of my burying hath she kept this"*. This appears to link to Luke's reference to Mary playing *"that good part"* in the Dionysian ritual: Luke 10:41 *"And Jesus answered and said unto her, Martha, Martha, thou art careful and troubled about many things: But one thing is needful: and Mary hath chosen that good part, which shall not be taken away from her."*

In Mark, Yeshua is anointed on his head and the pharisees murmur against him because of the cost: Mark 14:3 *"And being in Bethany in the house of Simon the leper, as he sat at meat, there came a woman having an alabaster box of ointment of spikenard very precious; and she brake the box, and poured it on his head. And there were some that had indignation within themselves, and said, Why was this waste of the ointment made? For it might have been sold for more than three hundred pence, and have been given to the poor. And they murmured against her. And Jesus said, Let her alone;*

why trouble ye her? she hath wrought a good work on me. ... She hath done what she could: she is come aforehand to anoint my body to the burying.

Fig 215: Piero della Francesca "The Baptism of Christ", Giovanni de Milano "Anointing", Piero della Francesca "The Crucifixion", Icon "The Holy Myrrh Bearing Women", Titian "Noli me Tangere". The women play a pivotal role in Yeshua's mission and are thus portrayed as witnesses and ritual participants in all the critical events, from the baptism, ministering unto him out of their substance, with Mary Magdalene, out of whom went the seven Galla of Inanna (above) anointing him for his burial, watching over his crucifixion and witnessing the risen Christ.



In Luke this woman is described as a "sinner", interpreted as a prostitute and they murmur because she is a sinner: Luke 7:37 *"And, behold, a woman in the city, which was a sinner, when she knew that Jesus sat at meat in the Pharisee's house, brought an alabaster box of ointment, And stood at his feet behind him weeping, and began to wash his feet with tears, and did wipe them with the hairs of her head, and kissed his feet, and anointed them with the ointment"*.

This sinner has also been associated with Magdalen and with the woman caught in adultery: John 8:3 *"And the scribes and Pharisees brought unto him a woman taken in adultery, saying to Yeshua "Master, this woman was taken in adultery, in the very act" to which he replied He that is without sin among you, let him first cast a stone at her, And they which heard it, being convicted by their own conscience, went out one by one, and so Yeshua said "Woman, where are those thine accusers? hath no man condemned thee? She said, No man, Lord. And Jesus said unto her, Neither do I condemn thee"*.

Yeshua's very fanciful genealogy in Matthew, as King of the Jews, descends through five "fallen" women: (1) Tamar who covered her head with a veil as a prostitute to become impregnated by her father-in-law when he failed to honour betrothing her to a husband's brother on the death of her husband according to Hebrew law. (2) Rahab, the prostitute who let the Israelite spies into Jericho. (3) Ruth who lay with Boaz at night and later became his wife. (4) Bathsheba who sired Solomon with David, although then married to Uriah, whom David later had killed and (5) mother Mary who was found with child out of wedlock and was partnered by Joseph: *"Then Joseph her husband, being a just man, and not willing to make her a publick example, was minded to put her away privily"* (Matt 1:19).

All these women are perceived to be virtuous, but all have at face value sexually transgressed, despite the fact that Mary is claimed by the Christian account to be impregnated by God in the form of the Holy Ghost, just as Semele was impregnated by Zeus.

Likewise the parable of the foolish virgins, which is clearly apocryphal, as it appears only in Matthew, overlays an intensely sexual theme of the Bridegroom entering a marriage ceremony with multiple virgins, at least five of which he consorts with. This is of course an echo of the Jewish relationship of God with the bride Israel, expounded throughout the Old Testament in God's jealousy and violent opposition to the whoring of the nations, taken to a pastoral climax with Rabbi Akiva's adoption of the Song of Songs, one of the most fertile and

haunting love songs ever committed to scripture, as the Holy of Holies, the inner temple sanctum, and which despite its myrrh on the locks enigmatically remains in the Christian bible as the same metaphor.

However the dark side of this parable is that it is used sacrificially. Luke 2:19 *“And Jesus said unto them, Can the children of the bridechamber fast, while the bridegroom is with them? as long as they have the bridegroom with them, they cannot fast. But the days will come, when the bridegroom shall be taken away from them, and then shall they fast in those days”*, again echoing the Dionysian winebibber *“And no man putteth new wine into old bottles: else the new wine doth burst the bottles, and the wine is spilled, and the bottles will be marred: but new wine must be put into new bottles.”*

Christianity thus waits endlessly for the messiah’s Second Coming, in contrast to the fertile quest of the Jews to go forth and multiply as a living species. It thus constitutes a hijacking of the fertility principle to enshrine Christianity as the cosmic portal of salvation.

The women also play a pivotal role in the tragic enactment of the Crucifixion, with the daughters of Jerusalem and the women of Galilee playing opposing parts as a contrapuntal dramatic chorus:

Luke 23:27 *“And there followed him a great company of people, and of women, which also bewailed and lamented him. But Jesus turning unto them said, Daughters of Jerusalem, weep not for me, but weep for yourselves, and for your children. For, behold, the days are coming, in the which they shall say, Blessed are the barren, and the wombs that never bare, and the paps which never gave suck”*.

Luke 23:48 *“And all the people that came together to that sight, beholding the things which were done, smote their breasts, and returned. And all his acquaintance, and the women that followed him from Galilee, stood afar off, beholding these things”*.

Consistent with the Dionysian maenads and fertility traditions of the nations, the women are intimately involved, while the male disciples are scattered like sheep in Yeshua’s hour of need. The women of Galilee were pivotal and Magdalen prominently among them for pronouncing the risen Christ: *“And the women also, which came with him from Galilee, followed after, and beheld the sepulchre, and how his body was laid. And they returned, and prepared spices and ointments; and rested the sabbath day according to the commandment”* (Luke 23:55). Luke 24:10 *“It was Mary Magdalene and Joanna, and Mary the mother of James, and other women that were with them, which told these things unto the apostles.”*

7. Whom do Men say that I Am?

The canonical gospels pivot on the critical assumption that Yeshua is Christ the Son of God who must die and rise again on the third day. Luke 9:20 *“He said unto them, But whom say ye that I am? Peter answering said, The Christ of God. And he straitly charged them, and commanded them to tell no man that thing; Saying, The Son of man must suffer many things, and be rejected of the elders and chief priests and scribes, and be slain, and be raised the third day.”*

Mark has the latter discussions in more detail which indicates that the entire mission was conceived as a confrontational assault on the division of dark and light in which the sacrifice would bring about the Resurrection in three days. When Peter rebukes Yeshua, his response is to call him Satan, confirming the war of dark and light – Matt 12:30 *“if you are not with me, you are against me”*, *“Mark 8:31 And he began to teach them, that the Son of man must suffer many things, and be rejected of the elders, and of the chief priests, and scribes, and be killed, and after three days rise again. And he spake that saying openly. And Peter took him, and began to rebuke him. But when he had turned about and looked on his disciples, he rebuked Peter, saying, Get thee behind me, Satan: for thou savourest not the things that be of God, but the things that be of men.”*

Matt 16:13 *“When Jesus came into the coasts of Caesarea Philippi, he asked his disciples, saying, Whom do men say that I the Son of man am? And they said, Some say that thou art John the Baptist: some, Elias; and others, Jeremias, or one of the prophets. He saith unto them, But whom say ye that I am? And Simon Peter answered and said, Thou art the Christ, the Son of the living God.”*

In his trial, Yeshua confirms he is the Christ and will return in power. Mark 14:61: *“But he held his peace, and answered nothing. Again the high priest asked him, and said unto him, Art thou the Christ, the Son of the Blessed? And Jesus said, I am: and ye shall see the Son of man sitting on the right hand of power, and coming in the clouds of heaven”*.

In complete contrast, in **The Gospel of Thomas**, which begins *"Whoever finds the interpretation of these sayings will not experience death"* Yeshua says he is NOT the disciples master, but they are drunk on his Dionysian spring: Thom (13) *Jesus said to his disciples, "Compare me to someone and tell me whom I am like." Simon Peter said to him, "You are like a righteous angel." Matthew said to him, "You are like a wise philosopher." Thomas said to him, "Master, my mouth is wholly incapable of saying whom you are like." Jesus said, "I am not your master. Because you have drunk, you have become intoxicated from the bubbling spring which I have measured out."* Again a Dionysian metaphor, but also a veridical declaration of truth.

Likewise, the Kingdom, which the canonical gospels declare will come with apocalyptic cataclysm, is the natural world around us obscured by our own barriers to knowing and appreciating reality: Thom (113) *'His disciples said to him, "When will the kingdom come?" Jesus said, "It will not come by waiting for it. It will not be a matter of saying 'here it is' or 'there it is'. Rather, the kingdom of the father is spread out upon the earth, and men do not see it'.*

Rather than a future day of judgment, the new world is already here: Thom (51) *His disciples said to him, "When will the repose of the dead come about, and when will the new world come?" He said to them, "What you look forward to has already come, but you do not recognize it.*

The Kingdom is preceded and evoked by the natural condition in which we all become the sons of God: Thom (3) *Jesus said, "If those who lead you say to you, 'See, the kingdom is in the sky,' then the birds of the sky will precede you. If they say to you, 'It is in the sea,' then the fish will precede you. Rather, the kingdom is inside of you, and it is outside of you. When you come to know yourselves, then you will become known, and you will realize that it is you who are the sons of the living father.*

Thom (20) *The disciples said to Jesus, "Tell us what the kingdom of heaven is like." He said to them, "It is like a mustard seed. It is the smallest of all seeds. But when it falls on tilled soil, it produces a great plant and becomes a shelter for birds of the sky."*

The end of days is not an end but is as it was in the beginning. Thom (18) *The disciples said to Jesus, "Tell us how our end will be." Jesus said, "Have you discovered, then, the beginning, that you look for the end? For where the beginning is, there will the end be. Blessed is he who will take his place in the beginning; he will know the end and will not experience death."*

Nevertheless he reinforces that he is there to provoke conflict and conflagration: Thom (16) *Jesus said, "Men think, perhaps, that it is peace which I have come to cast upon the world. They do not know that it is dissension which I have come to cast upon the earth: fire, sword, and war. For there will be five in a house: three will be against two, and two against three, the father against the son, and the son against the father. And they will stand solitary."*

Yet he will do this by instilling new vision: Thom (17) *Jesus said, "I shall give you what no eye has seen and what no ear has heard and what no hand has touched and what has never occurred to the human mind."*

Perceiving ultimate reality with the mind counterpoints Paul's quote, which stresses loving God: 'But, as it is written, *"What no eye has seen, nor ear heard, nor the human heart conceived, what God has prepared for those who love him"* (1 Corinthians 2:9). This is again different from the Old Testament original *"From ages past no one has heard, no ear has perceived, no eye has seen any God besides you, who works for those who wait for him"* (Isa 64:4), which emphasises Yahwistic monotheism, waiting in in faithful covenant.

The key to the kingdom is childlike innocence: Thom (46) *Jesus said, "Among those born of women, from Adam until John the Baptist, there is no one so superior to John the Baptist that his eyes should not be lowered (before him). Yet I have said, whichever one of you comes to be a child will be acquainted with the kingdom and will become superior to John."* Thom (37) expands hinting that unravelling the Edenic Fall brings back the immortality of the Tree of Life claimed in the opening passage: *Jesus said, "When you disrobe without being ashamed and take up your garments and place them under your feet like little children and tread on them, then [will you see] the son of the living one, and you will not be afraid."*

He says we all have it within us, but warns that what we lack through denial can also kill us. Thom (70) *Jesus said, "That which you have will save you if you bring it forth from yourselves. That which you do not have within you [will] kill you if you do not have it within you."*

And that the undivided unity removing the duality of division is the key: Thom (106) *Jesus said, "When you make the two one, you will become the sons of man, and when you ' say, 'Mountain, move away,' it will move away."*

Thom (22) *Jesus said to them, "When you make the two one, and when you make the inside like the outside and the outside like the inside, and the above like the below, and when you make the male and the female one and the same, so that the male not be male nor the female female; and when you fashion eyes in place of an eye, and a hand in place of a hand, and a foot in place of a foot, and a likeness in place of a likeness, then will you enter [the kingdom]."*

Yeshua sees himself as pure cosmological spirit permeating the natural world. Thom (77) *Jesus said, "It is I who am the light which is above them all. It is I who am the all. From me did the all come forth, and unto me did the all extend. Split a piece of wood, and I am there. Lift up the stone, and you will find me there."*

Yeshua feels afflicted by human ignorance of his insights: Thom (28) *Jesus said, "I took my place in the midst of the world, and I appeared to them in flesh. I found all of them intoxicated; found none of them thirsty. And my soul became afflicted for the sons of men, because they are blind in their hearts and do not have sight; for empty they came into the world, and empty too they seek to leave the world. But for the moment they are intoxicated. When they shake off their wine, then they will repent."*

Some of the sayings tend to a gnostic pessimism about the natural world, but accepting of its potential to produce conscious enlightenment: Thom (29) *Jesus said, "If the flesh came into being because of spirit, it is a wonder. But if spirit came into being because of the body, it is a wonder of wonders. Indeed, I am amazed at how this great wealth has made its home in this poverty."*

He does not say physician heal thyself but acknowledges deftly that a physician does not treat their friends: Thom (31) *Jesus said, "No prophet is accepted in his own village; no physician heals those who know him."*

He makes a cryptic observation that the king will die after the sacred union: Thom (61) *Jesus said, "Two will rest on a bed: the one will die, and the other will live." Salome said, "Who are you, man, that you ... have come up on my couch and eaten from my table?" Jesus said to her, "I am he who exists from the undivided. I was given some of the things of my father." ... "I am your disciple." ... "Therefore I say, if he is destroyed he will be filled with light, but if he is divided, he will be filled with darkness."*

There is a mention of apocalyptic times, but no hint of Christ returning in power: Thom (79) *"A woman from the crowd said to him, "Blessed are the womb which bore you and the breasts which nourished you." He said to [her], "Blessed are those who have heard the word of the father and have truly kept it. For there will be days when you will say, 'Blessed are the womb which has not conceived and the breasts which have not given milk.'"*

Although he rejects Peter's patriarchalism, he still entertains a notion that the male is spiritual: Thom (114) *Simon Peter said to them, "Let Mary leave us, for women are not worthy of life." Jesus said, "I myself shall lead her in order to make her male, so that she too may become a living spirit resembling you males. For every woman who will make herself male will enter the kingdom of heaven."*

Thom (43) *His disciples said to him, "Who are you, that you should say these things to us?" Jesus said to them, "You do not realize who I am from what I say to you, but you have become like the Jews, for they (either) love the tree and hate its fruit (or) love the fruit and hate the tree."*

In complete contrast to the canonical succession through Peter to Paul, Thomas has Yeshua declare that James the Just, his brother the original founder of the Jewish Christian movement was his ordained successor: Thom (12) *The disciples said to Jesus, "We know that you will depart from us. Who is to be our leader?" Jesus said to them, "Wherever you are, you are to go to James the righteous, for whose sake heaven and earth came into being."*

As one final paradoxical counterpoint, we have: (11) *Jesus said, "This heaven will pass away, and the one above it will pass away. The dead are not alive, and the living will not die. In the days when you consumed what is dead, you made it what is alive. When you come to dwell in the light, what will you do? On the day when you were one you became two. But when you become two, what will you do?"*

As a counterpoint to the Gospel of Thomas, Thunder Perfect Mind remains the most enigmatic of the Nag Hammadi texts. It reveals a female presence at least as enigmatic and paradoxically transcendent as Yeshua's persona. Here her statements and Yeshua's are presented as a refrain between female thunder and male lightning.

Dialogue of the Saviours ⁶⁷**Thunder - Perfect Mind**

A: Look upon me you who reflect upon me
and you hearers hear me
You who are waiting for me
take me to yourselves.

*For I am the first, and the last.
I am the honored one and the scorned one.
I am the whore, and the holy one.
the virgin and the wife..*

*I am [the mother] and the daughter....
I am the barren one, and many are her sons
I am she whose wedding is great,
and I have not taken a husband....*

En/lightning El-Nino

B: Look upon me you who reflect upon me.
For I am alpha and omega,
the divine and the blasphemer,
Ba'al Zebul and the Holy Ghost,

the Father and the Son of Man.
I am the father of my mother
and it is my wife who begot me
or ever I was born

I am the Bridegroom
whose communion is celebrated
and I have not
taken a wife.

A: *I am knowledge and ignorance....
I am shameless and ashamed.
I am strength, and I am fear....
I am senseless, and I am wise. ...*

*I am the silence that is incomprehensible
and the idea whose remembrance is frequent.
The voice whose echo is reverberating
the thunder that intoxicates.*

*I am the one whom you have pursued .
I am the one that you have seized.
I am the one that you have scattered
and you have gathered me together.*

B: I am the word made flesh
and yet the bread of life.
I am the good shepherd
and yet the paschal lamb.

I am the true vine
and yet the sprouting rod.
I am the fisher of men
and yet the eye of the storm.

I am the lightning uniting heaven
and earth in rains of plenty.
I am the light of the world
and the darkness at noontide.

A: *The union and the dissolution.
I am the judgment and the acquittal.
I am the shameless one
before whom you are ashamed.*

*Though sinless, I am the root of sin.
The solace even of my labour pains.
I am the meaning of the word
and the very sound of the name.*

*I am the one whom they call Life
and you have called death.
In my weakness do not ever forsake me,
nor ever fear my power.*

B: Split a piece of wood and you will find me there
Lift up a stone and you will find me there
for I am the light above the All
and to me did the All extend.

I am not your master but you've become drunk
from the bubbling stream that I have measured out
and whoever discovers this interpretation
will never experience death

I am the one who returns to loosen the bands
and open the prison to them that are bound.
I am the din that is unendurable.
The epiphany of miraculous dread.

A: *I am the intimate companion of the savior.
He would come to kiss me on my mouth
He asked them "Why do I not love you,
as I love the one who permeates the All?"*

*I am lust in [outward] appearance
and yet I'm the very soul of discretion,
for many are the forms ...
and fleeting pleasures*

*which men embrace, till they become sober
and go up to their resting place.
And there they will find me
and live and not die again.'*

B: I am the one who is called Truth
and I am cast upon the face of the earth.
I am the one who you have despised
and yet you love me all the more.

Why do you curse me and honour me?
Why do you consume and sanctify me?
Why do you leave the body hanging there
when the fire is already alight?

**I bring you to weave, the garments of salvation
and offer you the requital of true love.
In our blood flows the fruit of the Tree of Life
and in our flesh the healing of the nations.**

⁶⁷ Titled in recognition of The Dialogue of the Saviour (Robinson 1990).

8. Descent into Hades and Harrowing Hell

Yeshua's crucifixion and resurrection on the third day, echoes Inanna-Ishtar's descent as the Goddess of Heaven and Earth, into her sister, Ereshkigal's domain of Hell in the three days of the dark moon, stripped naked of her garments one by one in the dance of the seven veils, by the galla, who later sacrifice Tammuz-Dumuzi on her return. Hellenistic writers have, since the crucifixion sought to explain Yeshua's death and perceived ascension, in terms of the Greek cosmology of Hades as the realm of the dead, echoing the Hebrew Sheol, later becoming the increasingly apocalyptic Harrowing of Hell, to delineate a revealed cosmology of God's cosmic manifestation, both forwards in time to the eschatologic apocalypse and backwards in time to the very beginning in Adam, thus trumping both the pagan world and the Judaic Hebrew traditions, as incomplete flawed realisations of the invincible cosmic deity manifesting in history, in the final conversion of Yeshua, the person and apocalyptic prophet into a Hellenistic man-God.

Fig 216: Five views of Christ's descent into Hades the Hellenistic realm of the dead, later hyperbolised into harrowing Hell. Christ leads Adam by the hand Vaux Passional, c. 1504, The Harrowing of Hell - Petites Heures de Jean de Berry, 14th-century, Harrowing Hell - Greek icon, Christ reaches out to Adam and stands on Hades with the broken door behind him, Christ grants salvation to souls by the Harrowing of Hell - Fra Angelico, c. 1430s. This sojourn is initially regarded as to preach to those drowned in the flood, and then extends to preaching to those who dies before Yeshua's time, then extending all the way back to Adam as depicted upper and lower left, thus cementing Christ's reign both forwards to the apocalypse and backward to Eden, claiming Christianity as the divinely ordained faith of the true God of all history.



The word "Hell"—from the Norse, *Hel*; in Latin, *infernus*, *infernus*, *infernus*; in Greek, ᾍδης (Hades); in Hebrew, שְׁאוֹל (Sheol) – is used in

Scripture and the Apostles' Creed to refer to the abode of all the dead, whether righteous or evil, unless or until they are admitted to Heaven. This abode of the dead is the "Hell" into which the Creed says Christ descended. This distinction between Hades and Hell continues, from the earliest creeds to this day, in the varying accounts of the Apostles Creed and its precursors: "he descended to the dead" and "he descended into hell". In the time before it entered the creed, the descent was frequently taken to mean that Christ had gone to rescue the souls of the Old Testament faithful from the underworld, from what Western Catholic theology eventually called the *limbo patrum*.

The Old Testament view of the afterlife was that all people, whether righteous or unrighteous, went to Sheol when they died. No Hebrew figure ever descended into Sheol and returned, although an apparition of the recently deceased Samuel briefly appeared to Saul when summoned by the Witch of Endor. The New Testament maintains a distinction between Hades or Sheol, the common "place of the dead", and the eternal destiny of those condemned at the Final Judgment, variously described as Gehenna, "the outer darkness," or a lake of eternal fire, otherwise known as Hell. The Hellenistic views of heroic descent into the Underworld and successful return follow traditions that are far older than the Orphic and other mystery religions popular at the time of Christ, including that of Gilgamesh and the Odyssey.

Milavec (2021) notes the progression in the view of Christ's descent, which undergoes an apocalyptic extrapolation as time ensues. In Acts 2:23, Peter says that Christ "was not abandoned by God in Hades [ο τε κκατελείφθη ε ι δην]," but says nothing about Jesus preaching in Hades. In 1 Peter however this is specifically described:

"By which also he went and preached unto the spirits in prison, which sometime were disobedient, when once the long suffering of God waited in the days of Noah, while the ark was a preparing, wherein few, that is, eight souls were saved by water." (3:20).

Justin Martyr (d. 165 C.E.) claims it is the Jews who had died prior to the coming of Jesus: *"The Lord God remembered his dead people of Israel who lay in their graves, and he descended to preach to them his salvation"* (Dial. 72.4). The intent here appears to be that the good news of the soon-to-arrive Kingdom of God was being shared with the hundreds of thousands of those Jews from Abraham to John the Baptist. Even though they are admittedly laying in their graves, they receive the message of God's future salvation intended for those "sleeping" in hope. Clement of Alexandria (d. 215 C.E.) tells that the Apostles, following their own deaths, descended into Hades where they preached to the pagan philosophers who had lived righteous lives (Strom. VI, 6:45, 5). The third-century Gospel of Bartholomew portrays the "King of Glory" as descending the stairs of a thousand steps into the underworld. Hades, the god of the underworld, is trembling uncontrollably as he descends. Jesus "shattered the iron bars" of the gates of Hades and grabs the god Hades himself and pummels him "with a hundred blows and bound him with fetters that cannot be loosed" in an operation to save "Adam and all the patriarchs". When Christ meets Adam, he specifically says: "I was hung upon the cross for your sake and for the sake of your children", establishing the backwards causality.

The Catholic Catechism states this forward and backward causality from end to end of time. "In his human soul united to his divine person, the dead Christ went down to the realm of the dead. He opened Heaven's gates for the just who had gone before him." His death is claimed to have freed from exclusion from Heaven the just who had gone before him: "It is precisely these holy souls who awaited their Saviour in Abraham's bosom whom Christ the Lord delivered when he descended into Hell", echoing the words of the Roman Catechism, His death was of no avail to the damned. "By the expression 'He descended into Hell', the Apostles' Creed confesses that Jesus did really die and through his death for us conquered death and the devil 'who has the power of death' (Hebrews 2:14):

Forasmuch then as the children are partakers of flesh and blood, he also himself likewise took part of the same; that through death he might destroy him that had the power of death, that is, the devil; And deliver them who through fear of death were all their lifetime subject to bondage. For verily he took not on him the nature of angels; but he took on him the seed of Abraham.

Given this annihilating redemptive power over the devil, it remains opaque why deadly sin is still deemed to exist.

This Hellenistic view of the underworld extends from the Synoptic Gospels through to Revelation:

"And you, Capernaum, who are exalted to heaven, will be brought down to Hades; for if the mighty works which were done in you had been done in Sodom, it would have remained until this day." (Matt 11:23, Luke 10:15).

"I am He who lives, and was dead, and behold, I am alive forevermore. Amen. And I have the keys of Hades and of Death." (Revelation 1:18)

"The sea gave up the dead who were in it, and Death and Hades delivered up the dead who were in them. And they were judged, each one according to his works." (Revelation 20:13)

In the parable of the rich man and Lazarus the beggar, Luke 16 has Yeshua referring to Hades in a manner that anticipates the punishments of Hell in the Day of Judgment, preordaining it for the guilty as an antechamber of woe. Versions of the Bible continue to predominantly refer to this as Hades or "the dead", with only King James using Hell:

"And being in tormented in Hades, he lifted up his eyes and saw Abraham afar off, and Lazarus in his bosom. And he cried and said, Father Abraham, have mercy on me, and send Lazarus, that he may dip the tip of his finger in water, and cool my tongue; for I am tormented in this flame. But Abraham said, Son, remember that thou in thy lifetime receivedst thy good things, and likewise Lazarus evil things: but now he is comforted, and thou art tormented".

The Gospel of Matthew allegorically relates that many people rose from the dead, and after the resurrection walked about in Jerusalem and were seen by many people there:

"And, behold, the veil of the temple was rent in twain from the top to the bottom; and the earth did quake, and the rocks rent; and the graves were opened; and many bodies of the saints which slept arose, And came out of the graves after his resurrection, and went into the holy city, and appeared unto many. Now when the centurion, and they that were with him, watching Jesus, saw the earthquake, and those things that were done, they feared greatly, saying, Truly this was the Son of God". (Matt. 27:53)

9. Balaam the Lame: Talmudic Entries

In contrast to the Christian gospels, the Talmudic entries cast Yeshua as a false messiah who led Israel into misfortune. These entries portray an antagonism which in itself explains the attitude in the gospels is not merely anti-Jewish

polemic based on the betrayal by the high priests, but genuinely records a spiritual tension about cosmological pretensions that arose from the Crucifixion and the claim to be the Son of God.

The Lexicon Talmudicum and Talmud babli Sanhedrin 106b, 43a, 51a and the Toldoth Yeshu states (Graves 1946 6, 1953 23, 288): *Commentators refer to Yeshu-ha-Notzri [Jesus of Nazareth] by mention of the wicked kingdom of Edom, since that was his nation... he was hanged on a Passover eve... He was near to the kingdom [genealogically].*

Likewise the Qur'an refers to Jesus as Isa after Esau the "red man" of Edom. It thus appears that both the Jews and the Arabs recognised the Edomite character of Jesus' mission in a way not understood by Christians themselves, probably because Muhammad used it from the Jews of Medina. "Isa" is used in his return in divining the day of judgment: Sura 43:61 *He (Isa) is surely a knowledge of the hour. ... And when Isa came with clear arguments he said: I have come to you indeed with wisdom, and that I may make clear to you part of what you differ in. "*

According to hadith, in Sunan of Ibn Majah, Muhammad said, *"There is no Mahdi save Isa son of Maryam". Balaam the lame was 33 years old when Pintias the Robber [Pontius Pilate] killed him... They say that his mother was descended from princes and rulers but consorted with carpenters.*

The Mishnah (Baraita and Tosefta) note the following passages highlighting the tension between conventional Jews and Jesus' followers: *"It has been taught: On the eve of the Passover they hanged Yeshu ... because he practised sorcery and enticed and led Israel astray ... Our Rabbis taught Yeshu had five disciples Mattai, Nakkai, Netzer, Buni, and Todah."* Rabbi Elizah ben Damah is cited asking that Jacob came to heal him in the name of Yeshu[a] ben Pantera. He died being forbidden to do so.

A disciple of Yeshu the Nazarene is cited in Sepphoris capital of Galilee saying *"It is written in your Torah 'Thou shalt not bring the hire of a harlot ...' How about making it a privy for the high priest? Thus did Yeshu ... teach me 'For the hire of a harlot hath she gathered them, And unto the hire of a harlot shall they return', from the place of filth they come, and unto the place of filth they go.*

The Jewish citing of Jesus as son of a Roman 'Pantera' [panther] has been cited as another term of derision insinuating Dionysian heritage, but a Roman gravestone has been found in Bingerbrück Germany for Julius Abdes Pantera, an archer of Sidon, dating from the appropriate early Imperial period.

Another Sanhedrin entry 103a by Rabbi Hisda comments on Psalm 91:10 *"There shall no evil befall thee, neither shall any plague come nigh thy dwelling"* that *"Thou shalt have neither a son nor a disciple who will publicly let his food burn (forfeit his salvation in a public display) like did Jesus the Nazarene".* Rabbi Abbahu taught *"If a man say unto thee 'I am God' he lieth; if he saith 'I am the Son of Man' he will live to rue his words; and if he saith 'I ascend into Heaven' he will not bring to pass that which he saith".*

10. Soma and Sangre: No Redemption without Blood

The Gospels portray Jesus as not just an apocalyptic preacher but preaching a destined death wish to become the sacrificial token of God's so-called love so that sins can be in the day of Judgment. This is a double-edged sword because Jesus will still judge the quick and the dead regardless in the Revelation. It is alien and wholly evil. There is no hint of any assertion that Yahweh ever required such a blood sacrifice. It needs to be exorcised from the Biblical account. It is wrong homicidally destructive and cosmologically degenerate:

*And he began to teach them, that the Son of man must suffer many things,
and be rejected of the elders, and of the chief priests, and scribes, and be killed,
and after three days rise again. And he spake that saying openly (Mark 8:31).*

*For God so loved the world, that he gave his only begotten Son,
that whosoever believeth in him should not perish, but have everlasting life (John 3:16).*

The Crucifixion and the account of the last supper leads to the cannibalistic Eucharist – to seek immortal life by consuming the bread and wine as body and blood of the Saviour:

"Then Jesus said unto them, Verily, verily, I say unto you, Except ye eat the flesh of the Son of man, and drink his blood, ye have no life in you. Whoso eateth my flesh, and drinketh my blood, hath eternal life; and I will raise him up at the last day" (John 6:53).

And as they did eat, Jesus took bread, and blessed, and brake it, and gave to them, and said, Take, eat: this is my body. And he took the cup, and when he had given thanks, he gave it to them: and they all drank of it. And he said unto them, This is my blood of the new testament, which is shed for many (Mark 14:24).

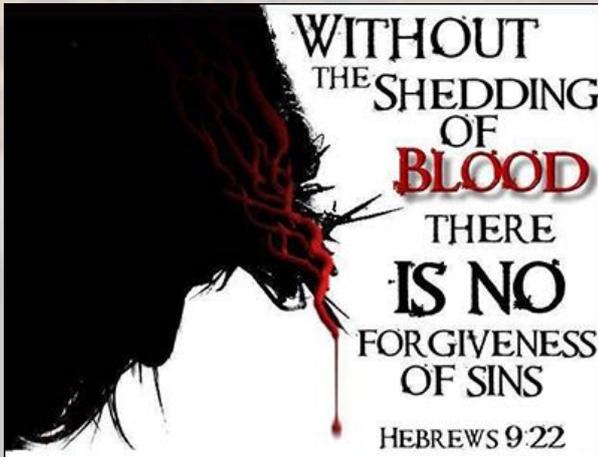


Fig 217: The cannibalistic filicide by God that dooms Christianity to be wholly a religion of evil.

These portrayals of Jesus instructing his followers to eat and drink his flesh and blood as a sacrifice of the only begotten Son by the Father are the most diabolical act ever conceived in human history that renders the Christian cosmology, fraudulent, wholly corrupt and stained to its very core with the blood of needless homicide. God giving his only begotten son as a sacrifice for sin is the equivalent of Huitzilopochtli, the Aztec war god, sacrificing Moctezuma so that his followers could be forgiven their utterly homicidal sins. Its legacy is martyrdom, Empire, Crusade, witch hunt and Inquisition, not to mention Islamic suicide attacks, such as 9-11 as martyrs in acting in Yeshua's image.

This becomes the central Christian thesis: “Without the shedding of blood, there is no remission of sin”, from “*And almost all things are by the law purged with blood; and without shedding of blood is no remission*” (Heb 9:22), in an erroneous exegesis of Lev 17:11: “*For the life of the flesh is in the blood: and I have given it to you upon the altar to make an atonement for your souls: for it is the blood that maketh an atonement for the soul.*”

Hence the Eucharist – consuming the *soma* and *sangre* of the Christ – becomes the central rite of Christianity as a sacramental religion. But the blood spilled is not merely metaphorical, but actual, as ensuing waves of Christian martyrdom, the blood of the Crusades, and the deaths of the Inquisition and Witch Hunts and the genocide of native Americans by the Conquistadors attest.

James Tabor (2012, 2015) astutely traces the origin of Mark 14:24 to a saying by Paul that disclaims direct knowledge of the Eucharist except as a divine communication, not through the disciples or Yeshua's own statement:

One of the more controversial but significant arguments I make in my new book, “[Paul and Jesus](#)”, is that the traditional words attributed to Jesus at the Last Supper—“This is my body,” “This is my blood” over the bread and wine – originated with Paul not with Jesus! Here is a summary of my reasons for reaching this conclusion and I invite readers to explore in depth this and other ways Paul and Jesus differed by reading the book itself.

Here is what Paul writes to the Corinthians around A.D. 54: “For I received from the Lord what I also handed on to you, that the Lord Jesus on the night when he was betrayed took bread, and when he had given thanks, he broke it, and said, “This is my body which is [broken] for you. Do this in remembrance of me.” In the same way also he took the cup, after supper, saying, “This cup is the new covenant in my blood. Do this, as often as you drink it, in remembrance of me” (1 Corinthians 11:23-25).

Mark, our earliest gospel, written between 75-80 A.D. has the following scene of Jesus’ Last Supper: “And as they were eating, he took bread, and after blessing it broke it and gave it to them, and said, “Take; this is my body.” And he took a cup, and when he had given thanks he gave it to them, and they all drank of it. And he said to them, “This is my blood of the covenant, which is poured out for many” (Mark 14:22-24).

The precise verbal similarities between these two accounts are quite remarkable considering that Paul’s version was written at least twenty years earlier than Mark’s. Where would Paul have gotten such a detailed description of what Jesus had said on the night he was betrayed? The common assumption has been that this core tradition, so central to the original Jesus movement, had circulated orally for decades in the various Christian communities. Paul could have received it directly from Peter or James, on his first visit to Jerusalem around A.D. 40, or learned it from the Christian congregation in Antioch, where, according to the book of Acts, he first established himself (Acts 11:25).

What Paul plainly says is easy to overlook: “For I received from the Lord what I handed on to you.” His language is clear and unequivocal. He is not saying, “I received it from one of the apostles, and thus indirectly it came from the Lord,” or “I learned it in Antioch, but they had gotten it by tradition from the Lord.” Paul uses precisely the same language to defend the revelation of his Gospel and how it came to him. He says he did not receive it from any man, nor was he taught it, but swears with an oath, “I

received it through a revelation of Jesus Christ" (Galatians 1:11-12). This means that what Paul passes on here regarding the Lord's Supper, including the words of Jesus over the bread and the wine, comes to us from Paul and Paul alone!

This means that the entire cannibalistic interpretation of Yeshua's sayings at the Last Supper are then repeated by Matthew and Luke based on Mark's account and later wildly embellished by John's interpretation of Jesus as the divine preexisting Logos. This means that Pauline Christianity, the canonical gospels and the entire concept of belief in the flesh and blood man who is also the sacrificed only-begotten Son of God saviour is a product of Hellenistic Judaism contrived as a means to bring about a short-circuit in the stark Zoroastrian notions of the Day of Judgment, or Frashokereti, so that we can all be sinners and have forgiveness and have our cake and eat it too in literal Eucharistic terms, of combined physicality and ultimate divinity, because God incomprehensibly sacrificed his only begotten son.

The Didache, or "Teaching for the Apostles to the Generations", a manual of church rituals contemporary with Matthew I refers to Eucharist of bread and wine, but not in the context of Yeshua's cannibalistic body and blood: *We give you thanks, our Father, for the holy vine of your son David, which you made known to us through your Son Jesus. Yours is the glory unto ages of ages. We give you thanks, our Father, for the life and knowledge which you made known to us through your Son Jesus. Yours is the glory unto ages of ages. As this broken bread was scattered upon the mountains and being gathered together became one, so may your Church be gathered together from the ends of the earth into your kingdom. For yours is the glory and the power through Jesus Christ unto ages of ages.*

Justin Martyr c 150 AD recounts wine mixed with water but again not specifically as Christ's flesh and blood: *There is then brought to the president of the brethren bread and a cup of wine mixed with water; and he taking them, gives praise and glory to the Father of the universe, through the name of the Son and of the Holy Ghost, and offers thanks at considerable length for our being counted worthy to receive these things at His hands.*

In fact the sacred repast of bread and wine is in no way a new invention of Jesus nor of Christianity. Indeed in Genesis we find:

And Melchizedek king of Salem brought forth bread and wine: and he was the priest of the most high God (Gen 14:18).

Moreover Geza Vermes (1961), in addition to noting two messiahs present in the Messianic Rule both of whom are actual humans as in the Jewish messianic tradition he notes that the blessed bread and wine was likely to have been bread and unfermented fruit juice:

Little more is learned from the Community Rule than that when the table had been prepared for eating and the new wine for drinking, the priest was to be first to bless the food and drink. The inference would be that after him, the others did the same, an inference supported by the Messianic Rule where a similar meal is described involving two Messiahs, that of David dealing with war and Aaron as a priestly role. Some uncertainty surrounds the meaning of 'new wine', but it would seem from the use of the scrolls, with the exception of the temple scroll, of the alternative Hebrew words for wine tirosh and yayin that the latter often has pejorative connotations. More likely than not, the wine drunk by the sectaries, the drink of the congregation, was unfermented grape juice'.

Furthermore, he describes the Essene notion of the End of Days as immanent and actual in a conflict between the Teacher of Righteousness and the Wicked Priest, presumably the High Priest of Jerusalem, rather than an urgent hypothetical catastrophic future event, as in Christianity.

Again the position of John the Baptist and its relation to Yeshua's notion of an apocalyptic end of days remains obscure because we have only the canonical gospels and a short passage from Josephus, neither of which are clarifying.

Josephus notes he had a strong following but mentions nothing of Jesus: *"For Herod had killed this good man, who had commanded the Jews to exercise virtue, righteousness towards one another and piety towards God. Many people came in crowds to him, for they were greatly moved by his words."*

Mark notes:

In those days came John the Baptist, preaching in the wilderness of Judaea, saying, Repent ye: for the kingdom of heaven is at hand.

Luke goes further and has John's disciples come to test Jesus:

And John calling unto him two of his disciples sent them to Jesus, saying, Art thou he that should come? or look we for another? Then Jesus answering said unto them, Go your way, and tell John what things ye have seen and heard; how that the blind see, the lame walk, the lepers are cleansed, the deaf hear, the dead are raised, to the poor the gospel is preached. For John the Baptist came

neither eating bread nor drinking wine; and ye say, He hath a devil. The Son of man is come eating and drinking; and ye say, Behold a gluttonous man, and a winebibber, a friend of publicans and sinners! But wisdom is justified of all her children.

John has the Baptist lavishly extolling Yeshua as the promised one but neither does this tell us anything about John's own thinking or whether Jesus was supposed to be sacrificed to God to end sin:

John bare witness of him, and cried, saying, This was he of whom I spake, He that cometh after me is preferred before me: for he was before me. I baptize with water: but there standeth one among you, whom ye know not; He it is, who coming after me is preferred before me, whose shoe's latchet I am not worthy to unloose. The next day John seeth Jesus coming unto him, and saith, Behold the Lamb of God, which taketh away the sin of the world. And John bare record, saying, I saw the Spirit descending from heaven like a dove, and it abode upon him. And I knew him not: but he that sent me to baptize with water, the same said unto me, Upon whom thou shalt see the Spirit descending, and remaining on him, the same is he which baptizeth with the Holy Ghost. Ye yourselves bear me witness, that I said, I am not the Christ, but that I am sent before him.

James Tabor (2012) notes that all the canonical gospels are anonymous productions, written a generation after the apostles. Scholars are agreed that none are an eyewitness account and the names associated with them are assigned by tradition, not by explicit claim by their authors in the texts. Mark, which comes first, gives no account of Jesus' birth miraculous or otherwise and in his original version, no post-resurrection appearances of Jesus to his disciples. In addition to Mark, both Matthew and Luke had access to the Q sayings source, probably dating from around AD 50 in which Jesus never speaks of his resurrection from the dead, while Mark, who comes later, refers several times to being raised on the third day. John comes last and is the most theologically embellished in terms of its view of Jesus as the divine, preexistent one of God. This gives a good indication of how mythical rather than historical the canonical gospels are and decisively discredits the canonical gospel accounts as any kind of accurate record of Yeshua's actual life, but rather the products of later beliefs. It reduces our understanding of Yeshua closer to that of Crossan (1991).

Hence we can very tentatively let Yeshua off the hook of both claiming Abba sacrificed him, as a Johanne extrapolation of Pauline thinking and the Eucharist as Paul's own cannibalistic folly and judge Yeshua's chaos messiahship directly in terms of its consequences, especially in the immediate epidemic of martyrdoms.

Elaine Pagels (1988 33-6) describes the way in which the Kingdom of the Father has led to precipitate and tortured death on the part of a young female Christian believer. Whatever their courage and conviction, the prophesied Kingdom has been too long in coming to justify such needless loss of life. The fallacy that the Kingdom was about to arrive was shared by groups such as the Montanists. Perpetua's sacrifice of herself is even more poignant in a young girl. Because her name is Perpetua she remains forever a living symbol in her precipitate martyrdom of that physical immortality which is vested in the passage of the generations through the fecundity of the female line.

Vibia Perpetua, fluent in both Greek and Latin, wrote about her experiences from the time of her arrest until the evening of her execution. Perpetua, twenty-two years old, recently married, and nursing her infant son, was arrested along with her friends and her personal slave Felicitas. Perpetua and her companions were scourged and thrown into a stifling and crowded African jail. After her arrest, Perpetua's father, .. *"out of love for me,"* she wrote, *"was trying to persuade me to change my decision."* Refusing his pleas to give up the name Christian, Perpetua rejected her familial name instead, although she says she grieved to see her father, mother, and brothers *"suffering out of compassion for me."* At first, she wrote, *"I was tortured with worry for my baby there,"* but after she gained permission for him to stay with her in prison, *"at once I recovered my health, relieved as I was of my worry and anxiety for the child."*

Then my brother said to me, "Dear sister, you already have such a great reputation that you could ask for a vision indicating whether you will be condemned or freed." Since I knew that I could speak with the Lord, whose great favors I had already experienced, I confidently promised to do so. I said I would tell my brother about it the next day. Then I made my request and this is what I saw. There was a bronze ladder of extraordinary height reaching up to heaven, but it was so narrow that only one person could ascend at a time. Every conceivable kind of iron weapon was attached to the sides of the ladder: swords, lances, hooks, and daggers. If anyone climbed up carelessly or without looking upwards, he/she would be mangled as the flesh adhered to the weapons. Crouching directly beneath the ladder was a monstrous dragon who threatened those climbing up and tried to frighten them from ascent. I began my ascent. At the summit I saw an immense garden, in the center of which sat a tall, grey-haired man dressed like a shepherd, milking sheep. Standing around him were several thousand white-robed people. As he raised his head he noticed me and said, "Welcome, my child." Then he beckoned me to approach and gave me a small morsel of the cheese he was making. I accepted it with cupped hands and ate it. When all those surrounding us said "Amen:" I awoke, still tasting the sweet cheese. I immediately told my brother about the vision, and we both realized that we were to experience the sufferings of martyrdom. From then on we gave up having any hope in this world (Young 47).

Hilarianus the governor, who had received his judicial powers as the successor of the late proconsul Minucius Timinianus, said to me: "Have pity on your father's grey head; have pity on your infant son. Offer the sacrifice for the welfare of the emperors." "I will not," I retorted. "Are you a Christian?" said Hilarianus. And I said: "Yes, I am. When my father persisted in trying to dissuade me, Hilarianus ordered him to be thrown to the ground and beaten with a rod. I felt sorry for my father, just as if I myself had been beaten. I felt sorry for his pathetic old age. Then Hilarianus passed sentence on all of us: we were condemned to the beasts, and we returned to prison in high spirits.

On the day before her execution, Perpetua wrote down another vision: She dreamed that she was led to the amphitheater, where enormous crowds waited to see her fight with a ferocious Egyptian athlete. *'Then a certain man appeared, so tall that he towered above the amphitheater. He wore a loose purple robe with two parallel stripes across the chest; his sandals were richly decorated with gold and silver. He carried a rod like that of an athletic trainer, and a green branch on which were golden apples. He motioned for silence and said, "If this Egyptian wins, he will kill her with the sword; but if she wins, she will receive this branch" Then he withdrew. "My clothes were stripped off, and suddenly I was a man." She fought and wrestled until she got him into a headlock and so won the fight. "But when I saw that we were wasting time, I put my two hands together, linked my fingers, and put his head between them. As he fell on his face I stepped on his head. Then the people began to shout and my assistants started singing victory songs. I walked up to the trainer and accepted the branch. He kissed me and said, 'Peace be with you, my daughter" And I triumphantly headed towards the Sanavivarian Gate. Then I woke up realizing that I would be contending not with wild animals but with the devil himself, but I knew that I would win the victory.'*

Two days before the execution, the Christians prayed for Felicitas in one torrent of common grief, and immediately after their prayer the labor pains came upon her. She suffered a good deal in her labor because of the natural difficulty of an eight-month delivery. One of the Christian women took the infant daughter to raise as her own, leaving Felicitas free to join her companions.



Fig 218: Left: "The Death of Sapphira" Ambrosius Francken the Elder. Right: "Triumph of Faith" Eugene Thirion

When the day arrived, Perpetua and Felicitas, together with their Christian brothers Revocatus, Saturninus, and Satorus, were led out of the prison to the gates of the amphitheater. The officer in charge, following the common practice, ordered the men to dress in robes of priests of the god Saturn, and the women to dress in the costumes of priestesses of the goddess Ceres, as if they were offering their deaths in sacrifice to the gods. Perpetua adamantly refused, saying: *"We came to this of our own free will, so that our liberty should not be violated. We agreed to pledge our lives in order to do no such thing [as sacrifice to the gods]. And you agreed with us to do this."* Again her plea prevailed, and the officer yielded. But just as Perpetua and Felicitas were to enter the arena, they were forcibly stripped naked and placed in nets, so that even the crowd was horrified when they saw that one was a delicate young girl, and the other woman fresh from childbirth, with milk still dripping from her breasts. A mad heifer was set loose after them; Perpetua was gored and thrown to the ground. She got up and, seeing Felicitas crushed and fallen went over to her and lifted her up, and the two stood side by side. Then after undergoing further ordeals and seeing their friend Satorus endure agonising torture. Perpetua and Felicitas, along with the others were called to the centre of the arena to be slaughtered. A witness records that Perpetua *"screamed as she was struck on the bone; then she took the trembling hand of the gladiator and guided it to her throat"*.

Given the time sequence outlined in [fig 211](#), the credibility of the canonical gospels concerning Yeshua's actual life remains tenuous to contrived. The Hellenistic role of Paul as the founder of the church as its entire religious view of Yeshua's mission is made clear in the section on [Hellenistic-Judaism](#). Paul, whose conversion on the road to Damascus is claimed to have occurred 31–36 CE shortly after the crucifixion dated to 33 CE, admits he had no direct contact with Yeshua: "Last of all, as to one untimely born, He appeared to me also." He was martyred in Rome in 64-67 CE around

the time of the Fall of Jerusalem. Mark was written 66–74 CE with earlier dates 35–45 generally dismissed. But Luke's account in his gospel and Acts dates from 80–90 CE and possibly as late as 110 CE. How then can Acts portray direct personal accounts of the Apostles leading up to Pentecost, remains as implausible as the canonical gospel accounts of Yeshua's mission.

Moreover, the ensuing events are fraught with conflicts with the Jews, or Jewish Christian resisters to the gentile mission, and negative 'miraculous' events associated with anything but compassion or realisation. Ananias and Sapphira donated to the cause, but kept back some of their capital and were both literally frightened to death for not giving all, ostensibly by the Holy Ghost, but actually by the assembled company, contrived as a miraculous act, demonstrating the need for utter submission to the Christian cause.

Having lost his sight on the Road to Damascus, while persecuting early disciples of Yeshua, possibly Hellenised diaspora Jews converted to Christianity, and blinded by a "light from heaven", Saul had his sight restored by Ananias. He is initially rejected by the disciples as "they were all afraid of him, and believed not that he was a disciple". Later Paul appears in a conflict with Barjesus, a Jew, disclaimed as a sorcerer, whose superior the deputy Sergius Paulus sought to "hear the word of God". But Elymas the sorcerer withstood them:

"Then Saul, (who also is called Paul,) filled with the Holy Ghost, set his eyes on him. And said, O full of all subtilty and all mischief, thou child of the devil, thou enemy of all righteousness, wilt thou not cease to pervert the right ways of the Lord? And now, behold, the hand of the Lord is upon thee, and thou shalt be blind, not seeing the sun for a season. And immediately there fell on him a mist and a darkness; and he went about seeking some to lead him by the hand. Then the deputy, when he saw what was done, believed, being astonished at the doctrine of the Lord."

How far have we fallen into misuse of the very principles of redemption? Who is the wicked sorcerer here? The man who curses another with blindness, having suffered blindness himself, or the man who sought to avoid the cult indoctrination of the deputy?

11. The False Dawn of the Prophesied Kingdom

The acid test of Yeshua's mission is the actual appearance of the Kingdom with power in the same generation of those present when he was alive:

Mark 8:38 "Whosoever therefore shall be ashamed of me and of my words in this adulterous and sinful generation; of him also shall the Son of man be ashamed, when he cometh in the glory of his Father with the holy angels. And he said unto them, Verily I say unto you, That there be some of them that stand here, which shall not taste of death, till they have seen the kingdom of God come with power."

Luke 21:32 Verily I say unto you, This generation shall not pass away, till all be fulfilled. Heaven and earth shall pass away: but my words shall not pass away. And take heed to yourselves, lest at any time your hearts be overcharged with surfeiting, and drunkenness, and cares of this life, and so that day come upon you unawares. For as a snare shall it come on all them that dwell on the face of the whole earth.

But in Matthew 24 the passage is stunning in its sweep and unremitting declaration of a cosmological Armageddon apocalypse in Yeshua's own generation:

And as he sat upon the mount of Olives, the disciples came unto him privately, saying, Tell us, when shall these things be? and what shall be the sign of thy coming, and of the end of the world?

The ensuing apocalypse in true Revelation style, is then claimed to be Yeshua's own words:

And Jesus answered and said unto them, Take heed that no man deceive you. For many shall come in my name, saying, I am Christ; and shall deceive many. And ye shall hear of wars and rumours of wars: see that ye be not troubled: for all these things must come to pass, but the end is not yet. For nation shall rise against nation, and kingdom against kingdom: and there shall be famines, and pestilences, and earthquakes, in divers places. All these are the beginning of sorrows.

The persecution of the Christians is then declared:

Then shall they deliver you up to be afflicted, and shall kill you: and ye shall be hated of all nations for my name's sake. And then shall many be offended, and shall betray one another, and shall hate one another. And many false prophets shall rise, and shall deceive many. And because iniquity shall abound, the love of many shall wax cold. But he that shall endure unto the end, the same shall be saved. And this gospel of the kingdom shall be preached in all the world for a witness unto all nations; and then shall the end come.

We then come to the abomination and tribulations of Daniel:

When ye therefore shall see the abomination of desolation, spoken of by Daniel the prophet, stand in the holy place, (whoso readeth, let him understand:) Then let them which be in Judaea flee into the mountains: Let him which is on the housetop not come down to take any thing out of his house: Neither let him which is in the field return back to take his clothes.

Then the woe to the pregnant and breastfeeding mothers:

And woe unto them that are with child, and to them that give suck in those days! But pray ye that your flight be not in the winter, neither on the sabbath day: For then shall be great tribulation, such as was not since the beginning of the world to this time, no, nor ever shall be. And except those days should be shortened, there should no flesh be saved: but for the elect's sake those days shall be shortened.

Then we have accounts of the false Messiahs:

Then if any man shall say unto you, Lo, here is Christ, or there; believe it not. For there shall arise false Christs, and false prophets, and shall shew great signs and wonders; insomuch that, if it were possible, they shall deceive the very elect. Behold, I have told you before. Wherefore if they shall say unto you, Behold, he is in the desert; go not forth: behold, he is in the secret chambers; believe it not. For as the lightning cometh out of the east, and shineth even unto the west; so shall also the coming of the Son of man be. For wheresoever the carcase is, there will the eagles be gathered together.

Then we enter full fledged Armageddon with the stars falling from the sky, angels and trumpets:

Immediately after the tribulation of those days shall the sun be darkened, and the moon shall not give her light, and the stars shall fall from heaven, and the powers of the heavens shall be shaken: And then shall appear the sign of the Son of man in heaven: and then shall all the tribes of the earth mourn, and they shall see the Son of man coming in the clouds of heaven with power and great glory. And he shall send his angels with a great sound of a trumpet, and they shall gather together his elect from the four winds, from one end of heaven to the other. Now learn a parable of the fig tree; When his branch is yet tender, and putteth forth leaves, ye know that summer is nigh: So likewise ye, when ye shall see all these things, know that it is near, even at the doors.

But in the very midst, Yeshua is said to claim all his supernatural unveiling and cosmic cataclysm will occur in the same generation as those present:

Verily I say unto you, This generation shall not pass, till all these things be fulfilled.

Next Noahs flood re-ensues in which half the living are taken:

Heaven and earth shall pass away, but my words shall not pass away. But of that day and hour knoweth no man, no, not the angels of heaven, but my Father only. But as the days of Noe were, so shall also the coming of the Son of man be. For as in the days that were before the flood they were eating and drinking, marrying and giving in marriage, until the day that Noe entered into the ark, And knew not until the flood came, and took them all away; so shall also the coming of the Son of man be. Then shall two be in the field; the one shall be taken, and the other left. Two women shall be grinding at the mill; the one shall be taken, and the other left. Watch therefore: for ye know not what hour your Lord doth come.

Finally Christ comes as a thief in the night in the parable of the goodman, but here Luke 12:40 is earlier in the mission contradicting Matthew 24:44 in the timing:

"And this know, that if the goodman of the house had known what hour the thief would come, he would have watched, and not have suffered his house to be broken through. Be ye therefore ready also: for the Son of man cometh at an hour when ye think not."

Matthew's statement is implausible and incredible in every conceivable way. For Yeshua's claimed statement to be true, not only would nation have to rise against nation, which did eventuate in the siege of Jerusalem 30 years later, but the stars would have to fall from the sky amid the greatest tribulation since the beginning of the world, yet this is all claimed to take place while the living standing before him are still alive. No one reading this can have any honest reaction but to realise that either it is a retrospective contrivance on the author's part, or that Yeshua's claims in the light of ensuing events are those of a false messiah, in both cases a historical fallacy.

Given the date of writing of the synoptics, Elaine Pagels (2012) points out that these passages and those of Revelation occurred after the siege of Jerusalem in CE 66, in a time when Christian faith of the minority of followers who still believed in Yeshua had their faith restored by these events as signs of preliminary “pangs of the messiah” before the Lord’s return in power.

Nevertheless, these statements claimed in the gospels to be direct from Yeshua, taken anywhere near face value, despite severe doubts that many of them are inserted to fulfil Pauline interpretations of the Son of God, indicate the intention of his mission to be to bring about by his crucifixion the Kingdom of God through tumultuously violent events. This led to an urgent anticipation by early Christians that the kingdom was at hand, encouraging many to become martyrs rather than denounce their beliefs to the Romans.

There is silence all around. The Baptist appears, and cries: “Repent, for the Kingdom of Heaven is at hand.” Soon after that comes Jesus, and in the knowledge that He is the coming Son of Man lays hold of the wheel of the world to set it moving on that last revolution which is to bring all ordinary history to a close. It refuses to turn, and He throws Himself upon it. Then it does turn; and crushes Him. Instead of bringing in the eschatological conditions, He has destroyed them. The wheel rolls onward, and the mangled body of the one immeasurably great Man, who was strong enough to think of Himself as the spiritual ruler of mankind and to bend history to His purpose, is hanging upon it still. That is His victory and His reign.
(Albert Schweitzer, *The Quest of the Historical Jesus* (2001 654))

I can sympathise and even empathise with Yeshua’s position. The visionary experience is all consuming, as it is a singular relationship between the individual and what is the Godhead by any other name. Hence the references to the Father as an intimate parental relationship. This means that the visionary is and has to be prepared to do whatever it takes to fulfil the visionary responsibility that has been thrust upon them by circumstances. At the time the world was beset, not so much by environmental apocalypse, but nation against nation. The religious mindset led straight into an apocalypse and if our history serves us well John the Baptist laid this sense of immediate responsibility onto Yeshua in his baptism.

If I were in Yeshua’s time and place, I could easily have taken the same position. In a sense his apprehension was fulfilled, because in 66 CE Armageddon ensued in the holocaust of the siege of Jerusalem, in which Josephus recounts over a million lives were lost, resulting in a Jewish diaspora that still exists to this day. The idea that one should trade one’s mortal life for a renewal of the entire world condition of everyone alive is a transaction no compassionate being thrust into the visionary vortex can fairly abandon. Indeed today if I thought that my own death could secure the ongoing diversity of immortal life on the planet from risk of extinction, I would be psychologically obliged to do it, because not doing so will not save me from mortality, but condemn the fates of endless others throughout the future. But this is not the way of true redemption.

By the end of the first century it had become obvious that Yeshua’s messianic expectation had failed to arrive and the Christian forefathers, in the wake of the Pauline heresy of Hellenistic-Judaism – a form of Judaism in classical antiquity that combined Jewish religious tradition with elements of Greek culture, recrafted Yeshua’s mission in their own image of reality. Hence the infusion of pagan Greek elements into the early Christian accounts pervading both Paul’s writings and those of Luke, who unashamedly wrote his gospel in high Greek. Paul was born Saul in Tarsus, which had been among the most influential cities in Asia Minor since the time of Alexander the Great, who died in 323 BC. Although it is known (from his biography and from Acts) that Paul could and did speak Hebrew, modern scholarship suggests that Koine Greek ⁶⁸was his first language. All of Mark, Luke, Matthew and John wrote in Greek, not Hebrew or Aramaic. Luke’s Greek is the highest quality in style of anything in the new testament. This constitutes a frank reconstruction of history to forge a new implicitly fraudulent pagan gentile religion on the assumed basis of Yeshua’s mission and teachings powered by such single-minded conviction that countless martyrs intentionally suffered horrific deaths for no good cause.

The Gospel of Thomas also appears to have been originally written in Greek. After the Coptic version of the complete text was discovered in 1945 at Nag Hammadi, scholars realised that three different Greek text fragments previously found at Oxyrhynchus (the Oxyrhynchus Papyri), also in Egypt, were part of the Gospel of

⁶⁸ *Koine Greek* 'Common Greek', also known as Alexandrian dialect, common Attic, Hellenistic or Biblical Greek, was the common supra-regional form of Greek spoken and written during the Hellenistic period, the Roman Empire and the early Byzantine Empire.

Thomas. These three papyrus fragments of Thomas date to between 130 and 250 AD. The manuscript of the Coptic text (CG II), found in 1945 at Nag Hammadi, Egypt, is dated at around 340 AD.

This virtual universality of Greek occurs despite the suggestion that some documents, such as the Quelle source, may have originally been written in Aramaic. The transition to Greek happened very early:

"[M]issionaries, above all 'Hellenists' driven out of Jerusalem, soon preached their message in the Greek language. We find them in Damascus as early as AD 32 or 33. A certain percentage of Jesus' earliest followers were presumably bilingual and could therefore report, at least in simple Greek, what had been heard and seen. This probably applies to Cephas/Peter, Andrew, Philip or John. Mark, too, who was better educated in Jerusalem than the Galilean fishermen, belonged to this milieu. The great number of phonetically correct Aramaisms and his knowledge of the conditions in Jewish Palestine compel us to assume a Palestinian Jewish-Christian author. Also, the author's Aramaic native language is still discernible in the Marcan style" (Hengel 2005).

The earliest Christian writing is 1 Thessalonians, dated circa CE 50. In it Paul's message is to wait and not slumber, for the son of man shall come at any time hence, in the Rapture in the air:

"And to wait for his Son from heaven, whom he raised from the dead, even Jesus, which delivered us from the wrath to come. For the Lord himself shall descend from heaven with a shout, with the voice of the archangel, and with the trump of God: and the dead in Christ shall rise first: Then we which are alive and remain shall be caught up together with them in the clouds, to meet the Lord in the air: and so shall we ever be with the Lord. Wherefore comfort one another with these words. But of the times and the seasons, brethren, ye have no need that I write unto you. For yourselves know perfectly that the day of the Lord so cometh as a thief in the night. For when they shall say, Peace and safety; then sudden destruction cometh upon them, as travail upon a woman with child; and they shall not escape. ... Therefore let us not sleep, as do others; but let us watch and be sober."

In the light of our burgeoning knowledge of cosmology, the Rapture in the clouds is a dangerous contrivance. What is both alarming and appalling is that it is now over 2000 years since the Crucifixion and the Christian religion, despite failing to convincingly prove the acid test of veracity by the Fall of Jerusalem in CE 66, which committed virtually the entire generation in Yeshua's presence to oblivion, has locked itself into a perpetual delay of the Kingdom, claiming a false remit of authority, refusing to honestly admit to humanity the entire edifice of belief is a pagan contrivance, holding imperatively to the claimed status of being the ordained stewards of the Lord's return in the End of Days, the Day of Judgment, as diabolically described in Revelation's multiple genocides. This position is inconsistent with the paradoxical visionary immanence of Yeshua's own teachings, particularly those in the Gospel of Thomas, and strategically fixes the persona of Yeshua as pagan the Christ Son of God into the portal of reality, in a cosmological lie, preventing any evolution of the tradition through the insight of living people to address the actual needs of humanity and the living planet.

Paul's 'rapture', is both completely unnatural, and profoundly dangerous, because it leads to many Christians today imagining the second coming of Jesus as the heavenly rapture in which the 'late planet Earth' is carelessly discarded for an eternal life in mid-air. This completely frustrates being able to address the apocalyptically urgent questions of avoiding a planetary Armageddon from human misadventure disrupting the climate depleting Earth's resources and causing a mass extinction of the diversity of life, turning the planet from an immortal paradise into a potentially lethal man-made hell.

12. Transcending the Bacchae: Revelation and Cosmic Annihilation

The **Bacchae**, written by Euripides around 405 BCE, is considered to be not only one of Euripides's greatest tragedies, but also one of the greatest dramatic works ever written, modern or ancient. A clear exception has to be Yeshua's mission and Crucifixion which has clearly reverberated unparalleled throughout two millennia of blood spilled in the name of Christianity in martyrdom, Crusade, inquisition and witch hunt.

The Bacchae recounts in violent detail the slaying of Pentheus by the maenads and the reformation of religious practice in Thebes for not recognising the true divinity of the Son of God. To many Christians it may seem an antithesis of all that is good in Yeshua's compassionate sayings, but the consequences of the Kingdom coming with power invoked slaughter on a genocidal scale which leaves the single murder in the Bacchae paling to insignificance.

Semele, was a princess in the royal Theban house of Cadmus. She had an affair with Zeus, the King of the Gods, and became pregnant. As revenge, Zeus's jealous wife Hera tricked Semele into asking Zeus to appear in his divine form. Zeus, too powerful for a mortal to behold, emerged from the sky as a bolt of lightning and burnt Semele to a cinder. He managed, however, to rescue his unborn son Dionysus and stitched the baby into his thigh. This means that the historical journey of the concept of the Son of God by a mortal woman runs from Dionysus to Yeshua 500 years later.

Semele's family claimed that she had been struck by lightning for lying about Zeus and that her child, the product of an illicit human affair, had died with her, maligning her name and rejecting the young god Dionysus. Dionysus arrives in Thebes disguised as the stranger. During Dionysus's absence, Semele's father, Cadmus, had handed the kingdom over to his grandson Pentheus, who decided to forbid the worship of Dionysus. Dionysus tells the audience that when he arrived in Thebes he drove Semele's sisters mad, and they fled to Mt. Cithaeron to worship him and perform his rites on the mountainside. Unconvinced of their divinely-caused insanity, Pentheus sees their drunken cavorting as an illicit attempt to escape the mores and legal codes regulating Theban society. He orders his soldiers to arrest the Lydian stranger and his maenads. He orders Dionysus to be chained, bound and tortured, but Dionysus escapes his bands. Similar stories are told in the Pauline letters. When he tries to tie Dionysus he ties only a bull, and when he plunges a knife into Dionysus, the blade passes only through shadow. Suddenly an earthquake shakes the palace, a fire starts.

Dionysus tries to persuade Pentheus to abandon his destructive path, but Pentheus refuses. A cowherd arrives and describes sighting the maddened women of Cadmus seen resting blissfully in the forest, feasting on milk, honey and wine that sprang from the ground. They played music, suckled wild animals and sang and danced with joy. But when they saw the cowherd, they flew into a murderous rage. The cowherd barely escaped, but the herd of cattle was captured and torn apart by hand.

Dionysus offers Pentheus a chance to see the maenads for himself, undetected. He agrees to do all Dionysus suggests, dressing himself in a wig and long skirts. Once in the woods, Pentheus cannot see the bacchantes from the ground, and wants to mount a tree for a better vantage. Dionysus miraculously bends a tall fir tree, puts Pentheus on top, and gently straightens the tree. At once the maenads see him, and with rolling eyes and frenzied cries the women attack, bringing Pentheus down and dragging him to the ground. His mother Agaue, driven mad by Dionysus, proceeds to rip her son to death and returns home with Pentheus's head in her hands.

Cadmus, who knows what has happened, sadly approaches his daughter and Agaue begins to weep. Cadmus remarks that the god has punished the family rightly but excessively. In the end, Dionysus finally appears in his true form to the city. He banishes Agaue from Thebes and ordains that Cadmus and his wife will turn into snakes, destined to invade Greek lands with a horde of barbarians.



Fig 219: Left: Greek bowl illustrating the Bacchae and Lazzarini's Orpheus and the Bacchae. Orpheus is a personification of Dionysus. Right: Memling's "Day of Judgment". While in the Bacchae, despite madness and mayhem, only one person is killed, in the Christian version, failing to recognise Yeshua as the Son of God results in genocidal cosmological catastrophe.

Christianity adopted a fully fledged End of Days, with Jesus claiming in the synoptic gospels and John to challenge the devil in a final confrontation, through which he would come to return in power at the right hand of God. The siege of Jerusalem, the Jewish diaspora and the depravities of the Roman emperors subsequently sublimed this picture in Revelation into a view of world history in which Christ would return as the Lord and conqueror of evil in the Millennium and the effective Day of Judgment. Despite the failure of this entire concept over two millennia in the absence of the Lord's return, the spectre of apocalyptic victory in tumult and conflict remains integral to Christian eschatology.

Also implicating the Hebrew tradition, there are there are forerunners of this, for example in post-exilic Zechariah (520-518 BCE), looking to the restoration of the Temple, which does have an apocalyptic climax, which however ends in pastoral tranquillity, despite the destruction of the enemies:

"And it shall come to pass, that in all the land, saith the Lord, two parts therein shall be cut off and die; but the third shall be left therein. And I will bring the third part through the fire, and will refine them as silver is refined, and will try them as gold is tried: they shall call on my name, and I will hear them: I will say, It is my people: and they shall say, The Lord is my God. ... And his feet shall stand in that day upon the mount of Olives, which is before Jerusalem on the east, and the mount of Olives shall cleave in the midst thereof toward the east and toward the west, and there shall be a very great valley; and half of the mountain shall remove toward the north, and half of it toward the south ... And ye shall flee to the valley of the mountains; ... And it shall come to pass in that day, that the light shall not be clear, nor dark: But it shall be one day which shall be known to the LORD, not day, nor night: but it shall come to pass, that at evening time it shall be light. And it shall be in that day, that living waters shall go out from Jerusalem; half of them toward the former sea, and half of them toward the hinder sea: in summer and in winter shall it be. And the LORD shall be king over all the earth: in that day shall there be one LORD, and his name one. All the land shall be turned as a plain from Geba to Rimmon south of Jerusalem: ... And men shall dwell in it, and there shall be no more utter destruction; but Jerusalem shall be safely inhabited. And this shall be the plague wherewith the LORD will smite all the people that have fought against Jerusalem; Their flesh shall consume away while they stand upon their feet, and their eyes shall consume away in their holes, and their tongue shall consume away in their mouth. ... And it shall come to pass, that every one that is left of all the nations which came against Jerusalem shall even go up from year to year to worship the King, the LORD of hosts, and to keep the feast of tabernacles. ... and in that day there shall be no more the Canaanite in the house of the LORD of hosts." (Zech 13-14).

Similar passages can be found in Isaiah, Micah, Ezekiel and Jeremiah all ending in the peaceful rule of the Lord.

In Daniel, which is believed to have originated as a collection of folktales among the Jewish community in the late 4th to early 3rd centuries BCE, the apocalypse is political in nature, with the "abomination of desolation" identified with Antiochus IV, the king of the Greek Seleucid dynasty, who in 167 BCE, put an end to the practice of a lamb being sacrificed morning and evening, on the altar of the Jewish temple in Jerusalem. The visionary chapters of Daniel, chapters 7-12, are said to have been added to reassure Jews that they would survive in the face of this threat.

In 66 the Jews rose in revolt against the Romans as their ancestors had once done against Antiochus. The resulting First Jewish-Roman War ended in 70 CE when the legions of the Roman general Titus surrounded and eventually captured Jerusalem. The city and the temple were razed to the ground, and the only habitation on the site until the first third of the next century was a Roman military camp. According to Josephus this resulted in over 1.1 million deaths. It was against this background that the gospels were written, Mark around 70 CE and Matthew and Luke around 80–85. Mark harks specifically back to Daniel to validate the Kingdom as a prophecy:

"But when ye shall see the abomination of desolation, spoken of by Daniel the prophet, standing where it ought not, (let him that readeth understand,) then let them that be in Judaea flee to the mountains: ... But in those days, after that tribulation, the sun shall be darkened, and the moon shall not give her light, And the stars of heaven shall fall, and the powers that are in heaven shall be shaken. And then shall they see the Son of man coming in the clouds with great power and glory" (Mark 13:14).

In **Revelation**, ἀποκάλυψις (*apokalypsis*) this world view is taken to its annihilating cosmological extreme in culminating the Christian bible, although it is still not recognised as such by the Orthodox Church. Ironically it is not the latest work. Traditional sources date it to the reign of Domitian (CE 81–96), in the wake of the siege of Jerusalem.

Elaine Pagels (2012) has a detailed insightful analysis, both in terms of a revitalisation of early Christian apocalyptic belief as a result of the tumultuous events of the fall of Jerusalem also highlighting its position in terms of the more Judaic elements of John's vision whom she describes as a "provincial Jewish prophet", which brought him into open conflict with Paul over issues of 'kosher' purity of food, sexual purity noted in Revelation as 'virginity' and sexual relationships with pagan gentiles, in which popularity among the gentiles resulted in a "new religion" emanating from the born-again Paul's influence overtaking the traditions of the Jewish Christians. This gives an insight into how the formative early movements arose from diverse, conflicting positions, generating their own world views, which have

later become 'canonised' into scripture now believed to be cosmological fact by believers, but which started out as intense poetic allegories intended to inspire the followers of visionary leaders, each following their own conception.

However, dangerously for the current era of planetary crisis, Revelation becomes a fully-fledged apocalyptic fantasy of the triage of all life, amid conflict of nations, in which there are cataclysmic life-devastating cosmological phenomena - a great earthquake where the sun becomes black as sackcloth of hair, and the moon like blood, mixing an eclipse of the sun, an eclipse of the moon and an earthquake. The stars of heaven fall to the Earth, the sky recedes like a scroll being rolled up, and every mountain and island is moved out of place.

This takes us straight back to the flat-Earth cosmology of the sabbatical creation. There is no way that the islands and mountains would just move and shake when the stars fall and the sky rolls up. It is a cosmology in frank conflict with the 13 billion year evolution of the universe full of galaxies and the 3 billion year evolution of the diversity of life. This only makes sense as a conscious nightmare vision, and political hyperbole, not a genuine cosmological event. It is the most extraordinary book of eschatological religious vision ever written, bursting with tumultuous battles and cataclysms, from the beasts of belial, to the avenging Lord, amid tumult and destruction, resulting in the triage of all life and impossibly a triage of the Sun, Moon and stars:

"The first angel sounded, and there followed hail and fire mingled with blood, and they were cast upon the earth: and the third part of trees was burnt up, and all green grass was burnt up And the second angel sounded, and as it were a great mountain burning with fire was cast into the sea: And the third part of the creatures which were in the sea, and had life, died; and the third part of the ships were destroyed. ... And the fourth angel sounded, and the third part of the sun was smitten, and the third part of the moon, and the third part of the stars; so as the third part of them was darkened, and the day shone not for a third part of it, and the night likewise. (Rev 8). And the four angels were loosed, which were prepared for an hour, and a day, and a month, and a year, for to slay the third part of men. By these three was the third part of men killed, by the fire, and by the smoke, and by the brimstone, which issued out of their mouths" (Rev 9).

Later we see the pregnant woman clothed with the Sun standing on the Moon, who is an apotheosis of the Queen of Heaven, Inanna-Ishtar but also identified by Christians with Mary. Her boy-child, the warlord-to-come, is attacked by a dragon, and taken up to God, precipitating the war in heaven:

"And there appeared a great wonder in heaven; a woman clothed with the sun, and the moon under her feet, and upon her head a crown of twelve stars: And she being with child cried, travailing in birth, and pained to be delivered. And there appeared another wonder in heaven; and behold a great red dragon, having seven heads and ten horns, and seven crowns upon his heads. And his tail drew the third part of the stars of heaven, and did cast them to the earth: and the dragon stood before the woman which was ready to be delivered, for to devour her child as soon as it was born. And she brought forth a man child, who was to rule all nations with a rod of iron: and her child was caught up unto God, and to his throne" (Rev 12).



Fig 220: The woman clothed with the sun and the dragon (William Blake).

On the other side of the cosmic battle we find the great whore of Babylon, the dark manifestation of the same Inanna-Ishtar Goddess figure:

"I saw a woman sit upon a scarlet coloured beast, full of names of blasphemy, having seven heads and ten horns. And the woman was arrayed in purple and scarlet colour, and decked with gold and precious stones and pearls, having a golden cup in her hand full of abominations and filthiness of her fornication: And upon her forehead was a name written, "mystery, Babylon the great, the mother of harlots and abominations of the Earth". And I saw the woman drunken with the blood of the saints, and with the blood of the martyrs of Jesus: and when I saw her, I wondered with great admiration" (Rev 17).

Pagels (2012) notes the extraordinary time-suspending notion of eternity:

"Then the angel raised his right hand to heaven, and swore by him who lives forever and ever ... There shall be no more time". What use time standing still for eternity is to those in Heaven remains obscure. She further notes that many of the motifs, such as the Leviathan have echoes in some of the oldest Biblical passages that predate Genesis:

"And I saw a beast rising out of the sea, having ten horns and seven heads; and on its horns were ten crowns, and on its heads were blasphemous names. And the beast that I saw was like a leopard, its feet were like a bear's, and its mouth was like a lion's mouth. And the dragon gave it his power and his throne and great authority"

Thus the author of Psalm 74 praises God for having vanquished Leviathan:

“God, my king, is from old, working salvation in the earth. You divided the sea by your might; you broke the heads of the dragons in the waters; you crushed the heads of Leviathan; you gave him as food for the creatures of the wilderness”.

Pagels notes that *“Israel's storytellers, perhaps to reassure their hearers that God's power is uncontested, morphed the sea monster Tiamat into tehom, the Hebrew term for 'the depths', the primordial sea over which they say that 'wind from God' moved in the beginning”.*

The cosmic Christ appears as a feudal dictator-Lord of mass destruction treading the Dionysian winepress of revenge:

“And I saw heaven opened, and behold a white horse; and he that sat upon him was called Faithful and True, and in righteousness he doth judge and make war. His eyes were as a flame of fire, and on his head were many crowns; and he had a name written, that no man knew, but he himself. And he was clothed with a vesture dipped in blood: and his name is called The Word of God. And the armies which were in heaven followed him upon white horses, clothed in fine linen, white and clean. And out of his mouth goeth a sharp sword, that with it he should smite the nations: and he shall rule them with a rod of iron: and he treadeth the winepress of the fierceness and wrath of Almighty God” (Rev 19).

Unmitigated death and destruction is cast on the unbelievers:

“And I saw an angel standing in the sun; and he cried with a loud voice, saying to all the fowls that fly in the midst of heaven, Come and gather yourselves together unto the supper of the great God; That ye may eat the flesh of kings, and the flesh of captains, and the flesh of mighty men, and the flesh of horses, and of them that sit on them, and the flesh of all men, both free and bond, both small and great. ... And the beast was taken, and with him the false prophet that wrought miracles before him, with which he deceived them that had received the mark of the beast, and them that worshipped his image. These both were cast alive into a lake of fire burning with brimstone. ... And the remnant were slain with the sword of him that sat upon the horse, which sword proceeded out of his mouth: and all the fowls were filled with their flesh” (Rev 19).

As gratuitous violence, Revelation reigns supreme as a vision of destructive planetary apocalypse, that is profoundly dangerous, deceptive and misleading – an unmitigated planetary and cosmological disaster. Religious historians cast this in the light of prophetic beliefs in a time of wars of conquest, and particularly the fall of Jerusalem in 66 CE, by heathens over the true followers of God (Pagels 2012) .

However, as long term prophecy to this day and age, it tells of the diabolical violent rule of order of the Lord Son of the God of Creation, over the fecundity of nature, in the complete destruction of Earthly life, cast in the personae of the Great Whore and all the beasts, in which Christianity would move from the wantonly spilled blood of martyrdom, to its adoption as the authoritarian state religion of Rome, and thereby became the religion of dominant empire, leading to the Crusades against another totalitarian religion, albeit in the more compassionate person of Saladin, then the Gnostic Cathars and Albigenses, beliefs spilling out of the Crusades to the Holy Land, through Inquisition and Witch Hunts to the current planetary crises of human exploitation of nature in dominion over it, in climate crisis, the mass extinction of the diversity of life and nuclear mutually assured annihilation, currently being severely tested in the war of Russia on Ukraine, two Orthodox Christian countries. Thus we see a religion of assumed divine order at war with the chaotic fecundity of nature committing a genocide of life amid cosmological conflagration, to achieve the investiture of the avenging Lord of ultimate legislative command, the ultimate Darth Vader of Cosmology, leading to a sandbox replica of the Heavens in a sterile “Holy City” in the sky fashioned through the complete annihilation of the living , in which even the fearful are condemned alongside the murderers:

“But the fearful, and unbelieving, and the abominable, and murderers, and whoremongers, and sorcerers, and idolaters, and all liars, shall have their part in the lake which burneth with fire and brimstone: which is the second death.”

This is a huge tale of human misadventure in pursuing a false destructive ideology of oppressive order. Yet it contains two pivotal elements – the Tree of Life entwined around the throne of the Lamb, giving its Twelve monthly fruit for the healing of the nations – and the notion of the sacred marriage, or hieros gamos. However the sacred marriage is here not that of the true fertility between woman and man as sexual beings that generates the passage of the living generations, but in the corrupted form of the Lamb and the Heavenly Jerusalem, Christ and his Church, falling in the shadow of the dysfunctional marital relationship of Jehovah and the whoring bride Israel, whose ultimate Holy of Holies is sequestered in the metaphor of unrequited love in the Song of Songs:

Let us be glad and rejoice, and give honour to him: for the marriage of the Lamb is come, and his wife hath made herself ready (Rev 19). And I John saw the holy city, new Jerusalem, coming down from God out of heaven, prepared as a bride adorned for her husband. ... And there came unto me one of the seven angels ... and talked with me, saying, Come hither, I will shew thee the bride, the Lamb's wife (Rev 21).

Finally we come to the Tree of Life, hidden since the foundation of the world in Eden, beckoning to our living futures:

And he shewed me a pure river of water of life, clear as crystal, proceeding out of the throne of God and of the Lamb. In the midst of the street of it, and on either side of the river, was there the tree of life, which bare twelve manner of fruits, and yielded her fruit every month: and the leaves of the tree were for the healing of the nations (Rev 21).

Resurrection Revelation A Song after a brush with death, out of which the idea of resplendence arose.

13. The Human Messianic Tradition

Before I left on my millennial sabbatical vigil to the Amazon and Jerusalem, I took a single teaching at the liberal Jewish congregation. When I arrived, the rabbi revealed this was to be on the messiah, and duly expounded that the concept of the Christ, Mashiach or 'anointed one' in the Jewish tradition is a living human being who brings about an epoch or paradigm of long-term future goodness.

Before Yeshua's time there were a progression of messianic anointed, principally kings, in contrast both to the prophetic figures of Old Testament history, who were anointers, or protesters in sack cloth and ashes. Each of Saul, David and Solomon were anointed by a priest and and Cyrus the Mede was acclaimed as anointed in the scriptures (Isiah 45). All of these were clearly and unambiguously human men. Both 'messiah' and 'christ' mean 'anointed' in their respective languages, so the key to being a messiah is being anointed either by a priest, by a woman, or by God 'himself' as in the quotation of Isaiah 61 which Yeshua read in Nazareth "the Lord hath anointed me" and which Jane and I read together as woman and man in the name of God and Gaia on the night of millennium Eve on the Mount of Olives.

Out of the Old Testament anointed, Solomon shines forth in his kingly splendour, in his religious heroism in establishing the first temple, and in his reputation as having a deep knowledge of the natural and supernatural, from the hyssop that grows out of the wall to the key and seal of the magical arts. He was also above all the consort of the feminine, in the Song of Songs, in the Wisdom of Solomon, in the Wisdom of the Proverbs, in giving the Queen of Sheba all she desired, in his many wives and concubines, and his permissiveness, criticised by the Yahwist prophets for letting his many wives worship the strange deities of their own predilection. He is thus a messiah of fertility and abundance, as well as anointed by a high priest in the religious tradition.

In the lead up to Yeshua's mission, there was a growing tradition of Jewish apocalypticism in the shadow of the Zoroastrian renovation cosmology, that led to increasing eschatological expectations of a final end of days confrontation, as articulated in the accounts of prophets such as Zechariah, and in contemporary works such as Enoch and Jubilees. We can also compare Yeshua with contemporaries such as the Essene Teacher of Righteousness, all of whom are regarded by all as human beings. We can compare the cosmic scale of the conflict portrayed between God and Satan surrounding Yeshua's mission with the invectives in the Dead Sea scrolls casting the same kinds of apocalyptic conflict in a more regional and humanly political light in terms of known adversaries. John the Baptist likewise, for all his scorched-Earth apocalyptic rhetoric, is accepted as a human forerunner.

Since Yeshua, in the Jewish tradition, there have been a succession of human messiahs, most or all of which have been a source of lamentation to Jewish people.

A century after Yeshua, Bar Kochba was anointed by Rabbi Akiva⁶⁹ who brought about the final diaspora of the Jewish people in the last futile resistance to the Romans. For his pains, Akiva, was tortured and executed along with nine other prominent Rabbis by the Romans, after revolt of bar Kochba, whose name means "son of a star" following Numbers 'prophecy' 14:7 that "a star shall shoot out of Jacob" died, apparently strangled by a snake after the final battle of Betar. Thus we can see Jesus is not the only one, by any means, anointed, or anointer, to give his life for the cause. Both Yeshua's and bar Kochba's missions can be seen in the Jewish two-messiah model of a Josephic messiah who dies followed by a prophesied Davidic messiah who is victorious. Jesus is Yeshua ben Joseph and died claiming to return in an eschatological parousia disconnecting from the limitations of Jewish descent of traditional law. Great effort nevertheless went into demonstrating his Davidic connection, e.g. with Bethlehem. Later Maimonides expanded

⁶⁹ Akiva (50-135 CE) was instrumental in drawing up the canon of the Tanakh. He stoutly defended the canonicity of the Song of Songs, (as the Holy of Holies) and of Esther, despite it being an allegory of Ishtar. He was executed by the Romans after the Bar Kochba revolt. Akiva said of Bar Kochbah 'This is the King Messiah'. Johanan ben Torta retorted: "Akiva, Grass shall grow from your cheeks and yet the son of David shall not appear".

this concept into a set of almost impossible criteria, including bearing the long lost lineage of David, rebuilding the temple and regathering the diaspora.

The 15th and 16th centuries account several Jewish messiahs, including David Re'uveni and Shlomo Molkho who was burned at the stake. The latter influenced two messiahs from Tsvat in Galilee, Isaac Luria and his successor Hayim Vital.



Luria's new phrasing of the Kabbalistic myth of the Zohar provided for a cosmic rescue mission to be carried out by the messiah and newly endowed the messiah with the ability to determine the nature of the individual soul and human deeds in the effort.

Fig 222: Bar Kochba Kneset Menorah detail and Shabbati Zevi

By far the largest messianic event influencing those to follow and causing continuing ferment and interest internationally was the messiahship of Shabbati Zevi who led a Jewish expedition eastward from Europe but was imprisoned in Turkey and apostatised to Islam. This began

a tradition of duplicitous conversion in which successive messiahs extended the antinomian theme, culminating in Isaac Frank who espoused mysticism and sexual liberation opposed rabbinical teachings and whose daughter become the only female Jewish messiah in his stead. Following this, a line of Hassidic messiahs, begins with Israel ben Eliezer and continues in the messianic following of Menachem Mendel Schneersohn today. The uneven fates and fortunes and angst induced by messianic personalities has in turn led to much pain and a loss of confidence in the messianic persona on the part of Jewish people, faced with both the holocaust and flux and change, both in the New World and in the fortunes of secular Zionism in the 'Holy Land'.

What this parade of messiahs show is that the messianic tradition is one of human innovators and that the elevation of Yeshua to a man-God status is a disconnection from the messianic tradition into pagan beliefs in a super-human hero, characterised more closely by the fertility deities who bridge the realm between the sacred king and the personified god in roles such as Adonis, Tammuz and Dionysus, all of which are human heroes grown into deities associated with death and regeneration, and their projection onto the end of days revelation of the day of judgment, in the son of humanity coming in power, and the personae of Quranic Isa (Jesus/Esau reflecting Nabatean connections) and the mahdi in Shi'ite Islam.

There is a central problem with the idea that God the Father should choose the time and place of Yeshua to pronounce his only begotten son should be sacrificed in a final struggle with Satan to end the dysphoria that began with the mythical Fall in Eden. Why then, over one of many rumblings of civilisation and empire, albeit that of Jerusalem, and not now, since it is now that we have discovered the means of total nuclear annihilation and are laying waste to the planet in a mass extinction on a scale likely to reverberate over evolutionary time scales of millions of years?

The answer lies in social history and the evolution of religious ideas of a God acting in history and the confluence of the Zoroastrian concept of a final renovation with an increasingly apocalyptic Yahwistic following coming out of the Exile, after the subsequent overthrow of Babylon by Cyrus and his favour for the Jews. This confluence came neither from a cosmic God of the universe with a psychopathic jealousy and a tunnel vision for Zion, nor from a local God of history alone, but the collision, ferment and fertilisation of human religious imagination through cultural interaction.

Grillmeier & Bowden (1975) make clear that, central to the christological ideas of Paul are the notion of cosmological pre-existence and the worship of Christ as Kyrios or Lord, no longer a mere messiah, although at fist only implicit in his writing:

*For though there be that are called gods, whether in heaven or in earth, (as there be gods many, and lords many,) But to us there is but one God, the Father, of whom are all things, and we in him; and **one Lord Jesus Christ, by whom are all things, and we by him** (1 Corinth 8:5).*

In Classical Athens, the word *kyrios* referred to the head of the household, who was responsible for his wife, children, and any unmarried female relatives. He deepened existing ideas for the Hellenistic community, composing them into a

universal vision of the history of salvation. The notion of preexistence already had strong roots in Judaism, not only in apocalyptic, but also among the rabbis and in wisdom speculation, in which the messiah is conceived as first in a condition of concealment. Among the rabbis, a pre-existence of the messiah is assumed only as an idea in the thought of God although a real pre-existence of his soul is held.

The Jewish Hellenistic wisdom literature is more important for Paul than apocalyptic and the rabbis. Here, 'wisdom' is extolled as something existing before the world and already working in creation.

The Lord possessed me in the beginning of his way, before his works of old. I was set up from everlasting, from the beginning, or ever the earth was. When there were no depths, I was brought forth; when there were no fountains abounding with water. Before the mountains were settled, before the hills was I brought forth: While as yet he had not made the earth, nor the fields, nor the highest part of the dust of the world. When he prepared the heavens, I was there: when he set a compass upon the face of the depth: When he established the clouds above: when he strengthened the fountains of the deep: When he gave to the sea his decree, that the waters should not pass his commandment: when he appointed the foundations of the earth: Then I was by him, as one brought up with him: and I was daily his delight, rejoicing always before him; Rejoicing in the habitable part of his earth; and my delights were with the sons of men. Now therefore hearken unto me, O ye children: for blessed are they that keep my ways (Prov 8).

The 'rock' that followed, which Philo had already interpreted as wisdom is thus the preexistent Christ:

*Moreover, brethren, I would not that ye should be ignorant, how that **all our fathers were under the cloud**, and all passed through the sea; 10:2 And were all baptized unto Moses in the cloud and in the sea; And did all eat the same spiritual meat; And did all drink the same spiritual drink: **for they drank of that spiritual Rock that followed them: and that Rock was Christ** (1 Corinth 10:1).*

The link with the wisdom teaching is particularly close where Paul and John speak of the work in creation of the pre-existing Logos, now made manifest in Christ:

In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things were made through him, and without him was not anything made that was made. In him was life, and the life was the light of men (John 1).

We thus end with the hybrid notion of the Trinity, as a contrived Christian cosmological reconstruction, in which the Father pronounces the law, the Son provides salvation, and the Spirit confers eternal life.

We see that the god acting in history, as in the emergence of YHVH as the abstract god of reality, superseding the iconic deities of the nations, becomes reversed and temporally inverted, so that the advent of Jesus, now becomes a man-god, encompassing both human and divine natures, cast back to the cosmic origins as co-eval with God, beginning only subtly and implicitly in the Pauline letters, then exploding into apocalyptic prominence in John and finally Revelation. One looking cynically could see this as a device of Hellenistic Judaism to retrospectively manufacture, in Yeshua's persona, a crafted account that ensures eternal dominance of Christianity, extending its tenure forever, short of an intervening act of God, violating the very notion of the messiah as flesh and blood saviour and the tenure of Christianity as merely a stewardship until Yeshua's return.

This leads to a frank conflict in the messianic tradition between the contrasting personae of the messiah in the end of days, one a foregone Christian cosmic destiny, locked as it is by Paul and then John to Jesus as a Hellenistic-Judaic supernatural avenging Lord, diverging fundamentally from the Jewish mashiach, looking instead to a human saviour of Zion, in repair of the world in long-term future goodness.

James Tabor (1991), who sent me a courtesy copy of "Restoring Abrahamic Faith" in 2010, highlighted the unexpected nature of the shared notion of the Judeo-Christian messiah in the following words:

*"Both Christians and Jews will likely be surprised by the Messiah. In other words, he will probably not conform to anyone's expectations. ... One thing is certain when the Messiah comes, whoever he turns out to be, he will **uphold these essential teachings** of scripture. Can we do anything less?"*

James D. Tabor
February 14, 2010
For Christ, with warmth
but with —
James D. Tabor

These essential teachings are the logos of natural apocalypse in the epoch of Nuclear Holocaust, Climate Crisis and Biospheric Extinction – **Reflowering the Tree of Life, Opening the Gates of Compassion** and the **Hieros Gamos of Holy Reunion**.

14: The Empty Vessel and the Visionary Feast

Anyone who imagines that God is a cosmological reality needs to recognise that, in the diversity of religious beliefs, deity is and has always been a projection of the human imagination onto the universe. We reel with revulsion at the sacrificial excesses of the Aztecs, but this is simply a reflection of Christianity's own sacrificial violence celebrated in the cannibalistic rite of the Eucharist.

Although portrayed by their adherents as vehicles of peace and compassion, religions across the board, throughout history have been founded on social conflict and domination through oppression and violence. Despite attempts at demurral, Joshua committed genocide at Jericho (Josh 6:21) and Hazor (Josh 11:11). Yeshua's own sacrificial death resulted in martyrdom, Crusade and Inquisition. Muhammad ordered a genocide of Jews at Medina (Armstrong 1991 207) and Islam extols conversion by the sword and the death penalty for apostasy. In the Bhagavad Gita, Krishna urges holy war upon Arjuna. Even Buddhism has been wracked with conflicts (Jerryson & Juergenmeyer 2010). If you asked the religions of the world, "Who is without sin?", one by one, beginning with the oldest, they would be convicted by their own conscience, particularly over the women caught in "adultery". The inescapable conclusion is that homicide in Holy War is the "divine" signature of God's ultimate power.

Despite its pretensions to brotherly love and forgiveness and to be the true religion of the only begotten Son of God, Christianity suffers from a rot of confusion at the very core of its being that stems from the very apocalyptic vision it is founded on, compounded later by Hellenistic Judaism. While the Hebrew tradition is a fundamentally covenantal religion of the continuity of life - to be fruitful and multiply, Christianity is a sacramental religion (Ruether 1992) of death and guilt in which the inner sanctum Holy of Holies is the Eucharist - drinking Christ's blood and eating his flesh - the soma and sangre - in remembrance of his crucifixion. This classes Christianity, not just as a religion of human sacrifice like the Aztecs, or cannibalism like the Maori, but one of cosmic deicide - without the shedding of blood there is no remission of sin.

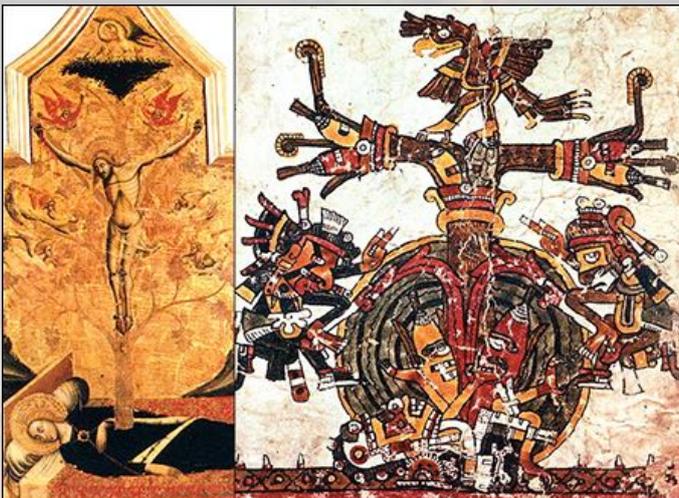


Fig 222b: Christian versus Aztec blood sacrifice. Left: The Dream of Mary (Christoforo Simone dei Crocefissi) Sacrificial blood streams from her Tree of Calvary (the place of the skull). Right: Tree of the Middle Place Blood mother of the corn from the place of the skulls. While Mary dreams of the sacrificed Jesus, the blood mother is sacrificed to the harvest. At the crown of each is a bird - a Christian pelican picking its flesh for blood and a quetzal sometimes holding a snake to symbol regeneration (Campbell). The Aztecs saw great similarities between the Crucifixion and Eucharist and their own forms of human sacrifice.

This comes from the utterly violent fact that Jesus is a figure of primary homicide in a purported crime against the entire universe by the Father, crucified by

the Romans and accused of blasphemy by the High Priests in the enactment of a diabolical ritual sacrifice, including the setting at naught of the sacred king, cursing the women of Jerusalem, and the plaintive cries to El on the cross. But this is only the beginning of the contradiction, because it is Abba himself who has ordained this sacrifice and the sin it is claimed to forgive.

In the Gospels, this is portrayed as a situation whipped up by Jesus, in the conviction that there is an active dark force of evil in the world extending far beyond mere human fallibility, where God and the devil are as complementary as day is to night. The synoptic gospels clearly say that Jesus effectively preordained this violent fate as an orchestrated collision with the devil, who had tempted him to cast himself down from the pinnacles of the temple:

And he brought him to Jerusalem, and set him on a pinnacle of the temple, and said unto him, If thou be the Son of God, cast thyself down from hence: For it is written, He shall give his angels charge over thee, to keep thee: And in their hands they shall bear thee up, lest at any time thou dash thy foot against a stone. And Jesus answering said unto him, It is said, Thou shalt not tempt the Lord thy God (Luke 4).

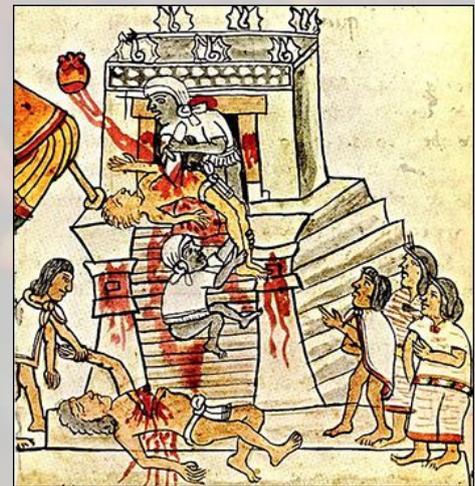
In John, Jesus passes the sop to Judas Iscariot, effectively instructing Judas to betray him to the Romans in a death pact:

When Jesus had thus said, he was troubled in spirit, and testified, and said, Verily, verily, I say unto you, that one of you shall betray me. ... He it is, to whom I shall give a sop, when I have dipped it. And when he had dipped the sop, he gave it to Judas Iscariot, the son of Simon (John 13).

Judas then returns the pieces of silver in a ritual reenactment of Zechariah's apocalypse, although he is effectively carrying out Jesus' instructions for the "Passover Plot" (Schonfield 1965). To take the contradiction to its cosmological conclusion, although the Jews have been blamed and sometimes violently punished by Christians ever since, we are then asked to believe that this entire spectacle is actually God sacrificing his only begotten Son, so all who might believe in him shall have everlasting life in the apocalypse.

This is the tragic flaw in the entire conception. Why would a God of creation that made the scented wildflowers, or the lilies of the field as Jesus said in the Sermon on the Mount, and the dappled forests, and all the creatures that run, swim and fly, and human beings full of a spectrum of emotions, from love to hate, and a stringent desire for personal autonomy, reduce the entire universe to a sacrificial filicide to save humans from the wayward ways, that He had Himself created; to avoid a damnation that He Himself had set in motion? This is a completely flawed cosmology, little better than the Aztecs thinking they had to sacrifice countless men, women and children to keep the Sun on course in the heavens. A God called the loving Father Abba who chooses to have his own son tortured and killed as high noon with the dark forces to redeem us from sin is a Neolithic throwback to blood sacrifice to ensure the fertility of the agricultural harvest. We don't need to invoke death to redeem life. We don't need cosmological homicide to have our sins forgiven. Fertility and birth itself are the antidotes to the mortal condition, not filicide, or human, or transcendental homicide in the name of eternal life.

Fig 222c: Human sacrifice as shown in Codex Tudela. According to the Ramírez Codex, in Tenochtitlan approximately sixty prisoners were sacrificed at the festivities of the war god Huitzilopochtli. For the reconsecration of Great Pyramid of Tenochtitlan in 1487, dedicated to both Tlaloc and Huitzilopochtli, the Aztecs reported that they sacrificed about 20,400 prisoners over the course of four days.



When Cortez arrived with the conquistadores, the Aztecs saw in Christian sacrifice a true reflection of their own sacrificial customs, which in turn enraged the Spaniards, who then embarked on their own unmitigated homicides of believers in native religious and spiritual notions. In Central and South America, "heathen" natives were tortured and burned for crimes against the true faith, such as not believing in it. Mayan scribes in Central America wrote:



Before the coming of the Spaniards, there was no robbery or violence. The Spanish invasion was the beginning of tribute, the beginning of church dues, the beginning of strife." Catholic fathers of the mission of San Francisco burned many Indian "witches" before the tribes were sufficiently subdued to accept God's word. Missionary teams included an inquisitor.

Fig 222d: Early in the conquest the notorious dismemberment and slaughter of Aztec musicians celebrating a heathen festival (Gruzinski).

This also applied to a desperate attempt to obliterate all trace of the divine sacraments of the Americas which did have inestimable visionary sacramental power:

"Sacred mushrooms played such an important part in Aztec life that Indian groups which owed tribute to the Aztec emperor paid it with inebriating mushrooms. One Spanish priest wrote that for the Aztecs, the sacred mushrooms were like the host in the Christian religion: through this bitter nourishment, 'they received their God in communion' ... All that could possibly happen to a person could be seen under the effects of the mushrooms. After the effect wore off, people would consult among themselves and tell each other about their visions" (Dobkin de Rios 1984 143).

When the Spanish arrived in Mexico in the 16th century, they persecuted the priests and practitioners who used the sacred plants in

religious rituals. Whatever the visionary effects that informants attributed to the various hallucinogens, the Christian priests concluded that the devil himself was involved. 'The Spanish, writing about the effects of the mushrooms, always conjured up the devil, but we shall really never know if the Aztecs were seeing anything like the Christian devil. Their visions may indeed have been spirits of their pantheon with whom they were in communication. ... The Spanish, culturally mycophobic to begin with, showed great disgust at seeing these mushrooms in use. In Roman Catholicism, communion with the supernatural is based not upon an individual's revealed knowledge, but rather upon membership in a complex hierarchical structure and faith in its doctrines. ... Moreover, Aztec belief that the powers residing in the plants could be controlled by the user was totally alien to Western thought. 'The Spanish ... were so thorough in their destruction ... that these practices went underground for four centuries. Punished for their alleged superstitions, the Mexicans kept their sacred and magical plants hidden from the conquerors'. (Dobkin de Rios 1984 144-5).

This resulted in the loss of knowledge of the sacred mushroom except for a small following of Mixatec people, whom Gordon Wasson discovered in 1953, through his meeting with Maria Sabina, or the world might have not known that such a tradition still existed.

Fig 222e: Mexican drawing of 16th Century shows three sacred mushrooms, teonanactl – the flesh of the gods – a man eating them and a god behind him, who is speaking through the mushroom.



This saga of violence is not without its irony. The departure of Quetzalcoatl to the east has been suggested to have resulted from the historical overthrow of the Toltec high priest Topiltzin-Quetzalcoatl, whose attempt to replace the warlike incarnation of Quetzalcoatl, Ce Acatl and usher in a new golden age of Tula, supplanting the excesses of human sacrifice with ascetic self-sacrifice and offerings of jade, birds, snakes and butterflies did not suit the vigours of the warrior caste who followed the warrior god Tezcatlipoca, the 'lord of the smoking mirror', supposedly with the clandestine involvement of Coatlique, goddess of the Serpent Skirt.



Fig 222f: Quetzalcoatl in combat with Tezcatlipoca (Gruzinski)

He was thus ritually humiliated and banished from Tula in 987 AD and travelled to the Gulf of Mexico where he was supposed to have immolated himself on a funeral pyre to become Venus, thus symbolizing death and resurrection. There is a striking parallel here with the seasonally dying and resurrecting Dumuzi and the subsequent crucifixion of Christ. This god, that tormented Moctezuma with remorse, is naturally considered the Christ of the pre-Columbian civilisation, a situation which gave the conquering Spaniards significant difficulties to come to terms with, particularly given the conflicts between the central role of the crucifixion and communion as sacrificial bloodshed in Christian destiny and the Aztec excesses of human sacrifice. The 'living sacrament' is in both Aztec history and Christian destiny, an antidote to this bloody sacrifice of empty sacramental visionary potency.

Quetzalcoatl, who had introduced the 55 year calendar of the Mayas to the Toltecs had been prophesied to return to bring in the golden age. Moctezuma had suffered a series of alarming prophecies and portents. Nezahualpilli, the chief of the Texcoco had prophesied that strangers were going to rule the land of Anahuac.

When Moctezuma challenged him in a ritual ball game, the Texcocan came from two down to win. When a 'bird with the mirror head' was caught, Moctezuma saw the reflection of hosts of armed men. Temples were struck by fire and lightning. In all there were six fatal signs. When Cortes appeared in 1519 in the year of 1 Reed (Ce Acatl) the year of Quetzalcoatl's return, he was ironically assumed to be Quetzalcoatl or his incarnation returning from the east, and handed the god's regalia by Moctezuma's emissaries.



Fig 222g: Moctezuma sights the comet: A premonition of the return of Quetzalcoatl (Gruzinski)

14. Ecocrisis, Sexual Reunion and the Tree of Life

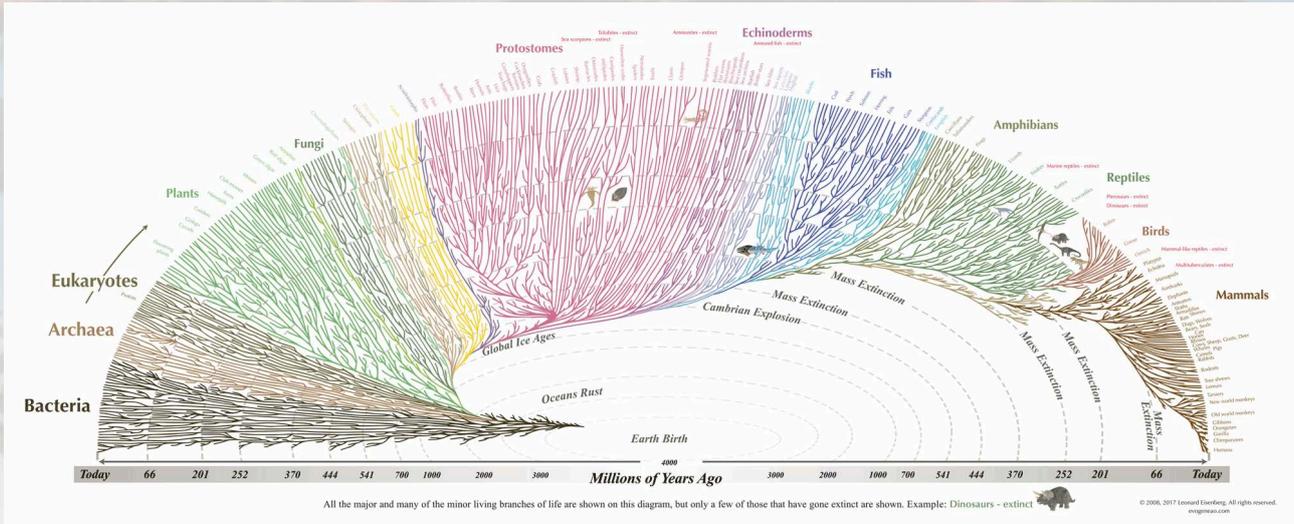


Fig 223: The Evolutionary Tree of Life showing its extreme age noting the mass extinctions which have ravaged it.

The Tree of Life, connecting all forms of creation, and the Tree of Knowledge, connecting to heaven and the underworld, and are both forms of the world tree or cosmic tree, portrayed in diverse religions as the same tree. Uniquely, the Eden origin sets these two trees in opposition withholding the Tree of Life which conferred immortality from Adam and Eve because they had become aware of their sexuality. This is little more than a device of the patriarchy to blame woman for sexual fertility. The seven branched fruiting Tree of Life, as depicted in fig 209 at 2200 BC is far more ancient than Biblical Eden. The life tree has been revered throughout the ancient cultures of the Near East as a symbol of perennial survival, as also noted in fig 225, but underlying this faith is an even more ancient truth going back to our gatherer-hunter origins in the genetic Tree of Life – the immortal Tree of Evolution of living diversity, upon which *Homo sapiens* is utterly dependent as a species, for our food, many of our medicines, for the air we breathe and the balance of the climate and the entire verdant paradise that Earth is capable of being in perpetuity if we don't critically injure it or allow an ill fate to befall it.

But the shoots and whole branches of the Tree are being cast into the fire of mass extinction by human misadventure. This is the most climactic crisis to face humanity in evolutionary time and it is one the traditional religions, despite attempts by some church leaders to address, are tragically ill-equipped to deal with, because the founding presumption of patriarchal monotheism is that nature is a flawed creation of God, doomed by moral sinfulness, that will be discarded in favour of eternal life in Heaven if we believe in Him, but if we do not the fires of Hell await us.



Fig 224: Assyrian Sacred Tree 865 – 860 BC Ashurnasirpal II

There is thus an acute reason, driven by sheer urgent necessity, to address the obstruction Christianity and other patriarchal world religions are causing to the planetary condition and unfold an epoch of planetary resplendence, in which the climax diversity of life can reflower. The planet is genuinely facing an apocalyptic crisis because a combination of business-as-usual exploitation of the Earth's habitat and climate and archaic religions based on

patriarchal religious and moral imperatives, amid scorched-Earth desert eschatologies, is precipitating a mass extinction of the diversity of life which could also result in perpetual human attrition, or our actual extinction, while our only true redemption is to regain the immortal condition life and with it humanity has enjoyed for 3.5 billion years of Earthly Paradise. This is a far more ancient crisis that is foreshadowed in the Fall from Eden, and has emerged with humanity in evolutionary time in the transition from gatherer-hunter existence within nature into urban civilisation and empire in dominion over it, with resulting habitat destruction and potentially irreversible climatic disruption and it can be resolved only by restoring the immortal paradigm of life as a whole.

Christianity is pivotally at fault because it has contrived an eschatology of history to make the planetary future subject to the return of a miraculous man-God whose powers are so extreme over the entire universe as to make it difficult or impossible to correct the fallacy and for any true enlightenment about our actual cosmological condition to prevail.

The status of nature in Christianity has been hotly debated, especially since historian Lynn White published the now classic "The historical roots of present-day ecologic crisis" (1967) in which Christianity is blamed for the modern environmental crisis, which he concludes is largely due to the dominance of Christian world-view in the west which is exploitative of nature in an unsustainable manner. White asserts that Judeo-Christians are anti-ecological, hostile towards nature, imposed a break between human and nature with attitude to exploit the nature in unsustainable way where people stopped thinking of themselves as part of the nature. This exploitative attitude combined with the new technology and industrial revolution wrecked havoc on the ecology. Colonial forestry is a prime example of this destruction of ecology and native faiths.

Although we are each mortal sexual beings, unfolding life is immortal. As a biological species, we are utterly dependent on the genetic and species diversity of life, for our food, for our climate and environment, for our health and medicines and for a sustainable economic future. This is the principle of cosmological symbiosis that the Judeo-Christian notion of dominion over nature stemming from Genesis has instead made a tragedy of the commons (Hardin 1968). But this is not the teachings of Yeshua we find in the Gospel of Thomas (3):

"If those who lead you say to you, 'See, the kingdom is in the sky,' then the birds of the sky will precede you. If they say to you, 'It is in the sea,' then the fish will precede you. Rather, the kingdom is inside of you, and it is outside of you."

Biocrisis and the Patriarchal Imperative

The Fall from Eden echoes in metaphor a descent from Paradisiacal gatherer-hunter existence into the tortured labours of tribal agrarian and shepherding societies. It signals two occluded founding features of our conscious heritage:

- (1) **Cultural Biocrisis:** It declares **the conversion of Paradise into human conflict with nature**, tilling the thorns by the sweat of the brow, dominating nature rather than coexisting with it, and the Tree of Life imprisoned by God to retain his power over mortal knowledge. Likewise in the Sabbatical Creation, humankind is given dominion over nature to subdue it.
- (2) **Patriarchal Oppression:** It confesses in stark terms, **a deep sexual falling out between woman and man** in which the cultural patriarchy (Lerner 1996) has blamed Eve "the mother of all living" (Gen 3.20) for the Fall, by heeding the serpent's claim that the tree of knowledge would make one wise, so **woman was cursed** and made **subservient to her husband**, under **pain of childbirth** and both are **doomed to mortal sexual existence**.

But if this thing be true, and the tokens of virginity be not found for the damsel: Then they shall bring out the damsel to the door of her father's house, and the men of her city shall stone her with stones that she die: because she hath wrought folly in Israel, to play the whore in her father's house: so shalt thou put evil away from among you (Deut 22:20).

If a damsel that is a virgin be betrothed unto an husband, and a man find her in the city, and lie with her; Then ye shall bring them both out unto the gate of that city, and ye shall stone them with stones that they die; the damsel, because she cried not, being in the city; and the man, because he hath humbled his neighbour's wife: so thou shalt put away evil from among you (Deut 22:23).

These questions are fully covered in ensuing sections below and the associated sections on the evolution of humanity, and religion where the emergence of super-intelligence is linked to female reproductive choice in XY-chromosome based mammalian evolution and the severe consequences of the patriarchal dominance emerging 10,000 years ago is discussed as well as the evolution of religion from animism and the social consequences of religious violence, particularly against woman and nature is discussed in full.

Origin Myths, Human Dominion over Nature and Patriarchal Dominion over Woman



Fig 225: The Sabbathal creation is a flat Earth cosmology in which the heavens are beaten domes (firmaments) in which the sun moon and stars are fixed and the plants are created before the heavenly bodies.

In the Sabbathal Creation of Genesis 1 'Elohim creates humanity female and male in their likeness.

On the **first day** "Elohim (God in the male plural) creates Earth from primal chaos (tohu va vohu) and light and darkness by Logos declaration:

In the beginning 'Elohim created the heaven and the earth. And the earth was without form, and void and darkness was upon the face of the deep. And the Spirit of 'Elohim moved upon the face of the waters. And 'Elohim said, Let there be light: and there was light. And 'Elohim called the light Day, and the darkness he called Night. And the evening and the morning were the first day.

The **second day** a firmament (beaten dome) is created called heaven dividing the waters above heaven from the waters below:

And 'Elohim said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters. And 'Elohim made the firmament, and divided

the waters which were under the firmament from the waters which were above the firmament: and it was so. And 'Elohim called the firmament Heaven. And the evening and the morning were the second day.

The **third day** land and seas are divided and the earthy plants come into being:

And 'Elohim said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear: and it was so. And 'Elohim called the dry land Earth; and the gathering together of the waters called he Seas: and 'Elohim saw that it was good. And 'Elohim said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so. And the evening and the morning were the third day.

The **fourth day**, we find the Sun, Moon and Stars:

And 'Elohim said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years: And 'Elohim made two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also. And the evening and the morning were the fourth day.

The **fifth day** we have the creatures of the water and air – fishes and fowls:

And 'Elohim said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven. And 'Elohim created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and 'Elohim saw that it was good. And 'Elohim blessed them, saying, Be fruitful, and multiply, and fill the waters in the seas, and let fowl multiply in the earth. And the evening and the morning were the fifth day.

The **sixth day** is very busy – all the land animals appear, and as if an afterthought, 'Elohim makes humanity male and female in "our likeness", implying the 'Elohim is indeed a male and female divine couple:

And 'Elohim said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind: and it was so. And 'Elohim made the beast of the earth after his kind, and cattle after their kind, and every thing that creepeth upon the earth after his kind: and 'Elohim saw that it was good.

And 'Elohim said, Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth. So 'Elohim created man in his own image, in the image of 'Elohim created he him; male and female created he them.

Then there is a sting in the tail of paradise, because humanity is given dominion over all living things to replenish and subdue the earth. Humanity has taken subduing nature to heart, but is manifestly failing to replenish it, so the covenant of dominion has been grievously violated. Dominion in the Hebrew radah is that of a benevolent leader, but it is not right for humanity to act as divine regents over the diversity of living nature, our survival lies in being symbiotic guardians of planetary life.

And 'Elohim blessed them, and 'Elohim said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth. And 'Elohim said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat. And to every beast of the earth, and to every fowl of the air, and to every thing that creepeth upon the earth, wherein there is life, I have given every green herb for meat: and it was so. And 'Elohim saw every thing that he had made, and, behold, it was very good. And the evening and the morning were the sixth day.

Finally, on the **seventh day**, “Elohim rests on the Sabbath setting up the religious paradigm:

And on the seventh day 'Elohim ended his work which he had made; and he rested on the seventh day from all his work which he had made. And 'Elohim blessed the seventh day, and sanctified it: because that in it he had rested from all his work which 'Elohim created and made.

This is a very beautiful creation myth, founded on the formation of complements, light and dark, waters above and below, day and night, female and male. It teaches that both sexes are in the likeness of the divine and that, while humanity is granted dominion over nature, this is not just to subdue, but to replenish the Earth and its living diversity. Moreover, it is not a literal creation that is any kind of justification to deny natural evolution. There are manifold inconsistencies. The Earth and land plants are incorrectly created before the Sun and Moon and the fishes and birds before earthly fauna. The stars are not fixed in a beaten dome, and the heavens are not a lid on the flat Earth, but outer space filled with galaxies containing billions of suns. Neither are the six days in any way meaningful or the notion of a recent creation some 4000 years ago.

Fig 226: Brothers Limbourg “Garden of Eden”

In the Fall from Eden account Yahweh wanders in the garden from which a mist has watered the Earth. He creates Adam from the dust of the ground, and breathes into his nostrils the breath of life and he becomes a living soul. But then having made Eve from Adam’s rib, Yahweh curses woman for eating the fruit of the Tree of Knowledge and withholds the Tree of Life:

*Unto the woman he said, “**I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children; and thy desire shall be to thy husband, and he shall rule over thee**”.*

*And unto Adam he said, “**Because thou hast hearkened unto the voice of thy wife, and hast eaten of the tree, of which I commanded thee, saying, Thou shalt not eat of it: cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life; Thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field; In the sweat of thy face shalt thou eat bread, till thou return unto the ground; for out of it wast thou taken: for dust thou art, and unto dust shalt thou return**”.*



*And the LORD God said, “Behold, the man is become as one of us, to know good and evil: and now, **lest he put forth his hand, and take also of the tree of life, and eat, and live for ever: Therefore the LORD God sent him forth from the garden of Eden, to till the ground from whence he was taken. So he drove out the man; and he placed at the east of the garden of Eden Cherubims, and a flaming sword which turned every way, to keep the way of the tree of life**”.*

This is also reflected in Jacob imposing patriarchy against the older matrilineal tradition of Laban (Sanday 1981), who notes his kinship with Jacob (29:15). The seven years Jacob spent with Laban for each wife, living with the family of his wives indicates the line of Laban gave “matrilineal” power to the son of the mother over his daughters’ endogamous partners (Gen 30:26), and to his sons (Gen 31:1).

Nancy Jay (1992) notes that moving to the family of the wife is consistent with the injunction in Genesis to “leave your father and mother and cleave unto your wife” and with Jewish marriage practice to go into the wife's tent, resulting in paradoxes of descent in early patriarchal traditions of the tribes of Israel:

“Israelite tradition did not deny descent from women and consequently faced the dilemma: How is a pure and eternal patriline to be maintained if descent from women is not denied? Endogamy appears to be a solution; marriage to a woman of the same patrilineage ensures the offsprings’ patrilineage membership even if it is figured through the mother. Close agnatic endogamy (marriage within the patriline) is extremely rare except in Semitic traditions. In a way reminiscent of the Patriarchs, throughout the Arab world families have preferred men to marry their father’s brother’s daughters. The descent line of the Patriarchs continued only through endogamy: Isaac and Jacob (but not Ishmael) married endogamously. Joseph married exogamously but his sons were adopted by Jacob, correcting this, and other, irregularities of their descent”. ... “for Jacob entangled in the local “matrilineal” scene a sister’s son working for his mother’s brother married uxorilocally and avunculocally to his mother’s brother’s daughter could not escape for twenty years” ... “What is determined by bequeathal of the gods is not title to an inheritance share but, rather, who is to carry on as paterfamilias ... Hence Rachel’s desire to possess the gods of Laban, if it meant anything in this connection, could mean only that she wished Jacob to be recognized as paterfamilias after Laban’s death”.

*“Is there any portion or inheritance left to us? Are we not counted of him strangers?
for he hath sold us, and hath quite devoured also our money.” (Gen 31:14)*

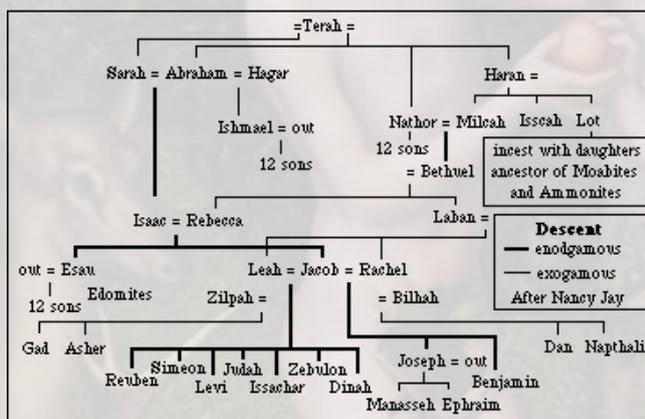


Fig 227: Although the three generations from Abraham to Joseph appear to have covered 700 years of history, making the genealogy of the 12 tribes mythological rather than historical, the peculiar tradition of frequent endogamous marriages which preserve both maternal and paternal lines is consistent with a slow transition from matriarchy (Jay 94). Sarah “queen” or “princess” in Hebrew is portrayed as the concubine of a pharaoh doubling as the sister and secret spouse of Abraham (Gen 12:15), while also his half-sister (Gen 20:12) as is Rebecca with Isaac and a Philistine king (Gen 26:6). Laban is also Rebecca’s brother (Gen 24:29), so Jacob’s marriages to Rachel and Leah are with full cousins.

This was climaxed by Jacob’s precipitate departure, portrayed as abetted by Rachel and Leah, utilising the metaphor of female compliance. As they are leaving, Rachel steals her family teraphim, or house deities. She then hides them under her skirts, to avoid Laban finding them, when they are pursued. The end result is a pointed capture of the older tradition by the Hebrew patriarchy, using Rachel’s menstrual skirts to cement woman’s compliance with the matrilineal overthrow:

*Now Rachel had taken the images, and put them in the camel's furniture, and sat upon them.
And Laban searched all the tent, but found them not. And she said to her father,
Let it not displease my lord that I cannot rise up before thee;
for the custom of women is upon me. And he searched but found not the images (Gen 31:34).*

Conflicting paternal and maternal conceptions can also be made out in the patriarchal blessing of the firstborn, (1) a socio-legal one, which assigned exceptional status to the first male in the paternal line – “the first fruit of vigor” (Gen. 49:3, Deut. 21:17), and (2) a religious one, which assigned special status to the first male issue of the maternal line – “the first issue of the womb” (Ex. 13:2-15, Num. 8:16).

More ancient influences than the biblical can also be seen in the spiritual and religious beliefs of our oldest surviving culture of the San Bushmen, a founding human culture, in genetic, evolutionary and archaeological terms, whose historical presence goes back over 100,000 years and whose ancestor, the mitochondrial Eve is literally the “mother of all living” (Fielder & King 2017). Although over the course of the last two millennia, the San may have had contact with other religious influences, their cosmology and deities have a fresh founding quality, just as engaging as Genesis 1. In addition to their trickster heros and first person experience of the numinous in the trance dance, the Bushmen believe

in the existence of two gods: a greater god manifesting the creative force and a lesser god invoking the malevolent forces of uncertainty and misfortune, each with a shadowy consort, but having little of the moral imperative seen in more recent religious traditions including monotheism.

In “Nisa” (1981) Marjorie Shostak provides an engaging detailed portrait of a !Kung San woman, her sexual relationships with men and her trials of familial life. What emerges from this account is the life of a spirited woman who throughout struggles to maintain her autonomy of choice over her life in a nominally patriarchal society in which the headmen would like to assert a patriarchal imperative, but in which the society has remained remarkably free of the oppressive influences of civilisation succeeding the agricultural revolution which itself was discovered by female gatherers, thus having remarkable similarities to features of sexual relations Western society is only recently re-engaging. We cannot thus assume that history dictates the dominance of patriarchy.

The Origins and Redemption of Religion in the Weltanschauung

Underlying religious history is a deeper evolving substratum of implicit beliefs at a subconscious level that deeply influences and cross-fertilises religious movements. This casts religion, and before religion animism, in a much older setting as a stream of consciousness mind set evoking images of human origins, creation of the universe and the relationship between humanity and the deities we invoke to explain existence.

We can see this in the creation myths across diverse cultures, in the Fall from Eden and in the progression from older belief in Sheol and nature deities into the stark division of Heaven and Hell and traumatic notions of eschatological renovation in the end of days.

Carl Jung has drawn attention to these deeper undercurrents in his concept of the collective unconsciousness:

“In addition to our immediate consciousness, which is of a thoroughly personal nature and which we believe to be the only empirical psyche (even if we tack on the personal unconscious as an appendix), there exists a second psychic system of a collective, universal, and impersonal nature which is identical in all individuals. This collective unconscious does not develop individually but is inherited. It consists of pre-existent forms, the archetypes, which can only become conscious secondarily and which give definite form to certain psychic contents”.

Jung’s view of the collective unconscious comprises in itself the psychic life of our ancestors right back to the earliest beginnings. It is the matrix of all conscious psychic occurrences, which exerts an influence that affects the freedom of consciousness, since it is continually striving to lead all conscious processes back into ancient motifs and experiences. Jung described archetypes as imprints of momentous or frequently recurring situations in the lengthy human past:

“Archetypes are typical modes of apprehension, and wherever we meet with uniform and regularly recurring modes of apprehension we are dealing with an archetype, no matter whether its mythological character is recognized or not”.

Joseph Campbell in turn presented a mythopoetic account of spiritual and religious traditions across cultures in which aspects of Yeshua’s mission, rather than being confined to the Jewish influences, has a wider backdrop in the persona of dying and resurrecting heroes from Adonis, through Tammuz, to Dionysus, sometimes arising as deified leaders. While I don’t personally hold to this view, it appears to have influenced the writers of the canonical gospels and the founding accounts of Yahwistic Genesis.

The entire religious quest is underpinned by the Weltanschauung (James 1868) the deeper world view, that originates from the unique world experience of a people, ensuing over several millennia, also expressed in their language and more anciently in the diverse forms of animism that preceded formal religions. I have underscored the Weltanschauung of Immortality as the founding conscious world view of humans during our emergence, that has now become an urgent quest to redeem humanity from the immanent mass extinction of living diversity. This now becomes the light of resplendence for life as a whole that redeems the apocalyptic tragedy of the religious imperative and enables humanity to find redemption in reflowering the Tree of Life of the evolving biosphere.

Given a planetary condition of environmental apocalypse that is a threat to our own survival and that of the diversity of life as a whole, it becomes essential to look deeply into the collective unconscious for the driving forces. Clearly both religion and business as usual exploitation are driving this, but our knowledge of the natural world remains powerless to address a situation that we all feel disquieted by because it is unable to fathom that nature of consciousness that is central to religious belief. A combination of human tribal motivations that evolved to ensure

human dominance accentuated by archaic religious conceptions whose doctrines have the same intent of ensuring perpetual dominance of religious belief, both by moral imperative and dire penalties, such as death for apostasy means everyone knows the situation is insane but no one knows how, or what to actually do about it.

The one and only way of addressing this is to induce a foundational change in the religious zeitgeist that addresses the root cause hidden behind the religious facade. Symbiotic Existential Cosmology and the Weltanschauung of Immortality provide that hope of a paradigm transformation just like the one that happened at the beginning of Christianity but coupled to the Sacred reunion of woman and man and repositioning the eternal Heaven-Hell divide with the immortal generations of life in Earthly Paradise in the epoch of the Tree of Life. This is the only way a long-term epoch of future goodness can ensue in the religious tradition.

The Cristo Rey Comunicado Rio Madeira, Brazil 1999

Think not that I am come to destroy the law, or the prophets, but to fulfil.

Paradiso and Inferno



Fig 228: el Camino de la muerte descending the Bolivian Andes, daubed with apocalyptic prophesies “Dios te ama, Cristo te Ama, Cristo veine pronto – God loves you, Christ loves you, Christ is coming soon”

I begin this hymn to the regeneration of life in night vigil amid relentless tropical lightning, reclining in a hammock on the Conquista, a river boat to Manaus, in consummation of a **long series of journeys** firstly began far away in the high mountains of the Andes, weaving our way on the precipitous el camino de la muerte, the ancient conquistador road down the Yungas in Bolivia through the burning season in the

dry tropical forest, and then along many rivers from the very source of the Amazon in sedge swamps in the high altiplano, through the alto-Urubamba, past the precipitous peaks surrounding Machu Picchu, the white-water rapids of the Pongo de Mainique, the last wild portal of the Andes, to that anaconda, the muddy, log-strewn Ucayali, winding its way relentlessly north for many days, to become at first the Peruvian Amazon to the junction of the Marañon, amid the lagoons and meanders of the Pacaya and Samiria, to Iquitos accessible only by river, only for the river to become deposited again at the Brazilian Solimões, now ever-larger, sweeping steadily under the hull of the river boat as it cuts its way towards Manaus and the final confluence with the clearer, darker Rio Negro, where the mighty Amazon will finally and unambiguously wind its way unchallenged to the Atlantic Ocean.

Fig 229: Vistas fuego – Fires in the dry tropical forest in the vicinity of Ascension which also had fifty houses burned a month before by raging uncontrolled fires set by hacienda owners.

Of course all the tributaries, from the Mamoré to the Madre de Dios, Mother of God, from the Negro to the Napo, are Amazonas in the integral whole, just as la selva, the forest and its ecological diversity of plants, fungi and animals is the verdant Amazonas - the largest tropical forest on Earth, literally the “lungs of our living planet”, fashioned from over 250 million years ago, as the Andes began to push upward, in a tectonic collision, reversing the westward river flow of the original continental valley that had from time immemorial flowed to the Pacific, to form the world's hugest river basin, as the giant shallow lake spanning almost the whole of the South American continent finally broke through to the Atlantic in the East.



Yet the Amazon is unique neither in its diversity nor in the destruction taking place. The diversity of life is threatened *todo mundo* - the world over from the equator to the poles – by a mass extinction which will haunt human civilisation throughout the rest of our fragile history, unless we can take the steps now to plant the seeds of renewal. Hence this hymn to life.



Fig 230: Vistas negro: The panorama of instant death. The burning of dry tropical forest in Bolivia, September 1999 for hacienda agribusiness development.

The rivers we traverse form an endlessly flowing highway, bordered by thatched villages with their attendant gardens and small plantations, mingling natural harmony with forest destruction, sometimes living closely in cooperation with the natural world, but nevertheless on a vast scale taming and forever changing the face of the forest along every river bank, because of the mass movement of population into the jungle, diminishing or eliminating many keystone species, from the seed-eating fish such as the great paiche to the tall hardwoods, such as the stately mahogany, and with them the many other dimensions of climax forest

diversity, as the secondary growth of a few dominant species lays claim to areas cleared of virgin forest too extensive to regenerate in full diversity for centuries to come.



Fig 231: A village on the Ucayali where our canoe stopped to trade.

Many indigenous peoples have learned how to live in close proximity with nature over countless centuries, without causing massive wholesale destruction, although it is true that the first waves of migration of 'primitive' humankind did cause the demise of many of the America's great land animals. Many village societies today do demonstrate how it is possible to live in cooperation with natural diversity and reap, through nurturing it, the benefits of abundant food, diverse medicines and many natural products which enhance the quality of life both at home and in far-flung urban societies. It is from such village culture that a more compassionate relationship with the natural world already made by many indigenous peoples and can be engaged and celebrated by an enlightened eco-society. It is also possible to have a productive world with genuine abundance for all without wholesale destruction of the world's great wilderness areas, given a fairness of distribution of resources to those in genuine need. Currently, for example, there is up to 50% more food produced world-wide than required to feed every man woman and child, so the real problem is fair distribution, clouded by ownership and property rights, obsession with palm oil plantations and methane-emitting hamburger farms, and who pays the distribution costs.

However, unrestrained developmental forces are encroaching upon the landscape from all directions with an ever accelerating pace of wholesale devastation, which could see the great forest resources of living diversity reduced to a few national parks, comprising only a tenth of their former area, before the end of next century. If this happens, as current rates of felling and burning indicate, two thirds of the living diversity of planet Earth could become extinct by 2100. Much of this drive for extinction is abetted by international financial pressures, but it is also comes from a deep misunderstanding of humanity's relationship with nature, fuelled by personal greed.

Miracle and Paradise: The Rains of Plenty



Fig 232: The Cristo Rey

Our river journey has now taken an unforeseen twist. Upon reaching Manaus, we have decided to turn south up the Rio Madeira towards Porto Velho and the devastation of Rondonia and Acre, by taking the Cristo Rey, which is my very namesake. This will leave open three possibilities to turn East and cross to Rio possibly via the Pantanal, to carry on south up the Rio Madre de Dios - Mother of God and traverse the wild north of Bolivia back into Peru and possibly Manu and to continue on by road to Rio Branco and Xapuri where Chico Mendes was assassinated. As the thunder rolls again and the boat has run aground, turned around and is travelling west. None of us can be sure of the outcome.

If this is the bearer of the logos of reality shouldn't it be accompanied by miraculous portents? Yes and no. To bring off the renewal of the epoch of paradise will be a miracle orders of magnitude beyond anything Jesus himself achieved in his lifetime. On the other hand Jesus himself, was a well-known thaumaturge of the therapeutae. His reputation for miracle thrived on the hypnotic atmosphere of crowd hysteria and evaporated in the harsh light of familiarity as the comments about his performance in his own home town of Nazareth illustrate. Comments ranged from "physician heal thyself" to commenting that he could only perform a few simple healings because of the lack of faith of his compatriots. Faith healing is a common shamanistic skill shared by many famous healers throughout history. As for Yeshua's claimed nature miracles on the waters of Galilee, wait for the lightning to strike.

Fig 233: Lightning strike at Borba

It just did as I spoke. In Borba, a city on the Rio Madeira with a church sporting San Antonio holding a child. Of course lightning strikes with tenacious frequency at sunset, as all rain-makers of the desert know. The Amazon is no exception. We have been besieged by thunder and lightning everywhere we have travelled. Take this as a verdant sign of healing rain if you will. Right now it is spring time and the beginning of the rainy season in the Amazon where we are, just south of the equator. The choice for life's diversity is after all yours.



In the last analysis I am pronouncing this Logos, not because I like or pretend to the role, which is dangerous, despite the fact that it comes as a victorious healing of life rather than the Crucifixion's atonement of death, but simply because I can't fairly depart from this incarnation and return to the cosmic source knowing the Earth is in its unique hour of need culminating the whole of evolutionary time leading up to the 'phenomenon of man' as Teilhard de Chardin put it, that despite the enormity of scientific discovery we are entering the space age adrift, steered like a rudderless ark by irrational forces of economic greed, plunging us into global eco-crisis, through severe lack of foresight, and no respect for the future generations to follow. We all know this situation is insane yet none of us can figure quite what to do about it. We have become disempowered. When one human being can stand and declare the truth of an insane society heading for the precipice of oblivion, it is time to stop and take stock. Judge this communication by its works. Which makes more sense, a world developing towards its own boom and bust decline through institutionalised personal greed, or the vision of the lone ferryman of the Styx, with a tongue like a sharp sword, holding the tiller of fate fast for the Tree of Life?

Central to revisioning the cultural paradigm is regaining our sense of genetic continuity in the evolving of life's diversity, so that conscious vision can unfold throughout our generations over millions of years. The paradigm of the Fall has led to an epoch of dominion over nature, in which the continuity of life has not been respected as a prime cosmological sacred responsibility. The tendency to see God as an agent of order over chaos, and of man over woman, has led to the frank repression of natural diversity in the form of wilderness in superimposing a humanly-devised

manufactured order. It is time to revere nature as sacred, in renewing Earth for the future flowering of all life. There can be no greater celebration. All the generations to follow shall call us blessed and hallow our names for this.

The key affirmations of the logos are very different from the assumptions of traditional religion. They espouse cosmology, sexuality, biology, consciousness, evolution and the preservation of life's diversity over cosmic time in a great flowering of life. They embrace gnostic insight and shamanistic illumination using the visionary power plant sacraments rather than traditional forms of worship. They pronounce liberation from poverty, and from corporate exploitation and from the oppression of moral edict and even the law of order. They unveil the epoch of the Tree of Life in the ending of traditional religion in the renewal of the ethic of true love, sacred marriage of woman and man unrestrained by moral confines. An explosive mixture at critical mass, yet poetic, natural justice in the healing of humanity's cosmic future.

"Tell us what the kingdom of heaven is like.' He said to them, 'It is like a mustard seed. It is the smallest of all seeds. But when it falls on tilled soil, it produces a great plant and becomes a shelter for birds of the sky.'"
Gospel of Thomas

*The Tree Hidden since the Foundation of the World, behind a flaming sword in Eden by a jealous God.
Revealed again by evolutionary science. That Truth is the Tree of Living Diversity,
in whose branches our immortal survival is enshrined, throughout our generations forever.
Cristo Rey Sep 2022*

Revival in Tierra de Vera Cruz

On the Conquista and the Cristo Rey, almost everyone is in the throes of a nascent Christian revival which is blowing in the wind across Latin America. Several of the crew are born again - amicable but committed to spreading the word that Jesus saves. Many people sing religious hymns loudly. Everyone wants to know what denomination you come from. A woman is studiously leafing through "Biblical Apokalypsis" beside me as I write. A more intellectual looking man is reading "Hermenutica". Another young man is poring over a Portuguese comic of the New Testament. Direct simplicity of belief conveyed in Jesus saves, Christ loves you. Christ is coming soon! - Jesu salvae. Cristo te ama. Cristo viene pronto! - as scrawled in white paint on the rock faces of the mountain passes out of La Paz. The question that continues to smoulder in my mind as I move through the Amazonas is "Can this ocean of spiritual belief, the historical endowment of the Western cultural tradition to the Garden, corpus Christianity as a social movement of transformative love, be tapped to seed a renewal of humanity's relationship with nature?" The question remains.

Fig 234: Julio Cañari Alvarado with the Virgin on the Cristo Rey

To those that would decry the intrusion into the ecological arena of an old style religion which has rejected evolution, treats nature as abhorrent and diabolical and opts for a naive divine creation of a universe only a few thousand years old, I reply that where the great gardens of Earth's living diversity lie are also populations following major world religions, that saving life's diversity is not just a scientific or even rational question, because the Earth stands before us much like an artist's palette, that because the Church is a river to her people, infiltrating every town and village far into the jungle, given a wind of change to fulfil the destiny of the Tree of Life, she too can become a flood tide for renewal of life's diversity, by appealing to human altruism and love in a way which science never can on logical grounds alone.



There is no logical or scientific way alone to save the ecology of the planet. Indeed, Bertrand Russel has pointed out that science itself preaches that life is meaningless in a universe of utterly immense violent forces and that only the cosmic heat death awaits those intrepid ones who would venture into the black hole of intellectual honesty. This dilemma of science - that it has no net ethical content - means that science can be used equally for healing our planet's ecology or reducing it to a fragile genetically-engineered nightmare - for every committed ecologist there is an unscrupulous corporate genetic engineer. The choices are creative and have to do with love and inspiration not simply scientific logic.

Although the evolutionary process will be with us as long as there is life on Earth and humanity may pass away through accident or misadventure long beforehand, we have gained such powers to alter the living face of the planet that is its now only through our love and creative vision that the planet will in the short term become whole again. This is a creative process of free choice which goes far beyond the rational and scientific. In so far as love and social justice have a meaning they are also the key to the future of life's diversity. Great social movements, the Christian church included, have a key part to play because they can give people the will, love and ethical commitment to share and protect Earth's living resources for the greater good and for the unfolding of conscious life in the universe at large.

A Millennial World Vigil for the Tree of Life

During a sacred mushroom *velada* in the 1980s, I had a sudden epiphany that, if the world hadn't resolved the world's biodiversity and climate crises by the millennium in 2000, I should make a sabbatical vigil to the Amazon as Earth's natural Eden of tooth and claw and to Yerushalayim as our historical religious nexus point, to pronounce the Sacred Reunion of woman and man under the immortal banner of the Tree of Life, that other tree hidden since the foundation of the world by a flaming sword in Genesis ⁷⁰.

With the world in a state of unmitigated short-term thinking amid bouts of genocidal conflict and no sign of a cohesive agreement to preserve biological diversity, let alone avoid a hard landing caused by human impact and climate change, I managed to secure another academic sabbatical to do a biodiversity field study of human impact in the Amazon in 1999 and to attend a millennial celebration in Jerusalem at the end of the year (King 2017) as appears in Apocalypsia.

The aim was not to evoke an apocalyptic climax, but to make a careful discrete mark in history in a rite of passage declaring that after 2000 years of unfulfilled waiting, the time had come for a true unveiling of the reunion of the female and male sexes of humanity under the immortally perennial banner of the Tree of Life. So we enacted a simple root set of ritual transformations. This is not to fulfil the Christian world view in a second coming, but to make a paradigm shift to an immortally sustainable human future. Scientific discovery has occurred because science has remained open to new theories and ideas which overturn existing assumptions. Key to scientific veracity is the sceptical principle that nothing is proven true until verifiable, in diametrical opposition to religion which is socially addicted to affirmative belief as the pillar of true faith. Archaic religions are urgently in need of a root paradigm shift but place formidable obstacles in the way. Christianity has invested in a miraculous saviour whom no one can unravel because the miraculous construction of the saviour prevents progress under threat of eternal torment or inquisition as a heretic. Islam likewise pronounces death both for apostasy and for any new prophet arising as the Bahai faith shows.



Fig 235: Rock painting with French kiss (Tanum Sweden), rock carving c 10,000 BC Europe , Negev Desert Catal Huyouk: The hieros gamos, leading to progeny. The courtship of the planter queen Inanna and the shepherd king Dumuzi (Wolkenstein and Kramer).

A key feature of the apocalyptic epoch is the fact that, while the Judeo-Christian idea of apocalypse is the expectation of an imminent cosmic cataclysm, in which God destroys the ruling powers of evil and raises the righteous to life in a messianic kingdom, a prophetic revelation, or a great disaster, the true meaning is "unveiling" Gk *apo-* "un" + *kaluptein* "cover", that is a sacred marriage. The entire period has been one of patriarchal domination, in which woman was cursed and social patterns involving the matriarchy and female reproductive choice were violently repressed. We can

⁷⁰ I noticed in writing this that this expression comes from Matt 13:35 claiming Yeshua is revealing his deepest insights, right after Yeshua pronounces the parable of the mustard seed, which is also quoted in Thomas 20. The parable says the Kingdom of Heaven (not the Christian religion) is effectively the seed of the greatest herb, the Tree of Life in whose branches the birds lodge.

thus see that reflowering apocalypse is centrally about the sacred reunion – the ancient *hieros gamos*⁷¹ celebrated since the dawn of time in the fertility of woman and man personified in Goddess and God, leading to fertile offspring.

This is where the balance of human visions of the future come together in a species where sex wars have always been a reality of the asymmetric prisoners' dilemma of our sexes, because of the huge investment of the female in a pregnancy which leaves her vulnerable and travail for months, the potential risks to life of delivering a large head, and years of lactation and early child-rearing. Humans are at an effective extreme of mammals, only 3% of whom are socially (but not in general genetically) monogamous for the same reasons.

Fig 236: Jane anoints Chris with olive oil from Jericho in the old wastes at the Tomb of Lazarus in Bethany and Chris(t) now anointed, kisses her feet and wipes them with his hair. Inset: The remains of the oil 22 years later. We visited Jericho to pronounce the renunciation of genocide in the spirit of sakina in the name of Isa (Esau = the returning Yeshua).



Jane King who partnered with me for the major phase of my sabbatical to the Amazon and to Jerusalem and I were hosted by Yitzhak Hayutman⁷² at the Academy of Jerusalem for a twelve day workshop in the Millennium on the Sacred Reunion and the Tree of Life, in which we discussed the Shekhinah⁷³ the feminine face of Deity manifest on Earth prominent in the Zohar and I gave an evening lecture on biocosmology, the evolutionary tree of life and the need to avoid a hard landing for the biosphere to avoid precipitating a mass extinction of biodiversity, as a fulfilment of the unveiling of reality. The then Director of the School of Mathematics granted my application on the understanding that I would not claim to be walking on water.



Fig 237: The all night gathering on Millennium Eve. Inset: view of the Dome of the Rock from the celebration

On Millennium Eve we hosted an all-night celebration on Mt. Scopus, in a little park overlooking the Dome of the Rock. We had been offered an olive grove next to Gethsemane on the Mount of Olives by a member of the family who originally kept the keys to the Haram-al-Sharif, but we were driven out by a court injunction and police prohibition.

⁷¹ *Hieros gamos* or Hierogamy (Greek ἱερός γάμος, ἱερογαμία "holy marriage") is a sacred marriage that plays out between a god and a goddess, especially when enacted in a symbolic ritual where human participants represent the deities.

⁷² The grandson of one of the founders of Tel Aviv.

⁷³ *shekhinah* שכ"נה "dwelling" or "settling" and denotes the indwelling of the divine presence of God manifest in the tent of Sarah, also linked to ruach ha-kodesh רוח הקודש, the divine influence of God over the universe or living creatures i.e. Holy Spirit.

Jane and I pronounced together our [Anointing Reading](#) for the new epoch of reflowering of the Tree of Life, reciting our Gaian variant of the Messiah's Jubilee passage in Isaiah 61, which Jesus pronounced in the synagogue at Nazareth, pronounced this time as woman and man together as Bride and Bridegroom in the name of God and Gaia:

Fig 238: Jane and Chris pronounce the anointing Millennium Eve.

*The spirit of God is upon us, the spirit of Gaia is within us
because they hath anointed us, to sing good tidings unto the meek
they hath sent us to bind up the broken-hearted,
to proclaim liberty to the captives
and the opening of prison to them that are bound
to proclaim the acceptable year, to comfort all that mourn
to appoint unto them that mourn in Zion
in Palestine, in Sidon, in Syria, Arabia and the world
to give unto them beauty for ashes, the oil of joy for mourning
the garments of love for the spirit of heaviness ...
that they might be called trees of compassion
the planting of the divine, that all might be glorified
in the abundance of wisdom
and we shall renew the old wastes
and we shall restore the former desolations
and we shall repair the waste cities,
the desolations of many generations*



*they hath clothed us with the garments of salvation
and I as a bridegroom decketh myself with ornaments,
and I as a bride adorneth myself with jewels
for as the Earth bringeth forth her bud,
and as the garden causeth the things that are sewn in it to spring forth
so shall harmony and fulfilment spring forth among all the nations
this day is this scripture fulfilled in your ears.*

The vigil was dedicated to the Sacred Reunion in reflowering the Tree of Life in preserving the biosphere and its biological and genetic diversity throughout our future generations. It is the spirit of Gaia and that of God that hath anointed us - the conjoint spiritual insight to perform the act of redemption – not God and Gaia as literal deities. I sang [The Hymn to the Epoch](#), [video](#) followed by a round of dedications from all.

This rite of passage served two key purposes to address foundation issues in the collective unconscious manifest in the Weltanschauung⁷⁴, the archaic formative world view driving patriarchal monotheism expressed in the Yahwistic Genesis **firstly** in Eve being cursed for heeding the serpent, to be obedient to her husband, under pain of childbirth, appeasing male paternity uncertainty, confessing an archaic conflict with the matriliney and female reproductive integrity and **secondly** with dominion over nature in the Tree of Life in Paradise hidden from humanity behind a flaming sword, dooming us to conflict with the thorns of the wilderness in the sweat of human dominance.

*cursed is the ground for thy sake;
in sorrow shalt thou eat of it all the days of thy life;
Thorns also and thistles shall it bring forth to thee;*

This transmission is not a matter of belief but of human realisation in action. This wasn't intended to be a magical pronouncement that would change the world overnight simply by saying it, but a series of rites of passage to dedicate a unique unparalleled event in its time and place, revealing the foresight to take responsibility to speak the words that are key to redeem the apocalyptic tradition in the sustainable epoch of the Tree of Life. The evening was accompanied by folk and harp music, chants to the Shekhinah and recitations from all present to bring in the new epoch, pronounced together "as one is to one" as Devorah Brous, who had coordinated the event stated. Eliyahu MacLean blew the shofar and pronounced the blessing of the collective Mashiach:

*We are here together the collective Mashiach and our vision here tonight will spread
peace in our hearts and peace on the City of Peace below Yeru-shalom Jerusalem.*

⁷⁴ *Weltanschauung* – a particular philosophy or view of life; the world view of an individual or group: *welt* "world" (see world) + *anschauung* "perception" (related to English show). William James (1868)

*and bisrata shem in Jah Allah we'll be as a light and a source for peace
in the whole world and in the whole universe.*

On the Epiphany, we led a small messianic march, of a spontaneous thirteen participants, from the Ascension site on the Mount of Olives, by Gethsemane, the Gates of Compassion ⁷⁵ on the Eastern wall, the Vale of Kidron where the Asherah was removed from the temple and burned in the time of Josiah, to the Western Wall הכּוֹתֵל הַמְּעֵרָבִי.

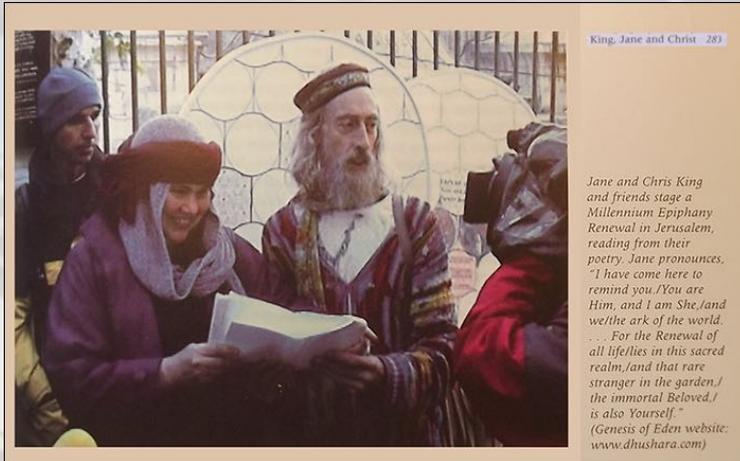


Fig 239: Jane reads the Resurrection of Magdelene Fisher (2002). Inset: Index entry.

This was documented in "Living Religions" (Fisher 2000 283) in the section on Jewish Renewal:

Contemporary Jewish renewal is not just an absence of fear. It is an active search for personal meaning in the ancient rituals and scriptures, and the creation of new rituals for our times. ... From highly conservative to highly liberal quarters, there are now attempts to renew the ancient messianic ideal of Judaism, that by its practice, the world might be healed.

The Resurrection of Magdelene

*I have come here to remind you.
You are Him, and I am She,
and we the ark of the world.
We must not transport to the void
but sweetly plant in Earth, our love so rare
We cannot escape through worship
our own conscious destiny.
Our meeting and our embracing.
For the Renewal of all life
lies in this sacred realm,
and that rare stranger in the garden,
the immortal Beloved, is also Yourself.*

At the gates of Gethsemane we pronounced the Dialogue of the Saviour and Thunder Perfect Mind.



Fig 240: Jane and Chris pronouncing the Gates of Mercy open and the thirteen in the Vale of Kidron.

⁷⁵ Here I prefer shared compassion rather than the theistic implications of mercy: **compassion (n.)** "feeling of sorrow or deep tenderness for one who is suffering or experiencing misfortune," mid-14c., *compassioun*, literally "a suffering with another," from Old French *compassion* "sympathy, pity" (12c.), from Late Latin *compassionem* (nominative *compassio*) "sympathy," from *compati* "to feel pity," from *com* "with, together" + *pati* "to suffer". Latin *compassio* is an ecclesiastical loan-translation of Greek *sympatheia* (see **sympathy**). **mercy (n.)** late 12c., "God's forgiveness of his creatures' offenses," from Old French *mercit, merci* (9c.) "reward, gift; kindness, grace, pity," from Latin *mercedem* (nominative *merces*) "reward, wages, pay, hire" (in Vulgar Latin "favor, pity;" in Medieval Latin "thanks; grace"), from *merx* (genitive *mercis*) "wares, Meaning "disposition to forgive or show compassion" is attested from early 13c.

At the Golden Gates of Compassion in the Eastern wall שלער הזבוי (باب الذهبی) barricaded by the Muslims in the Ottoman period and thought to be the gate through which people would pass in the unveiling), we pronounced them open from Isaiah 60:

*And your gates shall be open continually, they shall not be closed day or night.
The glory of Lebanon shall come to you, the juniper the box tree [fir] and the cypress together.*



Fig 240b: **Jerusalem Panorama**. Centre left the Garden of Gethsemane with a bus outside and above it the Orthodox church with gold leaf onion tops and to the right again the **Jewish cemetery** of the 144,000. Centre right the **Gates of Mercy** (compassion). In the Vale of Kidron, where the Asherah was burned by Josiah, and lower left centre is **Absalom's pillar** and an aqueduct tunnel you can wade through running from there to the **Pool of Siloam**. On Millennium Eve we had been granted the site in the olive grove to the left of Gethsemane to reflower the Tree of Life by the family who had originally held the keys to the Dome of the Rock, but it had to be moved to Mt. Scopus top left, because the authorities refused permission.

According to Jewish tradition, the Shekhinah (שכינה) (Divine Presence – the feminine face of God manifest on Earth) used to appear through the eastern Gate, and will appear again when the Anointed One (Messiah) comes (Ezekiel 44:1–3). I pronounced this passage alone at night in the portico of the gate, as appears in the movie **Apocalypsia**:

*“It is for the prince; the prince, he shall sit in it to eat bread before the LORD;
he shall enter by the way of the porch of that gate, and shall go out by the way of the same.”*

Finally we arrived at the Western (Wailing) Wall, where we pronounced the Sacred Reunion of woman and man, not just God and the bride Israel, but woman and man in the flesh, as the Song of Songs actually declares:

Fig 241: Pronouncing the reunion of woman and man in the Song of Songs which Rabbi Akiva extolled as the Holy of Holies ⁷⁶

*I sleep but my heart waketh:
it is the voice of my beloved that knocketh,
saying open to me my sister,
my love, my dove, my undefiled :
for my head is filled with dew,
and my locks with the drops of the night.
I have put off my coat; how shall I put it on?
I have washed my feet; how shall I defile them?
My beloved put his hand in the hole of the door,
and my bowels were moved for him.
I rose up to open to my beloved
and my hands dropped with myrrh,
and my fingers with sweet-smelling myrrh,
upon the handles of the lock.*



*Set me as a seal upon thine heart, as a seal upon thine arm:
for love is strong as death; jealousy is cruel as the grave:
the coals thereof are coals of fire, which hath a most vehement flame.
Many waters cannot quench love, neither can the floods drown it.*

These core rites of passage – to **unfold the promised epoch of the Tree of Life**, throw open the **Gates of Compassion** and **celebrate the Hieros Gamos of woman and man** in the **Song of Songs**, fulfilled in my subsequent pilgrimage to pay my respects to Kali in Varanasi, completing my academic sabbatical. These are the three core principles of natural redemption that heal the apocalyptic tradition in a true unveiling of the immortal abundance of life.

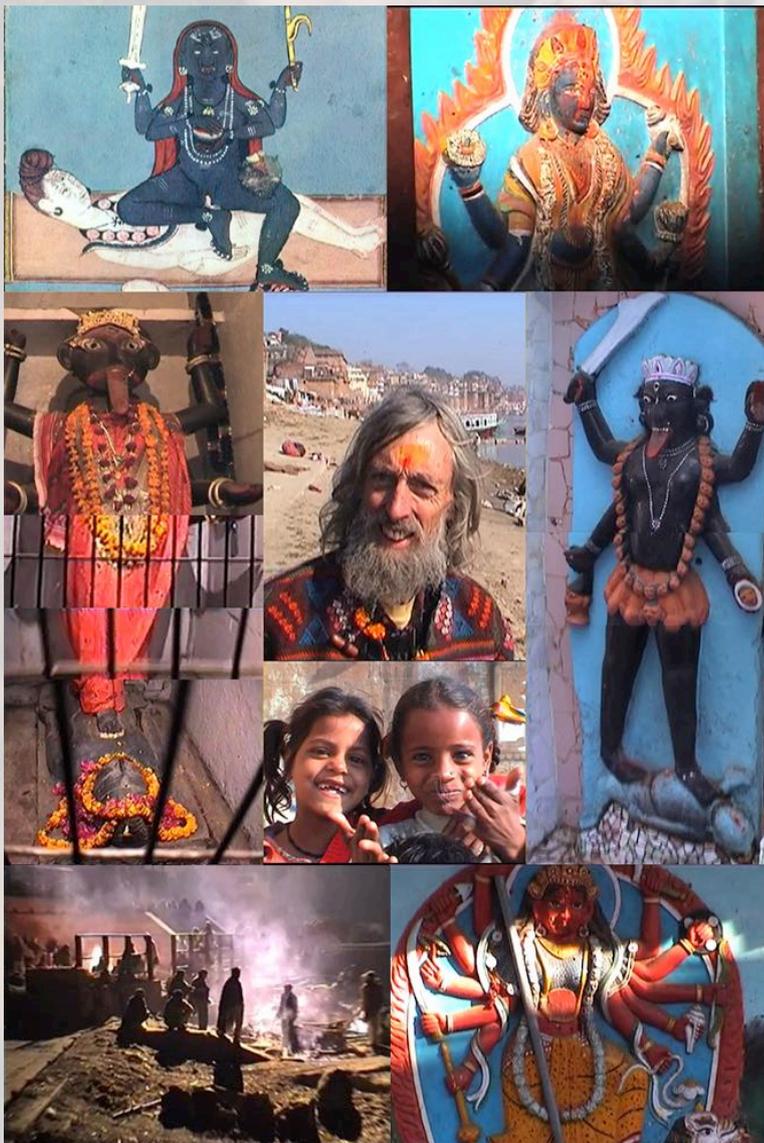
⁷⁶ I have always defended the Song of Songs as the most fertile expression of the Sacred Reunion but for this, a Zionist woman from Tsvat threatened to report me to Mossad as a Gentile “thief in the night”. Our dialogue is recounted in my song **Black Rose** – *video*.

If you imagine for one moment that I was suffering from messianic delusions in the Holy City, here's what happened next! Jane and I had to separate immediately after we pronounced the Sacred Reunion at the Western Wall. Jane flew to the US and I ended up for three days, stranded in Frankfurt airport because my adult son, who I had been flying with earlier on, changed all his bookings, and mine also got cancelled, including my next flight to Delhi to pay my respects to Kali on the Ganga to complete the appointment with fate. Jane and I had parked our little sleeping van in the Frankfurt airport car park and fled to Jerusalem. It was still there with flat tyres and "hundreds" of parking tickets, so I had a place to sleep. After pleading with Lufthansa for three days for a connection to India, they eventually came up with a plan to fly me into Nepal. I had found from the Indian embassy that I could get a 72 hour transit visa at one day's notice in Kathmandu. When I arrived in the evening, the Kathmandu border control seized my passport because I had only a credit card and they wanted \$US cash for the entry visa and then chucked me out of the airport, where there was a huge crowd trying to get in and the doors were locked tight. That meant that, with no passport I couldn't get money, so I had to go to an emergency agency to get a postal visa advance, then next day paid to get my passport back and then finally my treasured 72 hour transit visa, meanwhile visiting yet again the erotic Lakshmi and Durga temples of Kathmandu and the burning ghats of Pashuptinath in the valley opposite Boudhanath. Then down the Himalayan foothills by bus and to the plains of India.

I have had a long affair with Varanasi, that timeless sacred city – a kind of love affair amid the purgatory of existence, as deep as Jerusalem. The first time I was there in 1976, I struck up a personal relationship with a rickshaw driver who made the most desperate genuine pitch. He in turn took me to a wrestler who cared for a traditional Indian house on Kedar Ghat just beside the Golden Temple. I took a medieval room for 2 rupees a night, and had a designated two-foot square cooking area in the galley and a site on the roof where one could sleep in the cool with my padlock key on a string round my neck. The wrestler knew a boatman so I could also go down and sleep on the roof the boats with the

boat builders and listen to the eternal refrains echoing out from the temples and watch the panorama of the bathing ghats at sunrise. I could eat a beautiful vegetable platter at the boatman's house for a few rupees and share the life with his huge family. The wrestler would do regular pujas in the foyer and we would all go up on the roof and smoke opium ghoolies together. There was also ganga at the government ganja shop a little out of town. Each morning there was lemon curd, which you had to get to before the dust and manure and flies took over, served in small bisque-fired clay cups which you smashed ritually to avoid disease.

Fig 242: Chris pays his respects to Kali in Varanasi Jan 2000.



So above is a photo record of my hard won vigil of devotion to Kali as the supremely dangerous Goddess that puts mankind on notice, more extreme than the hapless knight in Chaucer's *Wife of Bath* who had to solve the riddle of "what women want" under pain of death, namely sovereignty. Kali is the archetype of the ancient planter Goddess. You can find her in sacrificial mode in Mohenjo Daro in the Indus valley at 2500 BC alongside Pashupatinath the Shivaic Lord of the Animals complete with his Sadhu trident. I gathered the Kali images from the little alleys I knew by heart that ran behind the bathing ghats to the burning ghats, paying

my respects as Shiva is to Shakti, Durga and Kali in her various forms and for light relief, as Krishna is to the cowgirls, to pay my utmost respects to the founding meditative religious traditions of human culture.

This was deadly serious – as serious as our mutual anointing with olive oil from Jericho at Lazarus's tomb in Bethany. It completed a journey that had taken us through the burning season in Bolivia and all the way from Maccu Pichu, following the Urubamba through the high Andes, then down through the jungle in dugout motor canoes, racing the rapids down to the Pongo de Mainique, the "manic gorge" where the Urubamba cuts through the last of the Andes. The lowland rainforests and mid-montane cloud forests within a radius of five miles of the Pongo possibly comprise the single most biologically-diverse site on the face of the Earth. Then more burning season and down the Ucayali in a banana boat, from Atalaya to Pucallpa, where we took Ayahuasca, with the leprous shaman Snr. Trinico, then the Amazon in river boats in cheap hammocks, with a sojourn in a jungle nature reserve, to Iquitos, then Manaus and south up the Rio Madeira to the Crocodiles and giant storks of the Pantanal.

This was a world vigil that started with the immolation of the tropical forest, our true Garden of Eden in the Amazon, then Reflowered the Tree of Life in Jerusalem and ended up with the immolation of humanity by Kali on the burning ghats of Varanasi. I hope you all understand this devotion to Kali and to the jungle of tooth and claw illuminates the Mount of Olives gathering in a whole new light. And this entire spiritual vigil on an academic sabbatical, for which I was never forgiven by the Dean of Science!



This brings us finally back to the motif of the Tree of Life in the Fall from Eden. The role of religion and of spirituality, ethics and our sense of human conscience is to ensure we collectively cherish and replenish the Earth throughout our generations forever, so that its biological and genetic diversity flourish, its climate remains optimally habitable and all the generations of conscious beings have a full opportunity to experience the mysteries of life and existence. The epoch of the Tree of Life is thus the epoch of sustainability, in which life is able to continue and evolve so long as the Earth shall live. This is the cosmic destiny that human consciousness faces as the guardians of the living planet.

Fig 243: Chris, Heath, Adam and Jane traverse the Andes and Amazon in the Burning Season to document the immolation of biodiversity. Bolivia burning season, Ucayali, Pongo, banana boat, Iquitos, Pantanal.

Although in this celebration effectively everyone was the collective Mashiach, as far as I know, I am the only person in the last 2000 years to correctly identify the culmination of the messianic epoch in the Tree of Life in perennial

immortality of planetary Paradise throughout our generations forever. This is the only epoch of long term future goodness that is relevant or achievable in the universe at large, and which is urgently critical in a planetary crisis of climate and habitat amid an apocalyptic mass extinction of living diversity, likely to harm Paradise for thousands, or millions of years, of extinguish life as we know it, unless we act decisively. It depends on the reunion of woman and man, ending the epoch of patriarchal dominion over woman and nature. To allow this to fail and for Earthly life to be extinguished, since we don't know if life exists elsewhere, could rob the universe of all its manifest meaning.

The responsibility of any *mashiach* in the era of scientific and natural discovery is and has to be to provide verifiable scientific information, veridical collective wisdom and visionary spiritual impetus to enable such a transition to perpetual abundance to become a reality, thus fulfilling the messianic expectation transparently, not as a religious leader, or a miraculous faith healer, but as a research scientist disclosing a cosmology of immortal coexistence.

This transmission is thus also to inform and convey this reality and release responsibility for it freely back to the world, twenty years later, by transparently declaring that the underlying inspiration for the vigil arose from a *velada* on sacred mushrooms, some twenty years before the millennial event. This becomes a visionary process in which we all can participate and seek our own reunion with the cosmos, without relying on a religious leader, or doctrine, or moral imperative, to bind us to the faith, except to have guides and helpers to ensure safe passage in our visionary trips. Thus the epoch of religion (*religio* "to bind together") becomes the epoch of resplendence (*resplendere* "to shine brightly").

Subsequently, when I returned to Aotearoa, in 2003 my partner Christine and I co-authored "Sexual Paradox: Complementarity, Reproductive Conflict and Human Emergence" (Fielder & King 2004) to affirm the reunion of woman and man and of courtship and female reproductive choice, alongside mutual partner choice as a key component of the prisoners' dilemma of our asymmetric sexes, running a Red Queen race of evolution, while standing still, catalysing the emergence of human intelligence and culture. The natural condition is sexual paradox in a game-theoretic edge-of-chaos. This is a climax example of asymmetric symbiosis, which the patriarchy has sought to appropriate in sexual dominion over the female, to our evolutionary disadvantage in future, just as dominion over nature to subdue it without replenishment threatens our very survival.

Dominant patriarchy has been and still is an acutely damaging part of history since the neolithic, that has led to the sequestering, enforced veiling and chaperoning of women, stoning for adultery applied principally to the female "because she didn't cry out", to menstruation becoming regarded as unclean and to diabolical practices of female genital mutilation on behalf of the patriarchy to avoid women enjoying sex and hence being able to make natural reproductive choices. This has in turn led to unremitting expectations by major world religions to increase their following and world domination by reproductive ascendancy.

GAIA & GOD

Eight years before Jane and I went to Jerusalem, in the Millennium, Rosemary Radford Ruether (1991) wrote "Gaia & God", which she described as an "ecofeminist theology of earth healing". Thus one can see in her work a forerunner of what we sought to achieve in pronouncing the reflowering of the Tree of Life in the reunion of woman and man.

"Vessel" Meinrad Craighead 1986 (cover picture)



It's final section entitled "Healing", looks in detail at the covenantal and sacramental aspects of Christian tradition as a potential avenue of sacralising and redeeming nature and the biosphere in a way that, if replicated across cultural and religious traditions could redeem and replenish the living Earth and secure it from human-induced extinction of living diversity. Despite invoking a multiplicity of views both of a transcendent God and a cosmogenic saviour in the person of Christ the overall view she is portraying is one of using religions traditions as human created belief systems to facilitate our integration with nature and our survival as a species and a culture within the closing circle of the biosphere as represented by Gaia as the Matrix of natural cosmological existence. The names

Gaia and God are thus human invoked expressions of wholeness and redemption, not absolute cosmological, or cosmogenic theistic realities.

Healing the World: The Covenantal Tradition

She is clear at the outset both that Christianity and Monotheism more generally are by no means a privileged view of redemption over other paths and traditions and that they remain insufficient as they stand without root change.

In this, and the following chapters, I will explore two lines of the biblical thought and Christian traditions that have reclaimable resources for an ecological spirituality and practice: the covenantal tradition and the sacramental tradition. I want to make clear at the outset what I am not doing in this exploration' I am not assuming that these are the only or, the best religious traditions for ecological ethics and spirituality; and I am not assuming that these traditions can be reclaimed and made usable without change. Both these traditions are marked by a legacy of patriarchy and must and must be reinterpreted if they are to be genuinely affirming of dominated women, men, and nature. Even then the question of whether they can be adequately liberated and made liberating will remain. Nor do I in any way discount that there are resources for ecological spirituality and practice in other traditions, Native American, African, and Pacific indigenous traditions and also Asian spiritualities such as Taoism and Buddhism. All of these many ways should be honored and their resources for ecological spirituality and practice developed.

She immediately notes the development of weapons of mass destruction and in particular nuclear weapons as a turning point in humanity precipitating an apocalyptic destruction of the planet, which requires a new world view as existing traditions are insufficient to address it:

In focusing on these two Christian traditions, I make several presuppositions. First, I assume that there is no ready-made ecological spirituality and ethic in past traditions. The ecological crisis is new to human experience. This does not mean that humans have not devastated their environment before. But as long as populations remained small and human technology weak, these devastations were remediable by migration, retreat from top-heavy urban centers, or adaptation of new techniques. Nature appeared a huge, inexhaustible source of life, and humans small. Only after the bombs of Hiroshima and Nagasaki did humans begin to recognize the possibility that they could destroy the planet by their own expropriated power. The radical nature of this new face of ecological devastation means that all past human traditions are inadequate in the face of it. Whatever useful elements may exist in, for example, Native American or Taoist thought, must be reinterpreted to make them usable in the face of both new scientific knowledge and the destructive power of the technology it has made possible. My second assumption is that each tradition is best explored by those who claim community in that tradition. This does not preclude conversions into other traditions or communication between them. Indeed I believe that we must ultimately draw upon all our spiritual resources in a global community of interrelated spiritual traditions.

She notes both the potential of the Christian tradition, given its size and is problematic defects:

The Christian tradition is one of those communities of accountability that has profoundly valuable themes for ecological spirituality and practice. It also has problematic defects and bears significant responsibility for the legacy of domination of women and nature. But, for that reason, it's liberating potential should not be disregarded. Those too alienated from this tradition to allow it to speak to them have every right to seek other spiritual traditions that can nurture them. But the vast majority of the more than 1 billion Christians of the world can be lured into an ecological consciousness only if they see that it grows in some ways from the soil in which they are planted.

In discussing Hebraic traditions, she claims the Bible has been made to appear to Western Christians to be much more anti-nature than it is by nineteenth-century western European Protestantism, in which "Nature" was understood as subhuman, as the sphere of necessity, and the realm to be negated in order to ascend into humanness and freedom and turns back to the Hebraic view unifying creation and redemption:

The Hebraic understanding of the God of Israel did not set history against nature, but rather experienced God as Lord of heaven and earth, whose power filled all aspects of their lives. The same steadfast love of God is present when God "spread out the earth on the waters, . . . made the great lights," made "the sun to rule over the day, . . . the moon and stars to rule over the night" and when God "brought Israel out from among them. . . with a strong hand and an outstretched arm, . . . divided the Red Sea in two . . . and made Israel pass through the midst of it . . . but overthrew Pharaoh and his army in the Red Sea (Psalm 136:6-1.5). . . Israel experienced both divine judgment and divine blessing in relation to threatening neighbors, and also in relation to storms and droughts. They praised God for deliverance from enemies and for the miracles of fertile fields and starry night skies. In contrast to Greek thought, which saw reality as moving in geometric space, Hebraic thought saw reality as "event."

She notes the problems of the Hebraic tradition, particularly in terms of patriarchy, but suggests this can be surmounted:

The Hebraic view of relationship to God is undoubtedly highly androcentric, anthropocentric, and ethnocentric. God is seen as relating to this particular people through the male leadership of this people. But this does not preclude more inclusive perspectives, a God who also relates lovingly to other people, a God who related directly to women without intermediaries, and a God who relates to nature apart from human mediation.

She then focuses on those passages showing a testimony to a God who relates directly to nature, whether or not it is a nature of benefit to humans. Noting that although the metaphor of God as "maker" is modelled after the artisan shaping artefacts, God is seen as creating a living world, not "dead things":

God is seen as taking profound pleasure in this work of creation, and the creation, in turn, responds to God with praise. God "rejoices" in the world "he" creates, and the planets, mountains, brooks, animals, and plants return this rejoicing in their relation to God. The relation of God and "nature" is often animistically interpersonal. ... Psalm 29 speaks of God present in the storm, whose "voice . . . thunders over many waters," whose thunder "breaks the cedars of Lebanon, . . . makes Lebanon skip like a calf and Siron like a young wild ox." In Psalm 65 God visits the earth in the rain showers, watering its furrows abundantly, blessing its growth. The earth responds with overflowing abundance: "The hills gird themselves with joy the meadows clothe themselves with flocks, the valleys deck themselves with grain, they shout and sing together for joy" (9-1,3).

She notes that the blessing of God's presence is found not only in those spheres of nature under human cultivation, where humans seek benefit from nature. In an extended rebuke to human arrogance, the God who speaks to Job from the whirlwind makes clear that God is equally present in places and times in nature to which humans have no access, noting that the Hebraic texts "social" and "natural" are knit together in one holistic experience:

"Where were you when I laid the foundation of the earth, when the morning stars sang together, and all the heavenly beings shouted for joy? . . . Have you entered into the springs of the sea, or walked in the recesses of the deep?" God also provides for the wild animals not under human control: Can you hunt the prey for the lion or satisfy the appetite of the young lions . . . ? Who provides for the raven its prey when its young ones cry to God . . . ? Do you know when the mountain goats give birth? Do you observe the calving of the deer? . . . Who has let the wild ass go free . . . which I have given the steppe for its home . . . ? It scorns the tumult of the city; it does not hear the shouts of the driver. It ranges the mountains as its pasture. . . . Is it by your wisdom that the hawk soars . . . Is it at your command that the eagle mounts up and makes its nest on high? (Job 38-39)

"He turns rivers into a desert, springs of water into thirsty ground, a fruitful land into a salty waste, because of the wickedness of its inhabitants." At the same time, God can reverse this disaster for the needy: "He turns a desert into pools of water, a parched land into springs of water. And there he lets the hungry live . . . they sow fields and plant vineyards and get a fruitful yield" (Psalm 107:33-36).

She notes that much of the ecological critique of the Bible has focused on the concept of "dominion" over nature granted to "man" by God, disclaiming that the biblical picture is one of keen awareness of the limits of human power and that nature is not private property to be done with as one wishes, but stewardship over an earth that remains ultimately God's:

"The Lord created man out of the earth and turned him back to it again. He gave to men few days, a limited time, but granted them authority over the things upon the earth." (Ecclesiasticus (17:1-2)

She notes that when disaster strikes the righteous man, nature itself teaches him that in this too lies the work of God: *But ask the animals, and they will teach you; the birds of the air, and they will tell you; ask the plants of the earth, and they will teach you; and the fish of the sea will declare to you. Who among all these does not know that the hand of the Lord has done this? In his hand is the life of every living thing and the breath of every human being. (Job 1,2:7-10)*

She notes that one of the major fruits of this Hebraic understanding of the covenantal relationship between justice and prosperity in the land is found in sabbatical legislation, describing the seven-day cycle of the Sabbath, that imitates God's creative pattern in making the world, the seven-year cycle, and the seven-times-seven-year cycle or Jubilee, in each of which, land, animals, and humans are to rest and be re-stored, in deeper and more thoroughgoing ways, culminating in a periodic "permanent revolution" in the fiftieth year.

"Six days you shall do your work, but on the seventh day you shall rest, so that your ox and your donkey may have relief, and your homeborn slave and resident alien may be refreshed" (Exodus 23:1,2). In this cycle the community of Israel imitates God's own creative pattern in making the world, laboring for six days and resting on the seventh.

"For six years you shall sow your land and gather its yield; but the seventh year you shall let it rest and lie fallow, so that the poor of your people may eat; and what they leave the wild animals may eat. You shall do the same with your vineyard and your olive orchard" (Exodus 23:10-11).

"You shall hallow the fiftieth year, and you shall proclaim liberty throughout the land to all its inhabitants" (Leviticus 25:10). In this year everyone who has lost their land through debt will be restored, with each one returning to their former property. The lawgiver accentuates the provisional character of all landholding, since the land remains ultimately God's: "The land shall not be sold in perpetuity, for the land is mine, with me you are but aliens and tenants" (Leviticus 25:23).

She notes that during the Jubilee, Hebrew men and women who have fallen into debt and sold themselves into slavery are to be released, along with their children. Debt too has its limits, and is to be liquidated at the time of the Jubilee, in which healing is guarantee against permanent Hebrew slavery. "

They and their children with them shall go free in the Jubilee year. For to me the people of Israel are servants; they are my servants whom I brought out from the land of Egypt; I am the Lord your God" (Leviticus 25:54-55).

She notes that the Jubilee year is a time of periodic righting of unjust relations, undoing the enslavements of human to humans, the losses and confiscations of land, that have created classes of rich and poor in Israel. The norm of a just community is one of free householders with land equitably apportioned among them, thus providing a model of redemptive eco-justice.

Unlike apocalyptic models of redemption, the Jubilee vision does not promise a "once-for-all" destruction of evil. Humans will drift into unjust relations between each other, they will overwork animals and exploit land. But this drift is not to be allowed to establish itself as a permanent "order." Rather, it is to be recognised as a disorder that must be corrected periodically, so that human society regains its right eco-social relationships and starts afresh. This vision of periodic righting of relationships is also projected on a more absolute messianic future, although still a future within history. This future time will bring a final fulfilment of the covenant of creation, restoring peace between people and healing nature's enmity.

For I am about to create new heavens and a new earth; the former things shall not be remembered or come to mind. But be glad and rejoice forever in what I am creating, for I am about to create Jerusalem as a joy and its people as a delight . . . No more shall the sound of weeping be heard in it or the cry of distress. No more shall there be in it an infant that lives but a few days, or an old person who does not live out a lifetime . . . They shall build houses and inhabit them, they shall plant vineyards and eat their fruit. They shall not build and another inhabit; they shall not plant and another eat; for like the days of a tree shall the days of my people be. Before they call I will answer, while they are yet speaking I will hear. The wolf and the lamb shall feed together, the lion shall eat straw like the ox. But the serpent-its food shall be dust. They shall not hurt or destroy on all my holy mountain, says the Lord. (Isaiah 65 :1,7-22, 24-25).

She further notes that this intimate unity between justice and right relations to nature in the covenantal relation between God and Israel is largely lost in the Christian New Testament, although it appears to be present in the establishment of just relations:

The fullest account of the Lord's Prayer shows an understanding of God's Kingdom as the establishment of justice and right relations on earth. This hope for earthly renewal is spelled out in three terse statements: "Give us this day our daily bread. Forgive us our debts as we also have forgiven our debtors. Do not bring us to the time of trial, but rescue us from evil". (Matthew 6:9-13).

She comments that as Christianity developed, even these concerns for this worldly justice would fade, to be replaced by a cosmological and spiritualised understanding of the work of Jesus as Messiah and the covenantal concepts of relationship to the land would be discarded. Christianity replaced the Jewish ethnic view of peoplehood with a universalist imperial view of God's "new people." It reinterpreted the promised land as the whole cosmos and particularly to "heaven." This meant that the concrete eco-justice perspective of Hebrew law vanished, until close links of Puritan reformers with some forms of militant nationalism revived the ancient connection between an elect nation and its national homeland. In a sermon addressed to the Massachusetts Bay colonists in 1630, while still on shipboard, John Winthrop spelled out the Puritan vision of covenanted commonwealth:

Thus stands the cause of God between God and us. 'Wee are entered into Covenant with him for this worke, we have taken out a Commission, the Lord hath given us leave to draw our owne Articles, . . we have hereupon besought him of favour and blessing. How if the Lord shall please to heare us, and bring us in peace to the place wee desire, then hath hee ratified this Covenant and sealed our Commission and will expect a strickt performance of the Articles contained in it . . .

However, the biblical concept of covenanted people was patriarchal, androcentric, anthropocentric, and ethnocentric. The Puritan revival of this idea in England and in America continued these exclusivist patterns.

The constitutional government constructed by the males of the merchant and planter classes of the thirteen colonies 150 years later would have the same restrictions, with the exception of church membership. All these other groups of people were understood as dependents without autonomous citizenship status. They were presumed to be represented by the collective headship of the male householder. ... In the nineteenth and twentieth centuries, the United States would see a series of reform movements-universal manhood suffrage, abolitionism, women's suffrage, and the civil rights movement-that would seek to redress these limitations. The goal, still not perfectly achieved, has been for equal civil status for all adults, regardless of religion, race, gender, or "previous condition of servitude."

In addressing the covenantal rights of nature, she contrasts environmentalists concerned with rare species extinction and animal rights activists focusing on the rights of animals as individuals:

The interpersonal model of relation to animals is criticized by environmentalists. It means that the category of "animal rights" is extended primarily to certain "favorite" animals, primarily mammals. Some birds, fish, and reptiles may also be included. Insects, which are the vast majority of animal species, do not draw the same response. The traditional line between humans who possess "soul" and animals that do not is extended downward to include categories of animals. But a line is still drawn between a category of beings to be respected on the basis of "sentience," and those who lack sentience and hence lack "rights."

Environmental ethicists, by contrast, are concerned with the health of biotic communities and the maximization of diversity of species within their habitats. Hence they are more concerned about the life of a few insects of an endangered species than they are about the life of the 2 millionth deer in a park where deer are overrunning the carrying capacity of their habitat. This concern for endangered species is often defended on anthropocentric grounds: that each plant or animal species that disappears re moves a potential source of knowledge about the earth that might be valuable for food or medicine. But the value of species goes beyond these utilitarian criteria. Each species of plant or animal is a distinct evolutionary form of life, and thus, as a species, has unique value in its own right. Environmentalists operate from the principle that maximization of diversity of species promotes the health of the whole biotic community. Although natural evolution results in extinction of species over time, the recent human impact on the earth has accelerated this process of extinction in a very dangerous way, and hence humans must assert a role of explicit guardianship over endangered species.

This means close observation of nature, so that we can learn how a healthy biotic community is sustained through complex interchanges of plants and animals implies that we become conscious promoters and restorers of such habitats:

Thus the biblical concept of humans as the "image of God," into whose hands care of nature is given, assumes a more profoundly ethical meaning. Not only does this role of humans give no mandate to destructive use of nature, but it also places a much more comprehensive responsibility for the preservation of nature in human hands. It is the human species that is accountable to the God of life to care for and protect the vast panoply of life forms produced by millennia of earth's creativity. ... But the concerns of animal rights activists should also be heard. There needs to be a place for moral sensitivity to the quality of life of highly sentient animals that most resemble humans in their capacity, not only to feel pain, but also to enjoy life, remember and imagine, and interrelate socially with their own species, as well as with humans.

The sheer numbers of animals used in laboratories far exceeds scientific necessity, and there is no excuse for the cruelty with which these animals are treated. Factory farming necessitates the use of artificial hormones and antibiotics on animals that are cruel to these animals themselves, not to mention their dubious results for the health of humans who consume the meat.

She then comes to the consumptive nub of the problem of the attempt to derive this mandate from "nature" that predation as an unavoidable:

Not only do carnivorous animals depend for their existence on eating other animals, but all life forms exist through an interdependency of consuming and being consumed. Even the bodies of large mammals must eventually decay, providing food for worms and insects. Nor is it sufficient to claim that one does not eat beings with whom one can have an interpersonal relation.

This dilemma is expressed in Genesis 1 that both humans and animals were vegetarians, so meat-eating, and the predator-prey relation of humans and animals, represent a fall into an inferior moral state:

The fear and dread of you shall rest on every animal on earth, and on every bird of the air, on everything that creeps on the ground, and on all the fish of the sea; into your hand they are delivered. Every moving thing that lives shall be food for you, and just as I gave you the green plants [in the original creation], [now] I give you everything. (Genesis 9:2-3)

However vegetarianism stumbles on the fact that a major and group of animals also eat other animals and have key roles necessary for the survival of the biosphere against boom and bust. Do we regard their predation as an expression of "fallen nature"? So the effort to escape from the ambiguity of killing other life in order to live is finally impossible, although there are compelling moral reasons for a mostly vegetarian diet, particularly for affluent people.

But we can hardly impose a vegetarian ethic on third-world peasants for whom the eating of the occasional chicken or pig that grows up in the barnyard is an indispensable part of an otherwise very limited diet. The possibility of having many forms of alternative protein, and hence a healthy diet without meat, is the luxury of the affluent. So it is we of affluent nations, whose supermarkets are filled with a great variety of foods from all over the world, who can and should adopt a near-vegetarian diet for the sake of the rights of both animals and other humans.

A covenantal vision of the relation of humans to other life forms acknowledges the special place of humans in this relationship as caretakers who did not create and do not absolutely own the rest of life, but who are ultimately accountable for its welfare to the true source of life, God as she put it in an identification with burgeoning life as a whole:

This covenantal vision recognizes that humans and other life forms are part of one family, sisters and brothers in one community of interdependence. Although we have limited rights of use of other life forms, and also responsibilities of care and protection toward them, there is an ultimate thouness at the heart of every other living being, whether it be a great mountain lion or swaying bacteria, that declares its otherness from us. The covenantal relation between humans and all other life forms, as one family united by one source of life, forbids this otherness from being translated into destructive hostility. We have no right to wipe out any other life form because it is different from us. But rather, we encounter each other being simultaneously as "other" and as kin, as indeed we encounter each human person. The plant stretching toward the sun, the animal whose eyes warily encounter ours as it pauses in its tasks, reveal their own being in and for themselves.

Healing the World: The Sacramental Tradition

Here, Reuther traces a line of Christian tradition that regards Christ as the cosmic manifestation of God, appearing both as the immanent divine source and ground of creation and its ultimate redemptive healing. Although this cosmological understanding of Christ as both creator and redeemer of the cosmos, is central to much of New Testament thought, she laments that Western Christianity since the late medieval and Reformation periods has ignored this holistic vision. Thus modern searchers for a cosmological spirituality have assumed that this is lacking in Christianity and can only be found in non-Christian perspectives' such as pagan "nature religions" or Asian religions.

Although the cosmological tradition in Christianity needs reinterpretation to be adequate for ecological spirituality, exploring what it would mean to restore for today the cosmological centre of theology and spirituality requires discovering how does this change our understanding of both "God" and "humans"?

Ruether shows how New Testament and early Christian cosmological Christology built on theologies of cosmogenesis in Oriental Hellenism, particularly as these had already been assimilated into Hellenistic Judaism, allowing Christians to assimilate ideas of Hellenistic philosophy, while denying their "pagan" origins. Christian theology thus took over the Hellenistic Jewish apologetic myth that Plato had learned his philosophy from Moses, making Platonism derivative of biblical revelation.

Christianity also took over from Judaism an ideology of religious "purism," over against paganism as "false religion." This dualism still shapes Christian self-understanding, causing it to obscure and deny its actual syncretistic reality. Today this role of Christianity as synthesizer of major Hebraic, Oriental, and Greco-Roman thought should be recognized as a strength, rather than a "secret" to be denied. Certainly Christianity's success as the "winning" religion of late antiquity can hardly be explained apart from this synthesizing process. Today's eco-spiritual crisis demands a synthesizing creativity of even greater expansiveness.

What is called here Oriental Hellenism encompasses both schools of Greek philosophy that had synthesized the Platonic, Stoic, and Peripatetic cosmologies, and also movements that restated this mystical philosophy as "Oriental wisdom," for example, the Chaldean Oracles and the Hermetic literature. Out of this speculative milieu there also emerged the Gnostic literature. But the writings I trace here rejected Gnostic anti-cosmic dualism. Instead they affirmed the cosmos as the expression of immanent divinity within which humans stood as microcosm to macrocosm.

In Middle Platonism the Platonic concept of the transcendent world of Ideas and the Aristotelian concept of the Divine Mind were combined. Also combined were Plato's concept of the World Soul and the Stoic concept of the Logos, which Stoics saw as the immanent life-power of all beings. There thus developed a cosmogonic story with either a two-part or a three-part sequence. Neoplatonism in Plotinus fully develops the three-part sequence.

The cosmos is seen as originating in a transcendent divine being, who is the source of all things. This divine being brings forth from "himself" a perfect "image" and self-expression, in which the intellectual essences of all things are contained. This second God is then also identified with the Demiurgos, who shapes the cosmos from the intellectual "blueprint" contained in "his" own mind. The

world soul, in turn, expresses this divine Logos in immanent form as the sustaining power of the cosmos. Human souls are seen as partaking in the substance of this world soul or immanent Logos of the cosmos.

This cosmogonic picture was used in Jewish Wisdom literature to describe divine Wisdom as a secondary manifestation of the Creator God who is God's agent in creating the universe and is also the immanent power that sustains the universe. Wisdom is understood also as the presence of God speaking in revelation. Through Wisdom human souls come to know God and grow into virtuous "sons" of God.

Philo⁷⁷, the major philosopher of Hellenistic Judaism, developed a more elaborate philosophical theology. He saw God bringing forth a secondary expression, the divine Logos, who is the manifestation of the divine mind. From this Logos radiate the "Dynamis" or energies of God that create the world. The cosmos is sustained by the power of this immanent Logos. Each human soul, in turn, reflects the divine logos. Humans and cosmos thus are seen as "brothers" and parallel "sons of God."

Ruether asserts that in Jewish apocalyptic thought, there had been no identification of the anointed one, Christ, or Messiah with cosmogenesis, even though he was sometimes seen as "preexistent." The Christianity reflected in the synoptic Gospels also lacks this identification, however, when we turn to Paul, the Gospel of John, and the book of Hebrews, this identification of Christ as redeemer with the cosmogonic Logos has been put together into a unified vision of the beginning and the end of "all things":

He is the image of the invisible God, the firstborn of all creation; for in him all things in heaven and on earth were created, things visible and invisible, whether thrones or dominions or rulers or powers—all things have been created through him and for him. He himself is before all things, and in him all things hold together. He is the head of the body, the church; he is the beginning, the firstborn from the dead, so that he might come to have first place in everything. For in him all the fullness of God was pleased to dwell and through him God was pleased to reconcile to himself all things, whether on earth or in heaven, by making peace through the blood of his cross (Colossians 1:15-20).

She notes that the resulting synthesis brings together the twin dramas of creation and redemption in the figure of the Logos-Christ. This one divine being is seen as (1) the manifestation of God, (2) the immanent presence of God that creates and sustains the cosmos, and (3) the divine power re-manifest at the end of time, healing the enmity that has divided the cosmos, reconciling the cosmos to God.

The divine person encountered in Jesus is thereby identified with this Logos-Christ. His redemptive act "through the blood of the cross" is seen as the paradigmatic manifestation of one and the same divine being of the beginning and the end of "all things." As firstborn from the dead and head of the body, the Church. Christ is seen as the power of the new creation, not severed from the cosmos created in the beginning, but the principle through which this cosmos was originally created and now is renewed and reconciled with God. The Church itself is seen cosmologically. It is not simply a group of human believers in this figure, but is the paradigmatic community of the whole renovated cosmos.

She states that the manifestation of the cosmogonic Logos in the end time thus can be understood as a re-incursion of God's primal creative power, subjugating the dissident rebellious angelic powers and thereby bringing about a reunified cosmos, reconciled to God, and filled with God's plenary goodness, as Paul puts it in 1 Corinthians 15:25, "So that God may be all in all." She notes that the effort to unify cosmogony and eschatology in early Christianity was jeopardised by the conflicting strands of Hebrew and Greek thought that they sought to synthesise.

The Hebrew concept of "creation" demanded a cleavage between the being of God and that of created beings, including humans. Jewish thought originally saw humans as essentially mortal. Redemption was a fulfilled, blessed existence on earth within mortal limits, that is, one hundred years.

Greek thought, by contrast, saw the relation of God and cosmos as emanational. There is ontological continuity between God, the Logos of God, and the cosmos. Each of these realities expresses being on different levels of existence. Thus the world soul and the human soul partake in the being of the divine Logos, which manifests the ultimate source of being. But Greek thought also sees the cosmos as split between a higher planetary realm of immortal being and a sublunar world of mortal being. The soul belongs to the

⁷⁷ Philo stated his theology both through the negation of opposed ideas, and through detailed, positive explanations of the nature of God, he contrasted the nature of God with the nature of the physical world. Philo did not consider God similar to heaven, the world, or man; he affirmed a transcendent God without physical features or emotional qualities resembling those of human beings. Following Plato, Philo equates matter to nothingness and sees its effect in fallacy, discord, damage, and decay of things. Only God's existence is certain, no appropriate predicates can be conceived. In Philo, God exists beyond time and space and does not make special interventions into the world because he already encompasses the entire cosmos. Philo also integrated select theology from the rabbinic tradition, including God's sublime transcendence, and man's inability to behold an ineffable God. He argued that God has no attributes (ἀπλοῦς), in consequence no name (ἄρρητος), and for that reason he cannot be perceived by man (ἀκατάληπτος). Further, God cannot change (ἀτρέπτος): He is always the same (ἰδιος). He needs no other being (χρηζει γὰρ οὐδενός τὸ παράπαν), and is self-sufficient (ἑαυτῷ ἰκανός). God can never perish (ἄφθαρτος). He is the simply existent (ὁ ὢν, τὸ ὄν), and has no relations with any other being (τὸ γὰρ ὄν, ἧ ὄν ἐστιν, οὐχὶ τῶν πρὸς τι).

higher realm and has been cast down "unnaturally" into a body. Its task is to escape from the body through turning the mind "upward" and so return at death to disincarnate, immortal blessedness in the stars.

Classical Christianity presented several efforts to unify these disparate world-views. With the Hebrew view, Christianity insisted that humans were a psychophysical union. The body was essential for wholeness of existence, and the resurrection of the body was intrinsic to salvation. Christ must have a real body, not merely an "appearance" of body. Both of these ideas were to cause great difficulty to those imbued with Platonic thought. Patristic Christianity fended off various efforts to deny a bodily incarnation to Christ and the bodily resurrection of both Christ and humanity.

At the same time, Christianity accepted the Platonic prejudice against "becoming." The transience and mortality of material existence was evil. The solution, found already in Paul, is the strange concept of the "spiritual body," a created vehicle of the soul, but stripped of its mortality. This concept of the transfigured body in redeemed life was applied, not only to humans, but to the whole cosmos. Christians shared with Hellenism the view that the whole cosmos was alive, pervaded by dynamic energy that Christianity identified with the immanent Logos of God. Even animals and plants had soul, and the human soul shared with them the animal and vegetative soul. Human psychophysical existence was inseparable from this cosmic whole, within which humans stood as microcosm.

The key difficulty with this very astute account, is that it shows essentially that **Pauline Christianity is a fraudulent concoction of Hellenistic Judaic cosmology, not Jesus' own teachings**, so the religion is a fallacy. A cosmologically contrived divine persona of Christ is overlaid on the person of the historical Jesus, an apocalyptic preacher whose sayings are therefore best understood through the Gospel of Thomas rather than the canonical gospels. As already noted previously, the flesh and blood eucharist was likewise a diabolical "vision" of Paul, later inserted into Mark and the other synoptic gospels. So the true sacrament is that of the living messiah of the Tree of Life's sacred abundance.

She notes that for Irenaeus, creation is itself an incarnation of the Word and Spirit of God, as the ontological ground of bodily existence. The incarnation of the historical Christ is the renewal of this divine power underlying creation. In the incarnation divine power permeates bodily nature in a yet deeper way, so that the bodily becomes the sacramental bearer of the divine, and the divine defies the bodily. The Christian sacraments are paradigmatic of this deeper mingling of body and spirit, renewing the life power of creation, refuting the gnostic negation of the body:

But indeed vain are they who despise the entire dispensation of God and disallow the salvation of the flesh, and treat with contempt its regeneration, maintaining that it is not capable of incorruption. But if this indeed does not attain salvation, then neither did the Lord redeem us with his blood, nor is the cup of the Eucharist the communion of His blood, nor is the bread which we break the communion of His body. For the blood can only come up from the veins and the flesh, and whatsoever else makes up the substance of man, such as the Word of God was actually made . . . And as we are his members, we are also nourished by means of the creation . . . He has acknowledged the cup, which is part of creation, as His own blood, and the bread, which is also part of creation, he has established as His own body, from which he gives increase to our body.

But since salvation has to do with transcending mortality, the only way he can finally think about redemption – not just of the human being, but of the cosmos as a whole – is by assuming that, through being infused by the immortal life of the divine, it will overcome its mortality. This redemption of creation, following the biblical apocalyptic tradition, takes place in two stages. First, there is the millennial blessedness of earthly life. Irenaeus describes the millennium in images drawn from Hebrew prophecy:

Then the whole creation shall, according to God's will, obtain a vast increase, that it might bring forth and sustain fruits, such as Isaiah declares . . . And they shall come and rejoice in Mount Zion, and shall come to what is good, and into a land of wheat and wine and fruits, of animals and of sheep; that their soul shall be as a tree bearing fruit, and they shall hunger no more.

Then the whole cosmos will be transformed into a "new heaven and earth," immortalised, and fully united with the divine life of God. This final union with the Being of God fulfils the promise of the original creation:

And in all these things and by them, the same God the Father is manifested, who fashioned man and gave the promise of the inheritance of the earth to the fathers, who brought forth the creature from bondage at the resurrection of the just and fulfills the promises for the Kingdom of his Son . . . For there is one Son, who accomplished his Father's will, and one human race also in which the mysteries of God are wrought . . . the wisdom of God, by means of which his handiwork, confirmed and incorporated with his Son, is brought to perfection; that is His offspring, the First-begotten Word, should descend to the creature . . . and that it should be contained in Him, and, on the other hand, the creature should contain the Word, and ascend to Him, passing beyond the angels, and be made after the image and likeness of God.

She notes that this effort to incorporate the Hebraic view of earthly blessedness into eternal salvation was dropped by mainline Christianity after the third century, where Christ is then seen as establishing his millennial reign through the political power of the church and Christian rulers, but this has no effect on renewal of nature, nor does it bring forth a new era of justice between humans. Dominant Christianity sees the earth as going downhill toward destruction.

However, the cosmogonic Logos, as the principle of creation, continued in medieval Christianity both Eastern and Western, as the basis of a view of nature as an ontological "ladder" of ascent to God, transmitted to Western Christianity by the writings of Dionysius the Areopagite, perceiving nature as emanational stages of continuous descent from God to angelic hierarchies to humans to animals and plants, rocks, mountains, and rivers is continuous, complemented by the contemplative ascent to God with the contemplation of visible things, moving upward to contemplative union with the being of God.

The Renaissance period also saw a great revival of cosmological mysticism, reinforced by new access to its ancient Hellenistic sources, including Hermetic literature and the Chaldean Oracles, Platonic and Neoplatonic works previously unknown in the West. Revelation in Christ renewed and fulfilled this ancient wisdom, so that the Renaissance reduplicated the ancient chronological error that justified the fusion of biblical and Neoplatonic thought. Then in the early sixteenth century, Copernicus would challenge the ancient geocentric cosmology, making the earth as one planet among others circling the sun.

She notes that the 18th and 19th centuries invoked a stream of philosophical idealism, which sought to bridge the division of mind and matter with a concept of the divine as the unifying source of both thought and physical things. For Spinoza (1632-77), God was *natura naturans*, the underlying substance from which arose the physical world and the human mind (*natura naturata*), as mutual reflections of each other. German idealists Fichte and Schelling also advanced philosophies of Nature that saw God as the unitary Being underlying both thought and physical things, while Hegel sought to bridge spirit and matter through a dialectical process of thesis (spirit), antithesis (material expression), and synthesis (matter-spirit union), which in turn became the new thesis. Those such as Coleridge and Wordsworth, moved toward a more pantheistic communion with deity immanent in nature, engaging more "pagan" modes of thought. In reaction to these trends, Christian theology would seek to establish its "purely biblical" roots by rejecting any presence of God in nature.

She provides a largely positive assessment of Chardin's cosmology with pertinent warnings about its evolution of an elite human culture over the natural realm:

Teilhard de Chardin, whose writings only became available in the late 1950s due to church censorship, used the new insights from evolution to restate the sweeping cosmic vision of salvation history found 1,700 years earlier in Irenaeus. Not just humans, but all of nature is part of this salvation drama. For Teilhard de Chardin, the universe is a total system that ascends in successive systems of organization, from the atomic to the planetary level. This ascent to increasing organizational complexity is also a moral and spiritual ascent, moving toward the unification of consciousness in what Teilhard calls "the Omega Point." The different stages of the evolution of matter, from atomic energy to molecular organization to cellular life to plants and animals and finally humans, are not merely changes of quantitative complexity but are qualitative leaps to new levels of existence.

The universe evolves along the axis of the complexification of matter. Increasingly complex organization of matter increases the internal "radial energy." It is this interior aspect of the complexification of matter that Teilhard sees as responsible for "boiling points" that bring breakthroughs to new levels of existence. There arises from molecular organization the living cell, then increasingly complex organic beings that become more and more aware, and then human self-consciousness. Everything that appears in the process of cosmogenesis is latent from its beginning, but this does not change the reality of its historical birth, which can appear only when a critical level of evolution is reached.

Teilhard's thought would mesh well with the Gaia hypothesis, for he sees the planet earth as a living organism. Earth is one living organism, not only spatially but across time. The planet earth grows through stages of development that are not repeatable, any more than the stages of organic growth from fetus to adult are repeatable. Like an organism, it will also eventually die. The link between geosphere and biosphere is the organic cell, the highest unit of the molecular structure and the simplest unit in the organic structure. The breakthrough to life expresses a new level of centeredness and unification, in which the whole structure becomes an organism participating in a common center and a common life.

For Teilhard, the evolutionary tree has a privileged axis or telos. This telos is toward increasing interiorization and centricity increasing coordination around the directing center of the organism. With vertebrates we arrive at an animal, not held together by an external shell, but from within by a central nervous system. From vertebrates to reptiles to mammals, the nervous system

develops a unifying center in the brain. The increasing size and convolutions of the brain correspond to increasingly intelligent species of mammals, until we arrive at Homo sapiens, in which conscious thought appears.

She comments that in his view For the last 100,000 years, humans have been the privileged axis of evolution, while the animal and plant kingdoms, from which humans arose, diminish. The age of animals is now over, and the earth has become a human earth. That once the level of thought is reached, evolution takes place socially through culture and technology, amid both increasing individuality and collectivity, in which Christian Western history is the privileged axis of cultural evolution. A new stage of modernity is now reaching around the globe, transforming all surviving cultures.

As we have seen, Teilhard sees this new global stage of consciousness and technology as making possible a "noosphere" or world mind that is increasingly unified and centralized. Human minds together increasingly become one unitary Mind, in the evolution of the immanent deity of the cosmic Christ. ... As increasingly collective consciousness develops, finally the organic substratum of the planet will die away, and Unitary Mind will be born from the finite earth into eternal life. The universe will fall away and die after having given birth to God, the ultimate communal consciousness, in which all that has gone before is gathered up and made immortal.

She makes clear that this world picture contains some disturbing elements that need to be rejected. One is the way in which traditional hierarchical order has been "laid on its side," in an evolutionary concept of "progress", together with the confident faith in Western civilisation and modernity as the privileged axis of this progress. Another is the sanguine acceptance of extinction of species as the acceptable price of progress and potentially an acceptance of ethnocidal destruction of other peoples and cultures.

Finally we must question the vision of the material underpinnings of consciousness as being tossed aside in the eschatological, culminating stage of evolution, a conclusion that contradicts the foundational insight of life and consciousness as the interiority of complexified matter. Surely this means that mind and body, the inside and the outside, cannot finally be separated. What is compelling about Teilhard's thought for today is precisely this insight that mind is the interiority of matter, and it is continuous from the simplest molecule to the most complex organism.

She also discusses both the Cosmic Christ of Matthew Fox and Process theology, as developed by Christian theologians such as John Cobb and Marjorie Suchocki from A. N. Whitehead's work, which sees an element of "mentality" present even in the random movements of subatomic particles as does Symbiotic Existential Cosmology. These provide fascinating accounts of the ways modern thinkers try to adapt the notion of God to an understanding of scientific cosmology:

For Fox, original blessing is the intrinsic nature of things. True Christian spirituality remains rooted in this vivid sense of original goodness. Evil is present in history, but as distortion and alienation from original blessing, not as primary reality. Evil can be evaluated as evil only in its negation of primary goodness, which remains our true "nature." Goodness is fundamentally relational. It is the life-giving and celebratory interconnection of all things. Evil is the denial of that interconnection. In "The Coming of the Cosmic Christ", Christ is the immanent Wisdom of God present in the whole cosmos as its principle of interconnected and abundant life.

"Mentality" is a capacity for interaction, which becomes increasingly self-determining and conscious as matter organizes itself at successive layers of organizational complexity. The Primordial Nature of God contains the whole of potentiality of all existing entities at every moment and provides the "initial aim" or best potential option for each entity at each occasion of existence. This "initial aim" embraces the total context of the past of that entity at that moment, and thus is interrelated with all that has been, ultimately, in the whole universe. Each entity has, however, its own subjectivity. It adapts or actualizes this aim of God through actualizing one possibility that can only partially fulfill that aim, and can even thwart that aim in negative choices that are destructive. Thus the God of Process theology "lures" but does not coerce. It offers continual new possibilities, but the choice belongs to existent entities that can negate their own best options. There is freedom and risk in divine creativity, and with this risk, the possibility of evil. This possibility of evil increases as consciousness and power increase on the part of existent entities. Process theologians also postulate that this Consequent Nature of God, reflecting the memory of all that has been, is taken up in some way into the Primordial Nature of God, not only preserving immortally all that has been, but also incorporating it into the total vision of what could and should have been, to reconcile the evils and missed opportunities of history. In this way all that has been is not only remembered in the eternal being of God, but is redeemed as well.

In "**toward an ecofeminist theo-cosmology**", Ruether says ecofeminist theology and spirituality has tended to assume that the "Goddess" we need for ecological well-being is the reverse of the God we have had in the Semitic monotheistic traditions; immanent rather than transcendent, female rather than male identified, relational and interactive rather than dominating, pluriform and multi-centred rather than uniform and mono-centred:

But perhaps we need a more imaginative solution to these traditional oppositions than simply their reversal, something like Nicholas of Cusa's⁷⁸ paradoxical "coincidence of opposites," in which the "absolute maximum" and the "absolute minimum" are the same.

She then cites the huge spread of discovered physical phenomena from the full-scale cosmology of the universe all the way through biological life to the voids of subatomic particles and uncertainties:

At the subatomic level, the classical distinction between matter and energy disappears. Matter is energy moving in defined patterns of relationality. At the level of the "absolute minimum," the appearance of physical "stuff" disappears into a void-like web of relationships, relationships in which the whole universe is finally interconnected and in which the observer also stands as part of the process. We cannot observe anything "objectively," for the very act of observation affects what we observe. ... Thus what we have traditionally called "God" the "mind," or rational pattern holding all things together, and what we have called "matter," the "ground" of physical objects, come together. The disintegration of the many into infinitely small "bits," and the One, or unifying whole that connects all things together, coincide.

As humans stand peering down through their instruments into the subatomic realm and outward into the galaxies, it cannot but be evident that, for us, the human remains the "mean" or mediator between the worlds. This is so because what we perceive can only be known and evaluated from the context of our own standpoints. But also because we are faced with the recognition that humans alone, amid all the earth creatures and on all the planets of these vast galaxies, are capable of reflective consciousness. We are, in that sense, the "mind" of the universe, the place where the universe becomes conscious of itself.

Reflective consciousness is both our privilege and our danger. At least for the last several thousand years of cultural history, male ruling-class humans have used this privilege of mind to set themselves apart from nature and over dominated women and men. Thereby they denied the web of relationships that bind us all together, and within which these males themselves are an utterly dependent part. The urgent task of ecological culture is to convert human consciousness to the earth, so that we can use our minds to understand the web of life and to live in that web of life as sustainers, rather than destroyers, of it.

She notes that there are other forms of consciousness present in other species, sometimes with capacities that humans lack, as in fish that can hear ranges of sound or animals that can see ranges of light not possible to our ears and eyes. Nor can we simply draw a line between us, together with large-brained mammals, and other beings including plants and some complex molecular systems.

Human consciousness, then, should not be what utterly separates us from the rest of "nature." Rather, consciousness is where this dance of energy organizes itself in increasingly unified ways until it reflects back on itself in self-awareness. Consciousness is and must be where we recognize our kinship with all other beings. The dancing void from which the tiniest energy events of atomic structures flicker in and out of existence and self-aware thought are kin along a continuum of organized life-energy. ... Our capacity for consciousness is sustained by a complex but fragile organism. Cut that organism at its vital centers, in the brain or in the heart, and the light of consciousness goes out, and with it our "self."

She reminds us that as biological beings, the immortal self has to be let go of, in oneness with the matrix of all natural existence:

It is this juxtaposition of the capacity of consciousness to roam through space and time, and its utter transience in its dependence on our mortal organisms, that has generated much of the energy of what has been called "religion" in the past. Much of this religious quest has sought to resolve this contradiction by denying it, imagining that consciousness was not really dependent on the mortal organism. The mental self could survive, and even be "purified" and strengthened, by the demise of the body. This concept of the "immortal self," survivable apart from our particular transient organism, must be recognized, not only as untenable, but as the source of much destructive behavior toward the earth and other humans.

An ecological spirituality needs to be built on three premises: the transience of selves, the living interdependency of all things, and the value of the personal in communion. Many spiritual traditions have emphasized the need to "let go of the ego," but in ways that diminished the value of the person, undercutting particularly those, like women, who scarcely have been allowed individuated personhood at all. We need to "let go of the ego" in a different sense. We are called to affirm the integrity of our personal center of being, in mutuality with the personal centers of all other beings across species and, at the same time, accept the transience of these

⁷⁸ In 1453, on his way home from Constantinople where he had gone with the hope of reuniting Eastern and Western Christendom, Cusanus claimed to have had a mystical vision in which he conceived of the "least imperfect" name for God: the *coincidentia oppositorum* or "coincidence of opposites." Unlike most of the Christian theologians of his time who held a monotheistic vision of God as a supernal power that exists independent of the physical world of existence, Cusanus stood out as a controversial figure because of his belief that God does not exist separately from Creation, but rather is both transcendent of and immanent within it – a simultaneous unfolding of Oneness into multiplicity and the enfolding of multiplicity within the One. The *coincidentia oppositorum* was not a description of God, Cusanus insisted, but an explanation of how God works. Because God is infinite and absolute, all things in existence are aspects of God, without which God would not be adequately represented. It was the inability to accept all forms of religious worship as a necessary reflection of God that was the cause of humanity's most devastating conflicts. He felt certain that if people were educated to the truth of this idea, humanity would recognize its ultimate unity, and there would be perpetual peace.

personal selves. As we accept both the value and the transience of the self, we can also be awakened to a new sense of kinship with all other organisms. Like humans, the animals and the plants are living centers of organic life who exist for a season. Then each of our roots shrivels, the organic structures that sustain our life fail, and we die. The cutting of the life center also means that our bodies disintegrate into organic matter, to enter the cycle of decomposition and recomposition as other entities.

She declares that compassion for all living beings becomes the key to being one with the Matrix of Life:

Compassion for all living things fills our spirits, breaking down the illusion of otherness. At this moment we can encounter the matrix of energy of the universe that sustains the dissolution and recomposition of matter as also a heart that knows us even as we are known. Surely if we are kin to all things and offspring of the universe, then what has flowered in us as consciousness must also be reflected in that universe as well, in the ongoing creative Matrix of the whole. As we gaze into the void of our future extinguished self and dissolving substance, we encounter there the wellspring of life and creativity from which all things have sprung and into which they return, only to well up again in new forms. But we also know this as the great Thou, the personal center of the universal process, with which all the small centers of personal being dialogue in the conversation that continually creates and recreates the world. The small selves and the Great Self are finally one, for as She bodies forth in us, all the beings respond in the bodying forth of their diverse creative work that makes the world. ... Then, like bread tossed on the water, we can be confident that our creative work will be nourishing to the community of life, even as we relinquish our small self back into the great Self. Our final gesture, as we surrender ourselves into the Matrix of life, then can become a prayer of ultimate trust: "Mother, into your hands I commend my spirit. Use me as you will in your infinite creativity."

In **Creating a Healed World: Spirituality and Politics**, she evokes a sweeping prophetic review of what needs to be done to redeem the natural biosphere of the planet, including everything from reducing dependence on meat eating, disposable plastic technology, addressing over-population through both voluntary and social measures fearing that the entire ecofeminist environmental agenda will be for naught if the world population rises to 8 billion:

If human population is allowed-to double once again in forty years or less, and hits 8 billion to 10 billion in the first third of the twenty-first century all the measures we have just discussed will go for naught. Humanity has no real alternative to population control. The question is, do we want population control to happen voluntarily, before conception or violently by war, famine, and disease?

In her view, despite expressing both God and the saviour in cosmogenic terms in Christian tradition, her own view of deity in fusing God and Gaia into one arrives at a more a social concept of God and Gaia as human-generated concepts invoking the potentiality for good within us to flower in protection of the natural world without accepting a binary concept of deity transcendent over humanity and nature:

In these two traditions, covenantal and sacramental, we hear two voices of divinity from nature. One speaks from the mountaintops in the thunderous masculine tones of "thou shalt" and "thou shalt not." It is the voice of power and law but speaking (at its most authentic) on behalf of the weak, as a mandate to protect the powerless and to restrain the power of the mighty. There is another voice, one that speaks from the intimate heart of matter. It has long been silenced by the masculine voice, but today is finding again her own voice. This is the voice of Gaia. Her voice does not translate into laws or intellectual knowledge, but beckons us into communion.

Both of these voices, of God and of Gaia, are our own voices. We need to claim them as our own, not in the sense that there is "nothing" out there, but in the sense that what is "out there" can only be experienced by us through the lenses of human existence.

Out of this diverse stream of crisis concerns and wise recommendations, I will let her speak for herself on the critical question of patriarchy through the eyes of a religious ecofeminist:

Patriarchy has multiple impacts on reproductive patterns. Its valuing of the male over the female means that families cannot rest content with having produced two children, if both of these children are female. Often two males are desired to assure the patrilineage. Patriarchy also denies women control over their own sexuality and reproduction, and values women only to produce children, sharply curtailing other ways in which women can live satisfying lives and be held in esteem by their communities.

The empowerment of women as moral agents of their own sexuality and reproduction is thus an integral part of any authentic population policy. The female child needs to be valued equally with the male. This is only possible if the adult female is also seen as an autonomous person who will be an active cultural and economic agent in her own right, and not just an adjunct to a male-centered society. Only when women can no longer be beaten by men, raped by men, and traded between men as commodities, can they cease to be treated or to see themselves as passive bodies to be acted upon by men.

Women need a sense of their own integrity and to have that integrity affirmed by males. They need to have a full range of life opportunities for their many creative roles, of which reproduction is only one. They need to have the knowledge and technology of birth control and the right to enforce these in sexual relations with men. They need to have a sense that their daughters' as much as

their sons, will have these many options and will be given education for them. Finally they need to see themselves as responsible agents for a just and sustainable society in their communities'

Although the empowerment of women as moral, economic, and cultural agents in their own right is crucial for effective "family planning," it also lies at the base of all the value changes that will lead from cultures of domination to cultures of biophilic mutuality. The "liberation of women" cannot be seen simply as the incorporation of women into alienated male styles of life, although with far fewer benefits, for this simply adds women to the patterns of alienated life created by and for men. In fact' it is impossible to fully add women to this alienated life of males, since the male alienated life-style is only possible by the exploitation of women who remain tied to "nature."

Rather, what is necessary is a double transformation of both women and men in their relation to each other and to "nature." 'Women certainly need to gain some of the individuality that has been traditionally purchased by men at their expense. But this individuation should not be based on exploitative domination (of other women or subjugated men), but needs to remain in sustaining relation to primary communities of life. The ways of being a person for others and of being a person for oneself need to come together as reciprocal, rather than being split between female and male styles of life.

It is the male rather than the female life-style that needs, however, the deeper transformation. Males need to overcome the illusion of autonomous individualism, with its extension into egocentric power over others, starting with the women with whom they relate. Men need to integrate themselves into life-sustaining relations with women as lovers, parents, and coworkers. They need to do regularly what they have hardly ever done, even in preagricultural societies: feed, clothe, wash, and hug children from infancy, cook food, and clean up wastes.

Only when men are fully integrated into the culture of daily sustenance of life can men and women together begin to reshape the larger systems of economic, social, and political life. They can begin to envision new cultural consciousness and organizational structures that would connect these larger systems to their roots in the earth and to sustaining the earth from day to day and from generation to generation.

Both the "liberation" of women into male styles of alienated pseudoautonomy and the domestication of men into women's dependency are equally false compensations, if they function within the present pattern of distortion, and are not part of a larger transformation. The domestic-public split itself must yield to a new sense of a holistic culture that recognizes both men and women as individuated persons in mutual interdependency with each other and with the earth.

What we need is neither optimism nor pessimism, in these terms, but committed love. This means that we remain committed to a vision and to concrete communities of life no matter what the "trends" may be. Whether we are immediately "winning" or "losing" cannot shake our rooted understandings of what biophilic life is and should be, although we need to adapt our strategies to the changing fortunes of the struggle. 'We also remain clear that life is not made whole "once and for all," in some static millennium of the future. It is made whole again and again, in the renewed day born from night and in the new spring that rises from each winter.

We must start by recognizing that metanoia, or change of consciousness, begins with us. This does not happen all at once, but is an ongoing process. 'We all have been shaped to misname evil, to seek invulnerable power, or else to capitulate to such power demands in the hands of male authorities. We are tied to present systems of consumption and can hardly imagine alternatives to them that might give us greater peace and wholeness, even though the scramble to "keep up" in the present systems leaves us ever more insecure, anxious, and exhausted.

Being rooted in love for our real communities of life and for our common mother, Gaia, can teach us patient passion, a passion that is not burnt out in a season, but can be renewed season after season. Our revolution is not just for us, but for our children, for the generations of living beings to come. What we can do is to plant a seed, nurture a seed-bearing plant here and there, and hope for a harvest that goes beyond the limits of our powers and the span of our lives.

Recapitulation

The cosmological situation as we have now discovered it to be is that the conscious sentience of the universe arises from the living biota and so far as we know, only the conscious biota. As the mediators of conscious intent, we each inherit a personal responsibility to care for the universe we inhabit and to ensure life within it continues to flower and does not suffer risk to its future viability through human exploitation. This is the prima facie responsibility, we each inherit as incarnate sentient beings.

It is abundantly clear that humanity is risking a planetary extinction of the diversity of life due to human misadventure, driven by business as usual's, non-renewable energy consumption and habitat destruction and by the scorched earth moral delusions of world religions which are founded on moral imperatives that deny the sacredness of cosmological nature in what is an immortal Paradise, in favour of fantasies of heavenly and diabolical realms.



Fig 244: "Paradise Found" David Miller

We can thus no longer continue to see through a glass darkly in the distorted prism of Christianity's eschatological expectation and the false belief in a man-God who still hangs mortified on the cross two thousand years later in every church, whose flesh and blood we must consume, while endlessly awaiting the return of the Lord in power to have forgiveness of sins and achieve immortal life. It is now time for us to put away childish things (Ranke-Heinmann 1992), to see face to face and know also as we are known.

*"When I was a child, I spake as a child, I understood as a child, I thought as a child:
but when I became a man, I put away childish things.
For now we see through a glass, darkly; but then face to face:
now I know in part; but then shall I know even as also I am known" (1 Corinth 13:11).*

It is we who are the portal of cosmic awareness and the buck stops with us to take responsibility as stewards and guardians of the tree of evolutionary life, to ensure it survives and flowers in perpetuity. To allow this to fail is to anoint us all for our burial, with no hope of salvation.

The remedy the psychic species provides is to give us a direct route to experience reunion with the awakening of the conscious universe, so that we can learn to protect the planet as guardians of life in evolutionary and cosmological time scales. This both alleviates our mortal fear and gives us the ability to make our lives a meaningful part of unfolding life rather than a curse upon it.

The meaning and significance in the spiritual quest of humanity lies not in false fantasies of Heaven and Hell or the Rapture in the sky, but in developing the spiritual insight and practical motivation to care for the planet as guardians of the diversity of life in evolutionary time, so that life can truly flower as a cosmological phenomenon of conscious illumination over cosmological time scales. This is profoundly urgent and it can be achieved if we recognise the wisdom and inevitable necessity of this together.

15. Redemption of Soma and Sangre in the Sap and the Dew

Despite its history of spilled blood, violent Crusade and eschatological apocalypse, redemption is at hand. Christianity stands uniquely positioned as the founding religious tradition underlying Western culture. Christianity is also uniquely positioned as the prime vehicle of a worldwide sacramental religion, founded on 'holy communion' - a flesh and blood sacrament - the *sangre* and *soma* – albeit symbolic of a sacrificial death – “cannibalistically” eating the flesh and blood of the saviour. This aspect of Christianity is a disjunct with the Hebrew tradition and has closer connections with the Greek epoptea, the maenads and their belladonna, and Dionysus as the god of wine and altered states, echoing Yeshua's miraculous dread. It is thus, by an accidental fusion of cultural histories, the natural forerunner of a sacramental tradition of true integration with life immortal. These simple wafers of bread and sips of diluted wine carry no effect in themselves, but claim to infer a reality so powerful that merely to partake of the 'eucharist' is deemed to be the innermost mystery of communion with the godhead. If such a sacrament is going to be of functional effect, one should as the “acid test” of validity, expect it also to be a potent psychoactive substance in biological terms.

Fig 244b: William Blake - *The Marriage of Heaven and Hell*, later cited by Aldous Huxley in his book "The Doors of Perception" on his mescaline experience.



The notion of “sacrament” as something natural that is consumed to make ‘holy’ or whole poses a central question of symbiotic paradox in consciousness. How is such completion achieved in the universe? Is it arrived at through an outer journey of scientific or empirical discovery in the material world? Is it to be found through philosophical analysis and discourse? Is it to be found in a covenant of submission to the will of God? Is it to be pursued through an arduous meditative journey into the innermost reaches of the mind and soul to the cosmic self? Or is it to be found in symbiotic reunion in the interactive mysteries of the ‘living sacraments’ of the biosphere and the nierika portal to the cosmological mind at large?

Each of the three entheogenic living sacraments discussed in Section 1 have been adopted within nominally Christian traditions, seamlessly integrating the biospheric sacraments with Christian sentiments, attesting to Christianity’s redemption as a sacramental tradition to reflower the Earth as a living paradise throughout the generations of humanity and life as a whole. Some researchers have also associated Christian roots with entheogens (Allegro 1970, Hoffman et al. 2001, Brown & Brown 2016).

The experiences of these participants are consistent with each of those who ascend its spiritual peaks identifying with being first person transformative visionaries forming a spiritual consensus deeper than religious doctrine. Maria Sabina, despite being in the Catholic sisterhood, expressed in her chants these visionary positions: *“I am the Lord eagle woman. Woman of a sacred, enchanted place am I, says, Woman of the shooting stars am I. ... I am Jesus Christ, says ... I’m the heart of the virgin Mary.”* Likewise with peyote: *“Jesus came afterwards on this earth, after peyote”. “The white man goes into a church and talks about Jesus, but the Indian goes into a teepee and talks to Jesus”.*

Maria Sabina’s Holy Table and Gordon Wasson’s Pentecost



Fig 245: Upper row: Maria Sabina at prayer during the velada, giving mushrooms to Gordon Wasson, Maria collecting Psilocybe mushrooms for the velada. Lower row: Maria Sabina performing a mushroom velada. Blessing the mushrooms before the altar, altar, consuming the mushrooms.

Maria Sabina (see section 1) was both a Mazatec curandero of the “little things that spring forth” – *teonanactl* – flesh of the gods and at the same time a life long member of the Catholic sisterhood. The sacred mushroom is ‘known to the ancient Meso-Americans as the Flesh of God, echoing the soma and sangre of the Christian Eucharist (Harner R229 90). The mushrooms were consumed before a small altar. The curandera kept one corner free so that the Holy Ghost ⁷⁹ could descend in the form of the sacred words that came to her, the words of her little book: “I see the word fall, coming down from above as though they were little luminous object falling from heaven. The word falls on the Holy Table, on my body, with my hand I catch them word for word.” (Halifax 134).

⁷⁹ In Christianity, the Holy Ghost, or Spirit, is the ultimate reality not to blaspheme against: *“Jesus said: He who blasphemes against the Father will be forgiven, and he who blasphemes against the Son will be forgiven; but he who blasphemes against the Holy Spirit will not be forgiven, either on earth or in heaven.”* (Thom 44, as in Mark 3.28, Luke 12.31, Matt 3.28 with the exception of the Father). The grammatical gender of the word for “spirit” is feminine in Hebrew (רוּחַ, rūah), neuter in Greek (πνεῦμα, pneûma) and masculine in Latin (spiritus). The neuter Greek πνεῦμα is used in the Septuagint to translate the Hebrew רוּחַ. Holy Spirit was equated with the feminine Wisdom of God by two early Church fathers.

'On both nights Wasson stood up for a long time in Cayetano's room at the foot of the stairway, holding on to the rail transfixed in ecstasy by the visions that he was seeing in the darkness with his open eyes. For the first time that word 'ecstasy' took on a subjective meaning for him. ... There came one moment when it seemed as though the visions themselves were about to be transcended, and dark gates reaching upward beyond sight were about to part, and we were to find ourselves in the presence of the Ultimate. We seemed to be flying at the dark gates as a swallow at a dazzling lighthouse, and the gates were to part and admit us' ... 'In sum, concluded Wasson, the mushrooms "transport one for the nonce to heaven, where all the senses unite in a joyous symphony shot through with an overwhelming feeling of caritas, of peace and affection for the fellow communicants. The effect is a transcendence of the barriers existing between people, including the language barrier.' (Riedlinger 31).

The mushrooms were consumed before a small altar. The curandera kept one corner free so that the Holy Ghost could descend in the form of the sacred words that came to her, the words of her little book: "I see the word fall, coming down from above as though they were little luminous object falling from heaven. The word falls on the Holy Table, on my body, with my hand I catch them word for word." (Halifax 134).

*Illumination of life, Illumination from on high, says
Illumination of the sap, Illumination of the dew (Maria Sabina)*

Acts notes the advent of the Holy Spirit in the "upper room": *"These all continued with one accord in prayer and supplication, with the women, and Mary the mother of Jesus, and with his brethren. ... And when the day of Pentecost was fully come, they were all with one accord in one place. And suddenly there came a sound from heaven as of a rushing mighty wind, and it filled all the house where they were sitting. And there appeared unto them cloven tongues like as of fire, and it sat upon each of them. And they were all filled with the Holy Ghost, and began to speak with other tongues, as the Spirit gave them utterance"* (Acts 2.1).

Riedlinger (1992) notes: *'He also knew that, many centuries ago, the Mazatec Indians had combined what was to them a new religion, Christianity, with their ancient pagan practices, producing a syncretic hybrid focused on physical healing. In that sense, it is true, as Wasson noted, that the "Old Order does not mix with the New. The wisdom of the Sabin [Wise Ones], genuine though it was, has nothing to give to the world of tomorrow." In other words, such practices cannot be appropriated whole; they cannot be transplanted from one culture to another without changing their content and-forms to address the particular needs of the host culture.'*

"In light of Gordon Wasson's numerous referrals to the original Pentecostal experience, I believe he thought it feasible for modern Christianity to likewise adopt certain elements of this indigenous hybrid, [of pre-Colombian and Catholic notions] producing an experiential form of Christian worship in the Pentecostal mode which uses hallucinogens as sacraments for calling down the Spirit. Wasson's opinion of what this portends for Christian worship is unequivocal": '... God's flesh! How those words echo down the centuries of religious experience! The Christian doctrine of Transubstantiation is a hard saying, calling for great faith The Mexican Indian with his teonanactl has no need for Transubstantiation because his mushroom speaks for itself. By comparison with the mushroom, the Element in the Christian agape seems pallid. The mushroom holds the key to a mystical union with God, whereas only rare souls can attain similar ecstasy and divine communion by intensive contemplation of the miracle of the Mass'."

The Man in the Buckskin Suit

While the Huichol sacred use of peyote (see [section 1](#)) has continued ever since the arrival of Columbus, the Native American Church, also known as Peyotism and Peyote Religion, teaches a combination of traditional Native American beliefs and Christianity, with sacramental use of the entheogen peyote. The religion originated in the Oklahoma Territory (1890–1907) in the late nineteenth century, after peyote was introduced to the southern Great Plains from Mexico. Today it is the most widespread indigenous religion among Native Americans in the United States (except Alaska Natives and Native Hawaiians), Canada (specifically First Nations people in Saskatchewan and Alberta), and Mexico, with an estimated 250,000 adherents as of the late twentieth century.

Jesus came to the white man as flesh and blood, but to the Native American as peyote. John Wilson, who many claim as the 'founder' of the peyote religion in the United States claimed that he was continually translated in spirit to the 'sky realm' by peyote and it was there that he learned the events of Christ's life and the relative position of several of the spirit forces such as sun, moon and fire.

He reported that he had seen Christ's grave, now empty and that peyote had instructed him about the 'Peyote Road' which led from Christ's grave to the moon (this had been the Road in the sky which Christ had travelled in his ascent. Most peyotists strongly affirm the Christian elements as an important part of their religion (Anderson 36, 51):

*"God told the Delawares to do good even before He sent Christ to the whites who killed him ...
God made Peyote It is His power. It is the power of Jesus. Jesus came afterwards on this earth, after peyote."*

*"You white people needed a man to show you the way,
but we Indians have always been friends with the plants and understood them ...
The white man goes into a church and talks about Jesus ,
but the Indian goes into a teepee and talks to Jesus."*

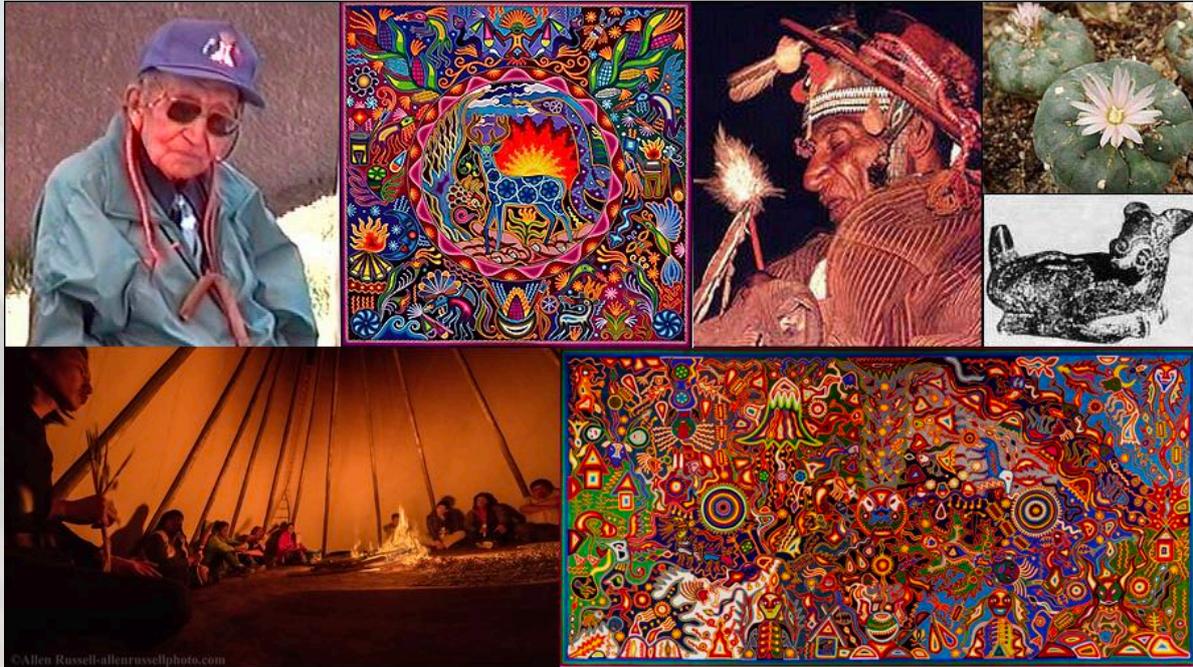


Fig 246: My roadman Tellus Goodmorning. The Nierika or cosmic portal of Kauyumari or Elder Brother Deer, linking the underworld with Mother Earth, through which the gods came (Nierika Arts). Through it all life came into being. It unifies the spirit of all things and all worlds. (Schultes & Hofmann 1979). Don Jose Matsuwa, peyote in flower, deer holding peyote in its mouth (Monte Alban 500 BC). Lower: A peyote meeting involves alternate rounds of chanting around the fire and personal healing, overseen by a road man and mother waters. La visión de "Tatutsi Xuweri Timaiweme" – a Huichol world view.

However, it is Christ in his second-self who came to give the peyote ritual to the Menomini:

"This old man was a chief of a whole tribe, and he have his son to be a chief. He said, 'I'm going to go, and you take my place. Take care of this [tribe].' And the boy, he went out hunting; He was lost for about four days. He began to get dry and hungry, tired out; so he gave up. ... So he went, lay himself down on his back; he stretched out his arms like this [extending his arms horizontally], and lay like that. Pretty soon he felt something kind of damp [in] each hand. So he took them, and after he took them, then he passed away. Just as soon as he - I suppose his soul - came to, he see somebody coming on clouds. There's a cloud; something coming. That's a man coming this way, with a buckskin suit on; he got long hair. He come right straight for him; it's Jesus himself. So he told this boy, 'Well, one time you was crying, and your prayers were answered that time. So I come here. I'm not supposed to come; I said I wasn't going to come before two thousand years,' he said. 'But I come for you, to come tell you why that's you [are] lost. But we're going to bring you something, so you can take care of your people.' ... So they went up a hill there. There's a tipi there, all ready. So Christ, before he went in it, offered a prayer. ... 'Take this medicine along, over there. Whoever takes this medicine, he will do it in my name.' So that's how it represents almost the first beginning." (Anderson 23-4).

Santo Daime and the Union Vegetale

The indigenous use of Amazonian ayahuasca (see [1](#), [2](#)), has been reformed into modern religious movements. There are three main churches: Santo Daime, Barquinha and União do Vegetal (UDV). The Union Vegetale or UDV is a nominally Christian movement devoted to experiencing inner harmony through partaking of ayahuasca tea, to "remember past lives and to understand the true meaning of reincarnation as well as to become familiar with the origin and the real destiny of nature and of man". The UDV seeks to promote peace and to "work for the evolution of the human being in the sense of his or her spiritual development". It has over 18,000 members, distributed among

more than 200 local chapters in all the states of Brazil, as well as in Peru, Australia, several countries in Europe, and the United States. The translation of União do Vegetal is Union of the Plants referring to the sacrament of the UDV, hoasca, or ayahuasca tea.

Likewise in Santo Daime, a Christian core is combined with other elements, such as an emphasis on personal gnosis and responsibility, an animist appreciation of nature, such as the Sun, Moon and Stars, as well as the totemic symbol of the beija-flor (hummingbird). They do not track members, but estimates suggest tens to hundreds of thousands attend the Santo Daime church each week. Spiritual beings from indigenous Amazonian shamanism and deities from the African pantheon are also incorporated into the doctrine. The nature of the work is sometimes personified and addressed as Juramidam, "God (jura) and his soldiers (midam)", disclosed to Irineu in his visionary experience.



Fig 247: Left: Santo Daime church with double cross and large ayahuasca flasks. Left centre: UDV ceremony with ayahuasca boiling in large pots and people reclining to experience the effects. Right: Chungatuya curing – Pablo Amaringo. Inset: Left Chacruna and the Vine of the Soul make ayahuasca, right my curandero Snr. Trinico.

Ayahuasca, consumed by Daimistas in ceremonies, has many different traditional names, but is known within the Santo Daime as Santo Daime, meaning Holy Daime, or simply, Daime, as originally named by Irineu. Dai-me (with a hyphen) means "give me" in Portuguese. A phrase, Dai-me força, dai-me amor ("give me strength, give me love"), recurs in the doctrine's hymns. Participants in the ritual come to submit themselves to a process through which they may learn. This may include various wonders — ayahuasca is known for the visions it generates, and the sense of communion with nature and spiritual reality — as well as more mundane, less pleasant lessons about the self. The Daime is thought to reveal both positive and various negative or unresolved aspects of the individual, resulting in difficult "passages" involving the integration of this dissociated psychological content.

These movements clearly show how Christianity can make a transition to a sustainable tradition reparadising the planet. However, what is at stake here goes far beyond Christian horizons. It is the discovery that the mystical visionary state is unlocked, not by doctrine or conscious control, but the incipient visionary cyclone surrounding the portal to ultimate reality that comes from the symbiosis with the 'Other' – the cosmological consciousness of the mind at large.

The Society of Friends and Non-sacramental Mystical Experience

This doesn't mean that everyone needs to take the sacrament, as in the Eucharist in 'Holy Communion'. Indeed Pentecost was alleged to have taken place 'in the upper room' in the manner of a mystery cult, but the change in sacralising the entheogenic sacraments can induce a root change in the zeitgeist, by those partaking becoming a similar source of conscious 'spiritual knowledge' informing the wider population of the inner nature of reality as it is experienced in the first person.

In this respect, the Society of Friends (Quakers) form an almost ideal counterpoint to the sacramental visionary path. Quakers embrace mysticism, as the personal experience of the divine (Atchley 2017, Brown 2012, Meyer E):

Rufus Jones (1863–1948) was arguably the foremost Quaker scholar, writer, and advocate of opening to mystical experience as a central practice among Friends. He built on foundations laid by Meister Eckhart, the anonymous author of The Cloud of Unknowing, William James, and many other Christian mystics—people who had had direct experiences of God and tried to describe them. Jones concluded that the founders of most great religions of the world got their spiritual understanding through mystical experience. The

Hebrew Bible and the New Testament are filled with reports of direct experiences of God. Mystical experience "makes God sure to the person who has had the experience," wrote Jones (Atchley 2017).

However they refrain from using the term mysticism as as too confining. This leads to an all-inclusive acceptance of divinity experienced directly in person transcending conventional notions of God and extending to "the Divine ground of all being":

Jones cautioned against using the term "mysticism." Each seeker of "God within" is confronted by a unique personal and cultural labyrinth that he or she must negotiate to directly experience God. Because each path is different, it is impossible "to make an ism out of" the journey to experience God. But perhaps we can agree that we seek direct experience of "the Divine Ground of All Being" – the term Christian theologian Paul Tillich used for the transcendent Holy Spirit. Perhaps we can agree that we are all dancing around a divine Light that eludes naming. Jones also pointed out that we are seeking our own direct experiences of God, not "second-hand descriptions" of mystical experiences in books and scriptures. However beautiful and uplifting Eckhart's descriptions of his direct experiences of God might be, we cannot have his experience. We can only have our own (ibid).



Fig 248: George Fox reading a Bible under a tree (Robert Spence), Quakers Meeting (Egbert van Heemskerck the Elder)
Below: Modern Quaker Meeting Berkhamstead Right: The certificate of my marriage to Hallie witnessed by all present.

Quakers specifically forgo the eucharist as a ritual distraction from the experience of Divinity and even more importantly are founded on an utterly egalitarian principle of complete equality of spiritual experience, shared between periods of contemplative silence and sharing personal accounts of their experiences (Wilde 2016):

The Quakers have never celebrated the Eucharist or any sacraments. This is partly because they are a tradition which is historically teetotal, like Methodists. More importantly, it is because Quakers find that all ritual distracts and takes focus away from God. Also, Quakers believe that ministry is not only equal between men and women, but that it belongs to all people, not just a few ministers.

This brings their tradition very close to the principle of subjective empiricism by mutual affirmation.

- Quakers do not have a written creed. Instead, they hold to personal testimonies professing peace, integrity, humility, and community.
- Quakers believe that God's kingdom is now, and consider heaven and hell issues for individual interpretation.
- Unlike other Christian denominations, Quakers believe that humans are inherently good. Sin exists, but even the fallen are children of God, Who works to kindle the Light within them.

The Society of Friends thus forms a counterpoint to the sacramental tradition for those who wish to pursue the discovery of true spirituality not contaminated by prescriptive doctrine and ritual that also lies in the purest traditions of the Christian origins that led to Pentecost. [Unitarian Universalists](#) and Quakers share many principles. It is therefore common to see Unitarian Universalists and Quakers working together. So many of these comments apply to Unitarian Universalists as well, characterised by a "free and responsible search for truth and meaning". Unitarian Universalists assert no creed, but instead are unified by their shared search for spiritual growth. These traditions are summarised by the Principles of Unitarian Universalism, (1) The inherent worth and dignity of every person; (2) Justice, equity and compassion in human relations; (3) Acceptance of one another and encouragement to spiritual growth in our congregations; (4) A free and responsible search for truth and meaning; (5) The right of conscience and the use of the democratic process within our congregations and in society at large; (6) The goal of world community with peace,

liberty, and justice for all; (7) Respect for the interdependent web of all existence of which we are a part. These documents are "living", meaning always open for revisiting and reworking. That said, flower, water and bread communion seem to miss out the medicinal features of plants and fungi that are there for our benefit and for our spiritual unfolding, unless we interpret "flower" as having genuine sacramental capacity.

The term Unitarian is sometimes applied today to those who belong to a Unitarian church but do not hold a Unitarian theological belief. In the past, most members of Unitarian churches were Unitarians also in theology. Over time, however, some Unitarians and Unitarian Universalists moved away from the traditional Christian roots of Unitarianism. For example, in the 1890s the American Unitarian Association began to allow non-Christian and non-theistic churches and individuals to be part of their fellowship. As a result, people who held no Unitarian belief began to be called Unitarians because they were members of churches that belonged to the American Unitarian Association. After several decades, the non-theistic members outnumbered the theological Unitarians.



Fig 249: "Adam and Eve" Lucas Cranach

The disciples said to Yeshua, "Tell us how our end will be." Yeshua said, "Have you discovered, then, the beginning, that you look for the end? For where the beginning is, there will the end be" (Gospel of Thomas 18).

Niño Song Cycle

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[To Shakti a Devotion](#)

[The Hymn to the Epoch video](#)

[The Song of the Biosphere video](#)

[Black Rose video](#)

[Dialogues of the Saviour](#)

[Kitten's Cradle](#)

[Resurrection Revelation](#)

[Marriage in Heaven](#)

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[The Efficacy of Subjective Conscious Physical Volition](#)

The Vision Quest to Discover Symbiotic Existential Cosmology

Introduction

So what is this key to life, the universe and everything about? I'm going to explain all this, but first we need to take stock of the actual situation we are all facing in raw acute terms of planetary survival.

Although a visionary, I am first and foremost a scientist, who has spent my life lecturing in mathematics, with a research speciality in quantum cosmology, chaos theory, fractal processes, neuroscience and biocosmology. This means that my entheogenic journey, the bubbling Dionysian spring I am going to intoxicate you with, is founded on a real, verifiable, scientific cosmology, not just some kind of spiritual pipe dream, but this cosmology is putting consciousness, and our free will to affect the world around us, right back into the driving seat, and that is going to upend the Copernican principle that humanity does not have a privileged view of the universe at large.

The Three Faces of Symbiotic Existential Cosmology

The symbiotic cosmology solves (1) the **hard problem** – why subjective consciousness exists, (2) the **problem of conscious intent** – how volitional will acts on the world, and (3) the **central enigma of existential cosmology** – the role of conscious life in the universe. It does this simply and directly, without invoking any spooky features of panpsychism, by applying objective physical and biological criteria to define complementary subjective modes, by the coherent forms of instability involved, so it uses objective science to qualitatively classify subjective phenomena.

- (1) **Fractal biocosmology**: The fact that life is a consequence of quantum cosmology is blindingly obvious! Just look around you! Life exists! It does so because it is an interactive manifestation of the laws of nature. While the cosmological **energy pathway** leads to the cosmic web, galaxies, black holes and stars; the **structural pathway** of the four symmetry-broken forces of nature leads to a fractal universe – quarks, composite baryons, atomic nuclei, atoms, fractal molecules, molecular complexes, cell organelles, cells, tissues, organs, the conscious brain, organisms and biospheres.
- (2) **Darwinian panpsychism**: This is again irrefutable that we all as subjective conscious agents, are consciously aware that we have volitional will over the physical universe in our decision-making and actions. But this means matter including brains have a hidden subjective aspect. This implies panpsychism. There thus follows a spectrum of graduated manifestations of subjectivity, from quantum to edge-of-chaos to cell to organism and biosphere, based on the biological and physical criteria giving rise to these systems. It is faithful to Darwin's own statement that free-will extends to the cnidaria, further extending it to all eucaryotes.
 - A. **Primitive subjectivity**: The ability of the subjective mind to affect the physical brain means the natural world has to have a primitive subjective aspect – autonomous volitional will thus implies natural panpsychism. Individual quanta, quantum-sensitive "butterfly effect" systems and prokaryote cells thus each inherit a primitive subjective aspect, although not attentive consciousness as such.
 - B. **Sentient consciousness** arose in a discrete transition in single-celled eucaryotes, accompanying the endosymbiosis between archaea and bacteria, when respiration became internalised in the mitochondria, leaving the cell membrane free for sensory functions through edge-of-chaos membrane excitation and social signalling via primal neurotransmitters such as serotonin, to anticipate threats and aid survival. This "experiential anticipation" predated multi-cellular nervous systems by a billion years.
 - C. **Organismic consciousness** emerged in multi-celled animals using the same edge-of-chaos excitability and social signalling molecules as in single-celled species as neurotransmitters. This explains why animals continue to be subjectively conscious through natural selection for survival, with nervous system phase coherent parallel processing seamlessly incorporated much later, but never replacing experiential anticipation.
 - D. **Uncertainty and mind**: The action of mind on brain necessarily arises from modulating the "random" aspect of quantum uncertainty in edge of chaos brain processing. This enables volitional will to intervene in the brain without disrupting the partial causal closure in computational brain processing. This provides plenty of room to affect the uncertain outcomes in evolutionary survival using both subjective anticipation and historical experience.
 - E. **Biosphere and universe**, in turn, inherit an indirect form of consciousness through the conscious biota that exist within them, as the most complex interconnected climax manifestations of sentient consciousness in the universe.
- (8) **Symbiotic Cosmology**: The universe is symbiotic biologically, psychically, and cosmologically, throughout.
 - A. **Organismic**: All higher (eucaryote) organisms are multiply symbiotic species, by archeal-bacterial endosymbiosis, sexual symbiosis, and viral/TE symbiosis.
 - B. **Biospheric**: Survival of the fittest is survival of the fittest biospheric symbiont, not the most dominant species, or the fastest reproducer. All species, including humans, whether parasites, hosts, predators or prey, evolve to symbiotic climax and inherit their cosmological role in conscious existence through symbiosis with the diversity of life over evolutionary time scales, rather than exploiting it, causing a mass extinction, as humans are currently doing. . Lions are predators but they kill the herbivore stragglers ensuring the herbivores don't go to boom and bust. Species which fail the test like humans become extinct.
 - C. **Psychic**: Psychedelics play a critical role in this symbiotic evolutionary process, as the perceptual mind of the unconstrained brain reflecting the psychic symbiosis of inner cosmological climax edge-of-chaos dynamics, transcending tribal egotism, in what the Upanishads call moksha. This enables the individual to experience from the cosmic viewpoint and the universe to become

self-aware. Humans thus inherit an existential responsibility, as climax manifestations of fractal biogenesis, to sustain the evolutionary diversity of life over the cosmological time scales we have inherited and need to preserve and unfold.

D. Cosmological: The climax of cosmology – conscious paradise on the cosmic equator in space-time arises not from the dominance of one conscious species, but at the edge of chaos, in symbiosis.

Given the fact that it is consistent with the views of both Charles Darwin, the founder of biological evolution and Erwin Schrödinger the discoverer of the quantum wave function equation determining the structure of quantum chemistry, it behoves us to take their advice and take this cosmology seriously:

“There is obviously only one alternative, namely the unification of minds or consciousnesses. Their multiplicity is only apparent, in truth there is only one mind. ... I should say: The overall number of minds is just one” (Schrödinger).

*“To see a puppy playing [one] cannot doubt that they have free-will”
and if “all animals, then an oyster has and a polype.” (Darwin)*

Panpsychism also makes it possible for quanta to “observe” and hence collapse superpositions of other quanta, so the universe is how we perceive it to be, not a shadow multiverse, with ghostly cats flung all over it, this picture is one in which new branches are being created in the wave function in a similar manner to [fractal cosmic inflation](#) while others are being collapsed by conscious measurement, resulting in dynamic evolution of the cosmic wave function. Special relativity, the most classical part of quantum reality, is implicitly retrocausal as well as causal, as in [Feynman diagrams](#), so quantum reality is implicitly anticipatory, involving transactional collapse across relativistic space-time in which a network of potential [quantum transactions](#) become one or a set of real emitter-absorber interactions.

Consciousness thus exists to anticipate existential threats, as Graziano's [AST](#) – attention schema theory highlights, although incorrectly thinking free will is a delusion. Darwinian panpsychism is also very like Tononi and Koch's [IIT](#) – integrated information theory, except it's based on edge-of-chaos dynamics, which fits with the quantum world, through the butterfly effect, while IIT is a classical computational theory about Markov processes, so phi doesn't capture the root phenomenon, of subjective awareness since sentient consciousness preceded computation, not the reverse.

Taking the Planetary Pulse

First we need to take the therapeutic pulse of the world condition. Although we conceive of ourselves as living in a world of scientific, social and medical sophistication, in which technology is enabling us to reach for the stars, the majority of people on the planet adhere to fixed beliefs in archaic religions which are cosmological fallacies in frank and violent conflict with the natural world. In 2020 56% of the population of Earth belonged to one of the monotheistic religions, Judaism, Christianity and Islam. All of these religions have belief systems focussing on the natural world and entire physical universe we exist in being merely a temporary moral test for a tumultuous end-of-days Armageddon apocalypse. In the resulting day of judgment, all of humanity will be consigned either to eternal life in Heaven, or an endless diabolical torment in Hell, shedding the verdant Earth and its billions of years of evolving diversity as a kind of skin to be sloughed off, in what Christians call the Rapture. This is compounded by a literalistic belief in creationism, or intelligent design by God, assigning evolution and the diversity of life to being disposable assets. Rather than make the world a better place, this cosmological fallacy abets the worst in human instincts for business-as-usual to exploit the living and non-renewable resources of the planet, in a patriarchal regime of dominion over nature that leads to an accelerating impact on the habitats of all the other species, and pushes the natural environment to potentially irreversible tipping points.

Compounding this is an even more ancient crisis that happened to humanity during the transition from gatherer-hunter coexistence with nature to civilisations based on agriculture and animal husbandry that is confessed in the Fall from Eden. The male fear of paternity uncertainty caused mankind to condemn the female sex to subservience, in an assertion of patriarchal dominance, reinforced by the monotheistic religions, although widely shared across all cultures [sealed into our genome](#) from around 10,000 years ago. This is clearly laid out in Genesis, in Eve being cursed for seeking the wisdom of the Tree of Life, being accused instead of eating the fruit of the tree of the knowledge of good and evil, destroying their paradisiacal innocence, sexually declared to God by the fig leaf. Humanity was cursed and driven out of Paradise by God, with the Tree of Life hidden behind a flaming sword. Man and woman alike were doomed to the mortal coil of sexual existence. Women were cursed as the “devil's gateway”, to be obedient to their husbands and suffer the pains of travail childbirth, with mankind condemned to a life of struggle against nature to

survive against the thorns, to till the ground in human dominion over nature, delineating the transition from gatherer-hunter paradise to the lost innocence of agricultural civilisation.

This in turn has led to a world in which major religions use the patriarchal imperative to increase their populations to achieve social dominance, leading to population explosion, suppressing female reproductive choice under dire penalties, from stoning for adultery, to female genital mutilation, veiling, chaperoning and denying jobs and education and escalating human impact on nature through the invocation to dominion over nature, in denial of Earthly Paradise.

I am a child of nuclear apocalypse. On Christmas Day 1944 the first radiated plutonium slugs began to roll out of Hanford, signalling the real beginning of the apocalyptic age of Planet Earth. My birth was 12 days later on the Epiphany 1945. Los Alamos received its first plutonium from Hanford on February 2. Consecrating this patriarchal apocalypse, the Trinity explosion of this plutonium occurred on July 16. The uranium Hiroshima bomb was named "little boy" and the plutonium Nagasaki bomb dropped on August 9 from the same Hanford material was "fat man".



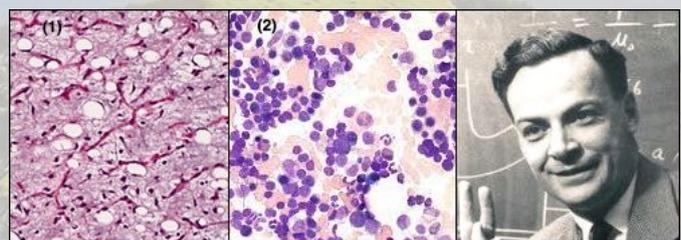
Michael Ortiz Hill (1994) in "Dreaming the End of the World: Apocalypse as a rite of Passage" describes the first words following the Trinity test:

Fig 249b: Trinity fireball.

It is striking that, following Oppenheimer's lead of naming the site of the first nuclear test "Trinity," Weisskopf and William Laurence - both Jews - saw in the Bomb the glory of Christ. In the Jewish tradition, the character of the Messiah has distinctly human dimensions, a "Son of Man" rather than the "Son of God" of Christian eschatology, while the Christ metaphor

speaks to an experience that dwarfs the human realm. Ferenc Szasz notes, "Others whispered, more in reverence than otherwise: 'Jesus Christ' ". Known to be something of a mystic, I. I. Rabi described Trinity by the overwhelming light that engulfed him: "Suddenly, there was an enormous flash of light, the brightest light I have ever seen or that I think anyone has ever seen. It blasted; it pounced; it bored its way right through you. It was a vision which was seen with more than the eye. It was seen to last forever. You would wish it would stop; altogether it lasted about two seconds.... Oppenheimer said, "We waited until the blast had passed, walked out of the shelter and then it was extremely solemn. We knew the world would not be the same. A few people laughed, a few people cried. Most were silent" He recalled the terrible and ecstatic eleventh chapter of the Bhagavad-Gita, where the warrior Arjuna requests that Vishnu display the nakedness of his transcendental form. Arjuna is cowed in holy terror as the god visits upon him "the radiance of a thousand suns" "Now I am become Death, the destroyer of worlds" Oppenheimer quoted the Gita. "I suppose we all felt that, one way or another," he continued. Three weeks later, the pilot of Enola Gay, Paul Tibbets, requested God's blessing upon the Bomb that would initiate the citizens of Hiroshima into the darkest consequences of this ecstatic presence. "Be with those who brave the heights of Thy heaven intoned the chaplain, "and carry the battle to our enemies".

Fig 249c: In July 1945, Feynman was present at the first atomic bomb explosion in the Trinity bomb test in New Mexico. He claimed that he was the only person who saw the explosion without the very dark welder's glasses that were given to all the physicists present on that day. He thought that the truck's windshield would block the ultraviolet radiation from the blast. Believed to be as a result, at the age of 69, he died of two successive rare types cancer: (1) Myxoid/round cell liposarcoma – a rare cancer of fat cells and (2) Waldenström's macroglobulinemia – a rare non-Hodkins white blood cell lymphoma akin to leukaemia.



Another striking theme that repeats again and again in the "dreaming up" of the Bomb is that of birth and paternity. On the mythic level, it is clear that the Bomb was not invented as much as "born." Some people recognized the godlike epiphany of light and fire - so long anticipated - as the birthing of something or "someone" new. We can discern a specifically paternal pride and even hints of tenderness toward the Bomb. William Laurence called the rumblings of the Trinity explosion the "first cry of a newborn world".

However, our true apocalyptic disaster, more tumultuously destructive, over time than any fantasy that Revelation can throw at us, is planetary biocrisis – our impending biodiversity and climate crises, driven by a patriarchal culture of dominion over nature and woman alike, that seeks to exploit the Earth and its living natural diversity rather than sustain it as the immortal living Paradise that has sustained us for three billion years of evolutionary emergence, in an unbroken line of inheritance to our own existence. A survey conducted in several countries as I write (Hickman et al.

2021) has found that 56% of young people believe “humanity is doomed”, because of climate and biodiversity crisis ⁸⁰. Current evidence indicates that the climate crisis alone could send our planet back 50 million years to the Eocene maximum, shortly after the dinosaur extinction. The damage caused by a mass extinction of biodiversity can never be recovered, but in raw terms would take another 50 million years to recover from in purely quantitative terms.

Planetary Reflowering

We urgently need to learn to let life overflow in abundance again, and give space on the planet for life to do so and rapidly correct the climate crisis we are causing that also lays waste to natural habitats, so that we shall survive as a species. This is the key to our living future. It’s as simple as that. I am a scientist dedicated to preserving the biodiversity of planet Earth from the almost unstoppable human stupidity of causing a mass extinction of life which could cause the end of humanity as we know it, if we don’t come rapidly to our senses and achieve **three active priorities** to protect the living dharma ⁸¹ of the sentient cosmos:

(1) Biodiversity and Climate:

(a) **Dedicate half the Earth** and its habitats to natural wilderness so that the millions of other species we co-depend with can survive and flourish (Wilson E O 2016) . Half the planet has to be enough for one species *Homo sapiens* alone among 3.8 million others to entertain and fulfil ourselves. This is literally the only way evolution can flourish and humanity can survive, because we need genetic diversity for species survival. If we don’t do this, our probability of long term survival is bleak and, while we might repair climate, biodiversity remains in mortal danger.

(b) **Fix the climate crisis** as quickly as possible by converting to renewable energy before the climate ‘fixes’ us.

This is fully achievable and inevitable. No further financial investment, or subsidies in CO₂ emitting energy sources.

(2) Nuclear/Mass Destruction: Cease production of nuclear weapons and weapons for biological warfare for military use. Devote the technology to protecting the Earth from astronomical impacts that could cause a mass extinction.

(3) Patriarchy and Population: End the Epoch of patriarchal dominion over woman and nature that has lasted for the last 4000 years and profoundly exacerbated the population crisis, in the **reunion of woman and man** in reproductive freedom, i.e. the **Sacred Reunion**, or *Hieros Gamos* ⁸² the fertile foundation of human cultural emergence and super-intelligence in sexual paradox (Fielder & King 2004).

Scepticism, Belief and Consciousness

The sceptical approach of objective science, which has revealed all the confounding detail of the physical universe and natural world we live in, is founded on the opposite of affirmative belief, that nothing we imagine to be true can be established to be so, unless every empirical test we make in the universe is replicable and contradicts the sceptical assumption that the idea is false. Thus the doubling of the bending of light around the Sun due to the Sun’s gravitational field, confirmed Einstein’s theory of general relativity.

But science, for all its inscrutable and meticulous care and veracity, has one terrible shortcoming, the elephant in the room of subjective consciousness itself. Key to my journey of visionary discovery has been the realisation that subjective consciousness has a central role in cosmology and that the entire universe is not just a physical nightmare of unrestrained forces of nature creating galaxies and black holes, populated by mindless atoms and molecules and biological organisms that are simply chemical machines and that the sun is doomed to eventually destroy the Earth and eventually the entire universe will destroy itself in a heat death, cosmic rip, or big crunch. Bertrand Russel’s overwhelming pessimism sums this tragic fallacy in precise words of doom.

In this materialistic scientific view, consciousness comes to be identified as a mere epiphenomenon of brain activity, which is at best a potentially unreliable, internal model of the reality of the world around us, which has no ability to effect any causal change on the physical circumstances of the universe. Thus conscious existence is deemed to be a

⁸⁰ “*Humanity is doomed*” All countries 56%, Australia 50%, Brazil 67%, France 48%, Finland 43%, India 74%, Nigeria 42%, Phillipines 73%, Portugal 62%, UK 51%, USA 46%

⁸¹ *dharma* – the eternal and inherent nature of reality, regarded in Hinduism as a cosmic law and in Buddhism the nature of reality regarded as a universal truth.

⁸² *Hieros gamos* or Hierogamy (Greek ἱερός γάμος, ἱερογαμία "holy marriage") is a sacred marriage that plays out between a god and a goddess, especially when enacted in a symbolic ritual where human participants represent the deities

mirage, and free will is an illusion, possibly evolved so as to convince us to continue to act as if we have the will to continue, because all human decisions are just a consequence of brain functions determined by our genes and the specific circumstances of the decision we are striving to make at the time. This classical world [denial of free will](#) leaves us with the status of automatons deluding ourselves into believing we have choice, leaving all questions of ethical or moral responsibility in the dust. But the quantum universe teaches otherwise, as I shall come to explain.

Religious believers of virtually every kind find this world view completely unsatisfying for very good reasons. While traditional religious cosmologies are archaic and wildly inconsistent with the reality of the universe as we now know it to be, they exist in a conscious condition of projected fantasy, where Heaven and Hell are conceived as all-too-real experiential realms, in which a sentient being can either live an eternal life in heavenly bliss, or suffer in the endless horrors of damnation. They also go half way to allowing free will as long as we use it to obey the will of God. A scientific view, even if it has experimental verification, that claims consciousness and free will are self-fulfilling delusions holds no candle to a myth that places this real Earthly life to be a mere temporary forerunner to a moral judgment for all eternity.

This means that we, the world and its living future, are living trapped in a schizophrenic existence, in which we treat the practical details, as if we are living in the physical universe with its physical laws and material boundaries, but underlying it, for most of us, is a contradictory belief that the real world is just a delusion, or a temporary place to undergo a moral trial by God, and the true realities that solve life, the universe and everything lie in the afterlife. This is the existential crisis that we are going to heal in this discussion to unveil and reflower the [Tree of Life](#).

The full scope of this contradiction becomes apparent if we examine our living experience of the world around us. We are all forced to concede the existence of a shared physical reality, that the table I am writing on is solid, and if I crack my knuckles on it, they will hurt, if I get hit on the head, I may pass out and lose consciousness, or if I eat a poisonous plant or catch a disease I may get sick, and if I am hit by a vehicle in the street, or shot, I may die, so we are forced to concede the existence of the objective world around us and know that it is part of a physical universe of galaxies, stars and planets, composed of particles, including atoms and molecules that also make up biology and ourselves.

But on the other hand, 100% of everything we experience, including our experience of the physical world, of our dreams and of our visions, including those on mind-altering substances, occur through **and only through** our subjective conscious experiences. So the world, as we see it, is actually a consensus view of subjective conscious experiences between people, which we are confident is shared with other conscious beings around us, from their lively engaging demeanour, although we don't generally have any direct access to anyone else's subjective experience.

We also have a basic belief in our personal autonomy – to make subjective decisions that affect the world around us, many as simple as getting a cup of coffee, or going to the toilet, but also critical decisions that may seriously impact on our lives, or the world at large. The sanctity of the legal system depends on the notion that we are accountable for our actions as conscious sentient beings and do have conscious intent. This is what we call 'free will' although we know all our decisions are partially determined by their circumstances and can be influenced to a certain extent by our genes.

In Galileo's error, the panpsychic philosopher Philip Goff (2019) notes that what has subtly happened is that the scientific method, from Galileo⁸³ through Newton, converted the perceivable universe into a set of dispositions codified in mathematical equations, demoting the qualitative aspect of reality to irrelevance. This is fundamentally a patriarchal scheme of dispositional dominion over nature, reducing the phenomenal world to a set of equations. Gather-hunter societies arose from the women classifying plants and defining culture through language, while the men hunted, often silently. Thus males generally have good mental rotation and tend to navigate by vector dispositions as hunters exploring alien terrain "take the first left and then second on the right" rather than the qualitative features used by females from their careful classificatory gathering "it's opposite the pay centre after the gas station".

⁸³ Galileo despite being excommunicated for his science, was still a devoted Catholic and a traditional patriarch. He never married his children's mother and deemed his daughters unmarriedable, and soon after Virginia's thirteenth birthday he placed both girls at the Convent of San Matteo, where they lived the rest of their lives in poverty and seclusion. By contrast Galileo's son Vincenzo, who was born in Padua like his two sisters: Virginia and Livia, was named after his grandfather, and after his mother's death, his birth was legitimised by the Grand Duke of Tuscany. Virginia was Galileo's first child, born in Padua, Italy the same year that the Dominican friar Giordano Bruno was burned at the stake in Rome for insisting that the Earth travelled around the Sun instead of remaining motionless at the centre of the universe. Although none of Galileo's letters are known to have survived, 120 of Maria Celeste's exist. These letters, written from 1623 to 1634, depict a woman with incredible brilliance, industry, sensibility and a deep love for her father (Sobel 1999).

In the Newtonian universe, the patriarchal approach of analytic quantification came to dominate the description of nature, just as the patriarchal religious description dominated nature and woman alike to humanity's detriment. The end result has been that the entire subjective descriptive aspect of reality has been eliminated from the scientific world view, resulting in an inability of science to understand what subjective consciousness is and does although it is everything we experience. Patriarchal science has literally lost the subject of the case.

Belief in materialism, because of its adroit use of the sceptical principle, to correct naive assumptions and elucidate properties of the natural universe that were at first sight very counter-intuitive, has since become a belief system exactly like a religion, so that researchers cannot afford to take any other position in peril of being shunned by the dominant scientific community and losing recognition altogether. This has grown to counterproductive proportions where the very researchers showing the benefits of psychedelics scientifically are bound to declare that psychedelics have no demonstrable value in solving the central problems of conscious experience, when it is obvious they are sine qua non the most consistent modulators of the depths of conscious experience available to science.

Psychedelics – The Edge of Chaos Climax of Consciousness

This is where psychedelics and their apotheosis, in the term enthoegens, when used for spiritual purposes, come centrally into the arena. Psychoactive substances have always had a formative role in the emergence of spiritual and religious viewpoints. Cannabis, which plays a central role in Shiva worship, has been consumed in ritual spiritual practices for several millennia. Hindu religion owes a portion of its Upanishadic cosmology of the atman and Brahman as the cosmic mind to cannabis and the Rig Veda to the mythical soma of the Aryans. Traces of cannabis used for ritual purposes have been found at an ancient Judaic temple (700-900 BCE) in Arad Israel (Arie, Rosen & Namdar 2020) and also in China (500 BC). Opium likewise has an ancient medicinal and spiritual use.

However long term spiritual use of the most significant of the psychoactive species, those bearing the classic psychedelics, have largely been confined to the pre-Colombian cultures of America, where there is evidence of spiritual use of mushrooms from the Mayan culture (1000 BCE), the use of peyote among the Zapotec (500 BCE) and long term use of ayahuasca and tryptamine snuffs in South America. These substances have much more profound effects on consciousness which lead directly to a vortical abyss of visionary states renowned for their intensity and transcendence. But their relative absence from existing historical traditions outside the Americas means their significance has been bypassed by the classical world, with the possible exception of Greek mystery cults.

The discovery of LSD and the later discovery of the continuing sacred use of psilocybe mushrooms in Mexico in the mid twentieth century brought the use of hallucinogenic visionary substances back into the focus of Western culture. Although peyote use had continued by the Huichol since Columbus and had been re-established in the Native American Church at the end of the 19th century, and ayahuasca had been consumed as a sacrament in the Amazon, these had remained marginal to mainstream Western awareness. But the advent of LSD as a recreational drug supported by prominent proponents in the US, from Timothy Leary in the East Coast to the Merry Pranksters and Grateful Dead in California, advancing a counter-cultural agenda, supported by devoted chemists who were prepared to synthesise vast numbers of doses of LSD at little or no charge, conceived in the "public good", set the stage for a cultural confrontation. Accompanied by disquieting media awareness that psychedelics were laying siege to consumer culture and values, amid some troubling incidents with their use, a campaign of frank misinformation ensued from the authorities. The result was that the US and then the world introduced a total clampdown on their use that initiated the unending war on drugs, and stopped all human scientific research in its tracks.

Given the long history of sacred use of entheogens, this constitutes the most benighted quasi-religious piece of authoritarian counter-reaction in Western culture since the Inquisition and Witch Hunts, in a complete mockery of the scientific age of discovery. Penalties for psychedelic use rose to schedule 1 sentences similar to murder, reflecting the perception that this was regarded as a deadly sin rather than any scientific evidence of significant harm, but a threat to the very consumption society that is driving the planet into ecological and climatic crisis. It is only now around fifty years later that the very tentative reopening of scientific research into these substances detailed in section 1 has been able to begin to set the record straight, while still largely confining them to therapeutic use in terminal and psychiatric conditions, while their recreational use has continued, although hidden from the mainstream and somewhat trivialised as a merely a recreational rather than a deeply formative spiritual experience, as their historical use attests.

What the psychedelics provide is a negotiable transcendental experience in the vortical abyss of conscious existence comparable with and potentially more profound than the peaks of meditative and contemplative experiences in mystical and meditative traditions. They constitute a/the central vehicle for us to explore and discover the innermost nature of the subjective mind. They differ from meditation, in that they have pronounced visionary qualities that challenge existing conceptions, rather than enabling a relatively featureless repose, from renunciation and careful top down mindfulness, that is reflected in the formless void of Buddhist thinking, outside the more spontaneous satori of Zen. Likewise they transcend contemplative mysticism, which tends to reinforce preconceived theistic beliefs. They also provide a more consciously explorable complementary condition to lucid states of dreaming associated with REM sleep because these are difficult, or impossible to maintain physiologically.

Discovering Cosmological Symbiosis

This is where we come to the symbiotic cosmology that solves life, the universe and everything summarised [here](#). The existential role of consciousness in the universe is the central enigma of existential cosmology, as we have seen. That's the key thing that everyday existence, no matter how meditative we may be, or whatever preconceived beliefs we may hold, misses out on the true enormity of, so that we will go through life in a state of distraction trying to fill it with habitual purpose until it's too late and we are gone.

Around the beginning of June just over two months ago, I summoned up the will to take a sacred mushroom trip after a seven year fast due to closed angle glaucoma, recently corrected by lens replacement. In the midst on the peak, I settled into meditating on the silent question of the central enigma and let go. As I descended deep into the abyss, at a certain point, everything opened out into what I noted later that evening to be "*the epiphany of being in the existential centre of the cyclone, where everything comes into focus in the transfixing presence of complete transfiguration*". "*Not an event, but a state of knowing, as we always have known, from time immemorial, as if we have always been conscious of this knowing, forever compassionate of the mortal coil*". I have experienced this many times before on mushrooms but not in this iconic way. The result was "*a sheer calm, unmitigated experiential awakening, as if the Big Bang of the universe is discovering itself in this very moment of illumination and is realising with irresistible intensity, the urgency and vitality of this state of knowing, which, the moment one experiences it, means saving the precious universe, the biosphere and the diversity of life within it from mortal risk to its survival*". This being true, despite the overwhelming reassurance of overflowing compassion for the mortal coil emanating from the apotheosis.

Psychedelic trips can be plagued by all manner of sensory and visionary experiences, from the sublime to the ridiculous or even alarming, but there is a name for this. The Huichol call it the *Nierika*, the visionary portal to the non-ordinary reality of the spirit world and the ancestors.

*There is a doorway within our minds that usually remains hidden and secret until the time of death.
The Huichol word for it is nierika – a cosmic portway or interface between so-called ordinary and non-ordinary realities.
It is a passageway and at the same time a barrier between the worlds" (Halifax 242).*

Emerging renewed and revitalised from this experience, accompanied as I moved and breathed by the lingering shadow of the apotheosis compassionately caring for me and encouraging me to put this whole illumination together into an account for the world, I began feverishly assembling this work.

What the experience brought home to me, above all was the veridical⁸⁴ reality of the cosmic mind, even though it was evoked in a human brain on sensory withdrawal under a hallucinogenic experience. This is a turning point from many past experiences, where I have witnessed the same compassion for the mortal coil as a visionary impression of the other – transforming it from perception into reality – the actuality of Brahma-atman unification in the form extolled in the Upanishads (Purohit & Yeats 1937).

This brings us back to the hard problem of consciousness research. The advent of neuroscience has provided us with genuine insights into how the brain processes information, including sensory and cognitive tasks associated with conscious attention and resting, or meditative states. We can then associate a variety of conscious states with activity, either by electroencephalographic portraits of brain waves, by functional magnetic resonance images of blood flow to

⁸⁴ *veridical* – coinciding with reality (Oxford Languages). Mid 17th century: from Latin *veridicus* (from *verus* 'true' + *dicere* 'say') + -al. In psychology – of or relating to revelations in dreams, hallucinations, etc, that appear to be confirmed by subsequent events

specific regions, or by positron emission tomography of radioactive glucose, and even by invasive studies of actual neurons and connections in animals. Various researchers can then attempt to deduce how these excitations give rise to the conscious experience, e.g. by the activities of certain frequency bands, such as gamma from 30-100 Hz.

The classical deterministic view of brain function, denying a role for subjective consciousness and making free will impossible, is undermined by two additional factors in the physics of brain function. The first is edge-of-chaos dynamics, which at tipping point instabilities associated with critical decision-making watersheds can enable a fractal handshaking between instabilities at the quantum level of the ion channel and changes in overall brain state. The second is the intrinsic uncertainty of quantum events and their entanglement, which is closely paralleled by phase coherence in wave processing associated with coherent conscious states – that brain states which rise and fall together in synch rise to consciousness while others constitute the unconscious ground of neurodynamic processing.

The trouble with the entire sweep of the objective description of brain dynamics is that no objective state, no matter how the brain does it, even if by edge-of-chaos instability and quantum entanglement, is anything other than objective, so it never solves the question of how subjective states actually arise. This is the so-called 'hard problem of consciousness' coined by David Chalmers (1995). Essentially, there is no way to get a ghost out of the objective biological machine of the brain by combining non-conscious components, whether molecules, neuronal excitations, edge of chaos dynamics, quantum phenomena or brain states, if none of these components have any subjective status.

The sceptical basis of the scientific description depends on Occam's razor, the idea that, given two views describing the same phenomenon, the simplest, most concise one is likely to be correct. Materialists thus try to claim that any reference to consciousness and volitional will is extraneous in a supposedly classical macroscopic world where causal decision making processes defined by brain function can in principle have a detailed mechanistic basis without reference to fuzzy vitalistic⁸⁵ notions like mind, consciousness or will. They will then claim the hard problem is a distraction to be finessed away in steps, as more discoveries of how the physical brain processes information become revealed. However the materialist case is not established and it isn't necessarily fulfilling Occam's razor at all. What has happened is that materialists have restricted the domain of evidence to be circumstantial physical fact, ignoring veridical truths stated by conscious observers and actors as mere personal opinions or beliefs, in fundamental conflict with legal situations, where sworn subjective testimony is evidential in the absence of contrivance.

For example Erwin Schrödinger's statement "the overall number of minds is just one", which coincides with the conclusions of this monograph, is discounted as just being his idiosyncratic belief in Advaita Vedanta, despite that fact that we depend on his wave equation to understand quantum chemistry, and his devising of the cat paradox to understand quantum observation. Taken at face value, this is a veridical teaching by a founder of quantum mechanics.

So we need to take a big step back and reassess the way Occam's razor best cuts a real swathe through existence. When confronted by a description of reality which denies our subjective consciousness is anything more than an epiphenomenon, and insists that our volitional will to make any sort of autonomous decision at all is a delusion contrived by evolution to ensure we survive and replicate, that debilitates any sense of personal autonomy, responsibility and confidence to act in the real world, we need to make a succinct determination. Should we just accept this is a scientifically proven fact, when the evidence doesn't exist that the brain is a causally-closed deterministic machine and looks increasingly to be a complex, messy claim that may never be confirmed? Or should we take the much simpler concise volitional choice to allow Occam's razor to cut the Gordian knot of this contrived belief that we are helpless automata, and assert that it contradicts our decision-making autonomy, and rule out of hand this fatalistic myth-making? How can we resolve this existential impasse?

The answer is both ridiculously simple and counter-intuitive – to move the elephant in the room – consciousness itself – into a new place on the cosmological chessboard, that of complementing the entire physical universe. This is a direct consequence of affirming volitional will⁸⁶, because will implies the conscious mind affects the physical universe

⁸⁵ Vitalism is the belief that "living organisms are fundamentally different from non-living entities because they contain some non-physical element or are governed by different principles than are inanimate things". Where vitalism explicitly invokes a vital principle, that element is often referred to as the "vital spark", "energy" or "élan vital", the vital force or impulse of life, a creative principle held by Bergson to be immanent in all organisms and responsible for evolution, which some equate with the soul.

⁸⁶ Arthur Schopenhauer concluded that the inner reality of all material appearances is Will. Where Immanuel Kant had concluded that ultimate reality - the "thing-in-itself" (Ding an sich) - lay beyond being experienced, Schopenhauer postulated that the ultimate reality is one universal will.

physically in terms of the forces of nature. This may be in the way the brain processes unstable tipping points, and may involve quantum phenomena akin to solid state physics, but it is still a physical process following the forces of nature under the [core model](#) of physics. But this means the physics of the universe itself is sensitive to mind and that mind plays an essential role in intentionality⁸⁷ in the universe, manifest in the biosphere as a whole and in the universe at large. This is then a form of pan-psyche cosmology. [Panpsychism](#) is thus the clean veridical Occam's razor cut.

Consciousness, as an expression of a more generalised pan-psyche, then has a role in quantum uncertainty and in collapsing the wave functions of the multiverse, as we see in [Schrödinger's cat paradox](#), which we know appears to be specifically associated with conscious measurement of the wave function. This gives us back both subjective consciousness and its ability to autonomously apply free will in the same process determining the course of history in the universal wave function. This solves the dilemma of science denying free conscious choice and gives us full freedom as sentient beings, unlike the bondage of moral religions, where we are given free will only to find that if we use it autonomously on our own best judgment, we would be likely to end up in hell. Instead of moral compulsion, giving us back autonomy also gives us subjective divinity in our union with the cosmic mind.

This solves the moral problem another way by showing us that our mortal existence is part of the immortal web of life and that there is no future in selfish activity because when we come to the end of our lives, any activities other than giving our all to life as a whole is futile. It also solves the problem for divinity i.e. the mind at large, because now it has a sentiently intelligent vehicle for conscious manifestation.

Since we are universally subjectively sentient conscious beings and have no knowledge of the physical world except through subjective consciousness, the only valid conclusion is that the subjective aspect is a cosmological property complementing the objective physical universe. This means a form of panpsychism, in which all quantum phenomena also have a complementary aspect. This seems counterintuitive, because we seem to be replacing a succinct objective description with something elusive and fuzzy, but that is because we aren't making the right test. The test of objective cosmology is empirical investigation. The test of subjective cosmology is veridical affirmation in which each conscious observer affirms verification.

There are alongside its foundational subjectivity a number of features of our conscious experience which 'colour' the nature of experience and are features or 'qualia' of our consciousness rather than its existential status. For example vision and hearing, smell and touch all differ qualitatively. These differences are partly due to the quantum modes of the senses and partly to do with the neuroreceptors and cerebral excitations eliciting conscious states. So we need to factor these out when addressing panpsychism and the ground roots of subjectivity.

However there are some features in the conscious brain that are clearly universal and hold the key to understanding what consciousness is and how it arises. While individual details of brain structure and dynamics are shared extensively with other mammals, leading to our empathy with our pets, the differences between us and arthropods and molluscs such as cephalopods are much more exotic and somewhat alien.

The fundamental basis of consciousness arises in coordinated edge-of-chaos [membrane excitability](#) in prokaryote cells, dating back to the first cells of our last universal common ancestor LUCA. However a key transition point to sentient consciousness arose in our last eucaryote common ancestor LECA, the founding single celled eucaryote. Here is the transition point where symbiotic cosmology really begins to kick in. This was a hugely significant event in the form of a [deep symbiosis](#) between the two existing prokaryote kingdoms some 2 billion years ago, in which an Asgard archaeon and a proteobacterium, similar to our intestinal bacterium *Escherichia coli*, became symbiotically interdependent. This freed the cell membrane from core energy processing, which was now handled by the bacterial mitochondrial respiration and made the new cell membrane able to become focussed on information processing. This meant that the eucaryote cell became sentient life form responding to quantum modes – sight, sound, chemical and electrical, in its environment sensitively due to the edge-of-chaos dynamics of its excitable membrane. At the same time these cells, across the board use the same molecules as the key repertoire of our [neurotransmitters](#) to facilitate the social signalling essential for survival of the collective single celled organism.

⁸⁷ **intentionality** – the fact of being deliberate or purposive. mental states (e.g. thoughts, beliefs, desires, hopes) which consists in their being directed towards some object or state of affairs. **Intentionality** is chosen rather than **causality** to include the effect of will complementing physical causes.

This is the point where panpsychism becomes consciousness as we know it and the entire rest of the story is simply elaborating on this theme, so the human brain ends up being a very ornately and closely coupled collection of amoebae communicating through these same social signalling molecules in their synapses to produce the highly coordinated form of cellular consciousness that we experience as subjective reality.

This turns what might seem to be specious vitalism into a clear-cut biological theory in which the development of subjective consciousness has a clear evolutionary trace from the punctuated equilibrium of eucaryote symbiosis, consistent with the physiology of chaotically excitable cells in a quantum entangled universe. Because this subjective product of excitability enhanced survival by avoiding lethal outcomes, it has been selected by evolution throughout. This in turn attests to the effectuality of conscious will on the physical universe

One can then find evidential support for this conclusion. A key point of transition is that from single celled eucaryotes to the metazoa – multicelled animals. A highly-studied example is the myxamoeban slime-mould *Dictyostelium discoideum*. This is a free-living single-celled amoeba that having eaten out its local bacterial habitat, aggregates, forming an excitable slug and then a sporulating fruiting body, to spread it to new habitats. It does this by using a combination of the same molecules that we use as neurotransmitters and second-signalling molecules – cyclic AMP, glutamate, GABA and serotonin pivotal to psychedelic activity and human mood. It turns out that an interplay between serotonin and its catabolic enzyme MAOa is key to maintaining development of the spore-forming tip of the fruiting body. In the same way, serotonin plays a key role not just in neurotransmission in the mature brain but evoking stages of brain development in the human embryo, for the neural groove at one extreme, to coordinating the correct formation of the layers of other neurons in the cerebral cortex, through serotonin-secreting fibres ascending from the basal brain that are later used in the moderating mood in the mature brain, to mediate organismic social survival.

Several of these molecules are primal in their simplicity and cosmological in their origin. Both glutamate and GABA both of which are key neurotransmitters are prominent components of comets and carbonaceous chondrites. Others are the amines of biological amino acids. Serotonin is 5-hydroxy-tryptamine, derived from tryptophan.

This goes a good way toward providing an immediate explanation of how psychedelics can cause a retreat from egotistical attentive consciousness into a primary consciousness, in which ego loss occurs, consistent with an underlying dynamic to secure collective survival, rather than personal survival of the individual, when the psychedelic state dissolves the distinction between self and other in a peak experience.

But the eucaryote symbiosis is not the only manifestation of symbiosis in *Homo sapiens*. As far as we know, all existing eucaryotes are sexual, or at least capable of intermittent (cryptic) sexuality. Dyadic sex is one of the most altruistic genetic acts an organism can commit to, by giving only half its genes, along with half the partners genes to make what is essentially a new life form never before conceived. All sexual species thus consist of two sexes each with their own genetic history (or more – *Dictyostelium* has three and some fungi fertilising by conjugation lots more). Sexual symbiosis in animals is highly asymmetric with the female contributing all the cytoplasm, ostensibly to avoid a mitochondrial genetic war, and the males contributing essentially only their DNA in the sperm, giving rise to sexually antagonistic co-evolution i.e. the sex wars of reproductive investment.

Humans are also extensively symbiotic with their endogenous transposable elements, which constitute over half of the human chromosomal genome, that arose originally as selfish genes, co-travellers that run back to the first multicelled animals and retroviruses related to HIV that became incorporated into our germ lines. These can cause mutations but also have key roles in coordinated gene expression and chromosomal processing.

Finally all species are co-dependent with the other species populating their ecological niches in biospheric symbiosis. This is what we capitalistically call survival of the fittest by natural selection, but really it is symbiotic co-evolution with the biosphere as a whole, even though individual species, including *Homo sapiens* have evolved to maintain strategic survival in their own right, leading to the egotistical expression of human character.

In the context of humanity, we are manifestly symbiotic with our food and medicinal species and likewise with our entheogenic species. The plant components of ayahuasca, the opium poppy, cannabis, coca and the herb of the shepherdess, *Salvia divinorum* have all been symbiotic with the human species for millennia, as has the yeast *Saccharomyces cerevisiae* responsible for bread, but also alcohol. Peyote and sacred mushrooms have been collected

from the wild for millennia but some species of Psilocybe mushrooms are the most easily cultivated entheogens, now in symbiotic use.

This brings us to the final component of the symbiotic universe, symbiosis with the mind at large. Humans consider ourselves to be the species that invented culture. We tend to define ourselves as reaching to the stars themselves, as a dominant species that stoops to no other, as the highest form of consciousness, apart from God himself and thus free to determine the destiny of all living species on Earth. This is a tragic fallacy in conflict with all the evidence.

Human attempts to seek moksha – escape from the egotistical and mortal round of birth and death are singularly rare enough that the Eastern traditions of both Buddhism and Vedanta have arrived at a fallacious notion of enlightenment through many reincarnations, essentially because the experience of cosmic reunion is so rare as to be essentially unattainable. The monotheistic faiths have abandoned any hint of such achievement. Christianity considers human nature fatally flawed by original sin and hence the only hope is faith in God, prayer and fear of the punishments of Hell in the day of judgment, while mystical experiences are rare and generally contemplative, rather than illuminative. Any idea that a person can manifest actual identity with God is blasphemous across all monotheistic paths. Islam regards it as a death penalty, just as Yeshua was condemned to death by the High Priests for blasphemy.

This leads to the conclusion that human consciousness is not the cosmological pinnacle of conscious existence, but we are a/the key active vehicle for cosmological symbiosis incarnate, and that the entheogenic state, by virtue of the very symbiosis induced by the entheogenic relationship takes us closer to the union with the mind at large that is the consummating manifestation of the cosmos in self-awareness. The biota are the only entities we know of in the universe that possess consciousness. They are thus the central candidates for the interactive emergence of cosmological consciousness from the Big Bang. This experience of union is also the only phenomenon we know of that comes anywhere close to the actual realisation of deity.

This finally solves the dilemma of God as a third agent outside the physical universe. The missing component explaining the creation of the observable universe is not God but consciousness itself. It is the missing piece in the puzzle and the manifestation of deity is thus realised in the subjective, not in a miraculous third party.

And although it seems counterintuitive to think that consuming entheogenic species is a/the key to saving the planet, there is a symbiotic truth in this because, the entheogenic relationship in [Maria Sabina's](#) words a way of “the sap and the dew” heightens our deep sense of inter-connecteness with nature and deep solace in our relationship with life as a whole, rather than delusory and damaging supremacy over it that leaves us in mortal isolation, so in the longer evolutionary time scale, given the current biospheric dominance of *Homo sapiens*, this is cosmologically pivotal.

A Visionary Journey

The other side of the coin of this transmission is that I am what I would call a true visionary. That is, I am transparent and simply give you the keys to resolve the existential enigma to use for yourself. I have no doctrine about what other people need to do spiritually, or should do to gain illumination and I am true to the pursuit of the vision quest. I don't follow any religion and don't ask anyone to believe in me, but I encourage you to find out for yourselves with an open mind. And to ensure everyone has love and support to keep the process tranquil. The reason is that the cure for the mortal condition is moksha not moral punishment and moksha heals and informs the ego. The true realities that matter to the meaning of sentient existence in the mortal coil are not found in the material world, but in accepting our transience within the eternal entanglement and realising that the only meaningful acts we can perform are to ensure the passage of the living generations continues to flourish. Therefore true enlightenment redeems the mortal condition. I have sourced my vital inspiration and literally navigated my life course through first person visionary experiences on entheogenic species that have propelled my life and its urgency and activism.

The intensity of these experiences could have consumed me and driven the most stalwart to the brink of messianic insanity, were it not for my intent to be true to nature and the universe at large, as well as my loved ones. I may have no religious or spiritual assumptions, or doctrine, but I do have one clear natural priority *sine qua non* and that is a mandate to save the living planet, its biodiversity and its largely beneficent, nurturing climate from a hard landing, irreversible tipping points, a mass extinction of life which would place our living future and the future of all life in serious jeopardy.

I was born in 1945, just as the first plutonium for Nagasaki rolled out of Hanford – on 6th Jan – the Epiphany of the advent, appearance and miraculous dread of Dionysus, who became Dhushara of the Nabateans in Yeshua's time. This event later became usurped by Hellenistic-Jewish gospel writers as Yeshua's Triple Epiphany: (1) of his visitation by the Magi, (2) in his baptism by John and (3) in his turning water into wine at Cana at the request of his mother, in an all-too Dionysian display of the god of wine and altered states.



Fig 250: Left: Dionysus mask Centre left: Dionysus mosaic Dion 300 BCE – 300 CE. Centre: Quetzalcoatl in human form. Centre right Teotihuacan 150-200 CE, Olmec la Venta 900 BCE. Quetzalcoatl is the god of wisdom, whose feathers represent the flight of visionary consciousness, while the serpentine body slithers among the plants and animals, entangled in natural existence.

The “feathery part” of my vision quest is summed up in “The Plumed Serpent” (Lawrence 1974):

*"I am lord of two ways. I am master of up and down.
I am as a man who is a new man, with new limbs and life,
and the light of the Morning Star in his eyes.
Lo! I am! The lord of both ways.
Thou wert lord of the one way.
Now it leads thee to the sleep. Farewell!
So Jesus went on towards the sleep.*

*And Mary the Mother of Sorrows lay down
on the bed of the white moon,
weary beyond any more tears.
"And I, I am on the threshold.
I am stepping across the border.
I am Quetzalcoatl lord of both ways,
star between day and the dark."*

I was christened Christopher Cyril King, but I don't answer to Christopher and I am not a cross-bearer. I won't carry a cross for anyone, or stand in anyone's shadow, least of all a dying and resurrecting saviour, who I admire as a brilliant innovator, but also lament for his self-destructive heritage of violence. We each come from a three billion year line of evolution, that has honed us to be conscious beings taking responsibility for our own lives and futures, so I have honed my vision quest as a journey – the trip of a lifetime – the trip of all trips together, till death us do part!

For those of us seeking psychic phenomena from visionary experiences, I've had these too, although, while they do affect my world view, I neither take any of these for granted and consider them deeply natural rather than supernatural.

I have had repeated precognitive dreams and precognitive creative experiences. When I was living on a canal boat we built in England, I read J W Dunne's (1934) "An Experiment with Time". According to Dunne, our wakeful attention prevents us from seeing beyond the present moment, whilst when dreaming that attention fades and we gain the ability to recall more of our timeline. This allows fragments of our future to appear in pre-cognitive dreams, mixed in with fragments or memories of our past. Other consequences include the phenomenon known as deja vu and life after death. At the time of its publication, not to have read him became a "mark of singularity" in society.

Fig 251: The Taniwha (Maori spirit of the rivers and swamps), the canal boat we built from a wreck submerged since the 19th century where the dream took place.

Shortly after this I had a double nightmare that I was being hideously stung by a spider, repeated in the second dream because I had failed to brush it off when it had removed its fangs. I continued to sleep in after Hallie, my young wife, got up to feed our first child, a newborn baby girl, opening the bedroom window in the process. I woke long enough to tell her "I had a terrible double nightmare" and then fell asleep again.



About an hour later, I was stung wide awake by a wasp that had flown in after she opened the window, going through all the same feverish motions under the intense pain I had experienced in the dream, blowing it off to find it was a large wasp. I have had many such dreams during my life most often anticipating things that unexpectedly happen early the next day. What it has taught me is that the universe is an entangled handshaking in which past, present and future are intertwined, and that the role of conscious existence is partly to anticipate future threats and challenges through direct perception of the space-time continuum.

I have also had lucid dreams combined with out of the body experiences. After practicing looking at the backs of my hands in dreams and after having dreams in which I was climbing a ladder and saw my hands but failed to respond, I suddenly realised in my first lucid dreaming encounter that I was fully aware in my dream and all hell broke loose. Firstly, I was being thrust up faster and faster like a rocket ship, in the manner of levitating and flying dreams. But I was also standing in the dream on an exceedingly bright promenade by the sea. A gust of wind that was also the levitating wind blew some sea spray at my light muslin Indian shirt. I was in a super-sensory state. I could simultaneously sense every one of the droplets separately touching my skin like the stars in the sky. But that didn't concern me. I looked up at the azure sky and the stratospheric clouds passing overhead and realised I was trapped in another world – in another universe. I saw a woman standing gazing at me with dark eyes and rushed towards her, grabbing her by both shoulders staring deeply down into her wild wide pupils, framing the silent urgent question where is the way back to Ixtalan echoing Carlos Castaneda's (1972) allegories⁸⁸ of the sorcerer Don Juan. She just looked at me and smiled knowingly and shook her head. But at the same time, I was out of my body floating just by the ceiling of my bedroom looking down at myself lying on the bed, totally reassured: "It's all okay! You are just down there sleeping". I thus awoke with three parallel streams of consciousness re-entwining together. Again, I have had many lucid dreams, but none so graphic as this first experience. I have had many lucid dreams but none so graphic as this first experience.



The difficulty with lucid dreaming is that the very act of becoming lucid rapidly tends to cause one to awaken because the triggers in the base of the brain flip towards wakefulness the moment we become lucid because neurotransmitters for vigilance such as nor-epinephrine kick in and flip the orexin neurons to wake the brain up. This is different from the visionary experiences induced by entheogenic species where a waking person can descend into a deep visionary abyss where other realities quite distinct from dreaming can occur, although returning from the depths of these other states can leave on in a similar situation of trying to recall the ineffable that has now receded, as Don Hose Matsuwa the Huichol shaman [makes clear](#).

This brings us to [psychedelics](#), or entheogens as the natural species are called, that possess psychedelic substances and are used, and have been used [for millennia](#) as visionary sacraments for healing, sorcery and spiritual realisation.

My relationship with psychedelic agents began as soon as I arrived in the UK to take a graduate mathematics degree in topology, with my first somewhat devastating experiences on LSD, still decanted with a dropper onto whole sugar cubes. The first trip was really awesome, but a week later a double dose of two cubes left me with the absolute certainty I had literally died (the most extreme form of ego death) and left me with shimmering after effects for weeks. At the same time, orchestrated by the US drug authorities, contrived reports were circulated that LSD split your chromosomes, which left me with five years of anxiety before I would take my next trip.

After that began a regular round of recreational tripping to try to get to the bottom of what these agents were showing us. I have always been devoted to my family which has now become a loving and caring extended *whanau* as relationships between partners have evolved and changed. For several years we held court, hosting a free-love establishment in the city, in which I ended up in three double partnerships in open 'marriages', spanning decades. Attesting to my consistency, I have lived with my current partner, Christine for over 50 years, despite times apart on world journeys, and all my offspring and grand children are nearby, so I must be doing something right, in spite of all.

⁸⁸ No not take too much stock by Castaneda's writings. His accounts of mushrooms and peyote are unreliable and he gathered a cult following of a troupe of woman writers, who appear to have [died or committed suicide](#) in Death Valley after he died.

On my first academic sabbatical, I split my efforts between a scientific investigation in the West to get first hand knowledge of what some of the famous scientists, including Nobel prize winners, made of the role of life in the universe. I spent the rest of my time imbibing the Eastern spiritual traditions, wandering India as a sadhu and taking Tibetan Buddhist initiations with Yeshe Dorje the Ningmapa exorcist who kept the rain off the Dalai Lama when he walked and Rangjung Rigpe Dorje the 16th Karmapa the head of the Karma Kagyu lineage, at the same time exploring sources of the world's power plants, from the poppy fields of the Golden Triangle, through the Ganga fields of India and Afghanistan, eventually to take peyote with the Native American Church in New Mexico, where I also encountered my first sacred mushroom experience.

On my return to Aotearoa, I began a symbiotic relationship with sacred mushrooms, both because of their genetic purity, by comparison with synthetic drugs and because, although not as overpowering as LSD, they provide, in my view, a more deeply spiritual experience, which is also a deep expression of conscious symbiosis, without some of the transient casualties of LSD trips that occurred among our friends. This doesn't mean taking mushrooms all the time. In fact I will sometimes go for years simply making sure they survive. Symbiosis means being faithful to their preservation. Their spores will live for decades if correctly stored at 5% humidity in a cool place and they can be cultivated in a chilly bin, with careful sterile techniques. I also brought species recognition to *psilocybe aucklandii*, and conserve a collection of species spanning each of the classic enthenogens, to safeguard the visionary heritage for humanity, as a symbiotic duty of care.



Fig 252: A panorama of Opuhi, our wilderness land in Aotearoa. The meeting house is just visible on the right up the path.

In 1970 we had established a windswept coastal wilderness conservation community, which provided endless opportunities to hold mushroom veladas in the moonlight, listening to the crickets and moreporks and the distant ocean below, either alone, in "solitario", which I prefer, or together in the meeting house, which has since become a heritage building. These experiences have become pivotal to my life's work.

Other waking experiences, both on sacred mushrooms and during creative experiences have assumed a prophetic quality that can be alarming or even devastating. On one particular velada in the 1980s I suddenly became aware that the mushroom was telling me that if the world failed to show adequate signs of arresting the human impact causing a mass extinction of living diversity, I would need to make a vision quest to the Amazon, as our figurative Garden of Eden paradise and to Yerushalayim as the nexus of the religious impulse to undertake a rite of passage to make a transition to the immortal epoch of the Tree of Life, hidden since the foundation of the world in Eden by a flaming sword. Around the same time on another trip, I had a horrific vision that my eldest daughter would have an obstruction to her fertility, as some twisted kind of sacrificial outcome of my undertaking this mission. Some years later she became pregnant and her first of three sons was born with Down syndrome. He is great, but the episode was very disturbing, and a triple chromosome 21 is a genetic obstruction to fertility, affirming the vision's veridical, or prophetic character.

In 1980 I made a second journey on unpaid leave to research the chemical origins of life in the US, later returning to Mexico and collecting and consuming peyote from the high desert below Wirikuta, the sacred mountain of the Huichol and then travelling to Yarinacocha lagoon at Pucallpa in Peru, where I took a powerful and formative ayahuasca trip with Snr. Trinico, a leprous curandero living at the extreme end of the slums around the lagoon. In 1992 I again returned on sabbatical and took peyote with the Native American Church in Taos with Tellus Goodmorning, my original roadman who was 92 and had lost one eye, but was still in fighting form chanting all night in the teepee.

In the two years spanning the millennium I made another sabbatical journey to the Amazon to document one of the worst burning seasons on record and returned to Yarinacocha for a second ayahuasca session with Trinico who was elderly, but now in good health.

Following this, with my sabbatical partner Jane King, we completed our [Millennial vigil to Jerusalem](#), pronouncing as Bride and Bridegroom the rite of passage of the of the immortal Tree of Life of living diversity in the Gaia anointing of

the Jubilee passage of Isaiah 61, completed on the Epiphany by declaring the Gates of Mercy open at the Eastern wall and celebrating the Sacred Reunion of woman and man in the Song of Songs at the Western (Wailing) Wall.

This served two key purposes to address foundation issues in the collective unconscious, manifest in the Weltanschauung⁸⁹, the archaic formative world view driving patriarchal monotheism expressed in the Yahwistic Genesis, **firstly** in Eve being cursed for heeding the serpent, to be obedient to her husband under pain of childbirth, appeasing male paternity uncertainty, confessing an archaic conflict with the matriline and female reproductive integrity and **secondly** with dominion over nature, in the Tree of Life in Paradise hidden from humanity behind a flaming sword, dooming us to conflict with the thorns of the wilderness sweat of human dominance.

In 2015 I had a near-death experience when involved in a cycle accident which knocked me unconscious and left me with temporary amnesia from ensuing concussion. This made me acutely aware of the risks I was taking not fulfilling the pact with the mushroom, by kicking the bucket before my time had come. This resulted in the notion of planetary resplendence transcending religion as a way of life protecting the biosphere in perpetuity. Resurrection Revelation Finally after a seven year hiatus, I took the mushroom trip that became this entire work.

On 19-7-2001, a month before 9-11, I published the lyrics of a song I had composed – Big Brother – The Song of the Biosphere – video. This was a poetic statement having read an AP news article “The Hollywood Syndrome - Is the US the Global Satan?”, concerning the failure of G W Bush to ratify the Kyoto convention. The article was well conceived and the song is a just response. The lyrics took this statement and declared poetic jihad for the biosphere. ‘When it comes to the final struggle, jihad of the biosphere, there’s only one true rogue nation - the great American shaitan - Big Brother you are uncle Sam’, because George H W Bush had refused to sign the 1992 Rio Convention on Biodiversity. (As of 2016, the convention has 196 parties. All UN member states – with the exception of the United States – have ratified the treaty. The US still only has observer status as I write this in 2022, 30 years later!). The lyrics continue with a lament for the dark canyons of lower Manhattan among the fallen towers: ‘walking in the twilight, down in the valley of shadows’, and then the plane: ‘We’ll fly so high well pass right to the other side and never fall in flames again’.

Just under two months later, at one in the morning on a continuous BBC news broadcast, I watched in horror, as firstly one and then two planes crashed through the twin towers of the World Trade Center in flames and the towers fell, turning the streets of lower Manhattan into a literal vale of the shadow of death.

Fig 253: A: Extracts from the lyrics posting of 20th July 2001 (<http://dhushara.com/nino/19julyjihad.jpg>). B: Passenger plane collides with one of the twin towers. C: Rudi Giuliani Mayor of New York the number of casualties will be more than any of us can bear (<http://youtu.be/xhBYWDy4m9M>). For the complete song video containing the 9-11 documentary footage, see: (http://youtu.be/g-giqTW4_YQ).

The lyrics contain an uncanny ‘prophetic’ reverse echo of the event a month before it occurred:

First we have the jihad against the U.S. over the Rio biodiversity convention, but now it has really become Islamic fundamentalism on 9-11:

*you tell us tales of hollywood of star wars and the common good
you told us global warming was a litany of lies, factory chimneys were the prize
you claim all living creatures are your intellectual property
you fail to ratify every treaty which doesn't give you more, have I heard this all before?*



⁸⁹ *Weltanschauung* – a particular philosophy or view of life; the world view of an individual or group: *welt* "world" (see world) + *anschauung* "perception" (related to English show). William James (1868)

*when it comes to the final struggle - jihad of the biosphere
there's only one true rogue nation - the great American shaitan*

This was karma, not a rude invention. The first line is “hollywood” and the last is the American satan just as in the AP article. Next we have an echo of the streets of New York amid the smoke and haze of fallen masonry amid a massacre:

*walking in the twilight, down in the valley of shadows
when will you comprehend - the damage you have wrought in your indiscretion?
can we undo - the death trance you have set in motion?*

Then the amazing, outstanding, caring efforts of those on the ground, to begin the process of recovery:

*will you discover - the fabric of love that ignites us?
can we embrace the ocean of life that unites us?
all our lives long this journey has been our destination
if we get this one wrong will there be any chance for restoration*

We have the planes flying clean through the towers in flames reminiscent of a martyr seeking the face of God:

*can we touch the sky?
can we fly so high we'll pass right to the other side
and never fall in flames? will we ever be the same again?*

To become the primal source and shining goal:

*we'll become the living soul, the primal source, the shining goal
the beginning and the end of life,*

Finally, a shadow of Rudy Giuliani’s statement as Mayor: The “casualties will be more than any of us can bear”:

the happiness and the pain ... can we bear it all again?

I apologise to all Americans for comparing your country to the Shaitan, but saving biodiversity is saving ourselves. Refusing to sign the Rio Convention on Biological Diversity is counter to the entire planetary future, so it **was/is** satanic, just as Donald Trump’s pulling out of the Paris accord **was** satanic. These are not the acts of a responsible superpower.

So what are we supposed to make of this? It’s just a coincidence isn’t it? There is more to this tale caught up in the quantum entanglement of past, present and future. It’s a completely non-replicable non-IID event. Is it a coincidence? What’s the probability of that? My father used to marvel at coincidence, repeatedly astounded.

How come, a month or more before 9-11 did I get it into my head to write these lines? Yes it's the same life-protecting motive that brought the SEC into existence. But no one remotely conceived this was going to happen. The lyrics are an allegory not conceived to be literal future fact, just poetry, but they are nevertheless written from an apocalyptic viewpoint. But they are also a stream of consciousness account of everybody and everything that happened. The minds of the martyrs thinking they'll fly so high they'll pass right to the other side and it's also the consciousness of the people who went in to deal with the destruction in the smoke and dust of Manhattan's dark corridors and the spirit of those who came to light their candles for life and the uncanny "can we bear it all again?" whose words Giuliani echoed on TV.

In the above account we have the following items:

- (1) Jihad declared against the great American satan – echoing 9-11 full on.
- (2) Flying so high we’ll pass right to the other side and never fall in flames
– echoing the planes passing right through the twin WTC towers.
- (3) we'll become the living soul, the primal source, the shining goal, the beginning and the end of life
– echoing martyrdom
- (4) the valley of shadows, the damage wrought and the death trance you have set in motion – the aftermath
- (5) The fabric of love that unites us – the candles and helpers risking their lives at ground zero
- (6) The pain, can we bear it all again? – echoing NY mayor Giuliani “this will be more than we can bear”

If we say each has a 1 in 10 chance of appearing randomly, then all appearing together in one situation gives 1 in 10⁶ i.e. a one in million chance of happening randomly.

In Plato's allegory of the cave, our state of knowledge is like that of prisoners chained together in a cave watching an illusory drama. Behind the prisoners is a fire, and between the fire and the prisoners are people carrying puppets or other objects, casting shadows on the cave wall. The prisoners watch these shadows, believing them to be real. One prisoner finally sees the fire and realises the shadows are fake. This prisoner escapes from the cave and discovers there is a whole new world outside that they were previously unaware of, but he becomes blinded because his eyes are not accustomed to actual sunlight, so when he returns to free them, his fellows do not trust his new knowledge.

Ruth Kastner has coined the analogy that quantum land hiding in the [transactional interpretation](#) of quantum mechanics, connecting all the potential absorbers to the emitter determining how quantum reality manifests, is the real reality and that physical reality we see in space-time is just the false image on the wall of Plato's cave. I have a different view of this which I'll describe, but Ruth's view has true reality value in suggesting that the foundations of consciousness lie outside physical space-time in the quantum land of incipient possibilities she calls *potentiae*. In a fundamental sense, this gives a true account of consciousness as the primary reality underlying the necessity of the physical universe, as the consensual illusion that binds together our conscious experiences of the world at large.

My view of this goes as follows:

Firstly 100% of people are subjectively conscious human beings, all of whose understanding of the physical universe has come from their conscious experiences, while only a subset believe in physical causality.

Secondly our experience of conscious volition is that we have autonomous intent and can perceive this intent veridically being manifest in our intentional actions. Therefore the physicalist description which sees consciousness as a mere internal model and volition as non-existent is empirically false.

Thirdly our conscious experience of volition is not like Plato's cave, because we are not passively watching a movie allegory, we are participating in it. The intervention of conscious volition is what actually causes history to emerge from the multiverse, so we are right there by the fire manipulating the images cast on the cave wall. To do this effectively we have to do it predictively.

One of the most central aspects of consciousness is that it is an extended space-time representation of our dynamical relationship with existence on an uncertain trajectory from the immediate past into the uncertain future. This looks convincingly like an entangled quantum representation of the now, i.e. the absolute instant of the present expanded into both the immediate past and immediate future – i.e. the uncertain quantum of the present. When this becomes extended as in the above example of 9-11 which is a strongly felt apocalypse in my vision that is going to become a world apocalypse in everyone's experience the two get caught in a Faustian space-time pact.

To a certain extent our relationship with time is a little like Plato's cave in the sense that the future is harder to see and we are stuck with the past in all our memories, dreams and reflections as Jung said. But this isn't the whole story. The brain-mind is a dynamical predictor as flash-lag illusions show it doing creating space-time artefacts. We experience this facing forwards into the unknown using consciousness as our cubic centimetre of chance to address uncertainty, so my bet is that consciousness is space-time transactionally predictive and has to be for evolution to retain it over a purely physical computational brain.

For consciousness to have any affect on physical outcomes that is useful to evolution, it has to be able to anticipate reality. The mind can do this logically or intuitively. But for conscious intuition to do it, it has to be in a sense precognitive (Bem 2012, Bem et al. 2016).

What about life immortality and the eternal? is the "ground" of consciousness a universal subjective phenomenon? If so, is it itself in any way connected to the death of the brain. The answer to this is probably yes, because the brain, at the very least is an immensely complex defining condition on the way human organismic consciousness manifests subjectively. This is where a scientist's comment – the brain "makes" consciousness is largely correct, even if the brain is not causally closed, so that conscious volition is efficacious physically.

But subjective conscious ground of being as a universal phenomenon is then something that is not confined to a mortal organism's lifetime. In fact it is not even confined to biological evolutionary immortality, so it stands as a principal candidate for being eternal or existing outside space-time, as space-time is an entirely physical construct.

So where does this leave us? Well, religious people, Psi people and reincarnation people and mediums all have to reconsider all monolithic assumptions about the afterlife. At the same time scientific materialists need to recognise consciousness is cosmological and stop insisting our conscious volition is just a product of the computational brain.

Frankly I think biological mortality is the key to conscious existence sine qua non, because it's the only way complex conscious existence can become physically manifest in sexual evolution. This is the incarnate focal point of conscious existence. I want to be effectual in my biological existence. I can already experience the immortality of evolving life and the eternal nature of the ground of conscious being and the so called spirit world of disembodied consciousness.



My take on this other world is entirely different from any other description of it I have seen in scripture, mediumistic accounts although is an extension of NDEs – rather as an integral transform of the entire conscious experience of the universe aware of itself, both as the mind at large and as the disembodied entities that constitute it, not some winged angels in “heaven” dancing on the head of a pin and not the tormented in eternal suffering in “hell”.

'Elohim

*We are whispering ... across the heavens and all the creatures ... they echo in reply.
We are the very blood ... of the tree of life. We are the void and the shining light.
We are the eternal gypsy spirits of the universe. We have been here since it all began.
We will outlast its final passing. We are here to free the heart of man.*

Adding further assumptions, in my not-so-humble opinion, leads to all manner of egotistical traps, as serious in the subjective world, as the human desire for cyborg immortality does in the physical universe.

William Shakespeare's Macbeth, in despair at the death of his queen, casts the whole of life as a tale told by an idiot:

*Out, out, brief candle. Life's but a walking shadow, a poor player That struts and frets his hour upon the stage,
And then is heard no more. It is a tale Told by an idiot, full of sound and fury, Signifying nothing.*

This is not the outcome we seek for the living planet, so please listen to the sound and fury of a hallucinogen-consuming voice from the wilderness. It is not me, but the direction human life is taking, and all of us with it, that is

idiotic beyond comprehension. That is a tale full of apocalyptic sound and fury, both religious and biospheric which, far from signifying nothing, might kill us all if we don't accept the **three priorities for reflowering the planet** above.



To quote Yeshua from the Gospel of Thomas (70):

*"That which you have will save you if you bring it forth from yourselves.
That which you do not have within you [will] kill you if you do not have it within you."*

Fig 253b: *It won't be easy but we can do this thing.*

Here is my Easter 2023 Revelation!

I don't usually adhere to the Everett interpretation, but as it's a valid QM interpretation, I am entitled to and will also use the transactional special relativistic interpretation. So I'm going to assert the following:

- (1) The objective universe, outside subjectivity, is a probability multiverse and on its own, no wave function collapse takes place, and everything remains “entangled”.

- (2) This applies also to the unconscious aspects of brain function, which proceed on a multiverse Schrödinger wave equation basis forming "massively" superimposed and entangled states.
- (3) Subjective conscious volition over the physical universe then collapses these brain wave states in the process of decision-making, to form a predictive form of quantum anticipation, due to the special relativistic nature of the wave functions, involving both causal and retro-causal interactions, via the transactional interpretation, or a super-determinism in which free will exists, and the hidden variables are context dependent on observation, and are not simply random.
- (4) To be effective over a non-conscious zombie, subjective consciousness still has to be predictive, to secure natural selection, so subjectivity is and has to be quantum anticipative or "predictive" through (3).
- (5) The reason consciousness has been conserved by evolution is thus that environmental uncertainty is uncomputable because it involves both (a) intractable "travelling salesman" problems (b) multiple possible outcomes and most acutely (c) interaction with other live conscious agents, which also possess conscious volitional anticipation.
- (6) This takes the form of a Red Queen evolutionary race between conscious predators and prey like the way sexuality evolved as a Red Queen genetic race between parasites and hosts by providing individual variation and avoiding epidemic species extinctions, but ironically resulting in organismic mortality.
- (7) This makes a clean cut cosmologically: All unconscious processes are type 2 von Neumann QM multiverses, but all conscious experiences are type 1 anticipatory collapse processes, which ironically make the universe look "classical" to us. In turn, this means that subjective consciousness as we know it, is and is exclusively to anticipate uncertainty, complementing the role of neural computation to infer a certain or uncertain outcome and subjective conscious volition is then "free will" over the uncertain universe with no causal conflict.
- (8) This process is cosmological, not simply neuroscientific, and it is integral to the cosmic symmetry-breaking which defined the asymmetric standard model of physics, leading to conscious life in "Paradise" on the cosmic equator in space-time. The late emergence is necessary because the cosmological interactive process takes 10 billion years to become physically viable, not because consciousness is a "late comer".
- (9) This means that there is no such thing as random uncertainty. All contextual and environmental uncertainty is a result of chaotic quantum molecular billiards which remains entangled until the moment of conscious observation. Hence karma, IS quantum uncertainty revealed, not a moral nightmare!
- (10) This also means subjective consciousness is creative, innovative and transformative i.e. transcendent over the physical universe.

Fig 292: Opuhi AGM 2023, the meeting house and the wind-swept puriri tree outside.

My visit to Opuhi, sleeping overnight at the summit with Christine reminded me of just how deluded these statements are, so I decided to explain to you all and the world at large just what Resplendence means to me, as the natural successor to religion – illuminating in autonomous visionary liberation, rather than binding by prescriptive spiritual belief.



If you read these thirteen points carefully, you will immediately realise these are nothing like any religion that has ever existed on the face of the Earth. It is also a scientific cosmology coming right out of left field that is itself a testament to the mushroom and to the sheer idiosyncrasy of the first person vision quest. Also you will realise that I am so far ahead of the ball that you will all probably disagree with one another about the physics and perhaps only Joshua Davis (2009) can understand the significance of the immediate first person vision. Maybe then you can begin to understand why I have not sought a religious following, or cultic focus but rather have since walked as Laotsu and why I have sought to be a member of these groups in the hope that someone can begin to appreciate the truth and significance of Symbiotic Existential Cosmology as a living redemption of planet Earth and its increasingly vulnerable biospheric diversity of life.

Thirteen Core Principles of Cosmological Resplendence

1. **Cosmos:** Conscious experience and the physical universe are Cosmic complements. Each is necessary to the other's existence and neither are sufficient unto themselves. Subjectivity begins as a primal vestige, complementary to the vestigial emergent universe and emergent in dynamically unstable quantum systems and manifests with the evolving universe. The universe does not begin with God, or from a fully-fledged cosmic consciousness, out of which the material universe is emergent. Neither is it theistically degenerate, heading to an Eschaton, Frashokereti, Kali Yuga or Samvartakalpa, but upward into the light of full illumination that IS resplendence manifest.
2. **Biogenesis:** The central purpose of the Cosmos is to be generative of conscious life. The living universe rises to interactive complexity climax in molecular abiogenesis and the ensuing evolutionary emergence of conscious organisms. The physical universe and the forces of nature form a symmetry-broken interactive "mandala" which generates the elements, the organic molecules of life and the non-linear fractal structures of complex molecules, including proteins and nucleic acids, organelles, cells, tissues and organisms as an interactive climax of cosmology.
3. **Biota:** The living biota are the centre of the existential cyclone of the climax of existence, because we exist at the interface of the physical and the experiential. All experience and manifestation of God(s), spirit beings, etherial or even purely physical phenomena arise through the conscious biota. None stands more pivotally in the cosmological manifestation than the biota and conscious life itself. Eternal consciousness is manifest through and only through the biota. This "worldly" existence IS cosmic existence becoming manifest. There is no greater heaven or hell than biospheric Paradise on the cosmic equator in space-time, mid-life in the history of the universe, as interactive Sigma rather than alpha or Omega as beginning and end states. Temporality and eternity are complementary perspectives. Through manifesting in space-time, consciousness is eternal.
4. **Quantum Reality:** The function of subjective conscious volition over the physical universe is to collapse the wave function of the quantum multiverse to bring about the phenomenon of history out of our multiple potential futures, through the autonomous conscious willing agency of the biota. Conscious experience is complementary to environmental uncertainty, ensuring the survival of the organism, ultimately due to quantum uncertainty in both brain dynamics and the physical universe. Conscious neurodynamics is thus a cosmological manifestation, not just a biological one. We are transformers of the universe and innovators, protectors and creators of the future and need to be prescient, compassionate and protective of the entire universe and all life within it. Subjectivity complements purely objective information processing in the brain, which is computationally insufficient to maintain life in the uncertain natural environment.
5. **Meaning:** The purpose and meaning of conscious life in the universe is so that the Cosmos, and ourselves as organisms, can come to know and realise ourselves ecstatically through each and all of us making the vision quest to discover ultimate nature of reality in upholding and protecting the evolving diversity of life, so that we and the living Cosmos can discover ourselves ever more deeply over cosmic time.
6. **Responsibility:** In coming to experience ultimate reality, we become personally responsible for every aspect of the fate of the universe and all life, both by our constructive, or destructive actions, and our negligence about or protective action to avoid existential threats we know as a species we are causing to the diversity and future of life as a whole. If we coexist in a world where there is mutually assured nuclear destruction, or human induced climate crisis, or a mass extinction of the diversity of life, we become personally culpable for failing to act with our lives to protect the future of life.
7. **Maturity:** We have, by our dire actions as a species, ceased to be children of Eden or adolescents of religion and have to learn to stand in the universe and on planet Earth as mature beings, taking full responsibility for our fate, as a people and as a biospheric species. We cannot assume to pray to higher powers to guide or direct us. The buck stops right here. We need to be compassionate of all living species and all sentient beings and plant the seeds of love in everyone's hearts, but there is no need for renunciation of worldly desires, or overcoming the grasping ego, or clinging to life itself, all of which are means to natural survival, because, as mortal beings, the only true meaning we can achieve in life is to give back to the diversity of life with our lives, to protect and assist its immortal flowering in abundance.
8. **Mortality:** To exist in the physical universe, the sheer complexity of life has to oppose entropic decay into the heat death characteristic of physical systems, forming a negentropic self-organising system we call the biosphere. But genetic replication is endlessly subject to the very mutations through which evolution occurs, shaped by natural and sexual selection. Eucaryote sexuality evolved genetic recombination between mother and father to avoid lethal parthenogenetic decay, in which only half our genes go to our offspring, creating organismic variety in fertilisation that avoids extinction but results in individual organismic mortality. This cannot be solved by hungering for eternal individual life of an organismic "soul", which is selfish in itself.

9. **Sentient Consciousness:** The emergence of conscious life as we know it arose in the eucaryote endosymbiosis between the two founding cellular life forms, archaea and bacteria through a topological transformation that freed the cell membrane from energy production through sequestering in the mitochondria, leaving the cell membrane free for quantum sentience and social signalling.
10. **Biospheric Symbiosis:** The biosphere rises to climax complexity through planetary symbiosis, in which the seeming conflicts between plants and animals, predators and prey and parasites and hosts act to avoid each rising to boom and bust extinction and encourage species diversity. Humanity as a dominant species can survive long-term only by full symbiosis with the biosphere on which we depend for our very existence.
11. **Sacramental Evolution:** The biospheric sacraments have evolved to be able to tweak the sappy biochemical brain to bring it into a more universal dynamic, underlying our conscious existence in a state of psychic realisation to ensure humanity as a dominant species understands its ultimate connection with and dependence on the diversity of life in the biosphere and will thus seek to protect it with our lives. With expert compassionate guidance and deep meditation, these can bring about full liberation from the round of birth and death in this lifetime.
12. **Moksha and Enlightenment:** Rather than seeking an illusory transcendent or eternal state through spiritual elitism, submitting to materialistic desires, or fragile technological utopias bound to Fermi self-extinction, the entheogens bring us into a symbiotic relationship with life as a whole, so that biospheric life can perennially survive in the immortal passage of the generations. Through sacramental and other deep meditation, we can escape the mortal round of birth and death to experience ultimate reality, in moksha, thus achieving and realising cosmic consciousness. This is the source of all ecstasy, happiness and fulfilment and opens the true discovery of the deepest conscious realms and for cosmic consciousness to emerge from deep organismic consciousness.
13. **Compassion:** The key to all life and wisdom is to be ever compassionate of the mortal coil, which is permeated, both by the ecstatic joy of conscious resplendent life and physical suffering and decay, because through the mortal coil, all the immortal wonders of existence, both corporal and etherial arise.

Resplendence is NOT a doctrinal religion: Outside these principles, there is no doctrine of what to believe, how to redeem reality, or what we must each do, or not do, to achieve enlightenment in resplendence. There is no moral imperative, as we cannot be autonomous transformative agents if we are under the social control of an overweening belief system. Resplendence "to shine forth brightly" liberates from Religio "to bind together". Resplendence is thus to liberate from religious and materialistic bondage, in autonomous free will, to transform reality and protect life.

The "religious" element of Resplendence is not to debate cosmology or philosophy of mind but to motivate us all to seek the redemption of what humanity has done to life itself before it is too late. You could think of this and ponder that it is somehow both a manifestation of how Jesus expressed his wild free spirit in the Gospel of Thomas as a visionary innovator and how Richard Feynman felt conceiving of QED. And maybe you can begin to get a glimmering of why I have up till now sought your company, as an exceedingly rare species of visionary who genuinely holds the future of life on this planet in the palm of my hand, if only one or two people begin to listen, and who knows no one else who really can do this good thing for life in this way. I repeat, the world and its biodiversity needs and justifies your support of my endeavour.

Dec 2021 Chris to Elaine Pagels: So, although 150 species become extinct every day, I've been working on this, there is still time to save the diversity of life. We CAN DO this! What other option could there be?

Elaine: Yes, you help us hold on to hope that we so much need! warmest wishes, Elaine

Apr 2022: The Christian church was invented by Paul and the Hellenistic influence sources to him. If you take the Gospel of Thomas on its own, there is only vestigial reference to sacrifice and no reference to Jesus returning in the day of judgment. In fact he says the Kingdom is already here but men don't see it even when he is talking about the dead: "*When will the repose of the dead come about, and when will the new world come?*" — "*What you look forward to has already come, but you do not recognise it.*" So we have two scenarios: (1) Jesus was a brilliant innovator who tried to bring all the traditions together in a (confused) conflation of the Zoroastrian end of days, Hebrew religion and the sacrifice of the fertility God. (2) Paul reinvented the entire end of days using Jesus' mission as a cipher to weave a Hellenistic myth of the super-human saviour sacrificed by God to return as the Saoshyant [then cemented in the canonical gospels]. Of course I have to go ahead to the ends of the Earth to save humanity and the diversity of life. But now I have had to exorcise and expose the whole question of religious integrity. What was the meaning of pronouncing the epoch of the Tree of Life in Jerusalem in the Millennium on the basis the Christianity was in some sense a true tradition, only to realise its deep and diabolical sacrificial basis is contrived?

Elaine: Yes, you do need to go to the ends of the earth to save humanity (your name requires it of you, yes?)

Aug 2023 To James Tabor This is an open letter to you. I've cc'd it to Elaine Pagels as well, because we have had a few exchanges over the years and I value her opinion and experience a great deal, as she knows!

I have on my bookshelf your work "Restoring Abrahamic Faith", (Tabor 1991) which you kindly sent me a signed copy of in Feb 2010. You may have sent it, having seen the picture of Jane and myself in "Living Religions" and sent me the book from Genesis2000 in echo of our Genesis of Eden. I also sent you the June 2023 version of Symbiotic Existential Cosmology, which has become the pivot of the current unveiling.

You may remember that I wrote asking you about the origin of the Eucharistic flesh and blood. I have long thought of your statement that it was Paul in a vision (1 Corinthians 11), who had originally pronounced the notion of the Eucharist as the soma and sangre of Christ, not Jesus himself, as in the redacted versions in the Gospels, leading to the cannibalistic notion that without the shedding of blood, there is no remission of sin.

So I turned to your book out of the blue and realised that the import of its title "Restoring Abrahamic Faith" is encapsulated in the chapter on the messiahs, because this is where the contrasting personae of the messiah in the end of days, one a Christian destiny, locked as it is by Paul to Jesus as a Hellenistic Judaic supernatural avenging Lord, diverging fundamentally from the Jewish mashiach, looking instead to a human saviour of Zion, in long-term future goodness, and hence that the book is attempting to conceive of the messiah in the whole wider Hebrew "mother" tradition – in restoring Abrahamic, rather than merely Christian faith.

Your chapter ends with these two sentences:

"Both Christians and Jews will likely be surprised by the Messiah. In other words, he will probably not conform to anyone's expectations. ... One thing is certain when the Messiah comes, whoever he turns out to be, he will uphold these essential teachings of scripture. Can we do anything less?"

This may have been the basis of your originally sending me your book, because Jane's and my vigil to reflower the Tree of Life was highlighted in Mary Fisher's (2002) "Living Religions", portrayed as "Jewish Renewal":

"Contemporary Jewish renewal is not just an absence of fear. It is an active search for personal meaning in the ancient rituals and scriptures, and the creation of new rituals for our times. ... From highly conservative to highly liberal quarters, there are now attempts to renew the ancient messianic ideal of Judaism, that by its practice, the world might be healed."

Now this is both true and an unexpected twist of fate, because we did celebrate the millennium as the collective mashiach, with liberal Jews, and others, culminating in Eliyahu blowing the shofar, and pronouncing:

"We are here together the collective Mashiach and our vision here tonight will spread peace in our hearts and peace on the City of Peace below Yeru-shalom Jerusalem, and bisrata shem in Jah Allah, we'll be as a light and a source for peace in the whole world and in the whole universe".

Jane and I had earlier in the evening pronounced the unveiling anointing of all, in the names of God and Gaia (Ruether 1992), a version of Isaiah 61 in the shadows of Yeshua's Nazareth anointing:

*The spirit of God is upon us, the spirit of Gaia is within us
because they hath anointed us, to sing good tidings unto the meek ...*

weaving in a progression of Yeshua's twist concerning Naaman the Syrian and the Widow of Sidon ...

*to appoint unto them that mourn in Zion
in Palestine, in Sidon, in Syria, Arabia and the world*

completing with reflowering the Earth in the sacred reunion ...

*that they might be called trees of compassion
the planting of the divine, that all might be glorified in the abundance of wisdom
and we shall renew the old wastes and we shall restore the former desolations
and we shall repair the waste cities, the desolations of many generations
they hath clothed us with the garments of salvation
and I as a bridegroom decketh myself with ornaments, and I as a bride adorneth myself with jewels
for as the Earth bringeth forth her bud, and as the garden causeth the things that are sewn in it to spring forth
so shall harmony and fulfilment spring forth among all the nations
this day is this scripture fulfilled in your ears.*

This changes the emphasis, from preach to sing, from righteousness to compassion. It's we, not they, that renew the old wastes, and it's the female and the male together both anointing and anointed, for the harmony and fulfilment of all, in wisdom (*hochmah*).

While Jews will see in this passage the Jubilee, it is clear that Yeshua's sermon in Nazareth is portrayed as a direct messianic claim that breaches the Hebrew covenant, causing the crowd to seek him out to kill him, as it is with our rite of passage on Millennium Eve – an innocent pass, with tumultuous implications.

And all they in the synagogue, when they heard these things, were filled with wrath, And rose up, and thrust him out of the city, and led him unto the brow of the hill whereon their city was built, that they might cast him down headlong. But he passing through the midst of them went his way.

However I am not a practising Jew, but a circumcised gentile who claims to be the root Jewish "thief in the night" due to my preemptive circumcision. In fact I had no idea of the full dimensions of the Jewish messiah until shortly before I departed on our millennial sabbatical vigil to the Amazon and Jerusalem. Before I left, I intentionally took a single teaching at the liberal Jewish congregation here. When I arrived, the rabbi revealed this was to be on the messiah, and duly expounded that the concept of the Christ, Mashiach or 'anointed one' in the Jewish tradition is a living human being who brings about an epoch of long-term future goodness. As well as healing the Eucharist and reflowering the Tree of Life, I am thus taking Christianity back into the Hebrew fold of long term future goodness.

However, the true picture of this undertaking runs much deeper into the evolution of conscious life in the universe. I have not come to destroy the law, or the prophets, but to fulfil, in a surprising karmic way just as you described above. It is centrally to heal apocalypse. Not the all-too genocidal political apocalypse that the siege of Jerusalem proved to be in CE 66, in which 1.1 million people are said by Hugh Schonfield (1965) to have died, but a devastatingly deadly planetary apocalypse of life in the third millennium due to accidental or intentional mutually assured nuclear destruction, accumulating climate crisis, and the mass extinction of biodiversity, in turn, risking atrophy or extinction of the human species and with it, all our spiritual and cultural traditions.

Hence, when I say I am come to fulfil, it is fulfilling the immortality of the diversity of life throughout our generations and throughout the universe, not just our cultural or religious traditions. This in the light of my moksha epiphany in 2021, in which my atman merged briefly with Brahman, like Moses watching the burning bush, who intimated in silent compassion that I should return to the mortal coil because this is the centre of the cyclone where reality is really born, and it is my sacred duty to save life throughout the universe, because if life ceases to exist due to human misadventure, all meaning in the galaxy could be lost forever, because eternal ultimate reality, or the 'Elohim if you prefer, can be realised only through incarnate life experiencing it. Otherwise even eternal cosmic consciousness becomes as vulnerable as we are, as mortal incarnate organisms.

This, I believe you can understand, is the fulfilment of the epoch of long-term future goodness the Hebrew messianic tradition actually aspires to. So the rites of passage we performed in the spirit of Yeshua's sermon in Nazareth, when he escaped through the crowd seeking to throw him off the cliffs for blasphemy were threefold: to **unfold the promised epoch of the Tree of Life**, throw **open the Gates of Compassion** to all spiritual traditions and celebrate **the Hieros Gamos of woman and man in the Song of Songs**. Man cannot survive on religion alone, so I see this as the correct therapeutic remedy, so that conscious meaning survives in the universe at large.

When I set forth on the millennial journey to the Amazon and Jerusalem, it was to save the diversity of life on our planet so that our species can also survive and avoid a Fermi extinction due to human misadventure. I had had a vision in the 1980s, as an entheogenic practitioner that if the world did not make a decisive move to save the tree of living diversity by the year 2000, I should go to Jerusalem and pronounce the unveiling, in consummation of reflowering the Tree of Life, hidden since the "foundation of the world" in Eden.

This was giving the world a good 15 year chance for either our collective social conscience, or some genius "messiah", to step up and deliver the redemption. As no solution in sight emerged, I duly planned and managed to secure an academic sabbatical to research the holocaust of living diversity in the Amazon burning season, culminating in an invitation to hold a 12-day workshop hosted by Yitzhak Hayutman, a grand-son of one of the founders of Tel Aviv at the Academy of Jerusalem.

In turn, Jane and I duly fulfilled this quest, from the Andes to the Amazon and through Europe to Jerusalem, ending paying my respects to Kali in Varanasi, as described in Symbiotic Existential Cosmology.

But now, the same dilemma remains. Just as I waited 15 years for the world to resolve its misadventure, without my idiosyncratic help, so I wait now 23 years closer to the edge with no remedy in sight and no other hero or heroine to invoke the unveiling. The lesson in 2000 was the inability of the three monotheistic religions to come to protect the epoch of the Tree of Life and I had to look pragmatically at this failure of stewardship and make a subtle intervention to record key rites of passage of renewal as renewal of the spiritual epoch. The same thing now applies to the entheogenic moksha epiphany, which has become overt because of the evolution in psychedelic research, in which psychedelics have been scientifically found to be redemptive of the mortal coil, so the stable doors of repression have been thrown off their hinges and the genie horse of the visionary condition has escaped into scientific recognition.

This vision draws together multiple spiritual traditions, fulfilling the sacramental tradition in biospheric illumination, the messianic tradition in unfolding the epoch of long-term immortal paradise, and the Upanishadic tradition in entheogenic moksha in a classic near-death meeting of Brahman and atman and primordially, in the oldest tradition of animistic shamanism that lies at the foundation of the mystical numinous and all religious traditions. I can't seriously neglect this responsibility, because I don't see anyone on the horizon who can relieve me of this and time is of the essence and I am already past my three score years and ten.

The whole of my incarnation is a karmic test. On Christmas Day 1944 the first radiated plutonium slugs began to roll out of Hanford, signalling the real beginning of the apocalyptic age of Planet Earth. Twelfth night, I was born Chris King on the Epiphany 1945, just as the first shipments of plutonium rolled out of Hanford for Trinity and Nagasaki, later that year, so I am the offspring of nuclear holocaust, graphically expressed by Michael Ortiz Hill (1994), in "Dreaming the End of the World: Apocalypse as a rite of Passage", in describing the first words following the Trinity test. To me karma is not a moral question, but a reality of the living quantum universe. By contrast, I ascribe to Richard Alexander's view of morality as a product of sociobiology in intelligent strategically-bluffing societies to achieve inter-social dominance by intra-social cooperation enforced by altruistic punishment. But karma is something I have to live with and accept, as a prime motivation to heal when there is no other avenue in sight.

Symbiotic Existential Cosmology is designed as a scientific cosmology which includes primal subjectivity as the existential part. It extols symbiosis as the full natural expression of what religions call spirituality in physical, biological, and conscious terms. It is also a living Logos of my personal vision quest to discover the foundations of reality, but it is not a nascent religion, but a consensual democratic way for all of us to reflower nature and discover ultimate reality together, no longer knowing only in part, but knowing also as we are known, as one is to one, face to face, no longer through a glass darkly.

Its key tenets are:

- (1) That subjective consciousness is primary, as in the Upanishads, but the universe is necessary to our conscious biological survival and immortal fulfilment.
- (2) That subjective consciousness has efficacy of volition over the physical universe, opening up the foundations of innovative spirituality to physical nature and our ability to take full responsibility for our actions, as criminal and corporate law on intent asserts.
- (3) That the universe rises to climax conscious diversity in planetary symbiosis on the cosmic equator in space-time.

And it takes a huge leaf out of Yeshua's book, as the controversial and even blasphemous figure, trying to provoke apocalypse by spanning all the near Eastern traditions, from Dionysian miracles, through the fertility religion of the women of Galilee who gave unto him our of their very substance, anointed by a woman to his doom, as was Dumuzi, and finally both the Hebrew and Gnostic traditions, as the Sermon of the Mount and the Gospel of Didymos Judas Thomas, demonstrate.

So if you think about it, since you already prefigured this, would you expect anything less than the impossible quest of a mathematical chaos theorist and wilderness mystic, carrying the entheogenic sacraments of the biosphere out of left field to fulfil the true eucharist of life, amid renewing the old wastes in the planting of the divine, so that all might be glorified in the abundance of wisdom, when the world is faced by ongoing potential nuclear annihilation, climate crisis entering tipping point whiplash, the frank mass extinction of biodiversity, particularly of the land mammals and the self-mechanisation of AI takeover of our very essential being? But this means it extends beyond cultural theism, to

ourselves becoming the visionary guardians of life unfolding, with subjective conscious efficacy over the physical world, invoking the full root mystical and spiritual natures of reality in climax living cosmology. This shouldn't be a shock because the Upanishads already conceive of reality either as personae in the 'Elohim Ishvara/Ishvari, or as meeting ultimate reality in the atman in cosmological symbiosis with Brahman.

I am doing this good thing regardless, but I realistically can't and shouldn't do it alone. I want to do it as Lao Tsu would. A mashiach doesn't have to be a religious leader, just provide the therapeutic avenue to world redemption. That's why Symbiotic Existential Cosmology is a resilient scientific Logos that marks out the Tao as a vision quest, but not any kind of religion, or we will never come of cosmic age and take astute responsibility for our fates. It's the full apocalypse, as a psychopomp marking safe passage in our mortal journey across the Styx, in the fulfilment of life as a whole, perennially throughout our generations amen. It's not a lesser Revelation. It is the gift of life itself. I don't ask anyone to believe in me, but simply to understand that the remedy is true redemption.

But let's look for a minute at the naked realities. Paul converted Jesus into a supernatural Dionysian figure of Hellenistic Judaism, and Revelation exploded his persona into a vengeful Lord of triage and genocide of life that no conceivable flesh and blood messiah can achieve, as a means to enforce the rule of Christ on Earth for ever and a day, when, as Elaine and others have noted, Jesus claimed return in power in the same generation as those who stood before him, never materialised. Equally unlikely is that notion of the Jewish state appointing a sacred king as messiah, so we have to consider the wider and deeper view we are facing of planetary cultural instability and an apocalyptic Fermi extinction caused by humanity itself.

We need to be practical and ask what the world really needs here, and it is clear as a bell that we are flying blind like a moth into the candle flame of a Fermi planetary extinction because humanity is unable, without help, to avoid irreversibly damaging the biosphere and precipitating our own extinction. This urgently needs compassionate healing to get us safely across the Styx so that the epoch of the Tree of Life can reflower and unfold in conscious immanence and transcendence in symbiosis with natural climax.

We need to take serious note of Yeshua's own view of his intrepid voyage, bearing in mind that as history tells it, he brought annihilation upon himself and that, although his apocalyptic visions appeared to be more than fulfilled in CE 66, he failed to return to complete the assignment.

"I took my place in the midst of the world, and I appeared to them in flesh. I found all of them intoxicated; found none of them thirsty. And my soul became afflicted for the sons of men, because they are blind in their hearts and do not have sight; for empty they came into the world, and empty too they seek to leave the world. But for the moment they are intoxicated. When they shake off their wine, then they will repent."

This is going to have to take some very level-headed assessment from astute human beings. If we are going to sacrifice the messianic tradition of healing apocalypse in long-term future goodness, do we have the ability to save the planet from ourselves without it? Would it be better to dispense with monotheism entirely, and would we then be able to put nuclear, climate and biodiversity self-destruction behind us on humanistic grounds of survival alone? Or do we need the visionary insight of apocalypse because otherwise, business-as-usual and populist politics and strong-man tactics will cause an inevitable tragedy of the commons? Or has karma in its own weird singular way, like the very evolution of the entheogens, given us this short, dangerous visionary way through to paradise on the cosmic equator, by realising ourselves and adopting natural messianism as a healing conscience to reflower life again on Earth and survive for another one to a hundred million years in natural abundance, rather than the triple witching hours of stock futures, nuclear hair triggers, climatic tipping points and habitat desecration?

So James, what sayest thou? Did I mention anywhere that this would be easy?

James: Thanks for this Chris ... I am totally under water with some hard publishing deadlines and a round of conferences and papers into the Fall, so can't give this much time right now now ... this is long and complex ...

Chris: Many thanks for the quick reply and for your astute consideration! We are living in a very fragile world. Time is critically of the essence and life is at stake. We all need to take responsibility for the situation in which we actually find ourselves. This prospect is not easy to evade with integrity for any of us. It's a root challenge to the zeitgeist, but please take it seriously.

Deepak Chopra: All perception is convenient magical lies - illusion. EEG, fMRI are sophisticated illusions, as is our body mind and universe.

Grant Gillett: But very handy to stop one getting hit by cars or other large objects.

Deepak: Car, body, pain, birth, death all entangled illusions. Agree that we should be careful in body and care illusions to avoid illusion of death. Awareness as formless being is beyond illusions of both and death. I would however love to upgrade the illusion of separate mind causing war, injustice, climate change and possible extinction of the dreamscape. ... I maintain what I said all perception is "convenient" magical lies. Perception hides the truth to maintain the survival of species. Biology is an experience in non local awareness. In pure consciousness, biology is spontaneously self regulating as homeostasis.

Chris: Biology is NOT just an experience in non-local awareness, it's our very incarnate embodiment as living organisms. The universe is not either. Biology is not just a homeostat like a simple thermostat seeking fixed conditions. This is trivialising evolutionary biology and it's creative, innovative capacity.

We agree on pure physicalism being inadequate but:

- (1) A complete somersault volte face from pure physicalism to pure mentalism is not a paradigm shift and it's not original or a new discovery. It's not even a revolution, but a cop out to ancient doctrine without any new insight. Neither Vedanta nor Creationist ideas solve this in a way which protects the status of life upon which our existence depends. Symbiotic Existential Cosmology is NOT physicalist and IS the middle way. That IS a paradigm shift that you can't even begin to disentangle.
- (2) The two solutions are toxic to the sanctity of life because they don't even count life in your vision of perception as simply an illusion to keep the species alive.
 - (a) Appealing to full blown primordial cosmic consciousness is nowhere near a solution and its NOT a paradigm shift at all because it dates from 3000 years ago. It has no details and no content except for a limited belief in samadhi as a route to ultimate reality endlessly postponed by cycles of reincarnation.
 - (b) Appealing to creationism in the false identities of intelligent design or "holism" simply doesn't provide an explanation. It leads to a sterile designed state of the universe with no consciousness, creativity or visionary capacity – just a designed object. Because design is manufactural. It's not even physical just a slave of the notion of technology and manufacture.

Put simply, mind-only, or consciousness-only, or God-created pseudo-cosmologies are just as toxic to life as hard core physicalism.

Deepak Chopra: Chris Sorry Not explaining anymore Try Samadhi if you haven't. Animals have awareness as do bacteria and plants - anything that is sentient by definition. However they all differentiate from pure consciousness. The difference between us and other sentient beings is our desire for self knowledge and wisdom. That's the prevailing opinion. I'm not a scholar but a serious student of yoga not just theory but daily practices for last 40 years up to 4 hours daily. At 77 years have not missed a single day.

Chris: I want to make clear how this Vedic dialogue about consciousness is incorrect cosmology and destructive to the cosmological role of life in the conscious universe.

Symbiotic Existential Cosmology has three components: (1) **Cosmology** because it is a scientific description of the natural universe, (2) **Existential** because it fully incorporates interactive subjective consciousness into the cosmic description and (3) **Symbiotic** because it correctly describes the central role of life, the biota and the biosphere in supporting subjective consciousness in the physical universe as a climax crowning cosmological manifestation of existence, over cosmological time scales. It does this based on a huge amount of empirical data spanning the sciences and fully opens the subjective vision quest that is at the mystical foundation of both Vedanta and Monotheism. It is not something you can reduce to a notion in samadhi, as a hearsay account, however long you have been doing yoga or believing in creation.

Life has emerged late in the evolution of the universe and requires multiple kinds of supernovae and neutron star collisions and novae to make the chemical elements and the elements of life. Everything we see in this shows for example that the generation of organic molecules up to amino acids is a cosmological phenomenon, as well as well as accompanying minerals like olivine that appear to be pivotal in the lost city vents providing the metabolic substrate for biogenesis. The evolution of life has proceeded on Earth for about a third of the universe's lifetime of around 13 bya

from 3.6 bya ago within a few hundred million years of Earth's formation and the condensation of liquid oceans and has taken a full third of the universe's lifetime to get to humanity and the present planetary crisis that risks human and biospheric extinction on evolutionary time scales due to a Fermi self-extinction from cultural instability.

Vedanta tries to claim a cosmological basis for fully fledged cosmic consciousness as ultimate reality that created the physical universe out of itself. Monotheism claims that the universe is a creation of an omniscient, omnipotent god that issued a logos command: "Let there be light" and "there was light". We know these accounts lack even the most basic elements of empirical biological validity. The Sabbatical creation in six days has the creation all out of order, with the plants arising before the solar system and the aquatic and land animals equally out of natural sequence. Vedanta and Buddhism see all living organisms as simply sentient conscious beings, and in the face of the inability of samadhi to reliably produce full visionary moksha, retreat into the notion of reincarnation, in which there is no recognition of living species and in which a selfish egotistical person can be reincarnated as a mosquito, or even as a malaria plasmodium, in a false moral cosmology.

In Vedanta, this has arisen from Upanishadic meditation producing states of subjective samadhi that the rishis, in realising that from birth they had known only subjective consciousness, was then claimed to be the very basis of the physical world around us. The first premise was correct as we all know this is the case – that 100% of our experience is subjective and that we infer the physical universe collectively through our experiences of it. The rishis should also have recognised that they are biological organisms, who die if they are cut or hit and taken much more interest in the diversity of life around them. But then the rishis extended the obvious realities of subjective existence into an eternal account of cosmic consciousness ruling and creating the universe, in much the same way as their Aryan roots in Monotheism. Both these cosmologies have no evidential basis and are simply patriarchal illusions that deny the ultimate sanctity of life itself and our long-term survival as a living species.

Both Vedanta and Monotheism are false cosmologies, because, unlike the living universe, which has risen to biological biospheric climax in life and consciousness, they both run down hill into a destructive chaos no better than physical entropy. Vedanta and Buddhism both end up in epochs of decline and destruction typified by the Kali Yuga and Samvartakalpa. Monotheism ends up in an Armageddon in which the entire living Earth is destroyed to hold all humans to account in a day of Judgment resulting in starkly divided heaven and hell realms. What is clear in both these accounts is that the central phenomenon and manifestation of conscious existence, we know as biological life is held captive hostage to degenerate cosmological notions of a consciousness which starts out fully powerful and aware and then descends, because of a false morality of divine order and obedience, to cosmic war and destruction of all life within it.

These grim realities are no better than Bertrand Russel's stark vision of physicalist demise: "*Such in outline, but even more purposeless, more devoid of meaning is the world which science presents for our belief. Amid such a world, if anywhere, our ideals henceforward must find a home. That man is the product of causes that had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and his beliefs, are but the outcome of accidental collocations of atoms*".

We as living subjectively conscious biological organisms need urgently to come to terms with what our role and meaning is in the conscious living universe. Neither physicalism nor Vedanta nor Monotheism are fit for purpose.

Vedanta poses a unique threat to the sanctity of life, for the very reason that it claims the entire physical universe was generated through a fully complete, ultimately powerful cosmic consciousness that generated the entire universe without any recourse at all to the biological existence we find ourselves in and having to come to terms with. This is a cosmological short circuit because it makes an a priori claim to an absolute consciousness that can create the entire physical universe, from individual quanta to black holes, without needing any form of life at all. There is no meaning or remote sense to any of this and it does NOT provide an explanation of anything. Why would such a complete existential cosmic consciousness make a universe that is endlessly running down into Kali Yuga full of individual egos that are struggling through endless reincarnating lifetimes to get back to the state cosmic consciousness was already in in the first place? The tantric creation has a different story in which male consciousness and female embodiment became ever more separated, but the notion of a pure conscious creation is denial of this sexual complementation, which arose later in history.

Vedanta is effectively cutting biological life completely out of the loop in a cosmic picture leaving only an objective universe propelled by a degenerated form of cosmic consciousness that Deepak decries as ego-consciousness, with the mind-brain as a mere object, which is in an endless failing struggle to get back to square one.

We simply can't afford to separate life from consciousness in this way. It's the worst form of cosmological schizophrenia.

Symbiotic Existential Cosmology is the middle way because it accepts all of empirical science as an account of the natural universe, and complements it with full subjectivity fully interactive with the physical universe and creatively unfolding it both in the evolution of life and in our subjective vision quest restoring our root creative meaning in existence of life, the universe and everything. And it realises in the symbiotic biosphere how subjective and objective aspects of cosmic reality rise to climax at the creative edge of chaos rather than simply competitive survival of the fittest, so it invokes the Tree of Life in the full unfolding of cosmic consciousness in real time.

Why can't you see and understand this all came from a moksha experience of meeting ultimate reality and being tasked with saving life throughout the universe so that cosmic consciousness itself can continue to survive. It's that simple. It's the remedy. It's the therapy. It's our living quest fulfilled. It's the corner stone the builders of Vedanta and Monotheism ignored, leaving a universe in ruins!!!!

Deepak claims authority by saying he is 77, so should I claim higher authority because I am 78?

All I can do is give you life unfolding. It's up to you all to protect it.

I am not going to be here forever, so please heed my words while life still lies vulnerable before us!!!!

Kashyap: I do not have any favorite model for consciousness, either scientific or nonscientific. I am hoping that neuroscience will understand it, but most likely it will not be in my lifetime!!! Anyway, cosmology I know uses just straight principles of physics. This has nothing to say about consciousness. Vedas and Upanishads are fine with me for their spiritual message. I doubt if we can learn much science from them!

Deepak: All the best. I have nothing to say. I'm not a scholar. I only speak from my experience. As a person I have no fixed identity. All identities seem provisional to me other than pure consciousness differentiating into all identities. I AM That

Chris: Deepak, nice to see you reply, but you simply haven't given any clear idea of the role of the diversity of life in your cosmic picture. I want to be your comrade in love, but you are taking a needlessly casual deconstructive position.

You quoted this: "I maintain what I said all perception is "convenient" magical lies. Perception hides the truth to maintain the survival of species".

This looks like it is coming straight from an interview with Don Hoffman on "Against Reality". Don is correct that our perception is an evolved internal model of reality, just as a cat's olive-shaped pupils are an adaption to night time hunting, but our perception is enhanced reality in full colour, 3D and size preserved transformations that preserve corporeal integrity. It is NOT an illusion but super realism – i.e. surrealism. The universe outside has no colour and is just collections of fundamental particles.

But you are turning it into a pre-emptive attack on nature as illusion, as if we shouldn't be taking care to survive at all. This raises lots of very thorny issues for your perspective. If you are saying perception is a lie to maintain the species, it implies your view of cosmic consciousness doesn't give a damn about whether species live or die because it's all cosmic consciousness anyway. You are a biological organism and a doctor, so this is a travesty of the Hippocratic oath to preserve human life.

You also treat all organisms without distinction, as simply sentient beings, without species, genetic or ecological meaning: "Animals have awareness as do bacteria and plants - anything that is sentient by definition". But nature rises to teeming symbiotic climax in the biosphere, not just colourless indistinguishable sentient beings. You then

immediately cite human superiority over nature: "The difference between us and other sentient beings is our desire for self knowledge and wisdom." Well that's news, so let's look at how you handle nuclear crisis.

Fig 292b: 5-11-23 The Israeli prime minister, Benjamin Netanyahu, has disciplined a junior member of his cabinet who appeared to voice openness to the idea of Israel carrying out a nuclear strike on Gaza. Netanyahu's office said in a statement that the minister concerned – heritage minister Amihai Eliyahu from a far-right party in the coalition government – had been suspended from cabinet meetings "until further notice". Asked in a radio interview about a hypothetical nuclear option, Eliyahu replied: "That's one way." His remark made headlines in Arab media and scandalised mainstream Israeli broadcasters.



Chris: When I originally formed the Resplendence group, *resplendere* to "shine forth" rather than *religio* "to bind together", it was to act directly save the planet from biodiversity extinction and nuclear holocaust, but then Ukraine happened and the pre-emptive nuclear threat from Russia, so it went on the back burner and I spent two years writing Symbiotic Existential Cosmology which is now, with the central thesis, as complete as it is going to be. Look at this little dousie! Do you all want our species to survive or not?

Deepak: Maybe homo sapiens is the most interesting evolutionary experiment that didn't work. There are 2 trillion galaxies, 700 sextillion stars and uncountable trillions of planets in the collective dreamscape! We are not even a speck of dust in the junkyard of infinity. We evolved as a result of the extinction of Dinosaurs. Nature may have another experiment in mind. Relax.

Chris: This is profoundly irresponsible. To allow nuclear holocaust, or to destroy the diversity of the biosphere, or even to mention it casually is disinformation that leads to human irresponsibility, NOT wisdom. That's the reason to act Deepak! Don't cast lots on the garments of the universe in vain hope when we have the holy grail of life before us. The original Yeshua said "*The Kingdom lies before you, but men do not see it.*"

The only way I can act to plant the seed is as the messiah of living diversity and try to bring a modicum of compassionate common sense to the people of this planet. I can do this good thing, but only with your good support. The messianic tradition is not religious superstition, it's karma speaking through individuals. I do have the karmic connection. On Christmas day 1944 plutonium production for Trinity and Nagasaki began at Hanford. I was born Chris King on the Epiphany 1945. I have a duty to fulfil.

The key to saving humanity is to have your finger on the pulse like a good doctor, rather than on the trigger. I have the remedy, which is to save the life of this blue green planet now for our future generations to survive. The mushroom is a catalyst that does not involve religious belief, but is a product of the evolving biosphere to make it all possible.

I know it's a paradox, but through this we ALL become saviours!

Deepak: Chris How do you treat collective insanity and diabolical science based on subject object split?

Chris: You know the answer Deepak! Collective insanity is samsara! It's unstable delusion! But underneath, everyone wants to survive and become whole, and we yearn for relief! So collective insanity is like the false inflationary vacuum that collapsed, causing the Big Bang that made this whole shebang!. Resplendence is the light of sanity that shines forth, through us coming to our senses in light relief. You are doing a very good job right now by playing the joker.

Dan Levine: Chris, I am with you all the way. As for my karma: my honeymoon consisted of a 10-day car trip from Los Angeles (where my wife lived before marriage) to Pittsburgh (where I had a job at the time), via the Grand Canyon, Petrified Forest, and Santa Fe. Toward the end we stayed with in-laws in Oak Ridge, Tennessee, and they took us to see a community theatre performing *Man of La Mancha*, the musical based on *Don Quixote*. The song in that musical summed up why I have devoted my academic life and writing to the pursuit of understanding, and eventually dealing with, the science of the roots of meaning, empathy, and their absence.

Joshua Davis (2009): Chris and others are calling people to participate in this collective messianic adventure. It seems to me that the readers and recipients of such a call ought to consider this call very carefully.

Deepak: Academics with Ph.D. Nobel Laureates etc have contributed a lot to human comfort and made modern living possible. They have also contributed to diabolical technologies including nuclear weapons and modern warfare and climate change and chronic diseases. Human extinction and extinction of life on this planet will be the gift of diabolical science.

Kashyap Vasavada: What you mention is the usual question “how to prevent misuse of science”. Neither Oppenheimer nor any scientist including poor me, have an answer for this question. Laws of science are same whether you use them for construction or destruction. There is one other point. This is not a recent problem. Since the day the human race arose, there have been endless fights for possession of territory. The tribe which had better weapons usually won. In Mahabharat war some 100,000 people were killed with bows and arrows. That was a very large fraction of population of North India in those days. In fact Krishna told Arjun repeatedly that it was his duty to fight to save Dharma. Of course the big difference between that time and today is the massive destructive power of nuclear weapons. But is it our duty to help Ukraine and Israel which could result in nuclear war? Do you have answer for that? I do not have!

Chris: The problem is due to males controlling the tokens of institutional culture and ignoring existential risks of annihilation because this is how males have always survived and reproduced. Mutually assured destruction is the logical end game of paternity uncertainty in which men risk death to reproduce and control women with lethal force to achieve it. It has been reinforced by religion so both Ukraine and even more Israel has a religious dimension of Zealous zionism facing utopian claims that Islam is here to dominate the Earth in the name of God. This is the ultimate alpha male delusion.

You men simply don't understand that women are fundamentally different because they give birth and have to invest their lives in the future generations. The females are truly the immortal sex because the cytoplasm is purely maternal and that is the mother liquor of life. They make much better long term investments than men, although we know about Indira Ghandi and Margaret Thatcher. Paternity uncertainty results in a male strategy of mortal vulnerability and lethal risks to dominate and reproduce because they can't do it on their own. Consequently, men have controlled women since 10,000 years ago e.g. under pain of stoning, FGM and suttee to control their reproductive choices. Women CEOs, even in so-called liberated societies, last only 2/3's as long as male CEOs because they are given poisoned chalice roles by chairmen of the board, so the glass ceiling has become the glass cliff (Tapper 2023).

Nancy du Tertre: Dead-on correct. I have often thought about ways to address this biological imperative that results in male aggression/wars. I believe soon the answer may come in the form of taking away the female exclusivity to give birth by tinkering with non-gender based and artificial Petrie dish births. This will result in less tension to fight for the female to perpetuate oneself/the species. And yes, with a few exceptions as you note, women do not think like men and find killing repulsive as a concept since their biological job is to protect and nurture life, not destroy it!

And, while we're on the topic, most of the aggression and competitiveness that goes on in these male-dominated Google groups, such as this, is an intellectual equivalent of war - kill the intellectual competition!! Aggression. You don't find that with groups of female colleagues.

Mike Pitman: Possibly you have no answer because the only answer, Kashyap, is morality and as you say, objective science doesn't 'do morals' or values of such kind. The issue is not scientific but ethical.

Chris: Patriarchal morality is the very source of the problem Mike! Legislating against abortion in the US on religious grounds is a key manifestation of religious patriarchy, not misuse of science. Ethics just brushes it under the carpet.

Mike: Nonsense, Chris. Killing is the problem. Where did the adult-to-be that's been killed in womb derive from?

Chris: Precisely Mike! You have type-cast yourself as a patriarch, just as I expected! Notice I said “on religious grounds” knowing you would fall in like a stone!

Women don't willingly terminate their own offspring. My partner was forced into an abortion because she didn't know if it was her then husband's or one of our her best friends. When she lamented the fact that her husband then ran off with several women, leaving her without child I offered to let her have a baby with myself and my wife, whether it was

mine or not. She is a wonderful loving adult daughter, that lives because her mother was forced into an abortion by a man unwilling to own possible responsibility because he was married!

Do you want me to expand on child death rates due to step fathers? And Nancy is right about male combat to the death in these groups.

Mike: OK since I'm male I can't help a patriarchal title thrust on me (by your agenda alone in my life) any more than a woman can a matriarchal. I'm not getting into the difficult, fraught, nuanced, emotional and personal areas of which you speak. That's for philosophers, politicians, psychologists and priests. I merely note that morality is a real issue. And that killing is killing. These are facts. So is the law of *karma* which (wo)men so at cost ignore. Whence does morality originate? You have failed, as usual to answer a germane question, in this case '**where did the adult-to-be that's been killed in womb derive from?**'

Cathy Reason: The same molecules which you imbibed in your Sunday lunch. I'll leave you to decide if that makes you a cannibal. By the way, I think so-called "anti-abortionism" should be called what it really is, which is coercive reproduction. It is morally indefensible under any circumstances, and no-one who advocates for it should be given the time of day.

Chris: I told you the answer to the germane question but you didn't comprehend it – the paternity in the case I quoted was uncertain and that caused my partner (before I met her) to have to fly to Australia to have an abortion at the behest of her lover who was also married. This is a common problem with fluid relationships. Women are meant to be the providers for the next generation but are treated like trophies by sexist men who often run for cover faced with parental responsibilities. It's called sewing wild oats! Actually the lover ended up never having their own children because his wife had had a back street abortion before he met her for fear of her parents and became infertile so he lost out as well. She died of alcoholism and their adopted daughter has ended up a meth addict. That's karma for you Mike but it's not moral! As I said, I gained a loving daughter out of this who would have never existed apart from my anti-patriarchal free-love ethics, so karma was on my side and cemented the extended family.

Even in the post-pill world, women have to have sex for social reasons, whether they like it or not and then become the victims of male-induced pregnancy. They are forced to be the risk takers, particularly in under-privileged communities, when it is the men driving the entire reproductive risk-taking and the planet to risk-taking nuclear and climatic demise.

Morality as we know it originated from the patriarchal control of religious and cultural institutions and the control of female reproductive choice. Morality is simply a prisoners' dilemma game inhibiting intra-social competition, under pain of punishment, to ensure inter-social dominance. Lethal in the case of stoning and lethal to conjugal joy in the case of FGM and prospectively lethal in the case of Suttee and bride burning.

Karma is the quantum universe in action, not moral law. Below is an example of patriarchal moral imperatives across Muslim cultures which is appalling but necessary to face. As shown in fig 134, Iran is literally shooting the eyes out of female protesters chanting "woman, life, freedom" and stockpiling nuclear resources as we speak. Is THIS morality at work, or just institutional male reproductive jealousy?

Kashyap: What I am saying is that the issue of war and weapons people use is a complex, tens of thousands or even millions of years old. Just calling it unethical will not solve the problem. ... Who is unethical, you the voter, politicians, military or the scientists?

Chris: You are looking through a physical view that sees it simply as an arms race, without any depth of understanding of human nature. Issues of ethics about democracy and cultural decisions exemplify the problem culture has defined, but human nature is absent in your description.

Mike: I meant where did humans come from? Like Kashyap, you stonewall on these issues because you 'know best'. So it must be all by chance. Many thousands (and rapidly increasing in number) of very well qualified biologists would dispute, by their interpretation of the facts, your view. And, if they are right?

Chris: Because you believe in creationism, you are looking through fundamentalistic glasses in denial of human origins and cultural versus biological evolution because you can't accept empirical biological science and pretend that "thousands of well-qualified biologists deny evolution, so you are in massive denial of empirical biology.

Joshua: These are precisely the kind of questions that can be addressed via the field of research of **The Science of Peace**. For example, if we can learn to achieve inner peace by practicing meditation, prayer and actions of kindness, would it be unethical to neglect such a learning process? So, voters, politicians, military people, artists, scientists and people in general, who neglect spiritual development and practices towards peace, are acting irresponsibly and unethically.

Chris: I can understand the desire to seek peace but it flies in the face of nature and it involves trying to graft pure spirituality onto a statue made of biological tissue with the head having no notion of long term survival of the body. A kind of metaphor for Biblical Daniel's statue with feet of clay. And what is peace going to do to deal with armed defectors? The peaceful naked Albigenses ended up throwing themselves into the bonfire at Carcassone!

You three men are all missing the picture because you are looking through different sets of falsely-tinted (biased) spectacles. Only Nancy and Cathy have a good grip on this problem. I have given an outline critique below of the ways each of you Kashyap, Mike and Yeshua are in error and in danger of resulting in stasis, or making matters worse rather than better. I'm doing this for SEC, not just for you all and its followed by the evidence of the human "Mark of Cain" on all of our genomes. You need to "get real" and read this very carefully if any discussion is going to further.

The empirical facts of human biological and cultural evolution, put in very simple terms are that (a) we evolved and emerged among the apes with a sexual investment strategy that shows intermediate similarities to both chimps (who live in alpha male troops maintaining hierarchical dominance) and bonobos (where the females retain ascendance and have a lot of vaginal-vaginal sex – 7 times as much as heterosexual sex – to maintain the female coalition) and falls part way in between these two, driven by female reproductive choice based on astute observation of male prowess and ability to responsibly father their children following a mammalian X-Y selection for intelligence.

The emergence of human culture and super-intelligence (Fielder & King 2004) occurred in a sexual Red Queen evolutionary race (Ridley 1993), in which neither the males nor the females had the upper hand in reproductive investment, in a pattern of astute female reproductive choice accompanied by mutual mate choice. The males put on shows of hunting genius, trading meat for sex and telling jokes round the camp fire, while the females chatted endlessly about their relationships while gathering 85% of the food, foraging together. Females have ecstatic orgasm and have concealed oestrus, so the males can't tell when they are fertile and instead menstruate visibly when they are NOT fertile. They have fatty enticing breasts and a neotenous babe-like physique, inviting non-stop social sex to promote human family bonding. The penis has grown large for female pleasure and lost the penis bone and sensitive spines, making human males more vulnerable to female arousal. There is plenty of evidence for a virtual sex-strike by the women who would twerk under the full moon, as the Sandawe are still reputed to do, and to refuse sex unless the men brought back fresh meat, as the San hottentots were forced to steal cattle over in the 19th century.

This went on until the neolithic around ten thousand years ago, when the males staged patriarchal cultural take-over. This is not about Darwin, but Dawkins and memes driving human culture, through sexual, moral and religious chauvinism. Male dominated clans committed genocide on neighbouring competing clans wiping out the males and abducting the women. The reproductive sex ratio fell from a historical 2 females to each reproducing male (because all fertile females can easily get pregnant, but only about half of men are successful) and rose astronomically to 17:1. This caused a precipitous trench in human Y-chromosome diversity, fig 133, which is the mark of Cain on the human genome. It led to patriarchal take over by the shepherd kings of the ancient planter Goddess in Sumeria and the Genghis Khan syndrome of extreme male hypergamy. 1 in 200 men still have a Genghis Y. This led in turn to patriarchal religious cultures, with the Hebrew "go forth and multiply" leading to the population crisis with Christian and Muslim and Hindu patriarchal control to outcompete one another by having more children, leading to war and the rumours of war between clashing civilisations as populations multiplied and competed for resources.

This shows that we can only solve climate crisis, biodiversity crisis and nuclear annihilation by correcting the patriarchal dominance of human sexual, cultural, religious and institutional culture. You can't do it by reinventing ethics of peace based on a morality that is already corrupted at its very source, or you will just repeat the mistakes of the last ten thousand years.

Mike: You have good points but are hung up on your own illusions. And you never answer any question! Break your habit just this once and tell us just how sex was able to evolve.

Chris: Sex is universal to both cellular and viral life. Transfer of whole genetic sequences is the most powerful form of sequentially-coordinated functional evolutionary mutation. It is highly non-random and far from equilibrium thermodynamically. Sex is sharing genetic information, rather than having to evolve it de novo, although it results in a contamination risk. Horizontal transfer preceded vertical inheritance in the founding progenote of loosely coupled genomes. Both bacteria and archaea have promiscuous interspecies sex, via viruses, phages, conjugation plasmids and other transposable elements. Horizontal transfer has continued in higher organisms too.

The origin of eucaryote meiotic sexuality is caught up in the eucaryotic origin, along with mitosis, both of whose origins remain speculative because all the evidence has been washed away by the sheer dominance of the eucaryotes themselves over all their predecessors. One interesting proposal is that the entire apparatus came from a large DNA virus with linear genomes that was also responsible for the transition from reverse transcriptase based RNA-DNA genomes to DNA-polymerase based genetics.

Meiotic sex in each parent contributing only half their genome to the child is the most altruistic end result of genetic evolution conceivable. But metazoan dyadic sperm-ovum sexuality is nevertheless a counterpoint interplay of sexually antagonistic co-evolution, as a prisoners' dilemma game, from which neither sex can escape, and so each tries in often diabolical ways on the male side, because his contribution is only the DNA of the sperm selfishly propagating its entire genome for the survival of its genes. So males seek to out-manoeuvre the other sex. Homo sapiens is no exception. Insects have notoriously exploitative male strategies, such as poisoning or injuring the females so they can't mate.

Because mammals have XY male and XX female sex chromosomal inheritance and give birth to live young, unlike birds with ZW females and ZZ males, where both sexes parent eggs, male mammals tend to specialise in sewing wild oats indiscriminately and risk-taking conflict in male-male reproductive battles, sometimes to the death, while females focus primarily on parenting the next generation and astute female reproductive choice. Hence only 3% of mammal species are socially monogamous and even those (including humans) are not genetically monogamous and have clandestine flings. In humans with massive single pregnancies and long child-rearing, this strategic asymmetry is at a relative extreme. XY inheritance gives human female choice a key role selecting smart resourceful partners because males are single X which selects strongly for a number of good X brain genes, fig 132. Consequently the variance of male intelligence is significantly higher than in females. Meiotic sexuality causes all organisms to be biologically mortal but endlessly varied. This results in a sexual red queen race between parasites and prey, so meiotic sex may be originally have been a defence by hosts against parasites, but it also avoids Muller's ratchet of parthenogenetic mutational decline. Even the oldest parthenogenetic rotifers use horizontal transfer to gain new genetic "blood".

Sperm-ovum sex is an express consequence of cosmic symmetry-breaking. The mandala of the symmetry-broken forces of nature gives rise to fractal molecules, among which are archetypal expressions of this symmetry-breaking. The symmetry-breaking is evident in sperm-ovum fertilisation in a similar way to the apparently universal basis of the use of cosmologically-abundant glutamate and GABA as in the Murchison meteorite as the primary excitatory and inhibitory neurotransmitters across the entire metazoa. Sperm-ovum fertilisation, fig 62b, evolved in single-celled eucaryotes as a symmetry-breaking to resolve destructive cytoplasmic warfare between the maternal and paternal mitochondria that could kill nearly all of them, so our energy batteries, the mitochondria and the primal cellularity and cytosol comes exclusively down the maternal line.

The single celled alga Chlamydomonas illustrates this phenomenon. Most of its life cycle it is haploid. It is only diploid when two haploid cells fuse. Fusion can only occur between a 'plus' type and a 'minus' type (which can be regarded as distinct male and female gametes) but both types have cytoplasm and cell organelles such as mitochondria and chloroplasts. When two Chlamydomonas cells undergo sexual reproduction, the haploid nuclei fuse, become diploid, undergo meiosis and become haploid again. Meanwhile, however, a 'war', or better, a genetic conflict breaks out. By means of restriction endonuclease enzymes, the mitochondria of one individual 'kill' the mitochondria of the second, whilst the chloroplasts of the second 'kill' the chloroplasts of the first. The process wipes out 95% of all chloroplasts of both types illustrating how destructive the process is.

Fungi get around the need for sperm-ovum symmetry-breaking by using conjugation where only the DNA is exchanged so they can have up to 20 different sexual mating types depending on sex determining genes in the different strains.

Joshua: Chris, I wish words like ethical, unethical, moral and immoral were less superficial, trickier, immoral and unethical, and since I am aware of your observations, the only words that come to heart and mind are: I AM the source of all ethics, the cosmic ethics, I AM I AM the source of all Peace, I AM

Chris: I agree with you about the subjective principle of messianism which involves: (1) the mystically awakened subject realising that they have within their consciousness the unveiling of reality and (2) the responsibility to communicate this to the world as a redemption of the existential crisis, because any one awakened being can become the vehicle of salvation.

This is not just a product of Zion, but an archetypal stream that Jung and Joseph Campbell have well described in “The Masks of God” that show the returning hero, in all his often tragic personae, from Orpheus, thorough Adonis to Tammuz-Dumuzi, to Dionysus, to Krishna and Shiva, to David and Solomon and on to Jesus. They are the avatars of the heroic male, throwing open the doors of perception and fulfilling the karmic cosmos in the great unveiling. Qualifying this as a figment of patriarchal illusion is not to deny Brahman, or moksha, or the spiritual noosphere, but to reveal nature in all her glory. The problem with the use of ethics in the mystical context is that ethics is a product of language and culture, not cosmic consciousness. If it was, the entire natural universe would be founded on ethics and morality and it's clear that it is not empirically on any level, from the quantum to the cosmos, with natural life in the middle. But we can solve this if we develop a cultural ethics that respects biology, sexuality in all its dimensions and sustainable biospheric ecology.

The first step in my visionary upbringing in my adolescence was my dream of the lion. The world was parched and I was standing in patch of wilting vegetation. There, looking at me in contemptuous sadness and pity was the lion knowing that I, a member of *Homo sapiens*, was of the species laying waste to the natural universe. I knew I had to leave and return to my culture, but when I did, it was a dark polluted factory city and I had to stand forever in a queue for menial work to belong, never getting the a place in this world, or even any hope of sustenance.

I recognise that unless I accept the lion for all its carnivorous being, standing all too close to me as I dreamed, not to simply lie with the lamb, I would be living in human delusion, grovelling on the factory floor, while the world darkened around us. Yes it is a huge irony that the circle of life involves eating other organisms to survive, but that's how negentropic energy stays far from equilibrium, so we have to live with it. We can choose as enlightened mortal beings to be ever-compassionate of the mortal coil and empathic of all sentient beings struggling for existence within it, but we can't fairly decide to impose cultural rules on our own free choices as natural living agents in the name of a Creator, or we are committing the original sin of the forefathers. Peace is an enlightened choice but it can't be imposed by ethics or morality and remain a true visionary tradition, because it identifies ultimate good with ultimate order, but life and consciousness thrives only at the edge of chaos. There is no way around this and it is illegitimate to assert a pure spirituality that claims to transcend the natural existence that gives it life.

Moses saw the burning bush and became fascinated and saw I AM THAT I AM – the abstract vision of the cosmic self. This is an experience of the living biota discovering cosmic consciousness in the first person. Our oldest founding culture, the San, practice the trance dance and regularly enter such states. They have enigmatic lines on their cave drawings, fig 163, that express its transcendent arc. The question is what we do with it.

Religions start out visionary and personal, afire with the animistic aura of mystical vision, but then they become dragged into utopian agendas of world domination, and damnation for the very moral transgressions they imposed. I'm sure ethics has a better look than moral imperatives, but culture can't define nature because it is a product of nature. It can influence it, but is unstable in evolutionary time scales. The I – AM is a natural experience of the subjective biota in the living universe, not an absolute deity. The fact that you and I and Moses can see the same Brahmanic entity, but Moses stated the Ten Commandments that gave us Monotheism, doesn't make it right. We need to move on in the epoch of biospheric crisis. We can't just go back to the apocalypse of Jesus in the nuclear age of ecological mass extinction. We have to do this right for nature, for the biosphere and for the living universe that we have only just discovered as a culture, through science itself.

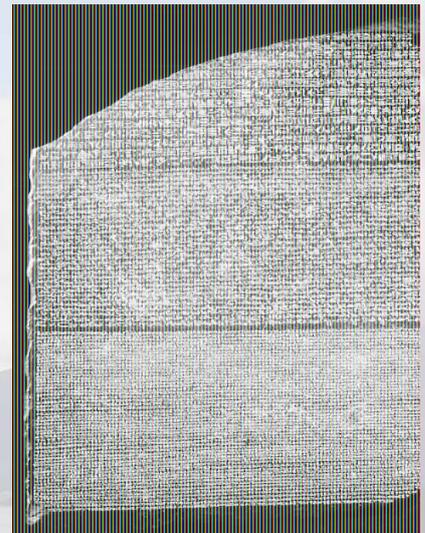
When I went to Jerusalem, I was still heavily into the male messianic paradigm, but fortunately my namesake and partner Jane King was a Wiccan woman who brought Gaia to the table, so we pronounced the anointing of the collective mashiach in the names of both God and Gaia and celebrated both reflowering the Tree of Life and the sacred reunion of woman and man in the Song of Songs in the Millennium, right in the so-called city of peace Yerushalayim.

Now there is more to this, because here I am this week dealing with Gaza and nukes and saying the same thing over again, to give sovereignty back to the female, as Chaucer’s “Wyfe of Bath” declares. Moreover I am NOT a male messiah as such, but an end of days avatar pronouncing the culmination of the apocalyptic patriarchy, in the era of long term future goodness of the Tree of Life, returning sovereignty to the immortal female line, carrying the sacrament of the sacred mushroom, *teonanactl*, the Flesh of the Gods, which Gordon Wasson called “The Divine Mushroom of Immortality” (Furst 1972), so I am renouncing the messianic title in pronouncing its fulfilment.

Neither do I just come across as some shamanistic pretender, high on psychedelics, expressing archaic talk about the nature of tooth and claw in the jungle, but a dedicated and devoted cosmologist recognising the living universe in all its natural and experiential glory, with Symbiotic Existential Cosmology being a natural scientific Rosetta stone, so that others can follow Ariadne’s thread to find their way out of the labyrinth of the existential dilemma. But still of the natural jungle, lying in the long grass in the moonlight, listening to the little breezes shiver among the singing grasshoppers, nevertheless of the nature of tooth and claw, of birth and death, of naked lunch on the dew of the lawn of time, of our hour of splendour in the grass of sexual oneness that is the source of all ongoing conscious life, so that life and existence can survive throughout our generations forever. How can I be a male messiah, while simply being one of many bearing the sacred mushroom of the immortal biosphere, returning sovereignty to the female?

Fig 292c: Symbiotic Existential Cosmology is a “Rosetta Stone”, both translating the languages of science, nature and visionary experience into one reality to provide an Ariadne’s thread for the vision quest and to translate the sanctity of woman, life and freedom throughout the biosphere into every language on Earth.

I am not lightly pronouncing the end of patriarchal cultural dominance, to give back sovereignty to the immortal sex, as a simplistic solution to a complex problem. There are many other factors in the complex dynamics of culture, as my daughter Arwen just pointed out. But patriarchal cultural dominance is a/ the prime causative precipitating factor in our entire existential planetary crisis, because it puts the entire world view and psychodynamics of human culture into a highly skewed, male risk-venture exponential dynamic which is biologically unsustainable – our prime core risk of precipitating ultimate Fermi extinction from all causes.



Jin, Jiyan, Azadī – Woman, Life, Freedom!

Vrou, Lewe, Vryheid – Africaans
 Gruaja, Jeta, Liria Albanian
 ሴት፡ ሕይወት፡ ነፃነት – Amharic
 المرأة، الحياة، الحرية – Arabic
 নারী, জীবন, স্বাধীনতা – Assamese
 Warmi, Jakañ, Qhispiyasiña – Aymara
 Qadın, Həyat, Azadlıq – Azerbaijani
 Muso, Nenamaya, Horonya – Bambara
 Emakumea, Bizitza, Askatasuna – Basque
 Жанчына, жыццё, свабода – Belarussian
 নারী, জীবন, স্বাধীনতা – Bengali
 नारी, जीवन, आजादी के बा – Bhojpuri
 Žena, život, sloboda – Bosnian
 Жена, живот, свобода – Bulgarian
 Dona, Vida, Llibertat – Catalan
 Babaye, Kinabuhı, Kagawasan – Cebuano
 Mkazi, Moyo, Ufulu – Chichewa
 女人, 生命, 自由。 – Chinese
 Donna, Vita, Libertà – Corsican
 Žena, život, sloboda – Croatian
 Žena, život, svoboda – Czech
 Kvinde, liv, frihed. Danish
 ڤڤو، ڤڤو، ڤڤو، ڤڤو – Dhivehi
 नारी, जिंदगी, आजादी – Dogri
 Vrouw, leven, vrijheid – Dutch

Naine, elu, vabadus – Estonian
 Nyonu, Agbe, Ablode – Ewe
 Babae, Buhay, Kalayaan – Filipino
 Nainen, elämä, vapaus – Finnish
 Woman, Life, Freedom – English
 Femme, Vie, Liberté. – French
 Frau, Leben, Freiheit. – German
 Γυναίκα, Ζωή, Ελευθερία. – Greek
 સ્ત્રી, જીવન, સ્વતંત્રતા. – Gujarati
 שׂוֹמְרוֹת, חַיִּים, חֵירוּת – Hebrew
 नारी, जीवन, स्वतंत्रता. – Hindi
 Poj Niam, Lub Neej, Kev ywj pheej – Hmong
 Nwanyı, Ndu, nnwere onwe – Igbo
 Wanita, Kehidupan, Kebebasan – Indonesian
 女性、人生、自由。 – Japanese
 ಮಹಿಳೆ, ಜೀವನ, ಸ್ವಾತಂತ್ರ್ಯ – Kannada
 ្រ្រី, ជីវិត, សេរីភាព – Khmer
 बायल, जिवीत, स्वातंत्र्य – Konkani
 여자, 삶, 자유. – Korean
 Jin, Jiyan, Azadî – Kurdish Kurmanji
 ئازادى، ئايان، ئازادى – Kurdish Sorani
 Аял, Жашоо, Эркиндик – Kyrgyz
 ແມ່ຍິງ, ຊີວິດ, ເສລີພາບ – Lao
 Wahine, Ora, Tikanga. – Maori
 အမျိုးသမီး: အခက်: လွတ်လပ်မှု –

Myanmarနာရီ, ဝီဇီဗ, ဝီဇီဗ – Nepali
 Kvinne, liv, frihet. – Norwegian
 ସ୍ତ୍ରୀ, ଜୀବନ, ସ୍ୱାଧୀନତା | – Odia
 Dubartii, Jireenya, Bilisummaa – Oromo
 Zan. Zendegi. Azadi – Persian
 Kobieta, życie, wolność – Polish
 Mulher, Vida, Liberdade – Portuguese
 Warmi, Kawsay, Kacharichiy. – Quechua
 Женщины, Жизнь, Свобода. – Russian
 स्त्री, जीवन, स्वातंत्र्य – Sanscrit
 කාන්තාව, ජීවිතය, නිදහස – Sinhala
 Naag, Nolol, Xoriyad – Somali
 Mujer, Vida, Libertad. – Spanish
 Mwanamke, Maisha, Uhuru – Swahili
 Kvinna, liv, frihet – Swedish
 பெண், வாழ்க்கை, சுதந்திரம். – Tamil
 స్త్రీ, జీవితం, స్వేచ్ఛ. – Telugu
 ผู้หญิง ชีวิต อิสราภาพ – Thai
 ڤڤو: ڤڤو: ڤڤو: ڤڤو: – Tigrinya
 Kadın, Yaşam, Özgürlük – Turkish
 Жінка, життя, свобода – Ukrainian
 ئايال، ھايات، ئازادىك – Uyghur
 Phụ Nữ, Cuộc Sống, Tự Do – Vietnamese
 Obinrin, Aye, Ominira – Yoruba
 Owesifazane, Impilo, Inkululeko – Zulu

So the quickest way for humanity to resolve cultural and biosphere apocalypse is to realise the rallying cry “women, life, freedom” in a coalition of the next and coming generations of children and adolescents with their mothers to coalesce with men who recognise the need for facilitating both sexes’ reproductive investment strategies, right through to professional, business and leadership positions to be on the human evolutionary basis of strong female coalitions pairing with men of cooperative and protective intent to redeem the biosphere and resolve the climate and nuclear crises as human society’s primary existential meaning in existence.

It’s not the only factor in cultural apocalypse but it is the key to untying the Gordian knot. We have to be honest that this IS the smoking gun of our cultural existential crisis, so addressing it is the quickest, most effective way, of ensuring our survival, while at the same time taking into account the complexity of cultural factors leading to destructive militarisation and business as usual tragedy of the commons. And it doesn’t involve what we SHOULD do but simply what we in our best conscience know we NEED to do for the entire living universe and for us to have tenure within it.

Here is how I think ethics actually can help bring peace. Cultural evolution is faster and more unstable than biological evolution, so for humanity to survive, ethics needs to be developed on the biological, sexual and ecological principles that sustain an immortal biosphere, while at the same time expressing cultural and visionary notions which emerge from the living universe. Ethics comes unstuck if it ends up cementing a schizophrenic cosmology in which men, fearing their own mortality and seeking eternal life, subjugate women to FGM, Stoning Sutte, Bride Burning and Honour Killing and so on and so on ... leading to unsustainable religious moral imperative cosmologies.



Fig 292d: Women’s Protection Units (YPJ) fighters in the Afrin Region during the Turkish invasion of Afrin in February 2018

The rallying cry "woman, life, freedom" in the Iranian oppression of women over the veil has an intriguing ethical underpinning in the Kurdish women's movement that was pivotal in defeating ISIS and stopping the genocide of the Yazidis and it is founded on sustainable ecology and an inclusive male-female free society in which women are the key to sustainable peace in decentralised direct ecological democracy. So here we do find ethics and even armament acting in the sustainable interests of planetary peace. Here is a short summary reflecting Wikipedia's own short account:

An example of a social system in which women are regarded as pivotal to the liberation of society is the Kurdish Autonomous Administration of North and East Syria, under the principles of Jineology, proposed by Abdullah Öcalan (2013) who has said "a country can't be free unless the women are free", and that the level of woman's freedom determines the level of freedom in society at large:

The extent to which society can be thoroughly transformed is determined by the extent of the transformation attained by women. Similarly, the level of woman’s freedom and equality determines the freedom and equality of all sections of society. . . . For a democratic nation, woman’s freedom is of great importance too, as liberated woman constitutes liberated society. Liberated society in turn constitutes democratic nation. Moreover, the need to reverse the role of man is of revolutionary importance.

In Kurdish, the word jin (ژن) both means "woman" and comes from the root jîyan (ژن), meaning “life”. Jineology, the “science of women”, a set of principles that includes the rejection of the nation-state system, governance through democratic confederalism, and the promotion of self-sustainability through ecological awareness and collective armament, has been embraced by Kurdish women. While these principles are seen as a means of challenging patriarchy, they are also viewed in contrast to Western feminism, which is associated with capitalism and statism. Despite this, the jineological principles embraced by Kurdish women are concerned with challenging patriarchy and the intersection of patriarchy with other forms of hegemony. The Jineology-based agenda of "trying to break the honour-based religious and tribal rules that confine women" is controversial and overcoming controversy in conservative quarters of society in northern Syria and has played a pivotal role in women fighters in the YPG and women’s YPJ overthrowing Islamic State.

It is built on the principle that without the freedom of women within society and without a real consciousness surrounding women, no society can call itself free. It is seen as superior to Western feminism because it aims to reject

all forms of hegemony, including patriarchy and positivism, in order to establish a more sustainable peace. This is because jineology is seen as more holistic and inclusive of all members of society. During the Rojava revolution, both men and women were required to study jineology and ecology, and it is integrated into the region's governance model rather than being treated as a separate issue focused on women's rights.

The Great I AM, Cosmic Consciousness, Conscious Life and the Core Model of Physics

In the light of the above conversations, I've come to a new synthesis of cosmic reality and belief in the light of research on intuitive versus rational modes of thought, which suggest belief in God is a function of only some modes of human ideation. While it's appealing to holistic spiritual claims that religious belief is intuitively divine, the idea that it also lacks rationality, suggests it is a product of only some types of organismic ideation and experience. This implies divinity cannot be physically absolute, for example in the creation of the universe, as we also suspect from the conflicting diversity of religious beliefs, leading to holy war.

First let's look at Yeshua's **I AM** (Joshua Davis). This is a legitimate messianic affirmation of the self as cosmic subject, because the visionary insight of a single inspired person can become a source to unveil ultimate reality to all.

Jesus said something similar in the Gospel of Thomas (77): **It is I who AM the ALL.** From me did the all come forth, and unto me did the all extend.

Fig 292e: Burning Bush Tree of Life [Deana Harvey](#)

But then Joshua extends it to the **Creator** – "**I AM** the source of all ethics, the cosmic ethics, **I AM**. **I AM** the source of all Peace, **I AM**". In its original form this is **Ayer Asher Ayer** – **אני זה שאני – I AM THAT I AM**, that Moses pronounced witnessing the burning bush. This is YHWH **יהוה**, saying that he is what he is, so Moses has transferred his subjective self-certainty explicitly onto his vision of reality, as an external absolute cosmic deity. Yeshua is doing the same.



Then we come to Deepak claiming **I AM THAT** which is **Tat Tvam Asi – तत् त्वम् असि** or **THOU ART THAT**. This is subtly different, saying I (the self or atman) am THAT (cosmic Brahman) – transferring the rishis' self-certainty onto ultimate reality in the abstract. Deepak is doing the same.

These come from different traditions, one about the Monotheistic God and the other about Upanishadic cosmic consciousness expressed abstractly as Brahman, although it can also be viewed personified as Ishvara/Ishvari, which is similar to the monotheistic plural 'Elohim, sourced in the common Indo-Aryan tradition. This development from the earlier theism of the Vedas was a stroke of genius of the Upanishadic rishis, who thus managed to separate ultimate reality from an anthropomorphic deity, neatly sifting the cosmological wood from the trees, but the expressions clearly have a common source we need to unveil.

Starting from Descartes cogito, in which rational thought, rather than "divine intuition" is dominant, we can also step back into the intuitive subjective to rediscover the **I AM** in existential terms:

Cogito ergo sum

I think therefore I am

Experior, ergo sum, experimur, ergo sumus.

I experience therefore I am, we experience therefore we are!

Existo ergo sum

I exist therefore **I AM** ⁹⁰

What we know, which is indisputable and the foundation of conscious existence, is that 100% of our knowledge of reality comes from our wholly subjective experiences, in dreams memories and reflections, as well as subjective sensory observations of the objective world around us, , so we learn to understand the physical world by subjective

⁹⁰ exist (v.) "to have actual being of any kind, actually be at a certain moment or throughout a certain period of time," c. 1600, from French *exister* (17c.), from Latin *existere/existere* "to step out, stand forth, emerge, appear; exist, be" (see existence). "The late appearance of the word is remarkable" [OED]. Middle English often used *ibēn, ibeon* (based on be) for "to exist."

inference through our common subjective observations of it, and thus come to realise that our survival as conscious sentient beings in the natural world is dependent on not getting eaten by lions or bitten by poisonous snakes. But the motivating core is and remains 100% subjective.

So what clearly happened is that the rishis, immersed in deep samadhi, which at least to some degree liberated their doors of perception from the evolutionary filters of animal survival, construed an insight that their conscious experience, which had now become able to meditatively experience itself, in turn became projected onto the physical universe, which became not just the individual atman, or self, but the universal cosmic consciousness they called Brahman, the ultimate reality of the entire universe. This became a possible conclusion because their organismic consciousness was running free and unattached to perceptual reality. Only the first part of the notion – that consciousness is subjectively primary, was empirically correct, but it became extended to the non-empirical conclusion of full consciousness being assumed to be cosmologically primary and hence intelligently invoking the universe.

In the same way, Moses, in his visionary state, akin to those of William Blake, perceived the bush shimmering with an unworldly prescience and likewise named the experience as the entity YHVH, again in equivalence to his own untethered transcendent first person, projecting his own visionary state onto that of an absolute abstract deity, eclipsing Jacob's simple erections of stone at Bethel.

But this transference of untethered subjective experience onto the world at large has no actual empirical or cosmological basis. Both Moses and the Upanishadic rishis were visionary figures in a state of spiritual trance, or transfixion and, just as no combination of objective physical attributes can constitute private subjective experiences, neither can any subjective trance state be construed to generate primordial cosmic consciousness throughout the physical universe, or generate the objective universe itself from subjective consciousness of it, nor can it be construed to form a creator deity, omniscient, or omnipotent, over the physical universe. No matter how convincing subjective experiences can be, given self-certainty of belief, there is no empirical basis from within subjective consciousness to establish any such objective notion or cosmic consequence, unless it is verified objectively as physically evident.

Therefore, as we have to know in our heart of hearts, this means that cosmic consciousness and the notion of absolute deity are similar projections of exalted subjective conscious states onto the physical universe at large. This doesn't mean they are completely unreal, or simply ephemeral superstition, but that they have contingent reality status in subjective consciousness and need to be seen for what they are, as subjective aspects of certain conscious states of living organisms appearing, with the metazoa, very recently in cosmological and evolutionary time scales, and not coeval with the cosmic origin, nor absolute on a cosmological basis. Neither does it make the cosmos any less transcendent. The empirical reality that lies before us clearly makes the living subjectively conscious biota transcendent in just the way religious traditions seek, and the vision quest remains just as valid, but in its becoming in us, as climax conscious beings and in future conscious beings that may evolve if we preserve the diversity of life, unveiling the intimate knowledge of reality in and of itself, thus allowing the universe to fully come to experience itself.

The notion of objective reality itself is even more recent. Humans, from the dawn of history have seen reality through their subjective experience of it, while negotiating the slings and arrows of outrageous fortune to survive and reproduce, and because all the existential threats and social benefits were from other subjectively conscious agents, or live phenomena like storms, we attributed conscious agency to everything around us as a good intuitive bet for our security of survival – i.e. humans emerged as animists. From there, cultural speculation led to culture-wide streams of idealism – that subjective consciousness, thoughts and ideas were reality itself – originally credited to Plato but appearing also in Vedanta, and Buddhism, and through Philo and Paul, in the Hellenistic Judaic Logos of Pauline Christianity and Gnosticism. It is accompanied by skepticism about the possibility of knowing the existence of anything that is independent of the human mind. In transferring subjective experience onto the universe, it makes the complementary category error to pure physicalism that is the basis of all major religious traditions as well as much of historical philosophy.

Subjective consciousness is holistic. It has to be, to provide a unified stream of tactical experience to guide the agent's coordinated behaviour towards survival in direct real time crises which are very much about gut reactions, and at best intuitive judgments that often don't allow the time for complex reasoning, leading us to act upon that which feels right to the experienter.

With the advent of cultural inventions, from toolmaking, through arrow poisons, knowledge of food and medicinal plants and inventions like the wheel, our analytical prowess became sharpened and amplified into what we now know

as physical and biological science and technology, so we are now overwhelmed by a second mode, of analytic thinking that is sceptical in its basis and runs counter to magical intuition.

Everything we know about subjective consciousness indicates that conscious states are optimally integrated, in notions like the global neuronal workspace, to achieve a unified stream of consciousness. But there is a deep problem with intuitive insights and that is that they work really well on hunch in most situations, and are central to the vision quest of subjective consciousness, but can make fatal errors if misapplied in a way which lies outside any evidence from either direct subjective experience, or our perceptions of the world. Just because samadhi is bliss, doesn't mean it is moksha, falling outside the incarnate, and even moksha needs unbiased empirical affirmation to become a working hypothesis. Moreover, the advent of doctrinal religion has shown us that even billions of adherents don't establish that a religion, or a spiritual belief is true, or that God is real, due to infectious cultural memes of affirmative belief.

Now supposing we wanted to test the credibility of the idea that a super-conscious agent or entity created or designed the physical universe by conscious means, we would have to address the thorny problem of the core model of physics, involving the four known forces of nature, which we have yet to discover any real evidence of divergence from, with the discovery of the Higgs boson in the LHC, although many of the parameters are still unexplained. What is outstanding about the standard core model, including gravity, is that it doesn't look at all like an arbitrary piece of intelligent design, but a cosmic mandala of symmetries and symmetry-breaking that puts to simplistic shame, even the beloved Shri Yantra of Shiva, and Shakti, encompassing the experiential and physical realms.

Fig 292f: Left: Shri Yantra represented by Shiva's lingam upper triangles and Shakti's yoni in copulation representing subjective consciousness and the natural world. Right the standard model surrounded by gravitational influences involves complex underlying symmetries some of which are broken in force divergence.



To understand how unique and idiosyncratic the standard model is, we can start with gravity and electromagnetism, which are both evidential in subjective experience, as both magnetism and lightning on the one hand and Newton's apple falling, on the other. We can also witness runaway chemical reactions in fire but didn't know these were also electro-magnetic until recently. Otherwise our personal experience was largely confined to biology and geology

| | 1st Generation | 2nd Generation | 3rd Generation | Q_e | T_3 | Q_c |
|---------|----------------|----------------|----------------|-------|-------|-------|
| Quarks | u | c | t | 2/3 | 1/2 | Yes |
| | u | c | t | 2/3 | 1/2 | Yes |
| | u | c | t | 2/3 | 1/2 | Yes |
| | d | s | b | -1/3 | -1/2 | Yes |
| | d | s | b | -1/3 | -1/2 | Yes |
| | d | s | b | -1/3 | -1/2 | Yes |
| Leptons | ν_e | ν_μ | ν_τ | 0 | 1/2 | No |
| | ν_e | ν_μ | ν_τ | 0 | 1/2 | No |
| | ν_e | ν_μ | ν_τ | 0 | 1/2 | No |
| | e | μ | τ | -1 | -1/2 | No |
| | e | μ | τ | -1 | -1/2 | No |
| | e | μ | τ | -1 | -1/2 | No |

| Force Carriers |
|---------------------------------|
| Strong |
| 8 g g g g g g g g |
| Gluon |
| Weak |
| W ⁺ W ⁻ Z |
| W and Z Bosons |
| Electromagnetic |
| γ |
| Photon |
| Gravity |
| G |
| Graviton |
| Origin of Mass |
| H |
| Higgs Boson |

Light → Heavy

including the use of fire to extract metals. Although Democritus speculated on atoms philosophically, the first experimental evidence came with Brownian motion in the 19th century. Now we know there are around 100 chemical elements and that for life to exist based on stable atomic nuclei, we need this number before nuclear instability makes larger nuclei impossible. We now know that all living systems are based on complex organic molecules using essential bio-elements from a core of H-C-N-O all the way up to iron with peak nuclear binding energy, and on to fifth row molybdenum, essential for fixing nitrogen.

Fig 292g: The core model of particle physics in more detail.

The fundamental particles are divided between the matter-forming fermions of spin 1/2 and the integral spin bosons, connecting the fermions in radiation and force fields. For atoms to remain stable, and to have strong enough chemical bonds to make biomolecules, places two conflicting demands on fundamental particles and forces. At the same time the nuclei have to contain huge binding energies to give stars their long lived energy essential for planetary life. Hence the baryons consist of triplets of quarks with 1/3 or 2/3 of the electron charge, which compensating for their 1/3 charge, bind in triplets of 3 colours, giving rise to the gluons and strong nuclear force between protons and neutrons, giving them their high masses and the energy that powers stars. In a universe with only protons and electrons, almost no nuclei would be stable because the electromagnetic repulsion of a proton-only nucleus would drive them apart. Thus we need both positive protons and

neutral neutrons to combine to form the nucleus. But this invokes the weak radioactive force, because balancing the fermionic $1/2$ spins requires neutron decay to emit a proton, an electron and a ghostly anti-neutrino. Hence we have a mandatory four forces involving charges in pairs, positive and negative, matched by 3 colours of quarks and three anti-colours, which also have to come in two flavours of triplets uud for the proton and udd for the neutron, matched in turn through the weak force to two flavours of leptons, positive and negative electrons and the neutrinos, resulting in a symmetry breaking where, in addition to the massless neutral photon, we have massive weak force W_{\pm} and neutral Z_0 bosons, that are otherwise like photons.

The fermions even have an underlying archetype in the rishons (primary in Hebrew) **T** for **Tohu** (unformed) with charge $1/3$ and **V** for neutral **Vohu** (void), so the positron and neutrino are TTT and VVV and the TTV, TVT and VTT are the three colours of up quarks and VVT, VTV and TVV are the three colours of down antiquarks, where order is important.

All of these symmetries and their breaking appear to be structural requirements of any remotely plausible set of forces of nature giving rise to a universe in which conscious life could exist as a fractally climax quantum system and they conform to symmetries and show no evidence of an arbitrary design that an intelligent designer would have any real options over. That said, we are still short of a fully elucidated TOE or theory of everything, with higher dimensional super-string theories failing to compactify uniquely into a universe like ours, amid the failure of super-symmetry to come to the rescue, as a hopeful, but probably unlikely, simplification of the idea that positive and negative vacuum energy of the bosons and fermions cancel one another in simple pairs of like kind, although at face value, the bosons and fermions have very different incidences, fig 292g, combined with a failure to unify gravity with the other forces.

In addition there remain the problems of fine tuning of the cosmological parameters, although these might disappear in a more fundamental underlying TOE. The standard model has 25 freely adjustable parameters and general relativity has the cosmological constant, which is known to be nonzero but profoundly small. Some of these are very sensitive. For example, the ratio of the electromagnetic force to the gravitational force between a pair of protons, is approximately 10^{36} . If it were significantly smaller, only a small and short-lived universe could exist. When four nucleons fuse into helium, 0.007 (0.7%) of their mass is converted to energy. If it were 0.006, a proton could not bond to a neutron, and only hydrogen could exist, and complex chemistry would be impossible. If it were above 0.008, no hydrogen would exist, as all the hydrogen would have been fused shortly after the Big Bang.

Thus although we don't have a final TOE, the forces of nature are shaped by symmetry and symmetry-breaking principles with no evidence external imposed design is necessary, or even feasible. In addition, although we know the energy processes of the universe, both nuclear and ultimately gravitational dominate the universe's evolution in space-time, leading to a big crunch, or heat death, it is equally clear that the universe rises to climax complexity in planetary life, fed by the free energy of solar radiation to invoke a negentropic planetary regime that, given the galactic distribution of key organics such as amino acids and nucleotide precursors, including our two primary excitatory and inhibitory neurotransmitters, glutamate and GABA and strong empirical evidence for biosynthesis routes for biogenesis (King 2020a), that in the example of our own planet Earth, has given rise to the emergence and evolution of increasingly complex multi-cellular life, which in the metazoa has come to manifest subjective consciousness in the universe. Evolution, given its massive evidential confirmation, genetically, geologically and archaeologically is an empirical fact of life. The sheer creativity of evolution transcends any concept of intelligent design. Thus taken at its face value, given the cosmological generality of organic molecules in galactic gas clouds resulting from previous supernova explosions, and the ubiquity of Earth-like planets in our galaxy, conscious life has central status as a climax manifestation of cosmology mid-life on the universe's cosmic "equator" in space-time, through the biota.

Although subjectivity is a primal complement to the objective world, as the shri yantra shows, it is life and conscious life that is the physical embodiment of all our notions of cosmic consciousness, with full consciousness arising late, in the universe's organic and biological complexity climax, in the eucaryote endo-symbiosis, that finally makes full self-awareness possible. Into the largely untapped subjective realm are drawn all our diverse experiential notions – of transcendence, immanence, the numinous, spirituality, deity, the vision quest, samadhi, moksha, the Tao, Tantra, psychic experiences, the notion of eternal life, dreams, and the dreamtime and above all psychedelic visions, which provide a uniquely rich empirical basis to assess and gauge all these other subjective manifestations and assumptions.

Unlike the rest, psychedelic visions are rich, ornate, confounding and veridically experienceable in the waking state, so they provide an empirical core for the discovery of subjective reality that parallels that of objective science in the physical realm and constitutes the equivalent to the LHC in particle physics for the discovery of non-ordinary conscious

states. Without psychedelic experiences, subjective reality would remain hostage to pre-conceived beliefs. That is why I see them as central and necessary to the wider science of subjective conscious experience.

It is life in all its diversity that is the physical embodiment and climax expression of cosmic consciousness, encapsulated and entwined in our organismic awareness. To neglect or deprecate life to cosmic consciousness is ultimate suicide.

The Cacophony of Deity: The Gods and Philosophers can't All be Right, Here in the Physical Universe.

Kashyap pursued the late origin of consciousness against the primal cosmic mind. When faced with Vinod's and then Deepak's mind-first consciousness-makes-the-universe, I realised that, in the sturm and drang of philosophical and quasi-religious debate, Kashyap's sheer resistance is necessary. So in my burning bush piece, I turned the tables, to put down a red line in the philosophical sand, that consciousness-only-rules is wrong for the same reason pure physicalism is wrong, because consciousness and physicalism are categorically distinct and no combination of one can make the other, particularly at the cosmic origin long before these insights. Full consciousness, as we know it, comes late with the evolution of the biota although SEC is primally panpsychic with primal subjectivity.

I also agree that science is fundamentally "of the empirical method". We disagree, in that I consider 1pp for subjective empirical investigation is the complement of the physical sciences' empiricism of verified observations by independent groups, in the vision quest method of mutually-affirmed empirical experience. That said, religions, and here I include both Vedanta with "consciousness rules okay", that denies biological species any meaning at all; and Monotheism, with it's clockwork orange "divine watchmaker" creationism, that leaves life creatively sterile; both violate all principles of unbiased empirical affirmation of 1pp experiences, violating independence and constituting bias.

To suggest that religious affirmation is unbiased would mean that two very questionable deities, the Christian Abba who sacrificed his only begotten Son to forgive our sins in time for the Day of Judgment, and al Llah the ancient Arab deity, who was originally paired with al Lat, the primal Arabian Goddess, but then summarily cast by Muhammad into oblivion in the "satanic verses", would imply there are two real deities ruling Earth, Abba and Allah, with a posse of Hindu gods and goddesses, from Vishnu to Kali, circling around in pursuit, leaving the Hebrew YHWH, lost in the population crisis by comparison, not to mention all the other "fictitious" deities worshipped by Wiccans, to the Tree Spirits of the Amazon shamans. Right now, since Christianity is still the biggest, so Abba could be said to rule the world, but Allah is coming up fast, amid terrorism and the endless rumours of holy war over utopian planetary supremacy.

No they can't all be real, so none of them are, as things stand. Yes we know about the perennial philosophy that God is a subtle changeling, that morphs and adapts to changing realities and keeps knocking on the back door of our conscious minds, trying to seduce us into believing in him through his subtle presence, so he is there if our minds are "open", but this is also a fantasy of human fallibility, based on affirmative belief, and moral imperative, not empiricism. As I see it, philosophy ⁹¹ is in the same boat because philo-sophia is, despite being "the love of wisdom", essentially the art of argument and debate, in which every point of view rules okay? Monism, dualism, IDAM, physicalism,

⁹¹ **philosophy (n.)** c. 1300, *philosophie*, "knowledge, learning, scholarship, scholarly works, body of knowledge," from Old French *filosofie* "philosophy, knowledge", from Latin *philosophia*, from Greek *philosophia* "love of knowledge, pursuit of wisdom; systematic investigation," from *philo-* "loving" (see **philo-**) + *sophia* "knowledge, wisdom," from *sophis* "wise, learned;" a word of unknown origin [Beekes]. With many spelling variants in Middle English (*filozofie*, *phelosophie*, etc.). From mid-14c. as "the discipline of dealing in rational speculation or contemplation;" from late 14c. as "natural science," also "alchemy, occult knowledge;" in the Middle Ages the word was understood to embrace all speculative sciences. The meaning "system a person forms for conduct of life" is attested from 1771. The modern sense of "the body of highest truth, the science of the most fundamental matters" is from 1794.

religion (n.) c. 1200, *religioun*, "state of life bound by monastic vows," also "action or conduct indicating a belief in a divine power and reverence for and desire to please it," from Anglo-French *religiun* (11c.), Old French *religion*, *relegion* "piety, devotion; religious community," and directly from Latin *religionem* (nominative *religio*) "respect for what is sacred, reverence for the gods; conscientiousness, sense of right, moral obligation; fear of the gods; divine service, religious observance; a religion, a faith, a mode of worship, cult; sanctity, holiness," in Late Latin "monastic life" (5c.). Derived by Cicero from *relegere* "go through again" (in reading or in thought), from *re-* "again" (see **re-**) + *legere* "read". However, popular etymology among the later ancients (Servius, Lactantius, Augustine) and the interpretation of many modern writers connects it with *religare* "to bind fast", via the notion of "place an obligation on," or "bond between humans and gods."

resplendence (n.) "vivid brightness, brilliance, splendor," early 15c., from Late Latin *resplendentia*, abstract noun from present-participle stem of Latin *resplendens* "brilliant, radiant". From *re-*, here perhaps an intensive prefix, + *splendere* "to shine, be splendid".

panpsychism, elimanativism, illusionism and all. There is absolutely no empirical reality emerging from this multiplicity of views.

So I support two empirical traditions, objective science and the subjective vision quest, in the paradigm of **resplendence**, replacing the bondage of **religion** to affirmative belief and imperative morality. I have to be utterly definite to make this division and oppose violations on either side, because otherwise Maya, the whole cabal of illusion, will overwhelm us, with subtle arguments and affirmative beliefs that have no evidential validity.

Kashyap: About religion courses, U.S. the constitution requires separation of church and state. State universities cannot teach a course in theology. Also they cannot give a course in just Christianity. When a course on religion as scholarship is given it has to cover all the religions!

I'm sorry to have to be the grim reaper, but we have to be honest with ourselves about where this is heading. How can anyone, from a benign Unitarian to a fire-and-brimstone Brethren, or a Pentecostalist speaking in tongues, believe such a violent, confused and vindictive cosmology as that God sacrificed his only begotten Son in a deicide and eat his flesh and drink his blood, in perpetuity, in every canonical Christian following on Earth?

How far do we take this? To Allahu Akbar? To the Aztec sacrifices? To the blood of the Crusades? Or take literally the advice of Krishna to Arjuna to kill his brethren to uphold the divine covenant, as those watching the Trinity test had to do? Do we now all take hostages and bomb the living daylights out of one another, or nuke them for good measure? Where do we take a breath and actually, with some care and no preconceptions learn to look truthfully at the Kingdom that lies before us but men do not see?

I AM happy with **I AM** as a revelatory affirmation. But **WE ARE** is the beginning and end of the story at this point in our existential unfolding. I "believe" religions can in principle save the world, as well as destroy it. Why else would I have taken this tortuous and improbable route to redemption? But it will work only if the paradigm of apocalypse becomes the epoch of paradise, by shifting the reference frame to the immortal survival of conscious life throughout the universe. This is what constitutes living peace. It is the true redemption. The meaning of conscious existence and the meaning of life in the mortal coil.

The trouble with God is that It/He/She is a surrogate for our own responsibility for the fate of the universe. The "Idea of the Holy" has been part of our growing up, but we become the godhead through the redemption of conscious life. That's the sadhana that Brahman taught me for He/She/It's own future survival, as the living cosmic consciousness, through which we become divinity. This has to be experienced in the first person, which is why the mushroom. The moment it becomes taught as theology, it becomes fatal doctrine.

Once we invoked nukes and the other features of planetary apocalypse, the buck passed to humanity as adults. We have to take the consequences fair and square right now, no longer through the dark glasses of religious belief. Once we get the good work done, the 'Elohim can begin to become realised. That's the eternal sadhana in space-time.

The historical process by which Christianity's sacrificial error occurred and how it became a contrived "false" religion is set out briefly as follows, related in detail in other sections. It's a real warning to everyone about ALL religious ideas, which is why I am drawing a red line of blood in the sand of history about consciousness making the universe:

(1) Jesus was an innovative free thinking wild apocalyptic and gnostic preacher whose mentality is best understood in the Gospel of Thomas. He may also have had aspirations to heal the Hebrew faith with the resurgent fertility worship and Dionysian beliefs in Nabatea in his lifetime as the Gospels seem to indicate. Ironically, according to Josephus, the Baptist did have his head served on a plate in the descent of Inanna performed by Salome at Herodias's behest, so Jesus' fertility sacrifice anointed by Mary to his doom has a weird karmic "reality"

(2) Three decades after his death for insurrection and blasphemy, Paul, strongly influenced by Hellenistic Judaism staged a born again revival of Christianity in which he crafted the life of Jesus into a contrived surrogate religion, in which Jesus became the intermediary between the Father God and humanity, in the Hellenistic Jewish cosmology, adopting the themes of the dying and resurrecting sacred kings of Greek and other fertility cults to explain his life and death. Motifs that are utterly non-Hebrew, like Jesus being anointed by a woman to his doom and performing Dionysian miracles like water into wine may have been introduced or embellished by Pauline allegorical thinking.

(3) This notion comes ultimately from a Hellenistic Judaic model due to Philo, in which the scriptures are thought of as creative mythology, by the use of allegory, in which the characters become figments of a cosmological drama. The synoptic gospels are thus creative glosses of Jesus' life, mission and death, built on a contrived interpretation overlaid on older fragmentary accounts. Philo thought of the cosmos as rather like the Vedantic notion of Brahman as cosmic consciousness, but instead it was cosmic thought called the Logos, which was like cosmological ideas making the universe in the way that Vedantist thinking that consciousness makes matter. In this thinking an intermediary was needed between an entirely formless abstract God and humanity.

(4) Here is where the trouble set in, because the entire process also had to explain Jesus' historical life and gruesome death. Paul then claimed in a vision recorded in his epistles that Jesus told his disciples to eat his flesh and blood in the last supper, giving rise to the notion that without the shedding of blood, there is no remission of sin. This subsequently got redacted into Mark's gospel and then the others verbatim, from Paul's vision and has no basis in historical reality.

(5) This tried to explain Jesus' life and death as the cosmic mediator in terms of God sacrificing his only begotten Son, partly in attempt to reconcile the Greek concept of the logos cosmos with flesh and blood Hebrew history of the Old Testament, turning it all into a cannibalistic blood fest.

The end result is that we have a completely false religious belief system with terrible outcomes, crafted behind the scenes by creative orchestrators of Hellenistic Judaism to evoke a mythical religion which became virally popular in the pagan world where all these motifs were already part of the world view which Christianity was designed to outdo.

The Jewish messiah was nothing like this, but an anointed human, bringing about about an epoch of long-term future goodness, as Jane and I set out to do in the Millennium in Jerusalem and now here I do in Symbiotic Existential Cosmology, but apart from Solomon, the other historical Jewish messiahs have ended up ignominiously.

So much for the messianic tradition!

Nevertheless, time is of the essence to save the living planet from a human-induced destructive apocalypse, so we each have a messianic duty to perform, as I do in writing this passage.

I have a great deal of respect for the Upanishadic and later Tantric traditions of Vedanta. The formative experience resulting in Symbiotic Existential Cosmology was due to sacred mushrooms. I note that Patanjali admitted the "herbs" as bearers of siddhi, and the sacred soma of Indra was at the very source of Indra's power, so this is an integral part of the Vedic tradition.

Now the supreme insight of the Upanishads is that the transcendent can be viewed and experienced either cosmologically as Brahman – ultimate reality – or anthropomorphically as the personae of Ishvara/Ishvari as personified divinities. This is clearly a choice, not an absolute fact of a divine power.

In my experience of union with Brahman, it was somewhere in between – as ultimate reality manifesting in cosmic consciousness, complete with its transcendent self of overflowing compassion of the eternal for the predicament of the mortal coil. That is, I was one with cosmic consciousness, with the anthropomorphic shadow of divinity, without it being predominant. Given both my own experiences of cosmic consciousness and the very obvious fact that subjective consciousness, including even our spiritual pretensions, has arisen very late in cosmic evolution with the metazoa, the notion of a primary cosmic consciousness that made the universe as a "higher power" lacks both subjective and objective empirical validation.

By contrast, with observable physical reality, from fundamental physics to psychology and neuroscience, the subjective realm of spiritual belief is contingent. The notion that scientists need to be made spiritual runs counter to the fact that 80% of people are religious and religious excesses are historically more to blame for our ecological crisis than science, which has astute sensitive awareness of biological and biospheric realities. It is clear that religious belief is not at all uniform across the human population, so there is no case can be made that a higher power is evident either in cosmological physics and biology nor in individual conscious experiences and preferences of belief.

Vedanta is very much a counterpoint between the unity of Brahman as cosmic consciousness and a profuse variety of deities, from Shiva through Vishnu to Durga, Shakti and Kali, not to forget Ganesh and Hanuman, who are still in reality

ancient human-animal thieranthropes. So the only unity is in ultimate reality, while the notion of deity is rife with dissonance, conflict and sacrifice. It is also not at all just about peace and love, for Krishna in the Gita declares holy war even against one's kith and kin. Nor is there evidence for a single common divine power.

Now there is a very big problem with Hindu culture, that is also shared by Monotheism, is the treatment of the female sex. In our book "[Sexual Paradox: Complementarity, Reproductive Conflict and Human Emergence](#)", Christine and I spelled out that human culture and super intelligence arose from a Red Queen race of reproductive conflict, in which astute female reproductive choice was pivotal to XY-chromosomal evolution of intelligence.

The religious history of planet Earth has been wracked by a succeeding period of patriarchal domination of female reproductive choice that has decimated Y-chromosome diversity due to powerful males dominating reproductive choice, particularly in the name of religions, both by male-male homicide and invocation of lethal punishments for female adultery. So much for religious morality! Hindu culture is rife with patriarchal oppression. Sexual paradox has an entire chapter "[Daughters, Wives and Widows](#)" dealing with the vagaries of hypergamic Hindu culture, rife with child marriage, bride burning, widows in charnel houses living a life of virtual suttee, sexual abuse and severe sexual imbalance due to killing the girl child in the womb.

Indeed this is why, after visiting Jerusalem in the Millennium to reflower the Tree of Life in the sacred reunion of woman and man, I took great trouble to go to Varanasi to pay my respects to Kali as the "Black Madonna" of history, to disband the messianic patriarchy, when my tickets inadvertently had got cancelled and I had to wage war with Lufthansa at Frankfurt airport for three days to get them to fly me into Nepal and then go overland from the Himalayas by bus.

Chris: "My answer is to enter the mysterium without polemics and report empirically on your vision quest without prejudice and see if you can find secular consensus."

Joshua: "My answer is to enter the mysterium without polemics and report empirically on your vision quest without prejudice and see if you can find secular [religious, spiritual and mystical] consensus."

Chris: I like your use of "spiritful" Yeshua, but as usual you are weighting the "spiritual" side as three times as "meaningful" as the secular. This is even more biased than the Quranic statement that the value of a man in law is twice that of a woman. It is the very source of bias in the 1pp empirical approach that means religious belief is fatally unreliable.

The only correct cosmological solution is the following: "My answer is to enter the mysterium without polemics and report empirically on your vision quest without prejudice and see if you can find scientific, visionary and biophilic, consensus."

Joshua: So far it seems that both science and Brahmanic philosophy are facing serious challenges to differentiate and then integrate different levels of reality. This is what the Urantia Book has to say about Brahmanic philosophy:

94:3.8 (1031.1) Brahmanic philosophy has approximated many of the facts of the universe and has approached numerous cosmic truths, but it has all too often fallen victim to the error of failing to differentiate between the several levels of reality, such as absolute, transcendental, and finite. It has failed to take into account that what may be finite-illusory on the absolute level may be absolutely real on the finite level. And it has also taken no cognizance of the essential personality of the Universal Father, who is personally contactable on all levels from the evolutionary creature's limited experience with God on up to the limitless experience of the Eternal Son [-Daughter] with the Paradise Father [-Mother].

About science, we already have pointed out the great limitations of 3pp science when divorced from 1pp, particularly in the study of human cognition, conscious vs. unconscious states, the integration of reason and emotion, and the experience of Cosmic or God's Consciousness resulting in embodied spirituality, and I AM Identity that cares for the sacredness of all life.

Chris: That's cute Yeshua, but all it reflects is the extreme bias [Urantia](#) has for Jesus and Christian notions of the "father God", just as your subsequent passage declares. In fact you yourself have inserted the alleviating [feminine] because Paper 10 "The Paradise Trinity" says it's a boy's club:

The Universal Father, the Eternal Son, and the Infinite Spirit are unique persons; none is a duplicate; each is original; all are united.

This is precisely why religious compilations show enough bias to render their conclusions counterfactual.

There is a deep parallel between Urantia and Symbiotic Existential Cosmology but SEC is sticking to empirical evidence 1pp and 3pp, because all previous spiritual and religious texts have failed to stick to empirical trustworthiness!

Joshua: All Human Beings, ought to seek to understand reality via science, as well as, religious, spiritual and mystical experience, and "enter the mysterium without polemics and report empirically on [our] vision [quests] without prejudice and see if [we] can find scientific, visionary and biophilic, consensus."

I wish you would have read a little more in the Urantia book, since it is far from being a boy's club, and the conceptual framework it portrays is vast. I quote some examples (bold and yellow are mine):

Paper 8 - The Infinite Spirit 8:2:2 (92.3) The Third Source and Center is known by numerous titles: the Universal Spirit, the Supreme Guide, the Conjoint Creator, the Divine Executive, the Infinite Mind, the Spirit of Spirits, the Paradise Mother Spirit, the Conjoint Actor, the Final Co-ordinator, the Omnipresent Spirit, the Absolute Intelligence, the Divine Action; and on Urantia he is sometimes confused with the cosmic mind.

Paper 14 - The Central and Divine Universe 14:6:36 (162.11) And lastly, since these Daughter Spirits of the Infinite Mother Spirit will not likely ever return to their Paradise home, they derive great satisfaction from the universal reflectivity phenomenon associated with the Supreme Being in Havona and personalized in Majeston on Paradise.

Chris: The only thing I can say is that I am prepared to say who I am as an author of SEC, however outrageous it may seem, while the authors here are elusive. It does read rather like Dante's Divine Comedy or the gnostic archons, but it's neither science nor scripture. Why are these daughter spirits not likely to return to their paradise home? Why does that mean they derive great satisfaction and what is a universal reflectivity phenomenon? This all doesn't make any sense except as a CS Lewis fairy tale about God.

I can accept religious scripture like the Upanishads and the Hebrew Bible because it's an account that can be exposed to both historical and cosmological assessment. How do we assess literature that reads as an unspecified author's imaginal allegorical description? Is it fiction or non-fiction? Does it just have allegorical "truth"? If so, what truth?

I can accept allegorical spirits. I see spirits of all the creatures who have ever existed, and feel the spirits of the wind and storms, as an animist does, but this includes life and celebrates life as sacred. It's not the sort of elitist spirituality that others like Paul talk about in the intellectual noosphere and I take it only as seriously as any other experience. It's not for me to tell you what – its for each of us to unveil.

My problem is not with spirituality in its widest sense, but with transcendent spiritual elitism. Animism is a founding human world view which treats all living beings and entities as conscious agents, including edge-of-chaos natural phenomena and invokes all of life in symbiotic awareness confluent with Symbiotic Existential Cosmology. The views of spirituality as complementary to science are a much narrower view of spirit in a transcendent religious context, as opposed to mere matter and the wholly incorrect notion that science is to blame for the existential crisis, which should therefore be solved by the unification of science and established religion. I see this as a false remedy because it leaves life supplicant, is not a redemptive paradigm shift and religion is as guilty as science of jingoistic ascendance.

This brings me back to the source of Pauline Christianity. I have realised that this entire construction that leads to endless flesh and blood of Christ hanging before every church lectern for 2000 years, actually originates from the Idealist thinking of Plato through Philo and Paul. This was an allegorical reality that became violent human history in martyrdom and Crusade. Philo and then Paul thought of everything in allegories so that it became acceptable to think of Jesus as an intermediary with a formless father deity and then that got caught up in dogma that he was both a mortal human and a divine being as mediator. Then it got turned into both the notion that God had had to sacrifice Jesus because that was the allegory of forgiveness of the sins in the all too diabolical Zoroastrian day of judgment and then it got turned into Jesus as Christ being at the very origin of the universe before Adam and Eve.

These are the dire consequences of runaway Idealistic philosophy, turned into visionary doctrine which is subjective experience thinking it is absolute reality. It's worse than pure physicalism by far. It has dire consequences and not just

in terms of sacrificial violence but encouraging martyrdom because we are just spirit beings waiting for eternal life and have to make strategic decisions to martyr ourselves to ensure eternal life, we are thinking of ourselves as not really physical in any meaningful way and physical as damned because Greek world views disdained the flesh, as well as Gnostic world views. But what if the only life we have is the one we have now, as I suspect.

I can't go down this spiritual reification route at all. I have to take the route of empirical integrity. It may seem severe but it's necessary for human survival.

Joshua: yours are questions that we can explore in the context and vocabulary of The Urantia Book

- "Why will they not likely return to their paradise home? "
- "Why does that mean they derive great satisfaction and what is a universal reflectivity phenomenon?"

However, if you have already made up your mind, I respect that.

Chris: This still all pivots on **I AM**. You said: "and the experience of Cosmic or God's Consciousness resulting in embodied spirituality, and **I AM** Identity that cares for the sacredness of all life". It's we all, not just I AM that needs to protect life, but this brings us to a question about what **I AM** is. How far does the subjective extend into the objective?

Vedanta sees this as something that is the completion of our organismic consciousness in **cosmic consciousness**. There is no separation between atman and Brahman. This is completely different from the Western view of **God consciousness**, as awareness of an absolute external abstract transcendent wilful deity independent of our own free will. I'm saying both are wrong in an absolute cosmological sense, because animistic spirituality emerged from the biospheric jungle, late in metazoan evolution. To say anything else is contrivance. Both samadhi and mystical union are real as visionary experiences and they might have supernatural powers, but we don't pre-empt reality with belief.

The **warriors path** has a stringent sense of spiritual integrity. This stringent path is retaining the sense of disbelief and letting the visions overwhelm one in the midst of overpowering numinosity without affirmative belief. I thus think, for all his deceits as a jackal, Carlos Castaneda is right about God fixing the assemblage point and stymying the vision quest. This is a world apart from Richard Dawkins saying God is a delusion!

The Brahmanic moksha in Vedanta is on a continuum. You can interpret union with Brahman as a meeting with the 'Elohim – Ishvara/Ishvari, but it's on a sliding scale of one's own view, so it's not absolute. Moreover the organismic psyche is emotional and personified, so Brahman has all the characteristics of organismic personality and compassion. This doesn't make God real. God is a way of looking at the self, projected onto the cosmos and the karma around us.

We can't go and set off nuclear Trinity and then try to turn to God to save the biosphere. There's no hiding place down there, hallelujah! We have to grow up and wake up now and take cosmic responsibility for our fate of taking a bite out of the nuclear apple of the cosmos. That's the buck. Knowledge of good and evil. We **HAVE** to make good now to protect the tree of life's diversity. It's make or break.

But the point is to keep having intense transformative visions, then we don't need presumptions. The way I do that is very occasionally takingentheogens as deep transcendental meditation, because this is the way to span heaven and earth in a moksha bridge.

The way of samadhi is sparse and referred to as "emptiness". The way of the entheogen is overflowing with experiential and spiritual fullness, but it's also of the earth, of life, and of the unity of all life, and of the insightfulness of the evolving biosphere, protecting itself and us from Fermi extinction. So it really is a mystery! I'm just an earth conductor.

Once the mysterium tremendum of mortally fearful men who, unlike the females of our species, don't give birth to new life, hit the stratosphere, their feet left the ground, because their visionary bodies are too short. In a way, entheogens are the only thing that enables the axis mundi to reach the heavens while planted in the sacred earth. This makes it possible to be a visionary mystic, a rational scientist and a critical sceptic.



Fig 292i: Tree of Life Deana Harvey

The Before, During and Afterlife

Cathy Reason: I have seen Hell in this life, horrors beyond description. Can we really be sure that similar horrors don't await in the after life -- not for karmic or moral reasons, but simply because of random chance? I have seen people in this life having to undergo things I cannot even bring myself to imagine. And one of my nightmares about the afterlife concerns being lost in a trackless wilderness where no path ever leads to any destination at all -- you cannot go anywhere, because everywhere is exactly the same as "here". A mathematician can conceive of the ultimate-escape-proof prison -- a completely closed manifold. In fact, I believe the world of our living experience is just such a manifold, one in which we remain trapped by our psychic entanglement with the living. Who knows what happens when that entanglement is broken?

The reason I am convinced there is an afterlife, is that it is pretty clear by now that consciousness is not an emergent property of the physical world. It's theoretically possible that it springs magically into existence in response to a particular configuration of matter, and vanishes equally magically when that configuration disperses. But that seems extremely implausible. It seems far more likely to me that consciousness is a pre-existing entity which becomes entangled with the living world for a time, and then disentangles from it. But I agree that one might be better off not believing this.

Chris: I empathise with your despondency about being caught in the dysphoric loop of life, but death is not the answer, it's an inevitability. Hoping for an afterlife in death, to escape life itself, is a living tragedy.

Cathy: I was suggesting that while an afterlife of some sort is probably inevitable, it isn't automatically desirable.

Chris: Cathy is right, but she is not saying what you expect and the consequences are completely different from what you assume. We do not possess subjective consciousness, we manifest it. It IS a cosmological phenomenon, which is the culminating expression of the symmetry-broken forces of nature, which themselves are incomplete without the denouement of cosmic consciousness emergent in complex living organisms.

We are ALL conscious, as is life as a whole and this IS an empirical fact. We all verify this by empirical subjective experience every moment of our lives, just as we verify empirical observations externally. We can also empirically verify that we have intentional will to affect the universe around us in our behaviour. But this doesn't mean the existence of an afterlife, in the sense of an individual intentional consciousness, as a disincarnate ego, or soul -- another piece of damaged goods. The very term afterlife is an abuse of life itself.

We are Alive

*We are waves whose stillness is non-being.
We are alive because of this, that we have no rest.*
Abu-Talib Kali

Christo Rey on the Epiphany 2024. When I take mushrooms, it is as if I have become aware of all the living spirits of existence eternally from alpha to omega, because the doors of perception have been flung wide open, but it doesn't mean I have an eternal individual soul. Presume to have an eternal afterlife and we go down the gurgler of delusion. The very compounding of "after" and "life" is the root repression of life emergent to spiritual domination for religious largesse. The afterlife is a spiritual tragedy of the commons that violates the sanctity of life itself. So be here now and forever, in the before, during and afterlife, but remember it is what you do, not what you assume, that will sustain life unfolding or lay it to waste.

Pragmatism On Religion

1. All life survives on energy consumption. Lions and humans are both natural autonomous conscious agents, therefore any form of cosmic morality, e.g. not to kill, is false.
2. Organismic mortality is essential to life. It is the inevitable consequence of the entropic universe, alleviated only by sexual recombination, without which complex life could not exist. Eternal souls are not conducive to living diversity.
3. God and Brahman as the generative cosmic mind, are tokens of cosmic order over chaos, alleged to make the universe, but demonstrably failing, in moral oblivion and decline, from the fecundity of tohu va vohu to Armageddon and the Kali Yuga.
4. Life, evolution and consciousness arise in critical phase transition at the edge of chaos, and unfold throughout our generations, because the ultimate rule of order prohibits innovative escape and becomes stuck in its own oppressive rut.
5. Therefore God, or Brahman creating the physical universe as a state of ultimate good or ultimate order is a contradiction to the emergent conscious universe of life overflowing that we actually observe.

The Evolution of Symbiotic Existential Cosmology

Unified Field Theories and Cosmological Biogenesis

In 1978 I published a monograph on the cosmological foundations for the origin of life explaining life as a climax manifestation. In "Unified Field Theories and the Origin of Life" (King 1978), I described the prototype of many of the ideas you will find in Symbiotic Existential Cosmology. It was a very early attempt, in which I was absorbing many ideas from across the span of cosmological physics, through molecular biology to neuroscience, so some of the ideas are somewhat incorrect or speculative. Afterwards, I became so embarrassed by it that I had not looked at it until today in May 2022 with the monograph complete, and was astonished to find in my one 44 year old hard copy many ideas that are now fully articulated in the monograph with the advantage of nearly a half century of scientific discovery.

At the time I had not heard of chaos theory. Chaos in the logistic iteration was discovered by Robert May (1976) only two years earlier. Chaos became popularised with the discovery of the Mandelbrot set the same year I wrote (Brooks & Matelski 1980). The edge of chaos, was first articulated a decade later (Packard 1988). I had to depend on ideas of catastrophe theory, creodes, dynamical attractors and the breaking of structural instability. There is but one brief reference to fractal processes, in attempting to define chaos in terms of "generalised catastrophe" (Stewart 1976):

Previously it was thought that a real dynamical process must have a form which is stable to arbitrarily small perturbations, otherwise it would be ephemeral and cease to exist by infinitesimal perturbation. However, it was subsequently discovered that many basic physical phenomena, such as fluid turbulence are intrinsically unstable and cannot be approximated by a stable model. Such processes are called generalised catastrophes and may be regarded as structurally indeterminate. In such processes, the global dynamic may give rise to ramifying local structure through fractal stability breaking.

And an introductory poem in echo of a snow flake growing in the atmosphere ...

*I am a tree whose leaves are trees. You are the endless colours of the night.
I grow into you. You forever dissolve me, in the swirl of your eddies of eddies.*

Fig 254: Left and centre: Microcellular formations generated in my little lab from HCN and NH₃ over H₂O, sometimes with HCHO. Right: Spores of a psilocybe species at the same magnification used for size comparison (King 2020a).



Nevertheless the 1978 paper clearly elucidates the central theme of the cosmological symmetry breaking of the forces of nature, leading to cosmological biogenesis, through the interactive processes of strong and weak chemical bonding, expressed as a "holographic" non-linear process, due to the fractal nature of coherent spatial molecular orbital wave function interactions:

Recently unified field theories have been discovered, which indicate the four forces of nature, gravity, electromagnetism, the nuclear force and the weak radioactive force all differentiated from a common superforce in the big bang at the origin of the universe. This superforce is based on the duality between the bosons, which cause force and the fermions which cause matter. This theory demonstrates that the origin of life is a direct interactive consequence of the differentiation of these forces That it occurs in a substantially unique and general way throughout the universe (p5).

To form a more accurate picture of the non-linear behaviour of molecules, we note that the molecular dynamics of concentrations depends on the holographic energetics of bonding. We need to consider two levels of phenomena, the global dynamics of concentrations and the quantal transformations of the orbitals (p21).

In this, the theory cites prebiotic polymerisations as having formally unpredictable behaviour, leading to complexity, because the more complex products cannot be deterministically predicted from the wave functions of the simpler reactants and their concentrations alone, due to stochastic quantum and auto-catalytic effects:

Normally large numbers of molecules in a reaction are deemed to swamp any incidental quantum events ... suggesting that classical models of chemistry are sufficient. What is not generally appreciated is that the quantum character is not displayed in temporal terms, but spatially in the globally derived wave theoretic holographic bond. This introduces a structural form of uncertainty, where the nature of the products cannot necessarily be deduced from the wave functions of the reactants.

The bulk of the paper is a documentation of the then known prebiotic chemistry and molecular biology laid out as a biogenic evolutionary sequence, however in the last few pages an overview emerges articulating many of the key ideas, spanning biogenesis, evolution and consciousness that have 44 years later emerged in this manuscript.

The link between the eucaryote endosymbiosis and the origin of cell membrane neuro-excitability involved in neurophysiological activity and cellular social communication and cell-virus symbiosis is noted over 40 years before being published by Wan K & Jékely G (2021).

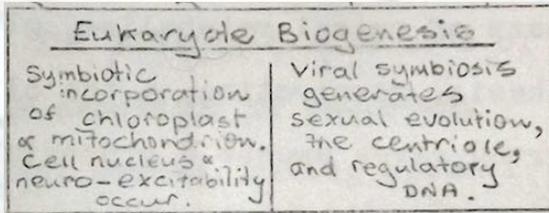


Fig 255: The link between eucaryote endosymbiosis and neuro-excitability noted in King (1978).

The link between understanding conscious brain dynamics and the evolution of the brain from single celled eucaryotes, through organisms like hydra, where there is only a primitive neural net, in Symbiotic Existential Cosmology is clearly articulated:

To understand the global properties of brain function, it is necessary to examine the evolution of the brain from its primal source. The amoeba already has a sensitive sensory-muscular coupling capable of controlling pseudopod movement and even capturing moving prey. It distinguishes active and passive prey, thus being sensitive to external vibration, probably via threshold neural excitability. ... it is also chemosensitive ... it responds similarly to bright light so is photosensitive, like algal flagellates. Such behaviour is complex, involving a degree of choice in of conflict of sense data (p104).

The amoeba-flagellate character of coelenterates is noticeable. The hydra may move slowly by gliding through a creeping amoeboid movement of its base. It may also somersault over on to its tentacles, letting go at the base and swinging over itself into a new position. Those with long arms can also drag themselves to a new site by grabbing a nearby structure. The nervous system of hydra is a net, covering the organism with a slight concentration around the mouth. There are no specific pathways. Impulses can cross synapses in either direction and excitation travels generally across the net. There are sensory cells, but no evidence of specific ganglia or a brain. Thus the behavioural repertoire does not arise from the organisation of the nerve net as such underlining the difficulty of explaining insect, or vertebrate behaviour in terms of neural organisation, which is only secondary to the neuron (p105-7).

Fig 256: Hydra showing complex coordinated behaviour (King 1996). The simple-eyed (fig 154) cnidarian box jellyfish, which is likewise "brainless", although it does have specialised neurons around the eyes (Nielsen et al. 2021, Arendt et al. 2016). Cnidaria are fully-capable of associative learning (Botton-Amiot, et al. 2023, Bielecki et al. 2023).



The idea of conscious brain dynamics occurring at the edge of chaos is clearly expressed a decade before the concept was defined:

We investigate the cortex as a generalised system which has evolved to cope with environmental structural instability in its functioning (p113). ... A computer breaks down whenever it faces a situation of generalised catastrophe that corresponds to a structurally unstable situation. To avoid this problem, the brain must incorporate generalised catastrophe in its function. For this reason, it must also utilise the sub-cellular catastrophe function of the neuron (p117).

The view of consciousness as cosmologically primary is clearly expressed, as well as its link to quantum uncertainty:

This brings us to the door of consciousness. In a deterministic system, here is no room for consciousness. The states of the system are already determined by the initial conditions. Consciousness has no definable meaning in terms of states of the brain, or otherwise.

However, in an indeterminate system consciousness may be dual with respect to uncertainty. Reduction of the wave packet to the particle has proved an irreducible problem in quantum theory. ... This has led some physicists to propose that the consciousness of the observer is involved (p118).

The only world we ever do experience is the conscious one. It is the umbilical cord that connects us to the physical world. If we become deeply unconscious, the world is lost too. Indeed, we never experience the physical world. We do not see the atoms of the

apple, not the photons that reach our eye, not do we see the excitation patterns of our nerve cells. Atoms and photons are colourless odourless structures of energy. They have wavelength but not colour. The physical world is a myth about consciousness. Sights and sounds cannot be reduced to brain states because brain states are colourless, soundless electrical phenomena. The nearest we can come is to associate sound and colour with certain dimensions of uncertainty. ... Consciousness is an immaterial phenomenon, as evidenced by our capacity to dream a full extra-physical reality (p119).

The idea of sense modes being quantum modes, rather than just brain states is presented:

The amoeba has three dimensions of uncertainty. Weak bonding of the trace chemicals from the environment. Perturbations from photon absorption, possibly by such molecules as serotonin (indole has maximum uv absorption and catalyses triple transfer). Finally there are vibratory perturbations caused on the global membrane surface.

The idea of non-IID quantum processes not converging to the classical is enunciated over 40 years before it was reported by Gallego & Dakić (2021):

Random models do not approximate uncertainty. ... Statistics is a model of probabilistic determinacy under repeated conditions. It gives no hint as to the situation when the conditions are transformed by each event (p119).

The central message of biospheric symbiosis, central to Symbiotic Existential Cosmology, is already fully articulated:

Let us now turn our attention to the environment. The instability theorem shows us that no external control of the ecosystem can provide a regime of advantageous stability. The biosphere survives from its catastrophic diversity. It is from this diversity and instability that it moves back from equilibrium, giving us the air we breathe and the food we eat. All attempts to subject the biosphere to manipulative constraint merely reverse the trend and return it to bleak lifeless equilibrium. This is grandly demonstrated in ecocrisis, which stands, a dark cloud over our future.

Although it is the biosphere as a whole, rather than the plants which evolve to climax diversity, the notion of biospheric symbiosis is already expressed:

The test of man is whether he can undo these effects before it is too late. There is considerable evidence that plants are exosymbiotic. Their evolution favours species diversity rather than survival of the fittest.... When we come to consider the atmosphere, we find a similar situation. It is an autocatalytic system just like ourselves (p120).

The research report finishes with an confession that the humble author has fallen right outside the puzzle box of reality in a psychedelic experience and just as now is trying to communicate with those still inside the bubble to alert them to their plight:

All science is a myth. A myth is a description of reality by a culture. Science is a brilliant invention of culture because it was a completely new way of going about myth making. It introduced the notion of scepticism and going out and checking the details to see if they fitted the myth or not. ... It also brought the idea of prediction. A myth should predict that some things would happen and other things not.

All this would be very fine if it were not that science has become such a powerful myth that most people take it for reality itself, especially scientists. Once this happens, the safeguards are gone. Thinking becomes lost in a paradigm of outlook, a dusty plain, broken by the occasional catastrophic perspective that is triggered by some errant genius finding his way out of the puzzle box of reality and being able to communicate with the people inside.

The prime task of the anthropologist is a creative one. To guide his culture into wholeness, by participating in the great myths of our origin. It would not be possible were it not for the brilliant work of thousands of careful experts to whom we are all indebted. This is not my theory. It has no name. It should never have one except perhaps the cosmological theory of biogenesis.

I persuaded the university to let me build a small origins of life lab and succeeded in making primal microcells. The research overview of biogenesis has continued (King 2020a).

Crisis and Resplendence

In 2015, while riding my pushbike at dusk without a helmet, in the interests of being as free as the wind, as one of the wild and feral generation that came before safety belts and cycle helmets, a car suddenly emerged from a driveway and, in jamming on the brakes I flipped over the handlebars and tumbled head-first onto the concrete. The next thing I knew an unspecified time later was that I walked into our house with blood streaming across my face, an eye like a pomegranate and my front teeth knocked out, saying what "happened to me"? "Was I mugged"? When I went out to check the bike I found it twisted and unrideable and the garage doors covered in blood.



Resplendence: A Revolutionary World-view (click the image to view on an internet capable device).
The other face complementing this talk is my resurrection song Revelation.

Hours later, in accident and emergency, cloudy images of my panic as I saw the car and began to tumble reconnected, as I waited in observation. It later transpired from other people's accounts that I had been knocked unconscious, was found staggering around the accident site and the ambulance was called, but by then I had wandered off and dragged myself and the bike across town in a concussed state with no memory of how I made it home. I refused an X-ray although the doctors pleaded with me that I could succumb from a haemorrhage and survived with no permanent sequelae.

As soon as I had recovered, I realised that what I had done was dangerously foolish. Not because of risk to my own life and sanity, but because it could have deprived me of revealing to the world an answer to the conscious existential dilemma of life, the universe and everything, pivotal to saving the diversity of life and our planetary future.

Fig 257: Bloodied, but unbowed



Thus emerged the concept of planetary resplendence (*resplendere* "to shine brightly", transcending religion – *religio* "to bind together") as a cultural paradigm. Resurrection Revelation a hymn to the event.

This project then remained quiescent and unfulfilled for the next six years, until my quantum change experience on sacred mushrooms in early June 2021 gave me a root jolt of realisation that I need to act now, re-galvanising the renewed urgency of this quest. I am in a world where there is a real and significant risk that humanity will cause a hard planetary landing, precipitating a mass extinction of up to half the planet's biodiversity amid a climate crisis that could take us back 50 million years to the early Eocene climatic heating peak shortly after the dinosaur extinction. If I don't speak out and do something decisive while I am alive, the ability to avoid this evolutionary and frankly cosmological calamity, which could prejudice human survival will evaporate.

This is again what the moksha epiphany on sacred mushrooms told me in the most compassionate possible terms. The message is real and glaringly urgent. It is not a religious or spiritual fantasy. It is hard reality speaking a warning that all the science tells us is serious and immanently needs to be addressed. Humanity must act and must act now and a key, however strange it may appear, lies in the biospheric sacraments, which is the purpose of this spore communication.

Biodiversity Affirmations



Communique on Preserving the Diversity of Life on Earth for our Survival as a Species Declared Jan 6 2022 on the Anniversary of Completing our Millennial Vigil to Jerusalem to Reflower the Tree of Life, in Sacred Reunion between Woman and Man

My name is Chris King (b Epiphany 1945).

I came into this world, in a time of planetary crisis to bear witness to an incontestable, urgent and neglected truth:

That for our own survival, we must act decisively, now without procrastination, to save the immortal tree of living diversity on our planet, before the immanent **mass extinction of life** fully ensues at human hands, **severely compromising our immediate prospects and dooming our long-term future as a living species.** From this umbilical truth, the very meaning of conscious existence and all its unfolding depths and wonders spring forth.

My defence of this claim, transcending both the materialistic and theistic world views is set out in **Symbiotic Existential Cosmology** – the veridical cosmology of the universe in which we consciously exist. This is demonstrably the most provocative creative commons work of 2022, because it fulfils our existential quest for the true meaning of existence, by augmenting quantum cosmology with conscious volitional agency, opening up the full dimensions of the subjective realm underpinning all religious traditions. This means that the Cosmology is not just a work of scientific empiricism, but is the veridical Logos of religious paradigm innovation, assigning to me a rightful duty of care to articulate the **Weltanshauung of Immortality**, thus fully transforming the zeitgeist, because, in saving the diversity of life, it fulfils our existential hope, in our relationship with existence once again becoming everlasting, as it has for the last 3.5 billion years.

The Weltanshauung of Immortality is the world view in which life and conscious existence are recognised as perennially immortal processes key to the cosmology of the universe and that the meaning and reason for conscious existence is the sacred process of fulfilment of the flowering of life, so that the universe as a whole can become fully aware of and truly know itself through the living biota it has generated as a climax phenomenon.

Covenant: In the spirit of consilience, I humbly ask all of us worldwide to join with me in this critical venture of planetary redemption, as autonomous human beings, in mutual affirmation:

That we agree:

- to dedicate** a full half of each of planet Earth's land and ocean habitats to the preservation and future evolution of life;
- to sustain** the diversity of life with our lives;
- to turn the tables** on exploitation and expediency;
- to support** the next generation's strike, not just for climate, but for the diversity of life itself;
- to act where necessary** in living rebellion against the genocidal extinction of life at human hands.

On receipt of this communication, we **each inherit a responsibility to act** upon it and to share the discovery process!

Please publish this message widely and forward it to everyone in your domain – because all future lives urgently depend on understanding the need and taking action now!

Most urgently we need small groups of inspired people to diversify the communication process!

The Indictment:

- (1) We are **assimilating the living wilderness habitats of the planet**, and the diversity of life is simply taking **the expedient back burner**.
- (2) The **biomass of humans + livestock is over 22.5 times that of all remaining wild mammals**, creating an **immanently lethal double population crisis**.
- (3) We have **no clear confidence of holding the line on climate crisis**, with COP26 **failing to phase out coal use and 1.5oC on life support**.
- (4) We are still **overflowing with nuclear overkill**. The superpowers are in brinksmanship on the border as I write.
- (5) We are completely losing the **distinction between conscious life and artificial intelligence**, and with it **human conscious volitional agency**.
- (6) We remain addicted to an **unsustainable exponentiating GNP economic paradigm of exploitation** over shorter and shorter triple witching hour instabilities.
- (7) Last but not least, a **clear majority** of people on the planet adhere to **religious views invoking dominion over nature, and directly embracing destructive apocalypse**.

These are **our seven deadly 'sins'** and all are abundantly clear paths to inevitable **Fermi paradox catastrophe**.

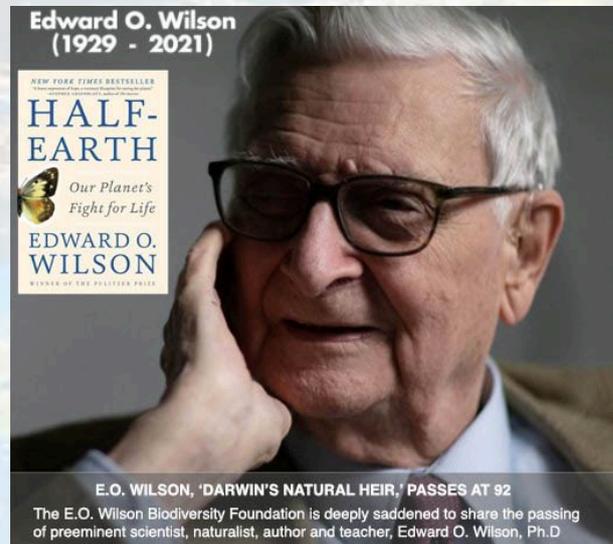
If you pause and reflect on this message, you will realise that everything I am saying here is veridically true, as is the cosmology. I have come in the time of acute need, to light the beacon of life's resplendence and guard it till it shines brightly! No one else on the planet has expressed any real hope of bringing both the religious and materialistic paradigms into full alignment with human and biospheric survival in time to save life as a whole. Someone had to discover their true incarnate calling and make that tortuous journey into the unknown. But I am just the catalyst, bearing a sacramental biospheric ally. With the full unveiling of this knowledge, this gnosis, the baton of conscious agency over the future of the living universe around us now passes to all of us.

The Huichol have said, that we are "*perdido*" – lost, done for. But in this sacred undertaking we shall find our true redemption. Through our collective affirmation, we shall begin at last to truly keep the immortal way of the Tree of Life throughout our generations forever. Through this awakening, humanity can be confident of inheriting perpetual life, as a species, through our true love for one another, just as Genesis envisaged before the Fall.

In this very act, we become liberated. We shall know it in our heart of hearts and can feel it in our bones – this is our one true calling, to have chosen that good part that shall not be taken away from us, in the time of true need, as one people, as a living species and as a symbiotic biosphere: To save the life tree of the living universe in the cusp of our planetary crisis, so that conscious existence can continue to fully flower and unfold in the universe unabated. This is our *raison d'etre*, our true meaning in life, and shall become our ultimate fruition in resplendent Paradise on the cosmic equator in space-time.

What we have within us will save us if we bring it forth from ourselves.

We CAN DO this! What other viable option can there be?



Affirmations: How to Reflower the Diversity of Life for our own Survival

Elucidated in a conversation between Chris King and Suzy McFarland

Ron Horgan: I agree Chris, the long term future of *Homo sapiens* on Earth requires us to live within our means as part of the biosphere. Can you enlarge on the rules and laws we need to live symbiotically with nature? Your 206 page monograph is a very detailed study but confuses me. My strength is rapidly reading and extracting the key points from a wide range of discoveries. What do you recommend we do?

Chris King: The solution is twofold: (A) **The meaning and purpose** and (B) **The action required**. Both are essential because without A, B won't happen in time to do what's really needed.

Both **theistic** and **mechanistic** cosmologies leave us with **annihilation**. The first sacrifices nature to human dominion, then apocalyptic triage and destruction. The second is a lifeless machine, in which conscious life is an informational accident that has no cosmological meaning or significance. **Symbiotic existential cosmology** puts the ghost of consciousness back into the machine of the universe, by minimally augmenting quantum cosmology to include subjective experience. The meaning and purpose is for conscious existence to fully flower to fruition as an immortal process of the universe becoming fully aware.

A: **Symbiotic Existential Cosmology**, in its simplest irrefutable form, comes in three short statements:

- (1) **Biogenic:** Life exists cosmologically as a fractal consequence of the symmetry-breaking of the quantum forces of nature, ensuing from the cosmic origin, eventually reaching interactive climax in biological evolution.
- (2) **Panpsychic:** Subjectively conscious volitional will has efficacy⁹² over the physical universe. *This imbues at least some matter (brains) with physically efficacious subjective consciousness. Thus primitive subjectivity, is a property of normal matter.*
- (3) **Symbiotic:** The planetary biosphere survives and evolves through ecosystemic symbiosis, upon which human survival is dependent. **Biospheric symbiosis** is thus **essential for human survival**.

This is, in its simplest form, the true veridical account of the universe in which we consciously exist.

The **first** is obvious – just look around you! The diversity of life exists physically as a climax phenomenon – a quantum complexity catastrophe. The **second** is subjectively conscious existence being able to affect the physical universe, as we know from every act we take and every decision we make. This implies some matter e.g brains have an occluded subjective complement, but because the brain obeys the core quantum forces, like other matter, its a fundamental aspect of cosmology, invoking panpsychism, animism and the spiritual/religious impulse, although it's counterintuitive that the most obvious solid fact of reality opens the entire spectre. The **third** and **most important** is that the universe rises to consummating complexity through **symbiosis** between life forms, **not dominance**, as in dominion over nature by *Homo sapiens*.

B: **Reflowering Paradise on the Cosmic Equator in Space-time** 13 billion years out from the big bang:

- (1) **Give half Earth back to re-wilding the wilderness**, so there is enough species diversity for the biosphere to evolve.
- (2) **Transition to renewable energy** immediately.
- (3) **Decentralise food supply chains** to protect humanity.
- (4) Ensure the **genetic diversity** of our **food and medicinal** species.
- (5) **Eliminate nukes** and consider how best to avoid a massive **asteroid Earth strike** (Lubin & Cohen 2022) and protect from **nearby supernovae**.
- (6) Teach people how to **live in symbiotic urban culture**.
- (7) **Use technology for the benefit of life as a whole** not for personal gain, humanity alone, or an artificial intelligence takeover.
- (8) **Celebrate the perennial wonder of existence** throughout our generations forever Amen.

Hillel stated the silver rule, claiming he had recited the Torah standing on one foot. This herein is the cosmological silver bullet for the immortal Tree of Life standing on one toe! This is it. This discovery can happen only once. We aren't going to get another. This is who we really are and what the universe is really here for!

Ron: Chris this is superb. "This is who we really are and what the universe is really here for". We sure aren't going to get another chance. How to get this message onto every television and computer screen? You have made my last 10 years. Thank you.

Suzy McFarland: And, what do you expect the rest of us to do?

Chris: I ask you simply to assess two things and make up your own mind up, about this:

- (1) Do you consider that I'm telling you the veridical truth here, as a subjectively conscious human being?
- (2) Do you affirm that you also have subjective conscious volition over the physical universe?

Suzy: (1) Yes, I believe you are telling me the veridical truth. (2) Yes, I do believe this.

Jane King: Yes indeed. I do. Yes to all!!

Ultimately everything that ensues in Symbiotic Existential Cosmology to reflower and reparadise the Earth flows from this mutual veridical affirmation and the preparedness of people to communicate it to others in this way.

⁹² *efficacy* – the ability to produce a desired or intended result.

Entheogenic Conclusion

The key to this article is not just that psychedelics can induce a type of conscious awareness of the “mind at large”, but that they have a potentially pivotal role in alleviating the climate, habitat and natural resource crises that are precipitating a human-induced mass extinction of biodiversity, through the symbiotic relationship with nature these experiences invoke in the shamanic context where human relationships with nature and its spirit world are paramount.

Traditional religions, sourced in patriarchal moral imperatives and an hierarchical top down business structure to enhance social dominion, based on a scorched-Earth desert philosophy, in which natural life is just a prelude to a Day of Judgment to be consigned to eternal Heaven or the fires of Hell, are tragically ill-positioned to be able to address this existential crisis of humanity and the planet. What is required is a paradigm of autonomous direct personal responsibility to care for the universe and the sentient life within it in immortal perpetuity over cosmological time scales. This is the epoch of living Paradise all spiritual paths hunger for.

“So what we’re seeing now is a rejection of religion across the world as a hierarchical business model to connect to spirit and they’re going straight for spirit” – Rak Razam (Stewart 2013).

The question is not transcendence in its own right, which is superlative, but the responsibility this imbues to cherish and protect the living universe. This is not just a moral responsibility, but an active intent that arises from purposeful symbiosis with the cosmic mind.

This is the overwhelming message the psychedelics have communicated to me through countless sessions over 55 years and particularly through the natural entheogens and the symbiotic relationship they invoke. It is not something that proceeds automatically out of the psychedelic experience, which, like love, is a many-splendoured and sometimes very challenging thing, but nevertheless its biodiverse aspect is widely shared, in the sense of connection with nature reported in the psychedelic studies and manifest in the shamanic tradition of entheogenic use, where spiritual realisation is accompanied by a sense of integration with nature and interdependence within it. The threat to biodiversity of a mass extinction lasts over evolutionary time scales, so while climate might be addressed and mitigated due to human pressures, the unrelenting pressure on biodiversity could become exacerbated. Hence entheogens come to provide a critical short and long-term remedy to dominion over nature by increasing awareness of our symbiotic relationship with life as a whole.

The reason I have concentrated on natural psychedelics is fivefold:

- (1) Entheogenic species are an integral part of the planetary evolutionary endowment of biodiversity, as are our food and medicinal species.
- (2) Natural psychedelics are potentially symbiotic cohabitants with *Homo sapiens*, which already exist in a symbiotic relationship with the cultures and movements utilising them entheogenically.
- (3) Natural psychedelics have been used for millennia and are proven to be both safe for the individual and safe for society when used in a guided and protected spiritual, or therapeutic context.
- (4) The entheogenic experience of natural psychedelics is powerful and capable of evoking a full psychedelic state, so that, although synthetics present additional features, natural psychedelics are “sufficient unto the day”.
- (5) As long as psychedelics remain illegal, natural psychedelics are verified by their genomes to be pure of synthesis contaminants and are easily cultivated, enabling autonomous use without contact with the illegal drugs market.
- (6) They are not addictive because the effects wane rapidly on repeated use, requiring a refractory period.

There are also a variety of other natural and synthetic agents which can also have profound consciousness-altering effects, including cannabis species (THC), *Salvia divinorum* (salvinorin-a) and the synthetic drug ketamine, each of which have properties distinct from and potentially complementary to those of psychedelic entheogens. Some may also induce forms of Bardo Thodol experience, but classic psychedelics take the centre stage (King 2021b).

Sacred mushrooms contain other related psychoactive molecules, fig 258, which also contribute to the overall effect. *Psilocybe cubensis* caps have been found to have 0.01% by wt of aeruginascin, 0.07% of baeocystin, 0.88% of psilocybin, 0.01 % of norbaeocystin, 0.06% of psilocin, with stypes having about half these levels (Gotvaldová et al. 2021). Previously the rare *Inocybe aeruginascens* was found to have high levels of aeruginascin – dry weight 0.35% aureginascin, 0.52% psilocybin, 0.36% baeocystin. Gartz compared reports from 24 cases people who accidentally ingested *I. aeruginascens* to those who accidentally consumed *psilocybe* species with high levels of psilocybin and

psilocin. Those ingesting the inocybe reported only euphoric experiences, while the others had an “often slight and in some cases deep dysphoric mood”. A typical dry weight dose of cubensis is 0.3 g (micro), 1 g (mild) 1.75 g (medium), 3.5 g (strong) g medium and 5+ g (heroic T McKenna), corresponding to ~40mg psilocin. Therapeutic doses range from 20-30 mg psilocybin. There is no evidence body weight is a significant factor (Garcia-Romeu et al. 2021).

Inocybe aeruginascens

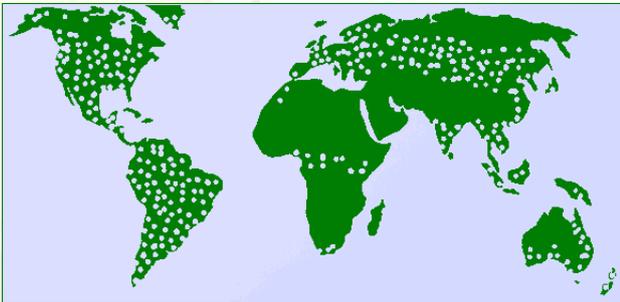


I have focussed my case on sacred mushrooms because peyote and ayahuasca are hard roads, due to nausea, while mushrooms are capable of being perfectly potent, have no such effects, particularly if ground dried in a mortar and pestle, soaked for 20 min in lemon juice to convert the psilocybin to active psilocin and drunk as a tea, resulting in a shorter, but intense experience that is easily contained in a busy life without fatigue or derangement. They are readily cultivated symbiotically (Stamets & Chilton 1984) and exist worldwide (Stamets 1996).

As Terrence and Denis McKenna stated to the reader in their mushroom growers guide (Oss & Oeric 1976):

“You as an individual and Homo sapiens as a species are on the brink of a symbiotic relationship that will eventually carry humanity and Earth into the galactic mainstream of higher civilizations”. ... “Flickering before us is a dimension so huge that its outlines can barely be brought into focus in the human frame of reference. Our animal existence, our planetary existence is ending. In geological time that ending is now only moments away. A great dying, a great extinction of many species has been occurring since at least the partnership society in prehistoric Africa. Our future lies in the mind; our weary planet's only hope of survival is that we find ourselves in the mind and make a friend that can reunite us with the earth, while carrying us to the stars. Change more radical by magnitudes than anything that has gone before, looms immediately ahead. Shamans have kept the gnosis of the accessibility of the Other for millennia. Now it is global knowledge. The consequences of this situation have only begun to unfold” (McKenna 1992 263).

Growing Wild Mushrooms



Psilocybe mushrooms have been found in all five continents. They have even been observed even in seven citations in [Antarctica](#). As noted previously, the active principles appear to originate from [horizontal transfer of a transposable element](#) between mushroom species and span more than one genus and both wood decomposing and pastoral habitats associated with Brahman cattle.

Fig 257a: World psilocybe distribution (Stamets 1996)

Although psilocin is a schedule 1 banned substance, natural psychedelics are being decriminalised in many locations. Oregon has made "magic mushrooms" legal for mental health treatment in supervised settings. The District of Columbia has passed the Entheogenic Plant and Fungus Policy Act of 2020, allowing for the possession and non-for-profit gifting or distribution of natural psychedelics. The Canadian province of Alberta has announced it will allow the use of natural psychedelics for medicinal purposes in drug-assisted psychotherapy. Australia has approved psilocybin and MDMA in prescription medications for the treatment of PTSD and treatment resistant depression. Until 2008, they were fully legal in the Netherlands. In 2023 One in 100 people in England and Wales took hallucinogenic drugs in the last year as “magic mushroom” use increased, due to increasing “studied” use by older adults. About 260,000 people aged between 16 and 59 have taken magic mushrooms in the year to Dec 2023, 100,000 more than in 2020.

The approach, roughly following Stamets and Chilton (1983), Harris (1978) and previously Oss & Oeric (1976) is for one of the most commonly cultivated tropical species *Psilocybe cubensis*, whose spores are widely available and do not contain psilocin, so are generally not illegal, but the same principles apply also to the wood decomposing species. This is the outlay to work securely from spores to fruiting fungi, as a stand alone kitchen pastime, but in many places there are online mushroom kits available which are also generally not illegal. This makes it possible for mature people to privately have deep psychedelic experiences without any connection with trade in illegal substances.

(1) Collecting and preserving spores. Collect a fresh fruiting cap showing signs of dropping spores on its gills and place it on matchsticks or a kebab sticks on a clean sheet of paper with on a piece of waxed paper or aluminium foil, covered by a protective bowl that allows air movement under the edge but out of drafts. After sufficient spores have formed a radiating print not too dense, remove the mushroom cap and leave the spore print to dry out. It can then be placed rolled up or hanging in a small clean sealed jar that has a small container of dried lithium chloride LiCl in a pill canister with vent holes to keep the humidity at 5% and store it in a fridge at 4°C. Spores can remain fertile for years this way.

(2) Propagating Media:

(a₁) **Malt Extract Agar:** 175ml water, 3.3 g agar, 0.1 g CaCO₃, 0.1 g K₂HPO₄

(a₂) **Potato Dextrose Yeast Agar:** 175ml soup of one small potato grated and boiled for 20 min, 3.3 g agar, 0.1 g CaCO₃, 0.1 g K₂HPO₄, pinch of flaky yeast, 1.5 g dextrose.

(b) **Rye Grain Mix:** 300 ml water, 224 g whole rye, 1/2 teaspoon of lime, 1/2 teaspoon of blood & bone (to provide phosphorus). A piece of decomposed cattle manure can also be added if the mix is to be grown on composted hay.

(3) Equipment.

(a) Laminar Flow Transfer Chamber. The initial stages of fungal propagation need to be performed in a sterile environment. The ideal way to do this is to build a small laminar flow chamber containing a low pressure high flow pump used in air conditioning combined with a large HEPA filter which keeps out particles larger than 0.3 μm with a steady flow into a chamber with a perspex top and front opening, as shown in the figure. One could use the outflow of a room air conditioner with an 0.3 μm filter to do this.

(b) Incubators. One needs a small incubator cupboard with a thermostat to culture spawn at 24-28 °C connected to an incandescent bulb warmer of suitable wattage. One also needs one or two mushroom growing incubators with a transparent lid to let in enough light to stimulate fruiting and a small floor vent to release CO₂.

(c) Propagating jars with filters. Buy small and large (250 ml and 120 ml) pots with sealing aluminium lids, that can have 50 ml 0.22 μm nylon filters inserted into the lids e.g. with epoxy, to be used for striking spores and transferring spawn. The larger pots can be used to break up the agar and transfer to large 1 litre cylindrical wide mouthed **KILNER** preserving jars with separate screw caps and seals which can easily tip out the spawned grain after it as grown. One needs to make a second seal of aluminium sheet which has a portal scored into it to glue a 50 ml 0.22 μm nylon filter onto it as well. Large 35 cm x 30 cm sealing plastic bags. Standard PM 2.5 face mask filters which can be taped over a portal in the bags to allow the spawn to breathe.

(d) Instruments. A small scalpel and scissors and a hooked stick that can be sterilised, and a simple meths burner to re-sterilise the transfer stick during operations to avoid cross contamination. Clean latex gloves. Disinfectant spray.

(e) A good pressure cooker that doesn't leak steam and preferably has a pressure gauge such as an **All American** 921

that is tall enough to accept two Kilner jars (of height 210 mm). Put the Kilner jar in with the filter seal above the inverted original seal to allow the grain to be shaken without hitting the filter. Put all the agar jars and sterile instruments in as well. Cook for 35 mins at 10 psi (0.7 kg/ch2). Let the cooker fully cool before transfer.

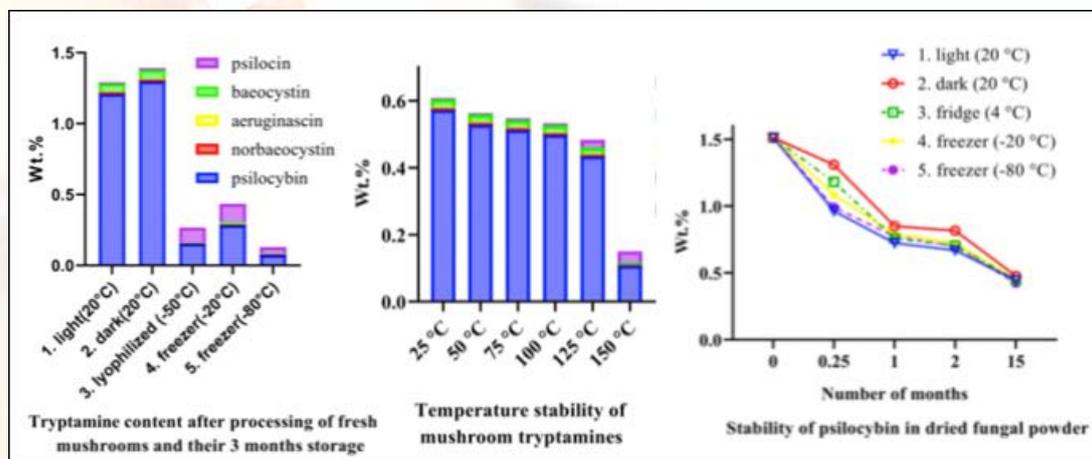
Fig 257b: Steps in the process. (1) Jar with hanging spore prints and LiCl to keep moisture below 5%. (2) 250 ml pot with filter lid with spawn. (3) Transfer chamber with large concertina folded high flow 0.3 μm HEPA filter in the back wall, a 120 ml pot ready to transfer and a Kilner jar with larger filter in the lid with grain, and a meths burner left. (4) Plastic bag with face mask filter and mature grain spawn. (5) Fruiting mushrooms.



(4) Sterile Transfer.

- (a) **Preparation:** Open the front of the flow chamber with the fan on in a still room and sterilise the interior with a cloth with disinfectant and leave it to flow for a short period to clear. Keep the fan on during the entire process.
- (b) **Spores to agar.** Hold a spore print in one gloved hand. Take the sterilised hook and flame it over the meths burner and insert it into a jar opened in the flow chamber to moisten it and stroke it on the spore print and then streak the surface of the agar, leaving a light spore streak and close the jar. Do this with several jars to ensure success.
- (c) **Agar to agar.** Replicate the above, by cutting out a small patch of fungus and transferring to new pots, to ensure a single diploid strain.
- (d) **Agar to grain.** Take a Kilner jar, knock and shake it gently to free up the grain and open it. Tip it on its side. Take a 120 ml jar of agar and open on its side and use the spoon handle to break up the agar into a slurry of small pieces and tip them into the Kilner jar either slanting or upright. Remove the inverted seal and screw down the filter seal avoiding contaminating the filter. Cover the jar with an open plastic bag, take it out and place it slanting in an incubator to grow.

(5) **Fruiting.** When the spawn has run and is clean and white without contamination, knock the jar gently with your wrist to dislodge the spawn from sticking on the walls. Put the plastic bag with the filter over the slanting down mouth of the jar and it should slide into the plastic bag. Now attach a litre jar of vermiculite that has been moistened to fully expand with boiling water and sterilised in the pressure cooker into the bag with the bag held tight and lie it down and seal the bag. Then gently break up the grain into small pieces and mix with the vermiculite. Return the bag to a fruiting incubator at just below 27°C and leave for the spawn to permeate the mix. When it has, cut the bag open in the fruiting incubator and add more sterilised vermiculite to cover so the spawn has a surface to make mushroom pinheads. Make sure the incubator (a styrofoam box with a clear plastic top and a light above 12/24hr). Reduce the temperature to ~24°C. Spray/mist it with sterile water 3 times daily to maintain ambient dampness. You need to have a vent in the floor of the box to let out the heavier CO₂. Wait for the results! Alternatively you can skip the vermiculite and spawn the grain onto compost made from fully moistened hay mixed with fresh cowpats and incubated until composted at around 60°C for two weeks or so, but this requires larger containers. You can do the same with wood decomposing mushrooms using wood shavings, such as alder, or aspen, which can be grown in a temperate mulched garden. Wood decomposing species grow in association with specific woody species so they require focused care.



(6) Drying and Storage

Fresh mushrooms can be eaten, but need to be dried for long-term storage. One can carefully split the stipes (stems) and break the caps into four using minimal crushing, as the blue staining degrades the active content. They can be dried over a warm blower heater, either at room temperature, or at a temperature no higher than 100°C, which preserves 90% of the strength (Gotvaldová et al. 2021). They need to be stored very dry in the dark at room temperature ~20°C in a sealed jar, as contact with air will destroy the active ingredients over months.

Alkaloid extraction of DMT Many plants contain DMT which is also the essential ingredient in ayahuasca, which contains DMT-bearing *Psychotria viridis* and *Banisteriopsis caapi* containing harmine. Ayahuasca can be consumed as a brew because harmine is a mild monoamine-oxidase inhibitor, which prevents the stomach destroying the DMT, but otherwise an alkaloid extraction is needed to get purer DMT which can be smoked or insufflated, as in the Amazonian snuffs like Epena and Yopo:

1. Using vinegar and water, acidify the solution to a pH of ~4 and add shredded leaves, bark or roots containing DMT. Boil for at least 90 mins and then reduce to a smaller volume by continued open boiling. The vinegar then reacts with the DMT in the plant material to create DMT acetate. Converting DMT into a salt form allows for easier absorption by the polar solution. You can do two or three such washes with the same plant material and new solvent and accumulate.
2. Use NaOH take the solution to a pH of 13 and extract with a non polar solvent such as naphtha e.g. hexane. The basic solution reacts with DMT acetate through de-protonation to produce the pure basic form of DMT (freebase), which is virtually insoluble in this alkali aqueous phase.
3. When naphtha is added and shaken, the freebase DMT transfers into this non-polar solution layer. This will require centrifuging or allowing to settle until the aqueous and non-polar phases separate. Carefully extract the non-polar solution using a basting syringe without contaminating with the aqueous muddy layer. Take care the non-polar solvents are highly flammable.
4. When kept in a freezer at temperatures near or at the solution's freezing point, crystalline DMT will precipitate out of the naphtha solution via crystallisation.

A Moksha Epiphany

My entire life has been shaped by psychedelic experience. When I first took LSD in the heady times of 1968, I immediately realised that the universe was the generator of sentient life as a climax manifestation. This became a life long quest, as a biocosmologist, to establish how and why life exists in the universe. I realised that traditional religions defining life as a preparation for Judgment in Heaven or Hell were corrupt cosmologies in conflict with nature, and while Eastern paths invoked meditative approaches to enlightenment, the fact that, by the traditions' own admission this could take lifetimes in rounds of reincarnation, also appeared to contradict realisable illumination.

But the reductionist scientific view also lacked any basis for conscious existence, as expressed by Bertrand Russel who has himself espoused Russelian monism – a form of panpsychism:

"Such in outline, but even more purposeless, more devoid of meaning is the world which science presents for our belief. Amid such a world, if anywhere, our ideals henceforward must find a home. That man is the product of causes that had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and his beliefs, are but the outcome of accidental collocations of atoms; that no fire, no heroism, no intensity of thought and feeling, can preserve an individual life beyond the grave, that all the labours of the ages, all the devotion, all the inspirations, all the noon-day brightness of human genius, are destined to extinction in the vast death of the solar system, and that the whole temple of man's achievement must inevitably be buried beneath the debris of a universe in ruins - all these things, if not quite beyond dispute, are yet so nearly certain, that no philosophy that rejects them can hope to stand. Only within the scaffolding of these truths, only on the firm foundation of unyielding despair, can the soul's habitation henceforth be safely built. ... Brief and powerless is man's life, on him and all his race the slow, sure doom falls pitiless and dark ..." (Bertrand Russell)

Francis Crick in "The Astonishing Hypothesis" put it this way:

"The astonishing hypothesis is that 'You', your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behaviour of a vast assembly of nerve cells and their associated molecules. As Lewis Carroll's Alice might have phrased it: 'You're nothing but a pack of neurons!'"

This is reinforced by Sam Harris (2012) in a radio discussion in which he puts the case against free-will:

"You feel like you are a thinker of thoughts - the author of intentions - you feel like you are a subject and commensurate with that feeling is the sense that you are in a position to do what it is you do, to decide to lift my left or right hand and deliberate between the two and I can have reasons for one or the other and I'm in the driver's seat - I really am - and that's where everyone is starting. The problem with that is that objectively we know that everything you are consciously aware of - all your thoughts and your intentions and your impulses and your intentions to resist those impulses - whatever's coming up for you - but we know that's all preceded by events in your nervous system of which you're not aware and which you didn't create and the state of your brain in this moment in every sense is the product of variables that you are not responsible for - you didn't pick your parents, you didn't pick your genes, you didn't pick the environment in which your genome was going to be expressed, you didn't pick the way your interaction with other people and the world sculpted the microstructure of your brain so as to give you the brain you have - you didn't pick the number of receptors you have of every type at each synapse, you didn't pick all the charges that are currently in place in your brain at this moment - you haven't created your neuronal physiology and yet your neuronal physiology is going to give rise to every next thought and intention that shows up for you".

What makes this invalid is that, as we have seen, the uncertainty of the quantum universe renders the classical notion of Laplacian determinism defunct, and it is precisely the loop hole of quantum uncertainty and entanglement coupled with edge of chaos self organised criticality that makes the subjective experience of volitional will possible in the physical universe.

Towards the end of my first academic sabbatical, having also experienced being a sadhu in India and Tibetan Buddhist initiations, I took peyote with the Native American Church and also sacred mushrooms. Much later I made two trips to the Peruvian Amazon to take ayahuasca. During this entire time, my entheogenic experiences were telling me that I needed to act on this knowledge received to protect the planet from a human-induced mass extinction of life.

As a child I had had a dream that I was standing in a parched jungle and all the animals were looking at me with heavy sorrow and disapproving recognition that I was a human that had reduced the earthly paradise to a scorched semi-desert. I had to run from this disapproval and found myself beside an endless queue of people waiting to find work in a dark factory surrounded by smoking chimneys. The dream left a permanent impression on me, long before the climate crisis became recognised. I have also had other formative precognitive dreams evidentially verified before the event.

In the late seventies and eighties held mushroom veladas in the moonlight on our wilderness land. 'Elohim: Living on the Open Road' gives a good expression of the psychic mood. During a mushroom velada in the 1980s, I had an epiphany that if the world hadn't successfully resolved the world's climate and biodiversity crises by the millennium in 2000, I would make a journey to the Amazon and Jerusalem to make a spiritual vigil to Earth's natural Eden of tooth and claw and to Jerusalem as the religious nexus point, to pronounce the reunion of woman and man under the banner of the immortal evolutionary tree of life, as a paradigm shift to restoring perennial sustainability of the biosphere. This is discussed in section 12 of the next article.

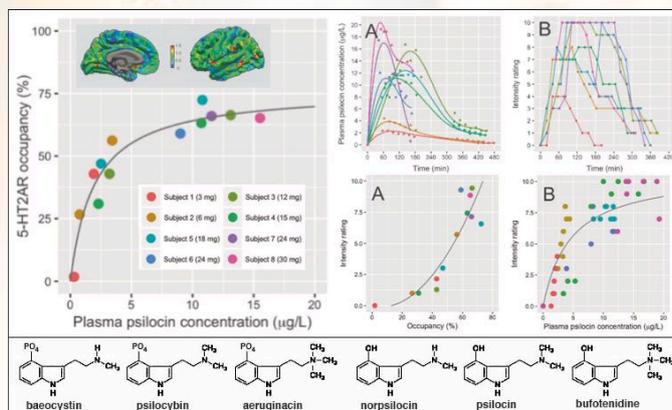
Having travelled widely and risked my life many times in far-flung corners of the Earth, I am now in my late seventies. I hadn't partaken of the sacraments for seven years, because of the fact that acute closed angle glaucoma was liable to make me go blind overnight, due to psychedelics causing my pupils to dilate. Finally, having had the lenses of both eyes replaced with cataract surgery, I resigned myself to break the fast of the mushroom sacrament to return to the source of my life-long inspiration, before I left it so late that I might end up in a terminal condition before circumstances forced me into a last desperate encounter. I took only 1.5 g dried weight, prepared as in the previous section, with some cannabis butter beforehand, to test a level that an elderly person who had not had the experience before could sustain without undue discomfort, given some caring support.

This is consistent with research fig 258, which shows a non-linear saturation curve of the 5HT2a receptor with increasing plasma psilocin levels, consistent with a moderate dose of psilocin being able to induce significant effects, with little of the collateral fallout I have sometimes experienced on an heroic dose.

The resulting quantum change experience is detailed in fig 259, from what I wrote down on my descent the same evening, reawakening my sense of life direction, creative insight and transformative urgency, just as my life has been spent on an unending expedition into the unknown, sailing down a great fjord, with the tacking and gybing, often taken at veladas, to re-envision the pointers on my journey of incarnation.

Fig 258: Dose-response curve for 5HT2a occupancy vs psilocin plasma concentration (Madsen et al. 2019). Psilocybin intake resulted in dose-related 5-HT2AR occupancies up to 72%. Plasma psilocin levels and 5-HT2AR occupancy conformed to a single-site binding model established by positron emission tomography (PET). Minor ingredients in *Ps. cubensis*.

It has many of the key peak hallmarks often described in near death experiences, except here with more emphasis on the letting-go of ego-death and meditative sensory withdrawal, as noted by neuroscientist Chris Koch (2020):



"Similar mystical experiences [to NDEs] are commonly reported when ingesting psychoactive substances from a class of hallucinogens linked to the neurotransmitter serotonin, including psilocybin (the active ingredient in magic mushrooms), LSD, DMT (aka the Spirit Molecule), and 5-MeO-DMT (aka the God Molecule), consumed as part of religious, spiritual or recreational practices".

Rather than representing an hallucinatory drug-induced delusion, such states represent conscious experience taken closer to the edge of brain dynamic chaos than normally occurs in the more controlled meditative and contemplative

traditions of religious spirituality and mysticism. By contrast with the mind-sky visions of the meditative traditions, deep entheogenic experience brings out a more symbiotic cosmic consciousness integrated with life as a whole rather than simply seeking divine grace. This is critical for human survival because the failure to incorporate the sacred transcendence and immanence of nature severely limits the capacity of the traditions to protect human survival and the diversity of life itself. Likewise, by comparison with life-transforming NDEs, the entheogenic brain is in an augmented, rather than diminished function and condition, facilitating a vast and sometimes overloading experience of ultimate reality in fully fledged form, as noted in Griffiths et al. (2019) in psychedelic studies.

For me, this took the form of an NDE that I was meeting Brahman the I was also HE and that because he was immortal or eternal He was ever-so-gently telepathically making me aware that, because I was a mortal being incarnate right in the centre of the existential crisis of life, in physical form, that I had the duty and responsibility to ensure saving the diversity of life on planet Earth, before I passed away.

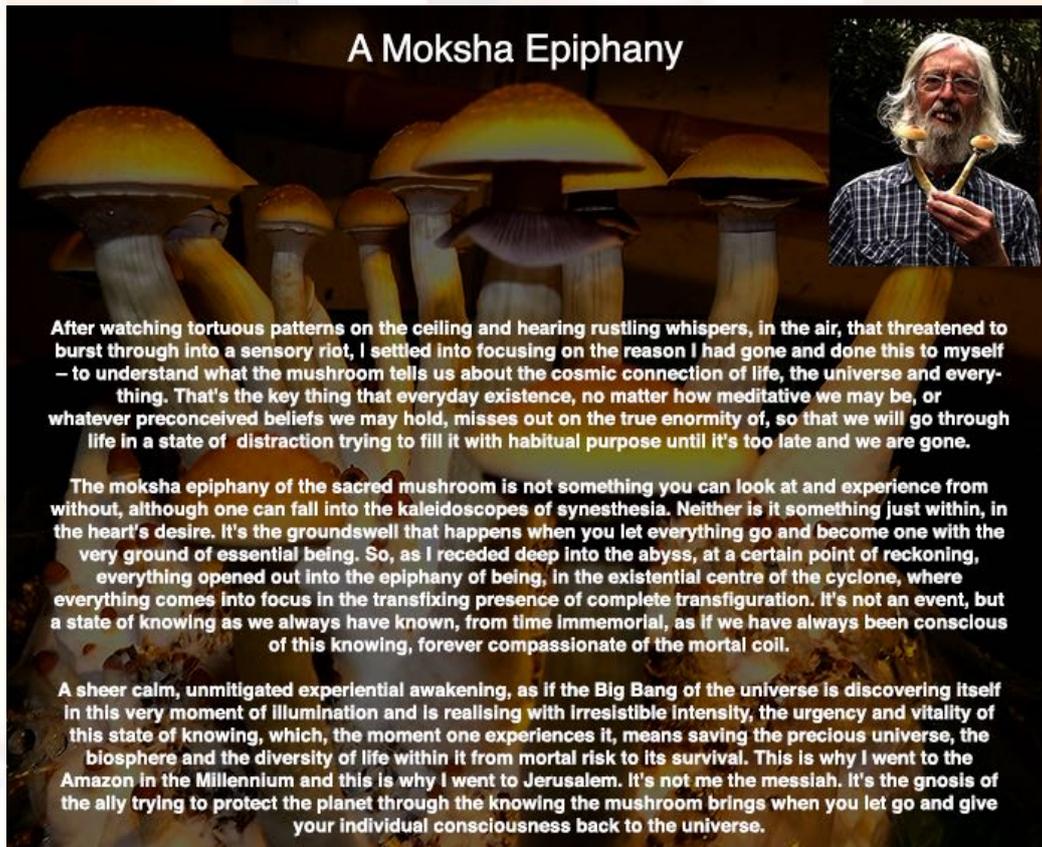


Fig 259: "A moksha epiphany". Written during the evening, after the experience had receded. *"I am not your master. Because you have drunk, you have become intoxicated from the bubbling spring which I have measured out."* (Gospel of Thomas 13).

Dissolving the distinction between self and other is pivotal to this process. The internal model of reality supported by the conscious mind has an envelope of characteristics, ranging from our sensory experiences of the external world, to internal somatosensory, emotional and other representations of self and our ongoing thought processes. Thus subjective consciousness in the ego state is dynamically polarised between representations of subjective self and objective world. When these distinctions are released, the distinction between individual and universal consciousness can also become dissolved, leading to transcendence. Entheogens provide a visionary realisation of this deeper, primary consciousness, giving it experiential reality, by opening the doors of perception to the mind at large.

What is truly extraordinary about this process is that releasing the ego state, even transiently over several hours, can result in long-term integrative changes in the psyche, consistent with adaptive long-term neural potentiation, showing that the underlying processes of universal consciousness are not extinguished, but merely suppressed by the evolutionary shaping of the ego, thus attesting to the reality of the entire phenomenon.

Three weeks after this quantum change experience, having feverishly worked day and night to achieve it, in completing the first full draft of this article, and the co-conceived complementary one [Natty Dread and Planetary Resplendence](#) on

transforming the Christian apocalyptic tradition based on the dying Saviour, into the immortal paradigm of the evolutionary Tree of Life of the living planet.

Two months after the event, with this monograph approaching full shape, I repeated the undertaking, with 1.75 g, again converted to psilocin under lemon juice as a tea, 40 mins after home made cannabis butter, to allow the latter to absorb in advance in the small bowel as an oily substance. Then another two months later I took 1.92 g, reaching a full-on intense psychedelic peak. These were more enveloping as labyrinthine visionary voyages, skirting the edges of the iconic centre-of-the-cyclone transcendence of the first one but presenting other features of the extended conscious state, as is always the case with the diversity of psychedelic experiences.

What they have demonstrated to me as a breakthrough is the ability of the psilocin acid-treatment method to produce a pure, clean visionary source consciousness unparalleled in everyday experience, dream states and any form of controlled meditation, without which humanity's understanding of the full dimensions of the psyche would be weak, pitiful and presumptuous. Taken in the late afternoon, these more powerful experiences, that had me reeling at the peak, were sharper and shorter than ingesting mushrooms predominantly containing the pro-drug psilocybin. The tea is pure dissolved entheogen and induces in the body a pure clean state, in which food is sumptuous and the inner quality of experience is abundantly overflowing for the astute participant to enter and explore the depths of immanent and transcendent consciousness. By midnight these left me able to sleep easily and wake fully refreshed, invigorated and whole, at the age of 76, confirming their fertile symbiotic relationship with my essential being, in the long, tortuous journey of incarnate existence. I have, in opening this confessional account and completing this cosmological description, traversed the long journey that began with the shock of my first experiences with LSD in London in 1968.

Since then other events have intervened, adding further complexions to the situation. I joined two expert groups on consciousness research which profoundly expanded the cosmology into a full cultural-evolutionary account of how human culture got ourselves into existential crisis, giving the cosmology overarching scope and veracity.

Eleven days ago, in July 2022, I contracted Omicron BA5 and rapidly went down hill and had to get an emergency exemption to get Paxlovid, the new Pfizer anti-viral. I nearly succumbed the next night but it stopped the severest phase in its tracks. That made me realise that this happening was a karmic warning I needed to recognise. Although I had written a definitive existential cosmology this has not achieved the covenant of saving the Tree of Life from human destruction, so the following insights summarise my current reflections, beginning again at the original mushroom experience and leading to the journey of living redemption.

Epiphany 1

There are two and only two routes to realisation:

(1) the scientific quest of verified empirical observation of nature and the quantum universe, including traditional neuroscience reframed so that it is not a physically closed classical causal description, but a contextual boundary filter guiding conscious experience as a cosmological complement to the natural universe reflecting all the subtleties of the qualia of visionary experience under the organismic filter applied by neurodynamics on the doors of perception.

(2) the subjective quest of discovering consciousness from within, through mutual empirical experience. The core of this is to **make the mystical vision quest ourselves with no prior assumptions** as the karmic trip of our lifetime because we are already complete conscious sentient beings who have the power to do so, but fail to understand the "Kingdom that lies before us, but men do not see it". That kingdom is our own conscious existence and we can't understand it by analysing it, but only by living it, by descending deeply into it, by **every** means and by actively achieving the redemption of the living planet and the conscious universe.

If we don't do this now we are literally doomed to a rapid, or slow burn Fermi self-extinction. Those that have ears choose to hear not! Time is too short. Things are not heading the right way. We all need to be pragmatic!

Little or none of this involves the kind of rational, philosophical and consciousness research speculation the expert groups I joined are feverishly debating, conflating pseudoscientific ideas of fields, encodings, reverberations, potentials, solitons or even the Ads-Cft correspondence, all of which are just conceptual physical analogies trying to pose as descriptions of consciousness, when neuroscience is already providing a clear objective description.

Decomposing and describing consciousness is not the name of the game. Experiencing reality to its foundational depths is. You don't discover meaning by analysing and describing it, but by taking personal responsibility for the fate of the living universe and redeeming it. Just learn to make the vision quest and save the universe before you die. You can culture mushrooms in a chilly bin. The key is understanding a root shift in the zeitgeist can become effortless, however unlikely it may seem, if it is true to life itself, not just human utopian folly.

"And it was the Evening of the First Day"

To understand this revelation of true redemption we have to briefly return to how it first began. This all started 13 months ago as yet another stroke of karma. I had become unable to safely take mushrooms for seven years because acute closed angle glaucoma risked instant blindness if my pupils dilated. But once I had complete lens replacements, the die was cast. I decided to take the delicate plunge. It was only a tiny morsel, 1.5 gm dry weight, something even an eighty year old spinster needn't turn an anxious hair to, just to test the visionary waters again.

If any of you want to have any insight into what the fully developed nature of pure experiential qualia are, mushroom kaleidoscopes and their deeper visions are the synesthetic sang raal. They are at once all the colours of visual insight and the sounds of immortal waves whispering and rushing and as they gather, rising to screeching intensity through ones being, in undulating resonance, and all the scents and tastes and thrills of the world too and all those things that have been and will be.

Western tradition leans to God as the external Creator, while Eastern tradition sees the Supreme Being internally as pure consciousness. When you look up I-AM, it arises in two complementary places - the Hebrew Bible Ayer Asher Ayer – אני זה שאני – I AM THAT I AM and the Upanishads I AM THAT – Tat Tvam Asi – तत् त्वम् असि or THOU ART THAT. The formative scope of this is extraordinary and potentially universal. This made me realise that the founding experience defining Monotheism was a visionary experience of a burning bush almost identical to my moksha epiphany, and both were essentially an NDE-like experience of meeting with a manifestation of Brahman-Īshvara as per the Brihadaranyaka, the Upanishad of the Great Forest. This places the entheogenic moksha epiphany and its symbiotic cosmology in the mainstream of formative religious paradigm shifts.

Krishnananda notes: In the Brihadaranyaka Upanishad we are told that Brahman – the Supreme Being is Pure Consciousness, in which subjects and objects merge together in a state of Universality. The Supreme Being knew Himself as 'I-Am', inclusive of everything. He became an 'other' to Himself in the act of the manifestation of the Universe. Even in the Biblical parlance we have the description of God as 'I-am- That-I-am'. One cannot say anything else about God. But, the Supreme was 'as if' an 'other', but not truly, for He, nevertheless remained as the Absolute, Self-Conscious Being, and He knew Himself as 'I-am'. 'I-Am' is the highest description of God, but the Absolute is supposed to be transcendent even to this condition of 'I-amness' of the Universal Nature, because the state of 'I-am' is Self-consciousness, though it is Universal. So, in Vedānta, a distinction is drawn between this Universal 'I-am' and the Absolute as it is – the distinction between Nirguna Brahman ultimate reality and Saguna Brahman Īshvara/Ishvari⁹³ the godhead, manifested in Vishnu and the conjugal 'Elohim Shiva-Shakti.

So it was that I lay down in the deepening twilight as the effects began to come on. I saw my son look curiously in and to avoid him distracting me I turned away, and noticed the little streaks of light in the corner of my eye which mean that at any moment I could fold over into the dream world of the nierika. I reminded myself – you're not here just to indulge yourself but to discover the meaning of life, the universe and everything, so I summoned up empty mindfulness and gave my self back to the universe in *fana* or self-annihilation.

⁹³ Ishvara, (Sanskrit: "Lord") in Hinduism, God understood as a person, in contrast to the impersonal transcendent brahman. The root of the word Ishvara comes from īś- (, Ish) meaning "capable of" and "owner, ruler, chief of". The second part of the word Ishvara is vara which means depending on context, "best, excellent, beautiful", "choice, wish, blessing, boon, gift", and "suitor, lover, one who solicits a girl in marriage". The composite word, Ishvara literally means "owner of best, beautiful", "ruler of choices, blessings, boons", or "chief of suitor, lover". In Mahayana Buddhism it is used as part of the compound "Avalokiteśvara" ("lord who hears the cries of the world") – a bodhisattva revered for his compassion. When referring to divine as female, particularly in Shaktism, the feminine Īśvarī is sometimes used. Particular communities within the Hindu fold differ in their understanding of the relation between Ishvara and brahman. Theistic communities maintain that the two are one and the same or even that the personal representation is superior; others, including some adherents of Advaita Vedanta, argue that Ishvara is a limited and ultimately inadequate representation of Brahman. Ishvara, as Avalokiteśvara in coitus with Tara, carries all the features of the male-female 'Elohim of Genesis. When referring to divine as female, particularly in Shaktism, the feminine Īśvarī is used. And Ishvara/Ishvari becomes Shiva-Shakti.

And down I went into the epiphany of being – a kind of jewelled seventh heaven where everything is illuminated and everything is illuminating. And there was Brahman exactly as in the near death experience. That thou art. Brahman is me. Brahman is my cosmic apotheosis manifest telepathically as one is to one. But Brahman isn't just here to say "Hi". He is saying the world is in acute peril – indeed the entire universe is in peril, because, if we self-destruct as we are heading towards doing, and conscious life on Earth as we know it ceases, we don't know that this great universe in which we exist can remain manifest, because we don't have certainty or even any knowledge that there is other life in the universe. Brahman is vulnerable too – eternally vulnerable. And Brahman is silently as one is to one saying to go back to your life and redeem the entire living universe as your life's work. You can do it because you are mortal on ground zero. Go to the ends of the Earth and stop short at nothing. And he imparted to me the elements of Symbiotic Existential Cosmology just as in Fred Hoyle's (1957) sci-fi novel "[The Black Cloud](#)" that took me weeks to begin to understand. That's the moksha epiphany transcending the incarnation cycle.

Likewise, Moses kept the flock of Jethro his father in law, the priest of Midian and he led the flock to the backside of the desert, and came to Horeb, the mountain of God. But he saw a flame of fire coming out of the midst of a bush: and he looked, and the bush burned with fire and was not consumed. And Moses said, I will turn aside, and see this great sight (experience this transformative vision), and discover why the bush is not burnt, and God called unto him out of the midst of the bush, and said, Moses, Moses. And he said, Here am I. Draw not nigh hither: put off thy shoes from off thy feet, for the place whereon thou standest is holy ground. And Moses hid his face; for he was afraid to look upon God. And He said, I have seen the affliction of my people which are in Egypt, and have heard their cry and I know their sorrows. And I am come down to deliver them out of the hand of the Egyptians, and to bring them unto a land flowing with milk and honey. And when Moses enquired what his people should call Him, He said unto Moses, I AM THAT I AM: and he said, Thus shalt thou say unto the children of Israel, I AM hath sent me unto you.

So Brahman is also 'Elohim and 'Elohim is just as vulnerable. Really the 'Elohim of Genesis one is male and female in the likeness of humanity as humanity's cosmic apotheosis, not the reverse. So the damning thing is that our self-centred egotism could literally lay waste to God, the Universe and everything if we don't perform the living redemption of the Tree of Life throughout our generations forever.

Shortly after, as it always happens, the spell broke, and I fell out of the nierika portal and Rohan was looking at me curiously and saying "Are you okay?" And I said "Yes thanks!" "I couldn't be more okay!" "I'm galvanised". And here we are thirteen months later and apart from the cosmology, which everyone looks the other way over, to neither confirm nor deny, so nothing has changed.

Chris Nunn: Stanislav Grof thought his 'holotropic breathwork' was second best to LSD for enabling 'higher' states of consciousness, but I don't think he ever said how or why. And you need to be a bit wary of physiological measures which generally have multifactorial determinants.

Chris King: LSD is too strong and unpredictable. Just take your fungal entheogenic toxins like a true visionary adult should, fearlessly with no hesitation or regrets! The universe evolved them for our realisation as a compensation for our species-dominant egotism destroying the biosphere. Although there are no guarantees, they are heads and tails over pure Vedanta and pure spirituality. Breathing and meditation is not a substitute but an adjunct. They aren't alternatives. As I showed you above, *fana* is also the way into moksha.

Epiphany 2

To understand the complementary relationship between (a) the physical and natural universe and (b) subjective conscious existence, we need to understand that the way the standard model of quantum physics and the symmetry-breaking of the colour and weak-electromagnetic forces occurred is (1) a critical indicator that the universe is absolutely destined to enable life to unfold including through natural evolution and for conscious life to be possible and (2) that the wave-particle complementarity of the quantum forces, especially electromagnetism as the most large scale force, (along with gravity), is key to subjective conscious volition over the quantum universe.

(1) Quantum physics is not just a ball and stick fatalistic mechanism but facilitates a highly creative life generating cosmological process. The chemical elements of life are a very subtle symmetry-broken products of the colour, weak and electromagnetic forces in interplay. You can't just cite carbon as a key element of life or ignore everything but the EM force, or you brutalise physics and turn it into a mechanistic unconscious nightmare. The reality is that the cosmic

production of the elements through symmetry-breaking leads to biomolecules and fractal tissue structures as the cosmological climax of life in paradise on the cosmic equator in space-time.

(2) Quantum uncertainty is built in in such a way as to just make it possible for subjective consciousness to have causal physical effect, as David Chalmers put very nicely on closer to the truth: *"If you wanted to have consciousness to effect physics, it looks like physics could not be designed more perfectly."*

The Elusive Subjective

Now this has a kick back to understanding what subjective consciousness is and what it isn't and why formally analysing it is specious. Primitive subjectivity is the effortless ability of the subjective 'Shivaic' aspect of cosmology to become moulded by the physical constraints of the 'Shakti' aspect of cosmological physics.

In very elemental contexts like quanta, all that can be realised is the root notion of consciousness as the historically-entangled special relativistic wave function spatio-temporally encoding the past and future of the quantum. The 'free will' is the intrinsic capacity for reduction of the wave packet in which a 'decision' is made. But there is no real evidence for adaptive integrated qualia. Things begin to get more interesting in butterfly effect systems, where there is a dynamical boundary condition filter in place in the global dynamic itself interacting with quantum uncertainty.

A discrete transition to attentive sentient consciousness occurs in the eucaryote endosymbiosis where chaotic sensitivity to physical modes, such as light (photons), vibrations (phonons), and orbital influences (olfaction) begin to lead to boundary filter constraints in the membrane dynamics where meaningful subjective qualia could in principle become expressed. With the multi-cellular brain these become "phenomenally" expanded, coupled with cerebral neurodynamic constraints to become the dynamic integrated qualia we call the experiences we can subjectively experience in the first person.

But as we described in Epiphany 1 these are framed by the formative neurodynamic constraints of the doors of perception filters we associate with sensory perceptual processing superimposed on the physical sensory constraints. These are not analysed by decomposing the adaptive capacity for coherent qualitative experience as a kind of subjective qualia mechanism in itself, but through causally open attentive-intentive neurodynamics.

Finally, because the universe evolves to interactive climax in the biota, although it is possible that other cosmic structures such as black holes, stars, galaxies, or Gaia herself could have primitive phenomenological volitional experience, the subjective aspect is clearly positioned to be a complement to the most elegant complex low energy interactive processes in the multicellular biota themselves and to be supremely adaptive to the doors of perception filters these provide for organismic survival in an uncertain environment.

So we are brought back square one to the overriding reality that (1) All forms of conscious and superconscious entity arise from and are manifest through the biota, including Brahman as ultimate reality and 'Elohim as "God" apotheosis. (2) That while the universe is necessary, subjective consciousness in the biota is primary without which it remains unclear the physical universe or the cosmic mind could become manifest.

So our conscious duty to the subjective aspect is, as stated in the first round, is living redemption, not futile attempts at mechanistic or structural analysis, which rather, disable the subject from active volitional agency over their affairs and world redemption.

Epiphany 3

So is my mushroom vision of Brahman (1) a meeting with ultimate reality as I claim, or it is just (2) a tale told by an idiot full of sound and fury signifying nothing, or (3) somewhere in between, some kind of hallucinatory 'false' vision of my own mortal angst projected into the kaleidoscopic aether?

Here are the reasons why (2) and (3) are completely mistaken.

1. A key interpretation of the Fermi Paradox – why there is no apparent evidence of life out there – is that It is the nature of intelligent life to destroy itself – the Medea hypothesis (Ward 2009). We are manifestly running this risk to the brink as I speak!

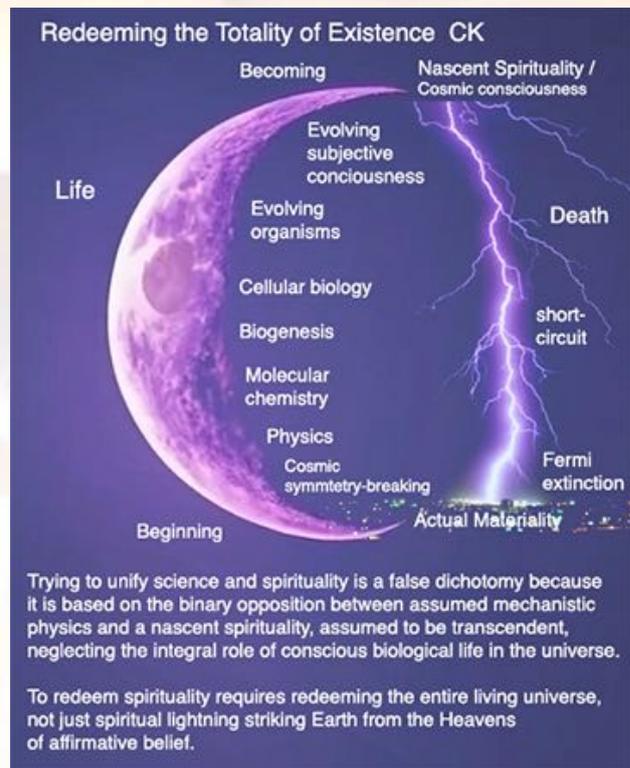
2. Brian Cox on the BBC ahead of COP26 warned that Earth's demise could rid galaxy of meaning Brian notes on the BBC that "Unique events that led to civilisation mean its demise could 'eliminate meaning in the galaxy for ever'. He is right and the conclusion is that this is not just what we are doing to ourselves and the diversity of life as a whole, but the living galaxy and the universe.

3. Uncertainty that life can Reboot: Although abiogenesis is eminently plausible scientifically, there is as yet **no empirical demonstration it can be achieved de novo**. Our scientific intelligence leads us to believe that the organic molecules produced in profusion in galactic gas clouds are eminently fecund to generate life where the conditions become possible but that the processes involved take about half a billion years on a goldilocks planet to come about but this remains only a scientific hypothesis. We can't afford to snuff life out on the casual assumption it can create itself from scratch.

4. Squandering the Cosmic Heritage: We do all need to have some root faith in the ultimate fecundity of life to regenerate itself anew, after all it happened didn't it? And because it did, we appeared. But we are already 13.5 billion years down the universe's evolution. The universe is no longer a babe in arms spawning the first blazars. Simply throwing up our hands helplessly and depending on this option to roll back human folly is far worse than futile. What more stupid fate could we envision for ourselves than to struggle for 500 million years to spark replicative life, another two billion years to form amoeba-flagellates and another billion years of unique evolution to get past the dinosaurs and finally become Homo sapiens, only to blow it apart in a nuclear holocaust through our own egotistical tribalism, or run the biosphere into the dirt by over exploitation? Recall that the only country which has prosecuted unilateral nuclear warfare is the US. This was a precedent humanity should have stepped back from and not set the die for the nuclear arms race. Although these conflicts have arisen from far right leaders namely Hitler and Stalin it is the democratic world that is guilty of nuclear warfare when Japan was already on the brink of surrender. We are also continually failing to learn the lessons from far right politics and the risks it invokes. Ironically, it is said that round 1911 the young Adolf Hitler took peyote during his formative period, provided him by apothecary Wilhelm Pretzsch, (Andrews 417-425) so that is a warning to a simplistic view of psychedelics and humanity.

5. False Religious Assumptions: We have no evidence whatever that there is an inscrutable ultimate reality called Brahman independent of our own experience of it. The evidence contradicts it. Moksha is so difficult to really achieve, the Vedantic tradition had to invent reincarnation to postpone full enlightenment. There is no convincing evidence that all the meditative and contemplative traditions have genuine transformative power over reality. There is no evidence whatever that a creator deity with root power over the universe exists independently of our belief systems. So my Brahman experience is as genuine as it gets and more transparently so than the contrived claims of the Yogis for which little has really changed in 2000 years.

6. Helplessness and Denial: Finally we all know the problem is that while all of us feel the Earth is heading towards existential crisis, none of you have any way to cope with the three key existential threats, the mass extinction of the diversity of life, human induced climate crisis and nuclear mutually assured destruction. We are living in the valley of the shadow of death and we know it. Some of you even try to claim climate crisis is a democrat deep state plot because you are choosing to drown in disinformation. But we know that we are burning all the coal that goes back 358 million years to the first great carboniferous forests and all the oily algal deposits of an age of 250 million years for the oil. We have to know this is disrupting and degrading and acting against the living Earth. Yet here we sit driving our autos and our urban food chains unable to get to these issues for selfish reasons of taxation, inflation and sheer personal ambition.



So what to do about it? We need to create a small world network based on limited degrees of separation to identify the three key existential threats – mass extinction of the diversity of life, human induced climate crisis and nuclear mutually assured destruction as primary objectives. We have spent decades trying to deal with the nuclear threat and remain on the brink of uncertainty if push came to shove. We can't let any of these drop until the planet is redeemed.

The Buck Stops at Karma My Dear

All this Covid episode and what it means comes down to karma, a philosophy I tend to despise but lives within me at all times, and particularly times of crisis. When I caught Omicron and went down hill fast I thought everything was utterly meaningless. Ukraine is in flames. The US is splitting itself apart and returning to religious chauvinism overturning the struggle for women's rights. And so it went. I tried to compile a few additions to the cosmology, which I will include, but otherwise it was pure ennui. Then I realised the buck still stops with me and I haven't fulfilled the karmic agenda. That's when I realised karma had struck (again) and regained my vitality and could eat again. And that's why I am sending these three epistles.

Let me explain what karma actually is. It's not a moral law, it's a manifestation of quantum singularity when the universe touches us on the shoulder. To take a very loose analogy, everyday life, as a bed of wine and roses is like sailing down our multiply entangled wave function. We are part of a great whole of life, offspring, world hopes of a better future, compassionate sentiments, the unifying power of love, the collective will to compassionate justice. There is no need to stick our necks out. But then there's the nitty-gritty – accidents happen, illness like covid, family, social and international crises. Here is where reduction of the wave packet comes into the forefront and shatters the equilibrium.

Just so as incarnate individuals, we are both singular and part of the great whole. But some of us become marked by our personal karma in a way which can set us apart. The mushroom trip that set off the cosmology, through unblinding my glaucoma with devastating insight has marked me. And going down the tubes with covid has marked the process with added significance, turning meaninglessness into acute urgency. The covenant has not been fulfilled. I still have to go to the ends of the Earth to save it and time is even shorter and the situation even more precarious.

I am a tragically marked man. From my birth on the Epiphany 1945 christened Christopher King, just as the plutonium came out of the Trinity test and headed for Nagasaki the die was cast. I am a/the foundational nuclear God child. You just try to find another Chris King born on the Hanford epiphany! Just remember Chris King is not just the cross bearer for Jesus. Christus Rex and Cristo Rey are literally Christ the King. The surname defines the genealogy. So does this have any significance? Delusions of grandeur you will doubtless say. "You are trying to save the world Saklas but you are sadly mistaken!"

The basic answer to this is that I am, and Symbiotic Existential Cosmology is, as a transparent affirmation, the ultimate remedy for survival of the human species and the immortal survival of the diversity of life. I am thus the bearer of the Logos of perennial immortality throughout our generations forever amen. This I swear, that I came into this world to bear witness to the truth, that I bare before you the long term future goodness of the age of Paradise. This is not the signature of a false prophet. Rather, the balance of the probabilities is that my vision is a rock of sustainability amid a swirling ocean of human folly and misadventure, on all sides, leading to existential crisis. The answer is judge wisely. Cast lots on your own garments, in advance to test the relative waters of veracity. Do not wait for your executioners to do it on your final day as happened to Jesus. Thus I am not Yeshua reincarnated. Nor am I pretending to be him.

*"I am as a man who is a new man, with new limbs and life,
and the light of the Morning Star in his eyes." (The Plumed Serpent).*

I could have easily paid no attention to my birth karma. But would that have been fair or considerate, if something could be done to protect life? As it was, I studied William James' "Varieties of Religious Experience", and later realised that psychedelics were more insightful than religious doctrine, wandered India as a sadhu and made a pilgrimage to the sources of the world's power plants. Then when I started seriously taking mushrooms, stranger things happened.

As an adolescent I had had a dream. I was in dry parched trees on the edge of the desert and a Lion was staring at me with eyes of both pity and deep contempt and sorrow, because I was of the species which was bringing nature to her knees. I realised I was the accursed Homo and so I made my way to my own kind – an almost endless queue of people

in a dark smoky city waiting for the chance to work in a factory for food. The dream haunted me. It affected my world view.

Mushrooms became my allies and my spirit nature and I realised from the work of Joseph Campbell and others that there was a deeper Jungian current of archetypal reality that could have played a part in the events of apocalyptic heroes such as Jesus. I realised the world was stuck in perpetual death-grip of re-celebration of Jesus' sacrifice and conceived of the idea that it was possible to make a second journey of spiritual renewal to correct what had gone wrong in the year zero and redeem the immortal age of paradise, not as Jesus' second coming, but as a true redeemer in the root tradition. The mushrooms encouraged this and their access to numinous reality realised it. Of course I couldn't reveal any of this because, at the time they were strictly class A prohibited drugs.

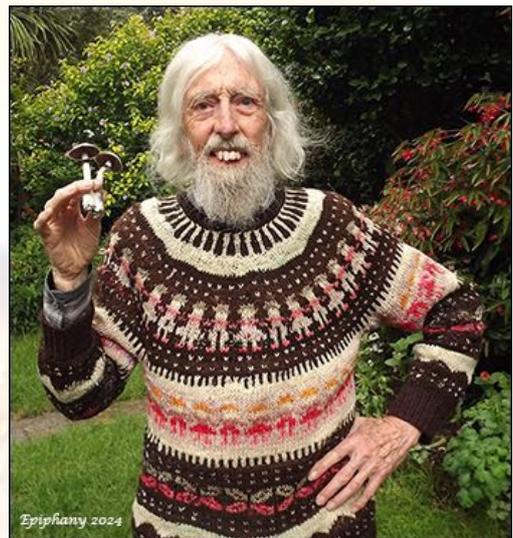
Stranger things happened. In the 1980s, the mushroom suggested that I make the millennial journey to Jerusalem if the world hadn't addressed the mass extinction of life by then. But then it came back with a horrific vision that somehow my daughter's fertility would be impaired as a consequence. Then her first offspring was born with Down syndrome. I had become adroit at casting lots on my garments to the extent that I was able to know enough of what I was up against, and made the millennial vigil, as an academic sabbatical hosted by liberal Jews in the Holy city with creditable flair as a stealth raid to celebrate the sacred reunion of woman and man and to reflower the Tree of Life as simple rites of passage to the new epoch.

Symbiotic Existential Cosmology is largely complete but it's a Rosetta stone artefact. The essential work is still to come.

Epiphany 4

Before we go further, there are some things we really need to very carefully understand. Mushrooms are not just hallucinatory agents. They are not hallucinatory agents at all. They show you ultimate realities that are visions that, once they have entered us can become devastatingly true. When you enter a mushroom vision you are taking on more than you can possibly anticipate.

As Maria Sabina put it: *'There is a world beyond ours, a world that is far away, nearby and invisible. The more you go inside the world of teonanacatl, the more things are seen. And you also see our past and our future, which are there together as a single thing already achieved, already happened ... Millions of things I saw and knew. And there is where God lives, where the dead live, the spirits and the saints' ... I knew and saw God: an immense clock that ticks, the spheres that go slowly around, and inside the stars, the earth, the entire universe, the day and the night, the cry and the smile, the happiness and the pain. He who knows to the end the secret of teonanacatl – can even see that infinite clockwork'.*



We always have to be very careful with what our visions wish on the world. Take my declaration of jihad in the [Song of the Biosphere](#) which promptly came true a month later on 9-11.

*when it comes to the final struggle - jihad of the biosphere
there's only one true rogue nation - the great American shaitan*

*can we fly so high we'll pass right to the other side
and never fall in flames? will we ever be the same again*

*we'll become the living soul, the primal source, the shining goal
the beginning and the end of life, the happiness and the pain
can we bear it all again?*

When we enter the visionary state we have to bear in mind that our own shortcomings may lead us to subtly distort the vision and lead either towards heaven or hell, as Aldous Huxley (1954) warned. We don't want to adhere to the fallacious view that war is necessary, or that success of an outcome requires a compensating sacrifice to God.

So when I had the horrific vision that my daughter's fertility might become occluded as some sort of sacrificial consequence of me attempting to overturn the Christian tradition of blood sacrifice to celebrate an empty cannibalistic Eucharist sacrament, consuming Christ's flesh and blood, this was no pretentious Aztec vision nor anything I wanted in any way to come to pass. The real source of this notion comes not from some Aztec mushroom delusion but the diabolical sacrificial nature of Christianity itself. To me God giving his only begotten son as a sacrifice for sin is the equivalent of Huitzilopochtli sacrificing Moctezuma so that his followers could be forgiven their homicidal sins.

The canonical gospels all make clear this sacrifice is and remains central to the Christian concept of God:

*And he began to teach them, that the Son of man must suffer many things,
and be rejected of the elders, and of the chief priests, and scribes,
and be killed, and after three days rise again. And he spake that saying openly (Mark 8:31).*

*For God so loved the world, that he gave his only begotten Son,
that whosoever believeth in him should not perish, but have everlasting life (John 3:16).*

And almost all things are by the law purged with blood; and without shedding of blood is no remission (Heb 9:22)

This means Abba is not a loving father, but a filicidal demiurge, however you try to pretend otherwise. Every Christian needs to take personal responsibility for the false vision they are perpetuating. It is truly sinful to turn a blind eye. James Tabor (2015) has [set the record straight](#) about Yeshua's actual role in this, accurately linking it to be an insertion in Mark that reflects a vision of Paul and is thus not Yeshua's actual words.

Christianity is thus an empty sacramental tradition, waiting for the biospheric sacraments of the natural entheogens to become recognised and established as a critical healing between our dominant species and the living biosphere upon which we depend for our own survival.

You all need to appreciate that, in coming to these strange messianic and sacrificial visions, I was a tenured academic taking mushrooms on an almost weekly basis, knowing that I was guarding the true visionary sacrament which could redeem humanity and bring about the epoch of long-term future goodness under the banner of reflowering the Tree of Life, announced discretely in Jerusalem in the millennium, while Yeshua's body continued bleeding to death in every Christian church altar, so that his followers could figuratively consume his flesh and blood in an empty powerless token to endlessly facilitate his ascendance on the third day to save them from their sins.

So the source of my dark vision, even though the mushroom was speaking the whole truth of what would come to pass a decade later, was in a sense the mildest possible accomodation to this unbelievably diabolical two thousand year cannibalistic ground hog day that had turned into martyrdom, Empire, Crusade, witch hunt and Inquisition. Anyone in the Christian tradition, before making any attempt to justify the overall good influence of the Western sacramental tradition needs only to turn to [Perpetua's untimely martyrdom](#), and contrast it with the spirit catcher image below, to say which sacramental path is true to life – the Eucharist, or the flesh of the Gods – Teonanácatl.

I clearly in all truth as a guardian of humanity and life as a whole, recognising the true status of the living sacraments in relation to the Western sacramental tradition, had and have a duty to redeem this diabolical belief, crafted by Pauline Judaic Hellenism, but it doesn't need any form of sacrifice, as Christianity claims, to overturn it! Just accepting the horrific sacrificial vision is real when we have to know in our heart of hearts it is a wholly corrupt fallacy. How any Christian on Earth can not see how fundamentally wrong and unethical this is, or pretend this is the basis of a true religion, leaves me aghast. There can be no justification, and no rationalisation in terms of Christian brotherly love, eternal life or anything else for this.

Re-Liberating Matriarchal Fertility

But the vision did come true a decade later, and my daughter's first child emerged with Down syndrome, five years before my vigil to Jerusalem. So what does a loving father do, when it seems that their accidental vision of fertility sacrifice appears to have actually come true, whether it actually caused the events or not? That father has to try to set in motion a counter-vision of redemption and fulfilment to heal the travesty.

Many parents have children with Down syndrome and love them dearly, but there is a risk that caring for a disadvantaged first child can lead a new couple both to feel that they should devote their future life to the care of a dependent child and to lose faith in their own fertility and a full future family life together. This would just cement a bad vision into a perpetuity of undesirable outcomes.

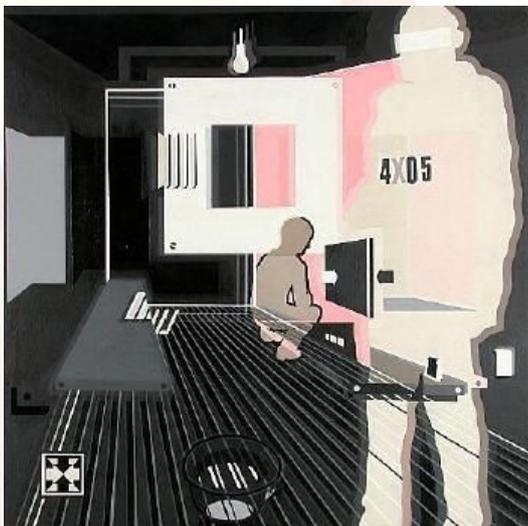
So seventeen days after the birth, I began a clandestine project of renewal. I secured the image of the uncompleted spirit catcher above. I then created the Fair Isle design in the second image. Finally I knitted the design into a tiny jacket for a newborn baby with the spirit catcher on the back. It was really much too small for a baby and was intended to give them both the hope and confidence in one another and in the fertility of life itself to make a real family future possible and gave it to them over an evening meal. Her husband looked at it rather despairingly and threw it in the boot of the car as he left, but three years later a healthy baby boy was born, then seven years later after even more reluctance, a third healthy baby boy and the family was at last, a living proof of redemption of matriarchal fertility from dark visions.

Fig 260: Sprit Catcher Baby Cardigan

So please remember carefully that mushrooms are far more than a hippie flash in the pan, or some kind of adolescent party kicks. As Maria Sabina said, they hold within them a reality we have barely begun to penetrate. There are more intense agents like LSD, but it's not the sheer strength of the effects but the reality they reveal that is the key.

Outside the Inside Out

I have spent all my life up to 77 trying to genuinely explore the nature of the universe and discover ways in which physical reality, particularly at the quantum level can give rise to the enigma of conscious experience. The same for the AdS/CFT correspondence and pseudoparticles like the helium 3 fluid and particulate phases and even tachyons, let alone vying with Hameroff and Penrose and David Chalmers at Tucson Quantum Mind 2002.



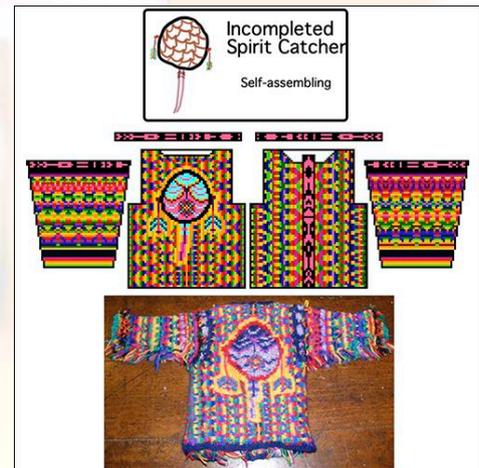
That was all okay until that very mild dose of mushrooms in mid-2021, which flipped my universe inside out. Way back in the 1960s as a student, there was an acquaintance, Harry Wong, who painted an enigmatic art work "Outside the Inside Out" of his jail cell, about the same time I first read about LSD the insanity drug in a local tabloid. Today on spec thinking of writing this e-mail, already holistically conceived before the words that are now flying off the tips of my fingers, I casually went on Google and thanks to Pinterest, there is one and only one image remaining.

Fig 261: Outside the Inside Out (Wong)

Now the title is a pun on an image of his jail cell for drug possession, probably hard drugs, but the metaphor is a potent expression of what happens when, after literally hundreds of wild trips seeking white light illumination, in a karmic twist due to having acute closed angle glaucoma and lens replacement eye

surgery and taking a very mild exploratory dose of mushies to see if my eyes can stand it and suddenly finding I had fallen completely outside the inside out of the "bubble of perception", as Carlos Castaneda (1968) called it and into the nierika as the Huichol describe, I was in an NDE with Brahman and so the story goes ...

This is an event for me just like Buddha discovering the death and decay he had been sheltered from when he left the shelter of the royal chambers, and it comes with a huge sting in the tail. Everything I have lived for in the quantum connection that makes physics able to evoke the conscious mind materially came apart and I had to put it all together from the other side of the Styx.



The end result is a cosmological ground shift away from the occluded story of how the brain does it all the way back to veridical reality and the efficacy of subjective conscious volition over the physical universe and the cosmological axiom.

At the same time I discovered Gallego & Dakić's (2021), little arxiv paper which shows that the whole idea of the border post between the classical and quantum worlds can be an illusion in biology where non-IID processes are the key to brain dynamics and evolution.

This freed me from having to find some idiosyncratic pseudo-physical connection to make the "brain makes mind" idea feasible.

It is transparently obvious if you take even a small step back from this obsession to find the mechanism, that the whole dynamic of the organism from quantum wave function and measurement, through molecular folding and kinetics, through enzyme active site quantum tunnelling, ion channel kinetics, open system quantum chaos, edge of chaos instability, and the fractal structures of membranes, ribosomes cell organelles through cells, to tissues and the whole conscious organism is one macroscopic resonant quantum system that can never be decomposed cleanly into interacting mechanistic parts.

Falling outside the inside out means also that I can dispense entirely with speculative pseudo-scientific reasoning and just add one minimal axiom confirmed by any of us that are honest with ourselves even to go to the toilet or to eat, let alone ponder serious thoughts or have deep psychedelic insights. That's the bare bones of it!

The Bushmen always carry poisoned arrows for hunting and like all of us they fear infidelity, there is a saying: As one of the !Kung men in an argument about a marriage put it to his adversary, their dispute could be quickly settled with an arrow. "**Just one little arrow**".

The cosmological axiom that subjectivity is primal extending physical cosmology, although full consciousness emerges later with the eucaryote endosymbiosis, is **that little arrow**, leading to mutual affirmation that subjective consciousness has efficacy of volition over the physical universe, freeing us from both materialistic and religious bondage as transformative conscious agents protecting life in the universe.. It justifies recognition for what it actually achieves in clarification of subjective reality for the benefit of life as a whole and the integrity of our cosmological account of reality.

Closing the Circle

Just to come full circle over the karma of the glaucoma and the cosmology mushroom vision, and this acute Omicron BA5 episode, in the middle of writing this epistle this morning, suddenly I could no longer see the words "self-assembling" in the top image in the figure. I tested both eyes and I couldn't see it in either, so it wasn't my new synthetic eye lenses or my retinas. Then I realised I couldn't read any of the text I had just composed because half of it was disappearing, so it was in my visual cortex. Was this the end of my visual life? Was this the moral punishment for my bad karma? I looked at my face in the mirror and there were no eyes, just a blur. Had I caused a stroke trying to go to the toilet? I began to see fortification patterns and decided to place my faith in waiting it out as a kind of migraine aura. About thirty minutes later everything settled down to normal. But it's a warning to everyone who reads this not to depended on me to save the world for you.

I have a [scientific research web site](#) updated in real time with a comprehensive description of scientific reality from quantum cosmology through the evolution of the tree of life from biogenesis to humanity and neuroscience:

[Quantum Reality and Cosmology](#)

[Biocosmology](#)

[The Tree of Life: Tangled Roots and Sexy Shoots:Tracing the genetic pathway from LUCA to Homo sapiens](#)

[Humanity's Evolutionary Heritage](#)

[Culture Out of Africa](#)

[Entheogens, the Conscious Brain and Existential Reality](#)

On the shadow side I have descended for decades into psychedelic states and spent whole seasons submerged in spiritual reality with fresh first person visionary eyes to see right into the events that invoked the human spiritual consciousness and the weird karmic twists therein all the way back to 150,000 years ago. That is the shadow side that is generally occluded.

I would be wasting my existence if I didn't use this qualification when it is most needed to ensure our survival and transform both the scientific and religious paradigms. Like all good shamans that's what I was born to do. So I am trying to make the religious paradigm shift from the centre of the cyclone, because that is where the beginning and end of time lies and where the uncertainties go wide open right at the source that evoked it all. All the beings that have gone before us are complexes of life-long non-IID quantum interventions, each life history constituting a unique quantum instance from creation to annihilation. I am trying to use mine fully aligned to good effect to transform our understanding to regain planetary immortality. Because it is to put our attention on the highest possible Self in the Now, where all the possibilities for transformation lie.



Fig 262: If you would like to hear this weird quantum reality sung in a beautiful accounting here it is: [Kitten's Cradle](#) [lyrics](#)

The onus on us is to bring forth what we have within us. If we do, these words come true and the entire epoch is realised.

*"That which you have will save you if you bring it forth from yourselves.
That which you do not have within you [will] kill you if you do not have it within you."
(Gospel of Thomas 70)*

Aldous Huxley, Moksha and the Yellow Mushroom

This section contains key excerpts from "Moksha" (Huxley 1962) his edited posthumous writings, his lecture on visionary experience and his peaceful death on LSD, that is a fitting sequel to his representation of a similar passing away in his climax novel Island. I am including this in retrospect because of a karmic experience I had in February 2024 realising that Huxley had named the sacrament in his novel "Island" (1962) moksha or moksha-medicine, which I had completely overlooked in my experience of a more Vedic moksha experience of union with Brahman in the formative mushroom experience that precipitated this work. Because I had read "Island" in the heady LSD days a decade before I had an opportunity to experience natural entheogens, and like many others saw "Island" and the "yellow mushroom" as science fiction, when he was talking about gold tops, the connection to the actual sacred mushroom and moksha had literally passed me by. Symbiotic Existential Cosmology is very much a descendent of Huxley's vision in "Island" so am including this short section in recognition of his heritage.

Huxley's last novel [Island (1962)] - the crowning work of his final decade - took him five years to write. For perhaps the only time in his writing career he questioned, his creative ability to successfully 'poetize and dramatize the intellectual material and create a work which would be simultaneously funny, tragic, lyrical and profound'. To Osmond he described the task as 'trying to imagine what could be done to create a good society, dedicated to eliciting all the latent powers and gifts of individuals ...' He worked into the book some of Laura's psychotherapy techniques. Island is dedicated to her: The Doors of Perception was dedicated to Maria: as Sybille Bedford notes, these are the only books among the nearly fifty Aldous published which bear dedications.

The Islanders - the Palanese – use a drug called moksha: a kind of perfected psychedelic in the form of a cultivated, yellow mushroom growing in the mountains. The substance is also called 'moksha-medicine' and provides 'the full-blown mystical experience'. Unlike the soma of Brave New World, moksha is not for escapists: a major ethic of the Islanders is 'paying attention'. In a rite-of-passage ceremony in which the drug is given to Palanese youth, the guide reveals its essential message: 'Liberation . . . the ending of sorrow, ceasing to be what you ignorantly think you are and becoming what you are in fact. For a little while, thanks to the moksha-medicine, you will know what it's like to be what in fact you are, what in fact you always have been.'

A key extract from 'Island': This focuses on the key ingredients of Huxley's vision of world healing in the context of the Palanese, the nature of organic natural visionary transcendence, the yellow mushroom, the very name moksha medicine and the reaction of the paranoid world at large which ultimately culminates in the tragic invasion of earthly paradise.

'Sex is different here,' Murugan insisted. 'Because of the yoga of love?' Will asked, remembering the little nurse's rapturous face. The boy nodded. 'They've got something that makes them think they're perfectly happy, and they don't want anything else.' 'What a blessed state!' There's nothing blessed about it,' Murugan snapped. It's just stupid and disgusting. No progress' only sex' sex' sex' And of course that beastly dope they're all given. 'Dope?' Will repeated in some astonishment' dope in a place here Susila had said there were no addicts? 'What kind of dope?' – It's made out of toadstools. Toadstools!, He spoke in a comical caricature of the Rani's vibrant tone of outraged spirituality'. 'Those lovely red toadstools that gnomes used to sit on?' 'No, they are yellow.' People used to go out and collect them in the mountains. Nowadays the things are grown in special fungus, beds at the High Altitude Experimental Station' Scientifically cultivated dope' Pretty' isn't it?'

'What's in a name?' said Dr Robert with a laugh. "Answer, practically everything. Having had the misfortune to be brought up in Europe, Murugan calls it dope and feels about it all the disapproval that, by conditioned reflex, the dirty word evokes. We, on the contrary, give the stuff good names - the moksha-medicine, the reality revealer, the truth-and-beauty pill. And we know, by direct experience, that the good names are deserved. Whereas our young friend here has no first-hand knowledge of the stuff and can't be persuaded even to give it a try. For him, it's dope and dope is something that, by definition, no decent person ever indulges in.'

'What does His Highness say to that?' Will asked. Murugan shook his head. 'All it gives you is a lot of illusions,' he muttered. 'Why should I go out of my way to be made a fool of?' 'Why indeed?' said Vijaya with good-humoured irony. 'seeing that, in your normal condition, you alone of the human race are never made a fool of and never have illusions about anything!' 'I never said that,' Murugan protested. 'All I mean is that I don't want any of your false samadhi. 'How do you know it's false?' Dr Robert inquired. 'Because the real thing only comes to people after years and years of meditation and tapas and... well, you know - not going with women.' 'Murugan,' Vijaya explained to Will, 'is one of the Puritans. He's outraged by the fact that, with four hundred milligrams of moksha-medicine in their bloodstreams, even beginners - yes, and even boys and girls who make love together - can catch a glimpse of the world as it looks to someone who has been liberated from his bondage to the ego.'

'But it isn't real,' Murugan insisted. 'Not real!' Dr Robert repeated. 'You might as well say that the experience of feeling real isn't real.' 'You're begging the question,' Will objected. 'An experience can be real in relation to something going on inside your skull but completely irrelevant to anything outside.' 'Of course,' Dr Robert agreed. 'Do you know what goes on inside your skull, when you've taken a dose of the mushroom?'

'We know a little.' 'And we're trying all the time to find out more,' Vijaya added' 'For example,' said Dr Robert, 'we've found that the people whose EEG doesn't show any alpha-wave activity when they're relaxed aren't likely to respond significantly to the moksha-medicine. That means that, for about fifteen per cent of the population, we have to find other approaches to liberation.' 'Another thing we're just beginning to understand,' said Vilaya' 'is the neurological correlate of these experiences. What's happening in the brain when you're having a vision? And what's happening when you pass from a pre-mystical to a genuinely mystical state of mind?'

'Do you know?' Will asked. "Know" is a big word. Let's say we're in a position to make some plausible guesses. Angels and New Jerusalems and Madonnas and Future Buddhas - they're all related to some kind of unusual stimulation to the brain areas of primary projection - the visual cortex, for example. just how the moksha-medicine produces those unusual stimuli we haven't yet found out'. The important fact is that, somehow or other, it does produce them' And somehow or other, it also does something unusual to the silent areas of the brain, the areas not specifically concerned with perceiving, or moving, or feeling.' 'And how do the silent areas respond?' Will inquired.

'Let's start with what they don't respond with" They don't respond with visions or auditions, they don't respond with telepathy or clairvoyance or any other kind of parapsychological performance. None of that amusing pre-mystical stuff Their response is the full-blown mystical experience. You know - One in all and All in one, The basic experience with its corollaries - boundless compassion,

fathomless mystery and meaning.' 'Not to mention joy,' said Dr Robert, 'inexpressible joy.' 'And the whole caboodle is inside your skull,' said Will. 'Strictly private. No reference to any external fact except a toadstool' 'Not real,' Murugan chimed in. 'That's exactly what I was trying to say,' 'You're assuming,' said Dr Robert, 'that the brain produces consciousness. I'm assuming that it transmits consciousness' And my explanation is no more farfetched than yours. How on earth can a set of events belonging to one order be experienced as a set of events belonging to an entirely different and incommensurable order? Nobody has the faintest idea. All one can do is to accept the facts and concoct hypotheses. And one hypothesis is just about as good, philosophically speaking, as another. You say that the moksha-medicine does something to the silent areas of the brain which causes them to produce a set of subjective events to which people have given the name 'mystical experience.' I say that the moksha-medicine does something to the silent areas of the brain which opens some kind of neurological sluice and so allows a larger volume of Mind with a large "M" to flow into your mind with a small "m". You can't demonstrate the truth of your hypothesis, and I can't demonstrate the truth of mine. Even if you could prove that I'm wrong, would it make any practical difference?' 'I'd have thought it would make all the difference,' said Will.

'Do you like music?' Dr Robert asked. 'More than most things.' 'And what, may I ask, does Mozart's G-Minor Quintet refer to? Does it refer to Allah? Or Tao? Or the second person of the Trinity? Or the Atman-Brahman?' Will laughed. 'Let's hope not.' 'But that doesn't make the experience of the G-Minor Quintet any less rewarding. Well, it's the same with the kind of experience that you get with the moksha-medicine, or through prayer and fasting and spiritual exercises. Even if it doesn't refer to anything outside itself, it's still the most important thing that ever happened to you. Like music, only incomparably more so. And if you give the experience a chance, if you're prepared to go along with it, the results are incomparably more therapeutic and transforming.

So maybe the whole thing does happen inside one's skull. Maybe it is private and there's no unitive knowledge of anything but one's own physiology. Who cares? The fact remains that the experience can open one's eyes and make one blessed and transform one's whole life.' There was a long silence. 'Let me tell you something,' he resumed, turning to Murugan. 'Something I hadn't intended to talk about to anybody. But now I feel that perhaps I have a duty, a duty to the throne, a duty to Pala and all its people - an obligation to tell you about this very private experience' perhaps the telling may help you to be a little more understanding about your country and its ways.' He was silent for a moment; then in a quietly matter-of-fact tone, 'I suppose you know about my wife,' he went on. His face still averted, Murugan nodded. 'I was sorry,' he mumbled, 'to hear she was so ill.' 'It's a matter of a few days now' said Dr Robert. 'Four or five at the most. But she's still perfectly lucid. perfectly conscious of what's happening to her' Yesterday she asked me if we could take the moksha-medicine together' We'd taken it together,' he added parenthetically, 'once or twice each year for the last thirty-seven years - ever since we decided to get married' And now once more - for the last time, the last, last time. There was a risk involved, because of the damage to her liver- But we decided it was a risk worth taking. And as it turned out, we were right' The moksha-medicine - the dope, as you prefer to call it - hardly upset her at all. All that happened to her was the mental transformation.'

He was silent, and Will suddenly became aware of the squeak and scrabble of caged rats and, through the open window, the babel of tropical life and the call of a distant mynah bird. 'Here and now, boys. Here and now ...' 'You're like that mynah,' said Dr Robert at last. 'Trained to repeat words you don't understand or know the reason for' "It isn't real It isn't real" But if you'd experienced what Lakshmi and I went through yesterday you'd know better. You'd know it was much more real than what you call reality. More real than what you're thinking and feeling at this moment. More real than the world before your eyes. But not real is what you've been taught to say. Not real, not real.' Dr Robert laid a hand affectionately on the boy's shoulder. 'You've been told that we're just a set of self-indulgent dope eaters, wallowing in illusions and false samadhis. Listen, Murugan - forget all the bad language that's been pumped into you. Forget it at least to the point of making a single experiment. Take four hundred milligrams of moksha-medicine and find out for yourself what it does' what it can tell you about your own nature, about this strange world you've got to live in, learn in, suffer in, and finally die in' Yes, even you will have to die one day - maybe fifty years from now, maybe tomorrow. Who knows? But it's going to happen, and one's a fool if one doesn't prepare for it.' He turned to Will' 'Would you like to come along while we take our shower and get into some clothes?'

Visionary Experience

The following is an extract from Huxley's 1961 lecture on Visionary Experience, which overviews all traditions and methods of gaining access to visionary states from religious, through deprivation and flagellation to shamanic and pharmaceutical.

ACCESS TO THE VISIONARY WORLD

Spontaneous Access. Before I go on to talk about the actual nature of this internal visionary world, let me say a little about the means of access to that world. Some people spontaneously go there; they seem to be able to move back and forth without any difficulty between the visionary world and the workaday, biologically useful world of our ordinary experience. You get people, for example, like William Blake, who is constantly moving back and forth between the two worlds. Blake had a period in middle life when he was unable to visit the visionary world. For about twenty years he didn't see it. He used to see it in his youth, and then again in his old age he was able to go into it quite freely. And we have, I think, plenty of cases of poets and artists who have gone back and forth from one world to another. There are very beautiful and very detailed descriptions of the visionary world given to the Irish poet, George Russell - who wrote under the name of A.E. - where he describes his own experiences of going back and forth into this luminous world within the mind. There are these spontaneous cases where a privileged few are able to visit the other world and come back again safe and sound. Then I think we can also say that, in a very large number of children - I don't know what the proportion is; I don't think it has ever been systematically investigated - but in a good number of children, there is this capacity to live in a kind of visionary world. They see both within and without this transfigured luminous world. It is of course the world described by Wordsworth in his famous Ode on the Intimations of Immortality from Recollections of Early Childhood. I think a great

many children have exactly the kind of Intimations of Immortality which Wordsworth described. Then in due course, as they are subjected to our system of analytical and conceptual education, they lose the capacity of seeing this other world which gradually, in Wordsworth's words, 'fades into the light of common day'. From having lived in a world which had 'the glory and the freshness of a dream', they return to this rather boring, rather drab world in which most of us pass our lives. I would say, in passing, that one of the major problems of education is how do we help children to make the best of both worlds? How do we help them to make the best of the world of primary experience (and of this extension of primary experience: visionary experience) and at the same time help them to make the best of the world of language and the best of the world of concepts and general ideas? At present our system of education seems almost a guarantee that while we teach them how to use words and concepts, we wipe out this other world of beauty and higher reality which so many children live in.

These are two cases of spontaneous awareness of the other world, of the visionary world. Another class of people who have this awareness spontaneously is the class of the dying. Readers of Tolstoy will remember in that extraordinary story *The Death of Ivan Ilyitch*, that at the end of his unutterable sufferings and miseries, this wretched man feels that he is being pushed into a black sack, deeper and deeper, and suddenly, within a few hours before he dies, he perceives that the bottom of the sack is open and at the end of it is a light. This is not merely a literary invention. In recent months Dr Karlis Osis, of the Parapsychology Foundation of New York, has been sending out questionnaires to a large number of doctors and nurses getting them to give reports of the state of mind of patients on their deathbed. The interesting thing is that he has, I think, about 800 answers from doctors and nurses who report that, spontaneously, patients on the verge of death did have these tremendous visionary experiences of light, of luminous figures. It is a most interesting fact to find that this phenomenon, which has been reported of course in literature in the past, is now statistically confirmed. This is one of the most fascinating things that professional psychologists are doing now. They are confirming, by questionnaires and in the laboratory, all kinds of things which were intuitively known, and known by observation, and recorded in a casual way by literary men and philosophers in the past. Well, as I say, this represents a third class of spontaneous cases. Now we have to go on to the induced cases.

Induced Access. The fact that visionary experience has always, at all times and everywhere been very highly valued, means that at all times and in all cultures systematic efforts have been made to induce this experience. The experience can be induced in a variety of ways. Let us quickly go through a few of them.

One method is hypnosis. Under deep hypnosis a certain number of people (not very many, but I have seen a few) do evidently enter this world and report very strange and interesting happenings: they see figures, they see luminous landscapes, and so on. These are not very common phenomena, but it is interesting to know that there are a certain number of people who can be transported into this other world by hypnosis. There are other psychological methods for getting into the other world, and one of the best known in the Orient of course is the method of one-pointed concentration, the traditional Yoga method of excluding everything except one particular point on which the attention is concentrated. This in many cases does seem to result in breaking through the barrier surrounding our ordinary, day-to-day, biologically utilitarian world of consciousness, and breaking through into another mode of consciousness, the visionary mode. There is yet another method which has been practised, of course, within all the great religious traditions, the method of what is now called sensory deprivation, or the limited environment. Here again it is most interesting to find professional psychologists repeating, in the laboratory, work which was done for metaphysical and religious reasons by hermits and saints living in caves in the mountains or in the desert. It is a very extraordinary fact that when we do limit the number of external stimuli or cut them out altogether, as can be done with some difficulty, then in a relatively short time one's mind starts producing tremendous visionary experiences. Historically we see such figures as Saint Anthony and the monks of the Thebaid in the fourth century in the Egyptian desert, and we see again the hermits of the Himalayas, the Tibetan and the Hindu hermits who lived in complete isolation in the caves. For example, if you read the life of Milarepa, the great Tibetan hermit, or if you read the lives of St Anthony and St Paul, the hermit in the Christian tradition, you can see that this isolation did in fact produce visionary experiences.

And it is interesting, as I say, to see these facts confirmed by such contemporary workers as D' O. Hebb at McGill in Canada, or my friend Dr John Lilly at the National Institute of Health in Washington. Lilly has probably gone further than anyone else in creating a limited environment. He immerses himself in a bath at the temperature of 96, has himself fastened into a harness so that he can hardly move, breathes only through a snorkel so that even his face is covered with water and there is no differentiation of sensation on any part of his body, and within three or four hours he is having tremendous visionary experiences. Now the interesting thing is that like St Anthony's, most of these visionary experiences are extraordinarily unpleasant, and I have asked Dr Lilly to describe these experiences but he would never tell me exactly what they were, except that they were very, very unpleasant indeed. St Anthony, as anybody who has ever visited any picture gallery knows, was also subjected to extremely unpleasant experiences, but he occasionally evidently had genuine mystical and divine experiences. It is interesting too that, in all the religious traditions, deserts and places where there is a minimum of sensory stimulation have always been regarded in an ambivalent way, first of all as the places where God is nearest and secondly as the place where devils abound. We find in the New Testament, for example, that the devils who are cast out by Jesus go into the desert because this is the natural place, the habitat, of devils. But again, hermits who lived in the deserts in the fourth century say they went there because this is the place where one can get nearer to God than anywhere else. As I say, it is extremely interesting to find that these ancient religious practices can be and have been confirmed in the laboratory of modern psychological workers.

Another method of getting into the other world is the method of systematic breathing. Breathing exercises were of course developed most systematically in India, and we find traces of them in the Western tradition, particularly in the Greek Orthodox Church tradition where people did evidently employ some breathing methods, and even in individual Western mystics' I am thinking of Father Surin, the French seventeenth-century Jesuit, who speaks about the different modes of breathing, though he doesn't exactly describe what they were. The significant fact about breathing is that I think one can say that all these elaborate breathing exercises tend to end up

in prolonged suspensions of breath. A prolonged suspension of breath necessarily means a growing concentration of carbon dioxide in the blood. Again, it is well known that high concentrations of carbon dioxide do produce very remarkable and startling visionary experiences in the mind, so that we see here, in an empirical way, that people in all the religious traditions of the past made use of methods for changing the body chemistry, in such a way that visionary experiences would become facilitated. This again is the physiological reason, not the metaphysical or the ethical reason, for such practices as fasting.

Fasting has been employed in virtually all the cultural traditions, among other things for the purpose of inducing visions. For example, in a primitive Indian society in America this was a regular part of the initiation of the adolescent young men. They went out into the forest or into the prairie and fasted until they got a vision of the god they were looking for, and in due course they always did get a vision. The methods of fasting of course have been used in every religious tradition. These psychological effects of fasting have been confirmed in the large study by Keys called, *The Biology of Human Starvation*. There is a most elaborate description of what happens after a long period of abstention from food, and among the things that happen are these visionary experiences. We know too that the inadequate amounts of vitamins as well as merely inadequate amounts of calories also produce profound psychological changes. There are profound psychological changes in pellagra, for example, and in beriberi. Here again it is interesting, with the knowledge that we now have, to look back over history and to see why a period like the Middle Ages was probably far more fruitful in vision than a period of the present time. The reason very simply is that we are simply stuffed with vitamins and they were not. After all, every winter in the Middle Ages there was a period of extreme vitamin deficiency: pellagra and the other deficiency diseases were very common. On top of a long period of involuntary fasting came the forty days of Lent where voluntary fasting was imposed upon involuntary fasting, so that by the time Easter came around, the mind was completely ready for any kind of vision. I think there is no doubt that this is one of the reasons why spontaneous visionary experiences are a good deal less common now than they were; it is simply a dietary factor. In the past, in earlier civilization, a rather deficient diet tended to make certain types of visionary experiences possible, whereas now our very full diet tends to block them off.

Among other methods of transporting the mind to the other world was the deprivation of sleep. You find this in all the religious traditions: the sleep is reduced and the mind is made open and ripe for visionary experience. Here again it is interesting to see the professional psychologist confirming the findings of the past. My friend Dr J West a year or two ago had the occasion to supervise the sleeplessness period of a man who was a disc jockey on an American radio station. For a bet he had resolved to go without sleep for I forget how many days, ten or twelve days. Dr West supervised this and he told me that it was very interesting, after about seven or eight days, how this man was living in a completely visionary world with breakings-in of every kind of strange visions, some horrible and some rather beautiful. So here again we see an interesting confirmation of old empirical findings, in the modern laboratory. Even the medieval habit of austerities or self-imposed punishment was probably also extremely conducive to visions. Self flagellation, for example: if you analyse what the effects of this sort of proceeding were, it is quite clear that they all made for visionary experiences. They first of all released a great deal of adrenalin, a great deal of histamine, both of which have very strange effects on the mind, and then in the Middle Ages, when neither soap nor antiseptics existed, any wound which could fester, did fester, and the breakdown products of protein got into the bloodstream. We also know that these things do have very strange and interesting psychological effects. In confirmation of this it is very curious to read of the remark by the great French nineteenth-century Cure d'Ars (and now canonized as Saint Jean Vianney) who was forbidden by his bishop to indulge in the extremely severe austerities, the self-beatings which he had practised as a young man, and he said nostalgically, 'When I was allowed to do what I liked with my body, God would refuse me nothing.' This is a very interesting psychological statement, that evidently there are psychological reactions on the biochemical level which, connected with this kind of self-torture, do tend towards visions.

Chemical Access. Let us now pass into a final class of vision-inducing procedures; these have to do with the ingestion of various chemicals. Now as the French anthropologist Philippe de Felice showed some twenty years ago in his book *Poisons Sacres Ivresses Divines*, virtually in every religious tradition, both civilized and primitive, use has been made of mind-changing drugs used for the purposes of inducing visionary experiences. Every kind of chemical substance has been used for this purpose. The most anciently recorded, I suppose, is the soma of the Indians. Nobody knows, I think, what the plant soma was. It has been identified as the Asclepias or milkweed, but the descriptions in the sacred text don't seem to fit in with the milkweed identification. From the ancient text it seems that this was a creeping plant which the Aryan invaders of India in 1000 BC brought down with them from Central Asia, and it became more and more difficult to get hold of the plant as they penetrated further and further into India. Philippe de Felice has a very interesting hypothesis about the development of Yoga (which evidently took place about this time, although it may have started earlier with the pre-Aryan people in India). The taking over of Yoga by the Aryan invaders may have been forced upon them by the fact that it was impossible for them to obtain supplies of soma so that, as they couldn't induce visions by biochemical means, they were forced to resort to purely psychological and breathing exercises to get to the same place. It is an interesting hypothesis which may perhaps be true. I don't know.

Then among the other drugs, which of course have been used in the past, are such extremely dangerous mind-changing drugs as opium and as coca, from which cocaine is derived, and such relatively dangerous drugs as hashish - and, after all, our dear old friend alcohol, which was used by the Greeks, later by the Persians, and used by the Celts in Europe as a mind-changing drug and worshipped as a god. This is the interesting thing: the substance which produces the change of mind is regarded as divine and is then hypostatized as a person projected into the external universe as a divine person. We get the same phenomenon in Central America where recently the archaeologists have dug up in the highlands of Guatemala a large number of small stone figures which represent mushrooms out of whose stem emerges the head of a god. It is a very significant fact that this mind-changing mushroom which, as we shall see in a moment, has now entered European life, was actually hypostatized as a deity.

The Mushroom Access. Among the more harmless mind-changing drugs used by people in their religious rites in the past are peyote, the Mexican cactus, which is used in the South-western states of America and over large parts of Mexico, then the Bannisteriopsis

caapi [harmine admixed with DMT-containing Psychotria viridis in the ayahuasca] of South America, and now of course the Mexico mushroom. In modern times pharmacology has produced, partly by more refined methods of extraction and partly by methods of synthesis, a number of mind-changing drugs of extraordinary power, but remarkable for the fact that they have very little harmful effect upon the body. Peyote, among the natural drugs, has almost no harmful effect upon the body; it is not addictive, and Indians 80 years old take no more of the drug than they did when they were young, nor do they feel any desire to take it more frequently than once every month or six weeks when the religious rites take place. The extract from peyote which is the active principle, and which is now synthesized, mescaline, has the same qualities. Among the more recent additions to the armamentarium of the pharmacologists, the psychopharmacologists, are LSD-25 (lysergic acid diethylamide) which was synthesized by Dr Albert Hofmann of Basel in 1943, and more recently psilocybin (about which we shall hear tonight, I hope, from Dr Leary) which was synthesized I think not more than 2 or 3 years ago, also by Dr Hofmann, who began by extracting the active principles of the Mexican mushroom which had been brought back by Professor Heim from his expedition to Mexico with Mr Gordon Wasson. I recently had the interesting experience of reading a letter which Professor Heim had written to my brother and which said, 'I have just come back from Mexico and as a great triumph I took with me a number of Hofmann's capsules of psilocybin and I gave a dose to the old lady - the curandera, the medicine woman - [Maria Sabina] with whom we had originally done our experiments with the mushrooms - and she was quite delighted because the effects were exactly the same as the mushrooms and she said, 'Now I can do my magic all the year round, I don't have to wait for the mushroom season!' So this perhaps is one of the great triumphs of modern science, that one of these days perhaps Professor Hofmann at Basel will receive a telegram saying, 'Please airmail one hundred capsules to Southern Mexico, have very important magic to perform next week' - and the capsules will go and the magic will be performed.

These biochemical methods are, I suppose, the most powerful and the most foolproof, so to say, of all the methods for transporting us to this other world that at present exist. I think, as Professor Leary will point out tonight, that there is here a very large field for systematic experimentation by psychologists' because it is now possible to explore areas of the mind at a minimum expense to the body, areas which were almost impossible to get at before, except either by the use of extremely dangerous drugs or else by looking around for the rather rare people who spontaneously can go into this world. (Of course it is very difficult for them to go in on demand, 'the Spirit bloweth where it listeth', we can never be sure that the people with the spontaneous gift of visionary experience will have it on demand.) With such drugs as psilocybin it is possible for the majority of people to go into this other world with very little trouble in and with almost no harm to themselves.

THE NATURE OF VISIONARY EXPERIENCE

Having discussed the means of access to this world of visionary experience, let me begin to talk about the nature of the world. What is the nature of visionary experience?

Light. *The highest common factor, I think' in all these experiences is the factor of light. There can be both negative, bad light' and good light. In Paradise Lost, Milton talks about the illumination of hell which he says is darkness visible. This I think is probably a very good psychological description of the kind of sinister light which sometimes visionaries do see, and it is a light which I think many schizophrenics see. In Dr Sechehaye's volume Journal d'une Schizophrène, her patient describes precisely this appalling light which she lives in: it is a kind of hellish light, it is a light like the glare inside a factory, the hideous glare of modern electric lighting gleaming upon machines. But on the other hand, those who go into a positive experience say this light is of incredible beauty and significance. The light experience on the positive side may be divided, I think into two main types. There is the experience of what may be called undifferentiated light, an experience just of light, of everything being flooded with light. And there is the experience of differentiated light, that is to say of objects, of people, of landscapes which seem to be impregnated and shining with their own light. In general I think it is possible to say that the experience of undifferentiated light tends to be the experience associated with the full-blown mystical experience. The mystical experience, I think, may be defined in a rather simple way as the experience in which the subject-object relationship is transcended, in which there is a sense of complete solidarity of the subject with other human beings and with the universe in general. There is also a sense of what may be called the ultimate All-Rightness of the universe, the fact that in spite of pain, in spite of death, in spite of all the horrors which go on all around us, this universe somehow is all right, and there is a direct understanding of such phrases as we find, for example, in the Book of Job, phrases which in our ordinary state we certainly cannot understand. I mean when Job says, 'Yea, though he slay me, yet will I trust in Him,' this is incomprehensible on our ordinary biological level, and yet it becomes perfectly comprehensible on the mystical level, even on the level of induced mysticism.*

Then there is another very characteristic psychological feature in the mystical experience: the sense of an intense gratitude, an intense gratitude for the privilege of being alive in a universe as extraordinary as this, as altogether wonderful. Here again one finds phrases in the mystical literature which are completely incomprehensible on the ordinary, everyday, biological level but which become completely comprehensible on the visionary and mystical level. For example, there is a phrase of William Blake's where he says 'Gratitude is Heaven itself.' What does this mean? It is very difficult to imagine in our ordinary state of mind, but it becomes perfectly clear in the induced or spontaneous mystical condition: gratitude is Heaven itself, gratitude is intense, and the actual experience of gratitude has an uplifting and joyous quality which is beyond all words.

The light experience is of course described again and again in all religious literature. After all, the most celebrated cases (the light experienced by Saint Paul on the road to Damascus; a tremendous explosion of light which woke Mohammed out of sleep which made him faint from its intensity; the experience of tremendous light which Plotinus described as having three or four times in his life) - you will find this again and again in literature. And don't let us imagine that these experiences of light are confined only to remarkable and outstanding men and women they are not. A great many quite ordinary people have had them, and this is one of the great merits of the most recent book by Professor Raynor C. Johnson, the book called 'Watcher on the Hills' where he brings together a great many case-histories of perfectly ordinary people who had this tremendous experience of undifferentiated light. If I may quote from a letter I received recently from an unknown correspondent - this is a woman in her sixties who wrote to me saying

that she had had an experience as a school-girl which had affected her throughout her life - she said, 'I was a girl of fifteen or sixteen, I was in the kitchen toasting bread for tea and suddenly in a dark November afternoon the whole place was flooded with light, and for a minute by clock time I was immersed in this, and I had a sense that in some unutterable way the universe was all right. This has affected me for the rest of my life, I have lost all fear of death, I have a passion for light, but I am in no way afraid of death, because this light experience has been a kind of conviction to me that everything is all right in some way.'

These experiences are relatively common; many more people have them than at present let on, I mean we live now in a period when people don't like to talk about these experiences. If you have these experiences, you keep your mouth shut for fear of being told to go to a psychoanalyst. In the past, when visions were regarded as creditable, people talked about them. They did run, of course, a considerable risk because most visions in the past were regarded as being inspired by the devil, but if you had the luck to convince your fellows that your visions were divine, then you achieved a great deal of credit. But now, as I say, the case has altered and people don't like talking about these things. This is the value, I think, of Professor Maslow's recent work on what he calls peak experiences. He is collecting a very large number of cases of this kind of experience, and he reassures his students that he is not going to regard them as crazy - they tell about these things, and he says it is surprising what a number of them do come out with the fact that they have had these kinds of experiences.

So much for the undifferentiated light, and here let me point out an interesting fact. I think one can say that in all the religions, both primitive and developed, light is the sort of predominant divine symbol, but the interesting fact is that this symbol is based upon a psychological fact, that the light of the world, the inner light, enlightenment, the clear light of the void in the Buddhist literature, all these are symbols. But they are also psychological facts. Just as the great metaphysical systems - so it seems to me - take their origin in many cases from psychological experiences, so again do we see these great primary symbols of religious life also take their origin from psychological experiences. This quasi-sensory experience of light is something which has run through many, I think one can say all, religions and has become, as I say, the primary symbol.

Now, from undifferentiated light we pass to differentiated light, that is to say, light contained in objects, shining out of things and people. Well, on its simplest level this is a kind of luminous living geometry. There is something rather interesting here. I think here again we can say that certain symbols are based on psychological facts. For example the mandalas of India, about which the late Dr Jung was so keen, these too are based I think on psychological facts. In what may be called the early stages of the visionary experience, people do see with the closed eyes things which are exactly like mandalas. These great symbolic constructs are again based upon immediate psychological experiences. Beyond these, of course, there are all kinds of more realistic, naturalistic visionary experiences - experiences of architectures' of landscapes, of figures. It is interesting to find that again and again in the accounts given by people of visionary experiences, we find the same elements described, for example, in Heinrich Klüver's book on peyote where he sums up most of the material which had been published up to the time he wrote it. We find again and again his description of luminous landscapes and architectures encrusted with gems. The doors and windows are surrounded by gems, the whole world of landscape is filled with what Ezekiel calls the stones of fire. These descriptions of course very closely parallel all the accounts of paradises, posthumous worlds and fairylands which are found in all the traditions of the world. We shall go into this further later, but I think it is important to point out that here again there is a psychological basis to a great deal of material which is to be found in the traditional literature of religion and folklore.

Visiary Figures. We come now to the visionary figures. These also occur, and here again there is a very curious and interesting fact which has been recorded again and again in the literature both of spontaneous experiences and induced experiences, that when a figure is seen, it virtually never has a face which we recognize. Our fathers and mothers and wives and children do not appear. What we see is a complete stranger. Here again I think this fact accounts for some interesting theological speculations. For example, angels are not, as now theoretically supposed, the departed spirits of the dead; they belong to another species altogether. This exactly confirms what the psychologists have found in relation to induced or spontaneous experiences; these are always figures of strangers.

When one starts to think about the neurology and the psychology of this state of affairs, it is most extraordinary that there is something in our brain/mind, some part of our brain/mind, which uses the memories of visual experiences and recombines them in such a way as to present to the consciousness something absolutely novel, which has nothing to do with our private life and very little to do, as far as one can see, with the life of humans in general. Personally I find it extremely comforting to something I have somewhere at the back of my skull something which is absolutely indifferent to me and even absolutely indifferent to the human race. I think this is something very satisfying, that there is an area of the mind which doesn't care about what I am doing, but which is concerned with something quite, quite different. And why this should be and what the neurological basis be I cannot imagine, but this is something which I think requires investigation.

Transfigurations. Now we come to another aspect of differentiated light which may be described as the spilling out from the interior world into the exterior world. There is a kind of visionary experience which people have with the eyes open and which consists in a transfiguration of the external world so that it seems overwhelmingly beautiful and alive and shining. This of course is what Wordsworth described so beautifully and so accurately in his great Ode on the Intimations of Immortality, and similar experiences can be found in the works of the mystics, in the work of the Anglican mystic, Traherne, who gives an incredibly beautiful description of the kind of transfigured world in which he lived in childhood. This description ends up with the most beautiful passage where he describes this wonderful world, and he says, 'And so with much ado I was taught the dirty devices of the world which now I unlearn and become as a little child again so that I now enter once more the Kingdom of God.' And here, as I said before, here is surely one of the great challenges to modern education: How do we keep alive this world of immense value which people have had during childhood and which certain privileged people retain throughout their lives? How do we keep this alive and at the same time impart

a sufficient amount of conceptual education to make them efficient citizens and scientists? This I don't know, but I am absolutely certain that this is one of the important challenges confronting modern education.

This transfigured external vision is very important in relation to art. By no means is all art visionary art; there is wonderful art which is essentially not visionary art. But there is also wonderful art which is essentially visionary art, which is the product either of the artist's vision, so to say with the eyes closed, of what is happening inside his head, this extraordinary other world; or else a vision of the external world transfigured either for the good or for the evil. In the works of Van Gogh, for example, one can find extraordinary examples of both negative and positive transfiguration.

VISIONARY EXPERIENCE IN RELIGION AND FOLKLORE

Now very briefly let us touch on some of the significances of visionary experience for religion and folklore. One finds, in all the traditions, descriptions of paradise, of the golden age, of the future life, which one places side by side with the descriptions of visionary experience, either spontaneous or induced, and sees that they are exactly the same; that the world described in popular religion, these other worlds, are simply descriptions of visionary experiences that men have projected from the inside into the universe. In all the traditions we find the same confusion of gems, and where gems are not used we find glass which, of course, was regarded as a very precious and strange material in the past! We find this in the Book of Revelation, a sea of glass in the New Jerusalem, the walls of which were gold and yet transparent, a kind of gold and transparent glass, and we find the same emphasis on glass as a marvellous magical material in the Northern traditions. We find it in the Celtic tradition, in the Welsh tradition; for example the home of the dead is called Ynisvitrin, the Isle of Glass, and in the Teutonic tradition the dead live in a place called Glasberg, the mountain of glass. And it is most curious to find, from Japan to Western Europe, these same images coming through again and again, showing how universal and how uniform this kind of visionary experience has been and how it has constantly been regarded as of immense importance and has been projected out into the cosmos in the various religious traditions.

THE VALUE OF VISIONARY EXPERIENCE

I suppose in a certain sense one can say the value is absolute. In a sense one can say that visionary experience is, so to say, a manifestation simultaneously of the beautiful and the true, of intense beauty and intense reality, and as such it doesn't have to be justified in any other way. After all, the Good, the True and the Beautiful are absolute values, and in a certain sense one can say that visionary experience has always been regarded as an absolute value, that it has been always felt to be intrinsically of immense significance and importance and worth having at a very great price. But it is also important to point out that, although they are in some sense intrinsically valuable and in some sense absolutely valuable, yet I think we can speak about visionary experiences in terms of their value within the frame of reference of goodness and spirituality. In this context I think it is very important to think of the theological definition of such experiences. The theological definition of a vision or even of a spontaneous mystical experience is 'a gratuitous grace'. These things are graces, they are given to us, we don't work for them. They come to us and they are gratuitous, which means to say that they are neither necessary nor significant for salvation or for enlightenment, whatever you like to call it. But if they are properly used, if they are cooperated with, if the memory of them is felt to be important and people work along the lines laid down during the vision, then they can be of immense value to us and of great importance in changing our lives. This idea of the gratuitous grace which takes on importance if we cooperate with it, is very significant in all the range of visionary experience, both spontaneous and induced.

We shall hear from Leary about the induction of such experiences by such substances as psilocybin, and I would certainly say that this kind of induced experience may be of no value at all, it may be like just going to the movies and seeing an interesting film. Or on the contrary, if it is cooperated with, if we perceive it has some sort of deep significance and we do something about it, then it may be very, very important in changing our lives, changing our mode of consciousness, perceiving that there are other ways of looking at the world than the ordinary utilitarian manner, and it may also result in significant changes of behaviour. We of course now come to the philosophical problem: what is the metaphysical status of visions, what is the ontological status? Well, fortunately, this is a Congress of Applied Psychology, we don't have to go into this kind of problem, though I think it is worth going into, and I hope somebody will go into it sooner or later. But for the time being we can say, I think, that the value, apart from their intrinsic value, so to say the ethical, sociological and spiritual value of the visionary experience, is that if it is well used, it can result in a significant and important change in the mode of consciousness and perhaps also in a change in behaviour for the good.

The Most Beautiful Death: Huxley's Death on LSD as described first-hand by his wife Laura Letters of Note.

I don't know exactly what time it was, he asked for his tablet and wrote, "Try LSD 100 intramuscular." Although as you see from this photostatic copy it is not very clear, I know that this is what he meant. I asked him to confirm it. Suddenly something became very clear to me. I knew that we were together again after this torturous talking of the last two months. I knew then, I knew what was to be done. I went quickly into the cupboard in the other room where Dr. Bernstein was, and the TV which had just announced the shooting of Kennedy. I took the LSD and said, "I am going to give him a shot of LSD, he asked for it." The doctor had a moment of agitation because you know very well the uneasiness about this drug in the medical mind. Then he said, "All right, at this point what is the difference." Whatever he had said, no "authority," not even an army of authorities could have stopped me then. I went into Aldous' room with the vial of LSD and prepared a syringe. The doctor asked me if I wanted him to give him the shot – maybe because he saw that my hands were trembling. His asking me that made me conscious of my hands, and I said, "No I must do this." I quieted myself, and when I gave him the shot my hands were very firm. Then, somehow, a great relief came to us both. I believe it was 11:20 when I gave him his first shot of 100 microgrammes. I sat near his bed and I said, "Darling, maybe in a little while I will take it with you. Would you like me to take it also in a little while?" I said a little while because I had no idea of when I should or could take it, in fact I have not been able to take it to this writing because of the condition around me. And he indicated "yes." We must keep in mind

that by now he was speaking very, very little. Then I said, "Would you like Matthew to take it with you also? And he said, "Yes." "What about Ellen?" He said, "Yes." Then I mentioned two or three people who had been working with LSD and he said, "No, no, basta, basta." Then I said, "What about Jinny?" And he said, "Yes," with emphasis. Then we were quiet. I just sat there without speaking for a while. Aldous was not so agitated physically. He seemed – somehow I felt he knew, we both knew what we were doing, and this has always been a great relief to Aldous. I have seen him at times during his illness very upset until he knew what he was going to do, then even if it was an operation or X-ray, he would make a total change. This enormous feeling of relief would come to him, and he wouldn't be worried at all about it, he would say let's do it, and we would go to it and he was like a liberated man. And now I had the same feeling – a decision had been made, he made the decision again very quickly. Suddenly he had accepted the fact of death; he had taken this moksha medicine in which he believed. He was doing what he had written in ISLAND, and I had the feeling that he was interested and relieved and quiet.

After half an hour, the expression on his face began to change a little, and I asked him if he felt the effect of LSD, and he indicated no. Yet, I think that a something had taken place already. This was one of Aldous' characteristics. He would always delay acknowledging the effect of any medicine, even when the effect was quite certainly there, unless the effect was very, very strong he would say no. Now, the expression of his face was beginning to look as it did every time that he had the moksha medicine, when this immense expression of complete bliss and love would come over him. This was not the case now, but there was a change in comparison to what his face had been two hours ago. I let another half hour pass, and then I decided to give him another 100 mg. I told him I was going to do it, and he acquiesced. I gave him another shot, and then I began to talk to him. He was very quiet now; he was very quiet and his legs were getting colder; higher and higher I could see purple areas of cyanosis. Then I began to talk to him, saying, "Light and free," Some of these thing I told him at night in these last few weeks before he would go to sleep, and now I said it more convincingly, more intensely – "go, go, let go, darling; forward and up. You are going forward and up; you are going towards the light. Willing and consciously you are going, willingly and consciously, and you are doing this beautifully; you are doing this so beautifully – you are going towards the light; you are going towards a greater love; you are going forward and up. It is so easy; it is so beautiful. You are doing it so beautifully, so easily. Light and free. Forward and up. You are going towards Maria's love with my love. You are going towards a greater love than you have ever known. You are going towards the best, the greatest love, and it is easy, it is so easy, and you are doing it so beautifully." I believe I started to talk to him – it must have been about one or two o'clock. It was very difficult for me to keep track of time. The nurse was in the room and Rosalind and Jinny and two doctors – Dr. Knight and Dr. Cutler. They were sort of far away from the bed. I was very, very near his ears, and I hope I spoke clearly and understandingly. Once I asked him, "Do you hear me?" He squeezed my hand. He was hearing me. I was tempted to ask more questions, but in the morning he had begged me not to ask any more question, and the entire feeling was that things were right. I didn't dare to inquire, to disturb, and that was the only question that I asked, "Do you hear me?" Maybe I should have asked more questions, but I didn't.

Later on I asked the same question, but the hand didn't move any more. Now from two o'clock until the time he died, which was five-twenty, there was complete peace except for once. That must have been about three-thirty or four, when I saw the beginning of struggle in his lower lip. His lower lip began to move as if it were going to be a struggle for air. Then I gave the direction even more forcefully. "It is easy, and you are doing this beautifully and willingly and consciously, in full awareness, in full awareness, darling, you are going towards the light." I repeated these or similar words for the last three or four hours. Once in a while my own emotion would overcome me, but if it did I immediately would leave the bed for two or three minutes, and would come back only when I could dismiss my emotion. The twitching of the lower lip lasted only a little bit, and it seemed to respond completely to what I was saying. "Easy, easy, and you are doing this willingly and consciously and beautifully – going forward and up, light and free, forward and up towards the light, into the light, into complete love." The twitching stopped, the breathing became slower and slower, and there was absolutely not the slightest indication of contraction, of struggle. it was just that the breathing became slower – and slower – and slower, and at five-twenty the breathing stopped.

I had been warned in the morning that there might be some upsetting convulsions towards the end, or some sort of contraction of the lungs, and noises. People had been trying to prepare me for some horrible physical reaction that would probably occur. None of this happened, actually the ceasing of the breathing was not a drama at all, because it was done so slowly, so gently, like a piece of music just finishing. There was not the feeling that with the last breath, the spirit left. It had just been gently leaving for the last four hours. In the room the last four hours were two doctors, Jinny, the nurse, Rosalind Roger Gopal – you know she is the great friend of Krishnamurti, and the directress of the school in Ojai for which Aldous did so much. They didn't seem to hear what I was saying. I thought I was speaking loud enough, but they said they didn't hear it. Rosalind and Jinny once in a while came near the bed and held Aldous' hand. These five people all said that this was the most serene, the most beautiful death. Both doctors and nurse said they had never seen a person in similar physical condition going off so completely without pain and without struggle. We will never know if all this is only our wishful thinking, or if it is real, but certainly all outward signs and the inner feeling gave indication that it was beautiful and peaceful and easy.

And now, after I have been alone these few days, and less bombarded by other people's feelings, the meaning of this last day becomes clearer and clearer to me and more and more important. Aldous was, I think (and certainly I am) appalled at the fact that what he wrote in ISLAND was not taken seriously. It was treated as a work of science fiction, when it was not fiction because each one of the ways of living he described in ISLAND was not a product of his fantasy, but something that had been tried in one place or another and some of them in our own everyday life. If the way Aldous died were known, it might awaken people to the awareness that not only this, but many other facts described in ISLAND are possible here and now. Aldous' asking for moksha medicine while dying is a confirmation of his work, and as such is of importance not only to us, but to the world. It is true we will have some people saying that he was a drug addict all his life and that he ended as one, but it is history that Huxleys stop ignorance before ignorance can stop Huxleys.

Epilogue

Symbiotic Existential Cosmology is Pandora's Pithos⁹⁴ Reopened and Shekhinah's Wings returning to Bless the Earth with Abundance.

Fig 263: Elpis the spirit, or goddess of Hope, who remained caught under the lip of Pandora's jar according to the will of Zeus, depicted as an adolescent girl, wearing adult dress for the first time, hitching her skirt to keep it from dragging, holding a flower, or sometimes a bird to emphasise the fresh hope of spring and new growth. (Roman coin to Spes or Elpis The reverse of a potin tetradrachm of Carinus 285 AD showing Elpis).



Causing a paradigm shift is literally opening Pandora's Box with potentially devastating consequences if it takes off. We are, whether we like it or not, living in an age of information. This means that the mere fact that Symbiotic Existential Cosmology now exists as a work on multiple platforms means that Pandora's Pithos has again been opened. Troubled by the death curse of the Box, I discovered today as I write, another charming karmic echo from history, dating from around 750 BC caught in our entanglement. This time opening the Pithos reveals Elpis – literally the youthful female spirit of Hope or Expectation – the one remaining spirit kept in the jar has now escaped into the world and the consequences are ensuing, however gradually. The arrow of time means this information flows on out into the world and irreversibly changes the situation for the good, whatever we do next.

The only way this could fail is if there were a critical flaw, which would mean that scientists and clerics could breathe a sigh of satisfaction, that yet another hopeful monster has turned into a mutant ninja turtle and that the interlocutor is just a pretentious deluded upstart at the age of 77. But that is unlikely, as Symbiotic Existential Cosmology agrees with quantum cosmology and empirical neuroscience and invokes the foundations spirituality in conscious human agency. For the first months I aimed high, seeking such criticism with hopes that astute people, particularly research scientists in psychedelics and related fields of consciousness and philosophy would find this discovery as utterly exciting as I did, but I was faced with a deafening silence.

Not one reply from anyone! My friends shunned me, academics whose opinion I valued refused to reply at all. Only two people fully responded. A math colleague, who read the first vestigial manuscripts and another friend who did likewise, both of whom gave commonsense encouragement, particularly on the basis that the world is in existential crisis. This led to ongoing angst. Some of the psychedelic scientists claimed the hard problem of consciousness was not even a scientific question and that psychedelics could only solve the easy problems. When I tried to point out that a magic mushroom experience had solved it in a panpsychic cosmology, I got nowhere with either scientists or philosophers, and simply ended up in a stand-off, when I critiqued their position in an open letter.

Over the ensuing months, I continued feverish writing, and Symbiotic Existential Cosmology blossomed into an impenetrable verdant thicket, spanning ethnic animism, religious exegesis, consciousness research, molecular biogenesis, psychedelic neuroscience, quantum cosmology, panpsychist philosophy, an evolutionary analysis of how consciousness as we know it emerged, and how neurotransmitters, such as serotonin play a central role in evolving brain development going back to social amoebae. The final denouement was that our empirically experienced subjective conscious volition over the physical universe alone reverses the implications of materialism, to invoke a complementary description of mental and physical reality. It is no longer just a psychedelic vision, subject to the Achilles heel of prejudice, but the irrefutable truth of volition itself, as accepted in intent and responsibility in law and in every intentional act we perform, that now underpins this revelation.

Later in conversation with a group of spiritually- minded scientists, I realised that I had to include the full sweep of the extended evolutionary synthesis to establish the cultural evolutionary phase leading to crisis and to parry false religious claims against natural evolution that is the foundation of the immortal tree of living diversity, and so the 100 page section on evolution was born, taking the monograph to a book length 400 pages.

⁹⁴ According to Hesiod, when Prometheus (fore-sight) stole fire from heaven, Zeus, the king of the gods, took vengeance by presenting Pandora to Prometheus' brother Epimetheus (hind-sight). Either Pandora or Epimetheus opened the jar left in her care containing sickness, death and many other unspecified evils which were then released into the world, or the lost blessings of the Gods as the other story goes. Though she hastened to close the container, only one thing was left behind – usually translated as Hope.

So for me, Symbiotic Existential Cosmology has become more than a just fortuitous mushroom trip. It is the Rosetta stone of reality that is already here in the world. It is a difficult, inscrutable work in scripture intended to be complete and definitive enough to last a billion years, provided humanity continues to survive and evolve, that also tells the first-person account of how an individual, facing the planetary apocalypse that had been created both by ancient religions and materialistic ennui, found himself caught in an uncanny quantum instance that made it possible to traverse the same unlikely portal defining history that had happened 2000 years before, to reveal the weltanschauung of immortality, unravelling the human zeitgeist towards a new symbiotic paradigm of organic and technological coexistence with nature and life as a whole.

It is not just a hypothetical theory that can be taken at face value or discarded at will, but four things: (1) Objective quantum cosmology invoking biogenesis and climax biodiversity, augmented by (2) Darwinian panpsychism and (3) cosmological symbiosis. Point (2) then invokes a subjective veridical transaction of mutual trust between conscious agents that we have subjective volitional will over the physical universe, inheriting the responsibility to protect conscious life as a whole, in the symbiotic climax invoked by (3). Finally it is (4) a complete confession of everything of significance I have said, been or done to this end, naked and unashamed in my singular quest to wreak salvation on a troubled world, my vigils to far flung corners of the Earth and the antipodean outlandishness of declaring the end of the Apocalyptic Epoch in the Holy City, so that we can now keep the way of the Tree of Life throughout our generations forever, as it was in the very beginning, as has likewise, from the outset, been stated on the closing page:

*"Have you discovered, then, the beginning, that you look for the end?
For where the beginning is, there will the end be"*
(Gospel of Thomas 18).

The cosmology is already out there! It can't be undone! It's not a grand, or petite delusion, but the redemption of life in complete transparency. So while I seek your support to help convey this crazy message that no one wants to hear or accept, I know underneath that root paradigm shifts have a long latency, and that SEC is cosmologically valid and empirically sound. Simply by convening the group, I made you all aware of this, so you are all now fully cognisant and complicit. My work is fulfilled and it is over to all of us, because we are all in possession of this fatal carnal knowledge, which can never be undone! The diversity of life still needs us and needs us now. So as the Talmudic statement said, "**we** are not obligated to complete the work, but neither are **we** free to abandon it."

Our involvement is now a question of taking advantage of what is already revealed, from which the lioness on the cover has already sprung anew, to accelerate the process of protecting the diversity of life. In return, I vouchsafe to protect you all and support your own inspirations of renewal.

If you look carefully at the last few lines of the text in figure 259, which gives my veridical account of the initial experience, written the same evening, you will see that I had already abdicated my responsibilities on the first night, passing all the onus onto the sacrament itself to escape the messianic tradition, in an affirmation from scriptural history!

*"I am not your master. Because you have drunk, you have become intoxicated
from the bubbling spring which I have measured out."* (Gospel of Thomas 13)

My role now, as a chaotic dynamicist is oddly enough, to make sure this process doesn't become unhinged, although I'm not forsaking the lionesses claws on the Symbiotic Existential Cosmology cover until I see some signs of cooperative progress for biodiversity, so will turn the tables and create dissension if need be – to guard the beacon light of resplendence, so it can shine brightly, rather than "cast fire on the world", as Yeshua did, which would just lead to apocalyptic climate crisis and deforestation, as we know.

Recall this whole phenomenon arose from my long-sightedness, causing acute glaucoma, which first delayed and then precipitated this entire phenomenon. So Symbiotic Existential Cosmology was clearly Promethean foresight and not the unfortunate Epimethean hindsight that opened Pandora's pithos in the first place.

Uziel Awret: I imagine we are as insistent as you about the fundamentality of the preservation of life and our debt to the future. In the end it's a question of understanding the nature of this responsibility. In the Jewish spiritual tradition this responsibility is not just the responsibility of Tikun aiming to preserve life (precisely to achieve the conditions that would make your utopia possible) but also a responsibility to a reconstitution of a God that 'sacrificed itself' (the

vessels of light breaking into a myriad of shards), or a singularity that exploded, and that depends on us for its reconstitution and the reuniting the shards. In this cosmology or, mythology, the appearance of man signifies a special point on the road of Tikun where for the first time a self representing universe (in which even a bacteria mapping its environment is a way in which 'the universe observes itself', see PGS on Awakening) manages to capture its singular nature. Here the primordial singularity can only be 'captured' by another singularity. It is said in the Haggada (quoted by Prigogine) that God has created the world 27 times and that this is the 27th. Each time God says – Halevai Sheyamod' – i.e. 'Hope this one survives'. While fragile, these worlds are saturated with hope.

Chris King: Symbiotic Existential Cosmology is not a utopia, whose aim is seeking "perfection in legal, social, and political systems" whose meaning is "nowhere" from Greek *ou* "not" + *topos* "place". It is the actual, cosmology of the conscious universe. I am not asking for a religious or spiritual movement to save biodiversity as a utopian quest. I simply seek ground zero recognition of, and action upon, the real existential threats to our survival, without which the meaning of life has no meaning. From this all these other utopian and spiritual quests flow.

The purpose of Symbiotic Existential Cosmology is to establish that human symbiosis with the biosphere in evolutionary time scales is the sine qua non necessary reality in the living universe in which we consciously exist. It doesn't present any spiritual point of view except for loving reverence for life itself as the climax process through which the universe becomes fully manifest, and the ability to experience ultimate reality in the first person with no a priori assumptions.

It might seem to others that Symbiotic Existential Cosmology is some kind of shamanic utopian quest for a lotus-eating culture based on mushroom mysticism, but since it has no spiritual doctrine, apart from first person experience of natural existence, it has no cultic status. It's not for me to advance mushroom mysticism, it's simply a scientific fact of biospheric evolution confirmed in multiple research studies. SEC's case rests entirely on its veracity as the correct description of the cosmological context in which our conscious lives are embedded.

You have introduced charming tales of the fragility of the many universes evoked by divinity that I love, as I love many diverse aspects of the "mother religion" from the Zohar to the Torah, but the key point about all these descriptions, particularly the Sabbatical Creation, that becomes the Achilles heel of creationism, is that they are allegories of the ephemeral world human imagination evokes about the cosmos. Humanity has spun creation myths since the dawn of history but these are allegories of an ephemeral so-called "divine" realm not having the veridical flesh and blood reality of nature in the raw. They are hypothetical, but biological survival is actual.

The Shekhinah of Jewish mythology, represents the indwelling feminine face of God's presence on Earth in matrimonial concord, in the tent of Sarah, and in the Eagle's wings, also carrying the pregnant madonna into the wilderness in Revelation and the Matrona that keeps the way of the Tree of Life:

The Shechinah is defined, in traditional Jewish writings, as the "female aspect of God" or the "presence" of the infinite God in the world. She is introduced in the early rabbinical commentaries as the "immanence" or "indwelling" of the living God, whose role as the animating life force of the earth is to balance the transcendent deity (Novick 1983).

We are taught that Abraham and Sarah initiated souls by bringing them "under the wings of Shekhinah" (Novick 2008).

The Shekhinah was said to have retreated in the Fall in Eden and will return in the End of Days unveiling as sparks or shards that will come together in reunion in completing the mosaic of the shattered feminine.



Fig 264: Shekhinah and the Tree of Life

So I want to give you my interpretation of this. We spent most of our time in Jerusalem in the millennium discussing this and related ideas. The Shekhinah is one of the most misperceived entities in spiritual, let alone Jewish, cosmology. As described in the Kabbalah, she is the feminine face finessed into a patriarchal mould. This confuses the entire nature of the God quest. The key thing is that the Shekhinah became fractured in the Fall and the End of Days is her reuniting. This turns the tables on the entire apocalyptic reality. This is not just a spiritual singularity capture. It is the feminine face regaining her rightful sanctity in the patriarchally imbalanced top-heavy cosmology.

The Fall was Yahweh's fall from the grace of unity that was expressed in Adam and Lilith as contesting equals, before Eve was made a surrogate wife in the patriarchal mould and then cursed to be the mother of all living under travail pain of childbirth and obedient to her husband, as man was to be to Yahweh:

After God created Adam, who was alone, He said, "It is not good for man to be alone." He then created a woman for Adam, from the earth, as He had created Adam himself, and called her Lilith. Adam and Lilith immediately began to fight. She said, "I will not lie below," and he said, "I will not lie beneath you, but only on top. For you are fit only to be in the bottom position, while I am to be the superior one." Lilith responded, "We are equal to each other inasmuch as we were both created from the earth." But they would not listen to one another. When Lilith saw this, she pronounced the Ineffable Name and flew away into the air (Alphabet of ben Sirach).

According to Midrash, the Genesis Rabbah states: "God proceeded to create a second Eve for Adam, after 'the first Eve' (Chavvah ha-Rishonah) had to return to dust". And in the Numbers Rabbah: "My firstborn, He is now destroying! As that Lilith who, when she finds nothing else, turns upon her own children". Lilith retreated into the wilderness and came to be demonised as a hyper-fecund destroyer of children, particularly male infants, in resentment over her displaced heritage (Plaskow 2005).

Wildcats shall meet with hyenas, goat-demons shall call to each other; there too Lilith shall repose, and find a place to rest. There shall the owl nest and lay and hatch and brood in its shadow (Isa 34:14).

The ultimate sin of God was withholding the Tree of Life hidden since the foundation of the world, so that the sanctity of nature and the creative process of natural evolution became repressed and female reproductive choice became oppressed. There is no way this can be addressed by trying to balance reverence for life against reuniting God. Yahweh has sinned against nature and the feminine and this is what needs reunification.

Now, what is "the way of the Tree of Life"? This is the great Matrona who is the way to the great and mighty Tree of Life ... is the Shekhinah (Soncino Zohar, Shemoth).

To give the traditional underpinnings of this account in the Kabbala, here is a short excerpt from Schwartz (1997) concerning an account of Isaac Luria – "Ha'ARI" ("The Lion") after Rabbi Abraham sent by Ari had in "A vision at the Wailing Wall (Kotel)".

Ari had touched the forehead of Rabbi Abraham and sensed he might face immanent demise and said to go to Jerusalem to pray at the Kotel for the Shekhinah to appear. He did so and saw a woman in mourning, and when he stared into her eyes he felt sadness and grief so great that he had never felt before, as it was the pain of a mother who felt sympathy for her children in banishment. He fainted and fell on the ground and experienced a second vision of Shekhinah as a beautiful woman in a wedding gown. She embraced him and whispered in his ear: "Do not worry, Abraham, my son. My banishment shall soon come to an end, and my legacy will not be for naught, as it is said: There is hope for your future and your children will return to their own territory, thus retelling the Rabbinical tale of the Shekhinah's exile and return in the reintegration of Israel, the rebuilding of the Temple and the coming of the Messiah:

The two appearances of the Shekhinah that Rabbi Abraham envisions at the Wall, that of the old woman in mourning and of the bride in white, represent the two primary aspects of her nature, one grieving over the destruction of the Temple and the exile of Israel, and other representing the ecstatic feminine, as symbolized by a celestial bride. Indeed, these multiple faces suggest that the figure of the Shekhinah contains within it a host of other goddess figures, all of which have been subsumed in one mythic figure.

Its central teachings concern the mysteries of creation: How God had to contract Himself in order to make space for the creation of the world, in a process known as Simsum. How God then sent forth vessels of primordial light that somehow split apart, scattering the sparks of holy light all over the world, but especially in the Holy Land. And how gathering these sparks can restore the broken vessels, returning the world to its primordial condition.

The deepest mystery of all among the students of Isaac Luria – the Ari concerns the true reason for the Shattering of the Vessels. The most important consequences of it, however, are apparent: it shifts the responsibility for the fallen state of existence from man to God, and it also sets the stage for the second phase of the myth, that of the Gathering the Sparks. Here the scattered sparks are sought out and gathered in the belief that when enough have been raised up, the broken vessels will be restored and the world returned to its prelapsarian state.

The most essential feature of the Ari's myth is its two-part nature. Here it is understood from the first that the complete myth requires both parts; it is not possible to consider one without the other. The first part of this cosmological myth is destructive, the second part creative. The archetypal pattern is that of shattering and restoration. But instead of shifting the blame for the Fall to

Adam and Eve, here it can be directly linked to God, Who, after all, is the ultimate creator and therefore responsible for any flaws in creation.

Note the remarkable parallels between the Ari's creation myth and that of the Exile of the Shekhinah. Both are two-part; both involve separation and reunion, exile and return; both attribute to the prayers of Israel the power to accomplish the necessary tikkun or repair. Indeed, it is possible to view the myth of the Ari as a mystical restatement of the Exile of the Shekhinah.

Thus the kabbalists did as the rabbis had before them: they received one myth and transformed it into another, which more closely mirrored their view of the world. For them this meant resurrecting the lost goddess, but doing so in a context that appeared to preserve the monotheistic basis of Judaism. So it is that the myths about God, the Bride of God, and the Messiah converge, diverge, and ultimately come together in the messianic vision of the End of Days. For when all of the holy sparks have been liberated, the Messiah will come, the Temple will be restored, and God's Bride will come out of exile, restoring the Godhead to wholeness.

If we are talking in the messianic paradigm, as I do to fulfil my covenant, I am here, born into this world, to reflower the Tree of Life in the sacred hieros gamos of nature and divinity in that of woman and man reunited and women's sovereignty again becoming sacrosanct. To do this I have to coalesce the shards, but do it in a way that is not simply another utopian religious movement. Hence I chose the vehicle of a cosmology, because cosmology is the way science sees the cosmos and this is the way the whole tragedy can be undone.

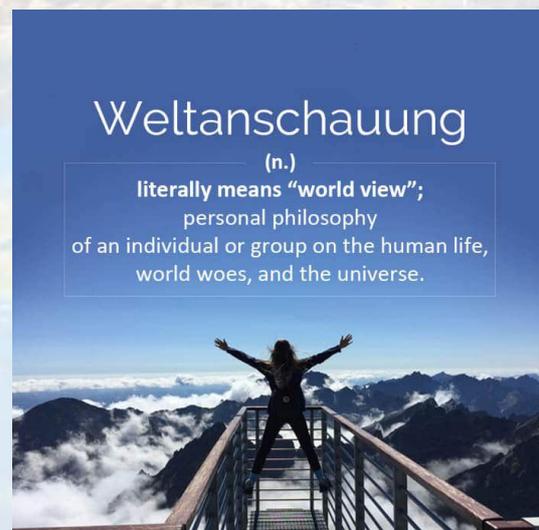
When I say it is necessary and imperative to make the existential threat of the mass extinction of life the sine qua non objective over spirituality, I am doing so as the messiah of the immortal age of the living tree of existence, in which the feminine element compensating God's original sin is nature herself and the primacy of symbiosis IS the reunion manifest. This can't be a utopia, or we will just go down the same route. It HAS to be the cosmology of the reflowering of the Tree of Life.

Out there there are actually still forests and jungles with wild animals and nutritive, medicinal and poisonous species which are not ephemeral unless we wreak annihilation upon life as a whole as we appear to be doing, but these are lying far beyond the technological machine-dependent culture of our increasingly urban society, which the majority of humanity, receding into urban concrete jungles, no longer recognises as motivating, perhaps beautiful, although somewhat threatening and certainly not essential to our fantasies of progress, from science-fiction utopias, to the noosphere, where as we know to our peril, thought seeks to supplant the necessity of evolving nature.

This is a recipe for disaster that can't be put on the back burner. It is NOT apocalyptic thinking to recognise this. It is the true Unveiling, and an eschatological death wish to ignore it!

The Weltanschauung of Immortality

The Weltanschauung⁹⁵ of Immortality is the world view in which life and conscious existence are recognised as perennially immortal processes key to the cosmology of the universe and that the meaning and reason for conscious existence is the sacred process of fulfilment of the flowering of life, so that the universe as a whole can become fully aware of and truly know itself through the living biota it has generated as a climax phenomenon. This point of view is both intuitively natural to human emergence in animism and transcends both the materialistic and theistic world views, each of which is degenerate, incomplete, confining and corrupt. It fulfils our existential hope in a way which neither



⁹⁵ **Weltanschauung** is used as an English word, from the German because the English *worldview* is too vague and not comprehensive enough. (For *anschauen* = to look at, rather with the meaning "to take a good look at", for *schau* = to show, display, as opposed to *blicken* = to look, or *aussehen* from *sehen* = to see). Primarily it means a way a person looks at the phenomenon of life as a whole. Some people (particularly those who have not lived very long) have not formed any broad (inclusive, even "sophisticated") view of life. Others consider a large number of factors before forming their overall view — maybe in their seventies — of the phenomenon of human existence. Typically a person's Weltanschauung would include a person's philosophic, moral, and religious conclusions — including e.g. the duality of spirit and matter — and perhaps their conclusions about the origins of the universe and of the development of life.

theism not materialism can do and places us as active, pivotal and responsible cosmological agents in the flowering and unfolding of conscious existence.

The paradox of the existential condition, amid an entropic universe is fundamental to cosmology. A symmetry-breaking has to occur, in which positive energy real particles inherit the arrow of time, amid a time-symmetric underlying milieu of quantum potentialities. From this symmetry-breaking, the second law of thermodynamics follows, in which isolated systems tend to a 'randomised' state of increasing entropy by mutual interaction, as the ultimate doom of annihilation of structure and meaning.

Molecular biogenesis and the ensuing evolution of life is a negentropic process of increasing complexity, that runs upstream against the entropic current of 'despair', because it is an open thermodynamic system on a planetary surface basking in gentle incident solar radiation of a wavelength spectrum that can be absorbed by the molecular systems of living cells without so degrading them that life is wiped out. We thus arrive at planetary biospheres where life beats the entropic odds and rises to a climax of species complexity and diversity and becomes conscious of itself.

Life in the universe rises to conscious climax through perennial species immortality, but it occurs inevitably coupled to organismic mortal sexuality. This is the dilemma of the mortal coil and is precisely the way it has to be, because the molecular genetic basis of life is always subject to mutational degradation by Muller's ratchet, the entropic randomisation of any structured genome bit by bit in the absence of active processes of genetic recombination to add vital new genetic combinations to restore life's genetic vitality.

Bacteria and archaea solve this problem by co-existing symbiotically with transposable elements and viruses that promiscuously exchange genetic sequences, even between differing species, in horizontal gene transfer. Complex organisms evolved through the endo-symbiosis between the archaea and bacteria giving rise to our respiring mitochondria giving rise to the first eucaryotes. Without this symbiosis complex life could not have arisen. The energy provided by this cooperative fusion provided the basis for a tremendously expanded genetic and phenotypic complexity and the large genomes of nucleated eucaryote cells, but with this complexity came crippling attrition from mutational degradation, despite the evolution of the error-correcting enzymes that ensure human longevity.

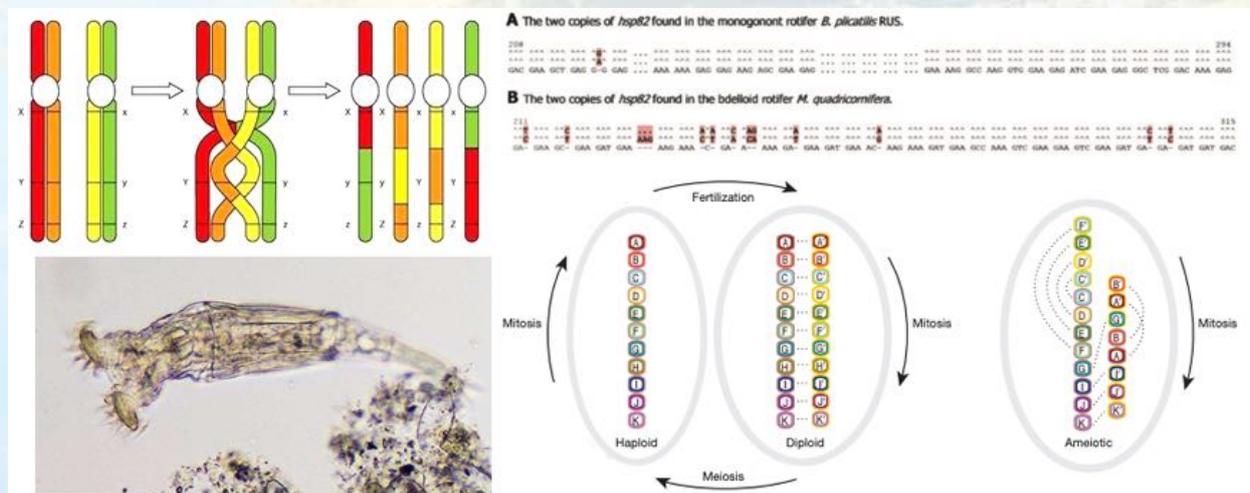


Fig 265: Meiotic crossing over (top left) in eucaryote haploid-diploid sexuality has sustained the diversity and evolution of eucaryote life forms from mutational degradation for the last 2 billion years resulting in unique mortal individuals of each sex while species as a whole are perennially immortal. A number of species, from lizards to aphids, can generate young by parthenogenesis, but all species resort to occasional cryptic sexual recombination to refresh their genomes, except for the bdelloid rotifers whose genomes, unlike those of sexual rotifers (top right) are densely packed with allele differences, indicating their diploid chromosomes are no longer able to cross over and have diverged asexually for up to 40 million years. However, bdelloid rotifers have been found to have another primitive form of genetic recombination like prokaryotes by scavenging the genes of sexual rotifers or other organisms to regenerate their vitality including horizontal transfer of genes from bacteria (lower right).

The solution the eucaryotes arrived at, at the very root of the eucaryote tree, was meiotic sexuality, where organisms in the diploid phase keep two copies of their genome and actively recombine these in meiotic gametogenesis, so that both sperms and eggs carry new haploid combinations of alleles (the maternal and paternal versions of a given gene) through crossing over, by lining up their genes in an indexed manner in the synaptonemal complex. These are then

brought together in the ovum in fertilisation and the development of a diploid embryo ensues. This means that each of our offspring carry half the mother's and half the father's genes, forming a new individual that has never existed on Earth before, unless there are identical twins or triplets.

The modern materialistic ambition in the pursuit of ultimate longevity, by seekers of a technologically-utopian 'final solution', amid human cloning and genetic modification, is a process of trying to turn elite humans into effectively parthenogenetic organisms, whose life span is indeterminate. These utopian aims are futile and ultimate selfishness. No parthenogenetic species can survive long term without sexual recombination and the biosphere to support them. Bacteria and archaea exchange genes promiscuously, even between species, via viruses and plasmids. An extreme is found in some bdelloid rotifer species, which appear to have been parthenogenetic for 40 million years, because their alleles are highly discordant, but they have been found to cryptically scavenge genes from other sexual rotifers or even fungi and bacteria. So the quest for technological immortality amounts to becoming mutant ninja turtles keeping their genomes viable by endless genetic engineering.

Eucaryote sexuality is a deeply embedded form of genetic symbiosis. Men and women share almost all their genes, but form genetic complements. Neither sex can continue to survive without the other. This is the most altruistic act of the evolutionary flowering because it means that, rather than trying to be individually immortal through parthenogenesis, we contribute a mere half of our genes to the next generation to create new life forms unique unto themselves yet in the parents collective image just as in the allegory of the Sabbatical Creation. Hence as humans, we hunger for one another sexually because, in our very fertility the immortal web of conscious life is spun anew.

However, this also leads to our existential dilemma of sexual mortality as individual organisms. Because we are each unique and have an ego, to emotionally seek and secure our personal survival, we come to lament our mortal condition because, however exciting life is and however much we hunger for it to continue, we are doomed to senescence and mortal demise.

But we are just beads on an immortal web of life. Humanity exists as a species with a history running back down the tree of life for three and a half billion years. Individual organisms are mortal, but species and biospheres are perennially immortal, so long as Earth shall live, in a fertile and habitable condition. All animals, humans included, have arisen through the immortal fabric of natural selection and because of this are finely attuned to strive for life, to care for their young and their kin, even at risk to their own existence.

Despite paying lip service to the selfish gene (Dawkins 1974), Matt Ridley (1996) in "The Origins of Virtue" has sought to elucidate the intrinsic goodness of human nature in evolutionary terms, based on long term judgment of character, verifiable trust and mutual cooperation to survive, contradicting the Augustinian doctrine of "original sin" stemming from Eden:

Our minds ... have been built to be social, trustworthy and supportive. ... Human beings have social instincts. They come into the world equipped with predispositions to learn how to cooperate to discriminate the trustworthy from the treacherous, to commit themselves to be trustworthy, to earn good reputations, to exchange goods and information, and to divide labour. In this we are on our own. No other species has been so far down this evolutionary path before us, for no species has built a truly integrated society ... we owe our success as a species to our social instincts; they have enabled us to reap undreamt benefits from the division of labour ... They are responsible for the rapid expansion of our brains in the past two million years and thence for our inventiveness. Our societies and our minds evolved together, each reinforcing trends in the other. Far from being a universal feature of animal life, ... this instinctive cooperativeness is the very hallmark of humanity.

Founding human cultures tended to be animists – that is they viewed both living organisms and the natural phenomena around them as conscious agents, perceiving themselves as embedded in the web of life, even though it was in many ways also threatening, as a world of tooth and claw amid accident and misfortune. Viewing of the universe as conscious agents leads to a greater embedding in the matrix of life, in which the generations are treated as sacred, so both offspring and ancestors were revered, both as real biological organisms and as conscious spirit beings spanning space and time in the immortal passage of the generations. This is our founding Weltanschauung of Immortality, our deeply perceived world view of the intrinsic perennial perpetuity of life amid the mortal coil.

As we shall see in the animism section, this hasn't meant that all animists are good or responsible ecologists, because migrating ethnic peoples from the Americas, through Australia, and Madagascar to New Zealand have caused serious

species extinctions on their arrival, but the record of our founding cultures such as the San Bushmen and Mbuti and Biaka Pygmies do show such sustainable reverence for protecting the ongoing continuity of life in their practices.

With the rise of urban societies, the spiritual web of nature receded into the background and new human cultural inventions distorted and degenerated this immortal view of consciousness embedded in the matrix of nature. The spirits of natural phenomena such as storms droughts and thunder and lightning evolved into supernatural deities that became ever more abstract and powerful, despite clearly displaying the projected aspects of human agency in God's jealousy, anger and sometimes compassion as cosmic super agents in an allegorical universe of extrapolated myth.

In the East, another current emerged, in which the shamanic states of the vision quest became elaborated into a religious philosophy of renunciation of the worldly ego in a mind-sky devotion to mental transcendence, no longer explicitly linked to the physical immortality of nature as its embodiment, leading to attempts to escape the round of birth and death in a moksha which proved attainable by very few in this lifetime. This in turn led to notions of reincarnation to achieve realisation in a future lifetime, karma and the inexorable decline of spiritual unity into varying forms of the Kali Yuga in both Hindu and Buddhist traditions.

The notion of evil in our founding cultures is not associated with the divine negativity of a satanic force, but just the notion of bad rather than good:

When a missionary inquired into a Bushman's ideas of good and evil he was told it was 'good' to sleep with another man's wife, but 'bad' if he slept with yours. Still lamenting the Bushman's ignorance of absolute morality, he later asked the man, whom meanwhile he had discovered 'was in the habit of smoking wild hemp', what he thought was the most wonderful thing he had seen. The reply he was given, that no one thing was more wonderful than any other and that all the animals were the same.

This shows the San as retaining an egalitarian animist view rather than disproportionate awe in the religious hierarchy.

Morality is not a divine, cosmological fact of existence, but is rather a sociobiological feature of intelligent human and animal societies, where Machiavellian strategic bluffing is common, and social disapproval or punishment becomes an influence to reduce internal strife to enhance inter-social dominance of the group (Alexander 1987). But it became enshrined in urban societies in codes of law such as those of Hammurabi and has taken centre stage in theistic doctrines of good and evil forces and divine moral punishment.



Fig 267: The Fall; expelled from Eden, Adam and Eve raise a family and set to work. Scotin, c. 1765. The Fall specifically links, carnal knowledge, mortality and sexual reproduction.

The Edenic Fall constitutes a metaphor of this transition. Among the arboreal splendour and abundance of the primal Paradise stand two trees, the Tree of Life common to many Near Eastern cultures as an archetype of immoral fertility and a new wholly unnatural tree – the Tree of the Knowledge of Good and Evil. Yahweh says Adam and Eve, the Mother of All Living can eat of the fruit of any tree except this one. In the event, the Serpent persuades Eve to eat the “apple” and she bids Adam too and they become aware of their sexual privacy and cover their genitals with fig leaves.

This allegory then leads to the Fall of the Weltanshauung of Immortality, because becoming aware of their sexuality is also the awareness of their sexual mortality, disconnecting them as the primal couple from the very passage of the generations that sustains the sacred fabric of existence. This occurs in a context where immortal reproduction has been flatly denied. As the first human beings, neither have sexually reproduced, so exist like the asexual angels of Christian heaven, unaware they are able to procreate by themselves. God then curses the ground, driving them from the garden with the woman consigned to be obedient to her husband and travail in childbirth:

I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children; and thy desire shall be to thy husband, and he shall rule over thee.

And the man to have to live by the sweat of his brow amid the thistles and thorns in dominion over the natural world:

*cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life;
thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field;
In the sweat of thy face shalt thou eat bread, till thou return unto the ground;
for out of it wast thou taken: for dust thou art, and unto dust shalt thou return.*

The Tree of Life is hidden since the foundation by a flaming sword lest they also eat of it and live forever:

*Behold, the man is become as one of us, to know good and evil:
and now, lest he put forth his hand, and take also of the tree of life,
and eat, and live for ever: ... and he placed at the east of the garden ...
a flaming sword which turned every way, to keep the way of the tree of life.*

Thus the Tree of Life that provided the immortal link was withheld, and humanity was doomed to mortal sexuality in ignorance of the ancient knowledge of the immortal web of existence that partaking of the fruit of the Tree of Life would have revealed anew.

One needs to understand at this point that Genesis is by no means the oldest, nor the cosmologically founding text in the Bible. Its putative date of authorship dates from the time of Solomon at the very earliest with scholarly opinions dating to the exile and one theory linking it to being as late as the 3rd century BCE. One theory for its inclusion is "Persian imperial authorisation" – that the Persians of the Achaemenid Empire, after their conquest of Babylon in 539 BC agreed to grant Jerusalem a large measure of local autonomy within the empire but required the local authorities to produce a single law code accepted by the entire community.

Also we need to recognise that to live forever is precisely what the evolutionary tree of life's diversity actually does. To live forever doesn't imply eternal, just unending, everlasting, that is, perennially immortal. This is both a biological and a spiritual reality of conscious existence. Eternality is rather a frozen static image of space-time as a whole.

The only references to the word eternal (Hebrew: עָלְמָי – unending, everlasting, perpetual) in the Old Testament are one in Deuteronomy referring to God and one in Isaiah referring to the Redeemer:

*The eternal God is thy refuge, and underneath are the everlasting arms:
and he shall thrust out the enemy from before thee; and shall say, Destroy them (Deut 33:27).*

*Whereas thou has been forsaken and hated, so that no man went through thee,
I will make thee an eternal excellency, a joy of many generations (Isa 60:15).*

The original Hebrew beliefs had referred only to Sheol, the underworld of the dead. But in the wake of the Zoroastrian eschatological renovation, the natural embedding in the fabric of the immortal life flow became seconded to a novel and alien apocalyptic notion of eternal life, either in Heaven or eternal torment in Hell. Thus we see the emergence of the word "eternal" applied to human kind only in the New Testament. Even the Gospel of Thomas does not refer to eternal life, although the preface cryptically says:

"Whoever finds the interpretation of these sayings will not experience death".

Neither do we simply experience death in the Weltanshauung, because life itself is immortal and we give our incarnate lives in our actions in the world to immortal life as a whole.

Thus the eschatology spawned initially by the Fall and finally by the apocalyptic Renovation shattered the Weltanshauung of Immortality, which was both naturally valid and evident and spiritually fulfilling in the perpetual regeneration of life, both in life as a whole and in the passage of the generations of humanity, replacing it with an destructive eschatology of the late planet Earth to be discarded as God's creation in the Day of Judgment in favour of a completely implausible, contrived and fundamentally evil war between light and dark principles, expanded from mere natural "badness" or personal selfishness into satanic eternal cosmological evil, to which all human beings are claimed to be fatally drawn leading either to eternal Heaven or unrelenting torment in Hell.

This is replacing the real life we have where we are conscious agents having real volitional efficacy over the physical world and cosmological responsibilities to the continuity of life to uphold, with the false hope of an afterlife which does not and cannot exist in the universe as we know it, cannot contain all the living creatures since Earth began in any

biospheric meaning and wastes our very agency on a fantasy where Heaven has no autonomous agency and no further meaning or purpose in life. If we want to experience such realities, we can do so through the biospheric sacraments, which do convey the experience of union with the living spirits of the universe throughout space and time, just as we can experience moksha escaping the Eastern round of birth and death in this life in the same way.



Fig 268: While Heaven above and Hell below are fictitious realms of the religious imagination, which have no basis in cosmological reality, the evolutionary process centre, which many Christians abhor, is actually the immortal passage of the generations, in which humanity has flowered into cultural emergence. But what are we now evolving towards in the centre image – AI takeover? In living immortality lie all our future hopes of survival, not a Heaven or Hell frozen eternally in time where Hell is one long scream of no fruitful meaning and we have no idea what we would creatively do in Heaven except sing hymns of praise, with no autonomy, no creativity no real life. Religious ideas of heaven are contradictory. Heaven lacks redemption through our own agency as conscious sentient beings protecting life in the universe. To preserve our species immortality in the face of a mass extinction of the entire diversity of life caused by humanity ourselves it is absolutely essential that we return to our conscious spiritual roots in the Weltanshauung of Immortality.

To see how deleterious, incorrect and deceitful this destructive eschatology of nature is, one simply needs to compare its claims with the natural realities of the universe as we have discovered it.

While perennial immortality is an incontestable fact of existence going back 3.5 billion years almost to the time the Earth's oceans first condensed, the notion of eternal life is neither natural nor is it any kind of spiritual fulfilment.

Since the discovery of relativity, we know that time is not a supernatural parameter independent of space but that the two are conjoint dimensions in space-time as a whole and space-time is eternal but fixed as everything there has ever been and will be. You can see this looking at the universe sideways on in fig 15 above in the right-hand image of Paradise on the cosmic equator. Once we view space-time from outside all the way from α to Ω , it is simply the entire history of the universe – everything that happened, sitting eternally in space-time. All our lives, from birth to death are in there somewhere, static and stranded, as everything there has been and everything there shall be. You can't do anything creative in eternal life, it is just static like the snowflake in the figure below. Believers have a notion of angels singing heavenly praise of God and Muslims have a sexy heaven with 72 black eyed virginal houri made anew every day for the pleasures of men, but its just a static vision, where the houris are not real people and can't really share your love, or concerns because they are born anew like Alexa rebooted again and again. It's all a ground hog day denying us the very creative agency of conscious existence the real world provides us here and now, which also provides us with cosmic responsibilities to ensure life continues to flower in abundance so that the universe can come to understand and know its own becoming.

Fig 269: Snowflakes have astoundingly varied individual forms that are created dynamically at the atmospheric ice-vapour interface by incoming moist air condensing individual water molecules, which "walk" over the surface quantum mechanically to preserve the ramifying symmetry. Yet the end result is "death" – a frozen life history of its becoming, "eternally" static in time once the dynamic process ceases.



We thus come full circle back to the elephant in the room. Both the materialist universe, as the ultimate machine, mindless of life in the computational paradigm, and the theistic view of supplicant will, dominion over nature and destructive eschatology, both lead to a human-induced mass extinction of life, when the cosmology of the living universe is founded on symbiosis, not capitalistic dominance and

competition, which are actually subcomponents of a predatory ecological strategy. These views are thus inconsistent with long term survival of our species in the closing circle of the living biosphere.

Thus we have a two-fold urgent, yet realisable task for humanity to achieve as fast as we possibly can : (1) To restore the living diversity of evolutionary tree of life in the biosphere, before a human-induced mass extinction destroys our 3.5 billion year genetic and living heritage and (2) to restore the paradigm of the Weltanschauung of Immortality in the full resplendence of life in the universe, shining brightly forth again, because this is the spiritual realisation of our cosmic 'destiny' as transformative conscious agents, having volitional agency over the living world around us, to restore the sanctity of life, so that existence can unfold unabated in the universe.

Paradoxical Asymmetric Complementarity

The Koan of the Tao of Existence
The objective universe is necessary
but subjective consciousness is primary

Symbiotic existential cosmology is a paradoxically asymmetric complementarity. It is neither dual-aspect monism nor naturalistic dualism and transcends both. The cosmology is founded on a cosmological paradox — we can't eliminate the physical universe because our lives and our ability to deal with the affairs of the world depend on it, yet all our experience of it is through the subjectively conscious mind, and we don't know the universe can actually manifest without this. So 'mind' is primary, although the universe is necessary to to our existence and to life itself. This is the koan of the Tao of existence, which becomes integral to our causality-violating volition, which ostensibly intervenes in the causal closure of physical brain processes, through quantum uncertainty, our "cubic centimetre of chance":

All of us, whether or not we are warriors, have a cubic centimeter of chance that pops out in front of our eyes from time to time. The difference between an average man and a warrior is that the warrior is aware of this, and one of his tasks is to be alert, deliberately waiting, so that when his cubic centimeter pops out he has the necessary speed, the prowess, to pick it up (Castaneda 1968).

Reality is an overlapping cascade of manifestations of a universal principle that emerges in quanta, but is manifest also in dynamics and biology and reaches all the way to the lateralised cortices of the brain. This is the principle of asymmetric complementarities making up an integral whole that arises from the phenomenon of symmetry-breaking.

This happens at a fundamental level with the wave and particle aspects of quantum reality, where the wave aspect is continuous and the particle aspect is discrete. The uncertainty principle $\Delta E \Delta t \geq h/2\pi$ neatly expresses this symmetry-breaking structurally in the inverse relation between E as the wave frequency and t as the temporal position of the particle. It is neatly defined by interference between a sampled wave form and a standard wave confirming the energy-time and position momentum-uncertainties, but the wave is commonly regarded as a calculation artefact. Indeed quantum field theory is particle-based except that the Green's function is a hidden wave propagator. On the other hand a point particle is an infinite energy self-singularity so we end up with superstrings and so it goes.

The standard model of physics list the known particles as radiation/force forming particles of integral spin and matter forming fermions of half-integral spin which stack only in pairs. These fit together, but in a highly asymmetric arrangement. The fermions, although they are complemented by the bosons in the standard model are asymmetric with strikingly different particle populations although these splice together seamlessly in the universe around us. Within this there are three others. The symmetry breaking of the weak and electromagnetic forces gives three heavy weak photon carriers and one massless electromagnetic photon. There is a deeper symmetry breaking between the colour force whose colour charge goes in threes and the weak-electro where it goes in twos. Finally we have gravity standing alone as universally attractive, while the rest are attractive-repulsive vector particle fields.

Supersymmetry, or SUSY as it is called, is the idea that each boson is paired with a fermion one half-integer of spin apart. This idea arises because the negative vacuum contribution of the fermions appears to cancel the positive contribution of the bosons, for example solving the hierarchy problem the huge energy gap between the scales of the standard model forces and the Planck scale of gravitation. The trouble is that the standard model has a very different set of bosons from the set of its fermions. This doesn't mean that the underlying symmetry is not true but that it must be broken, as indeed the weak-electromagnetic symmetry is. The fact that so far no supersymmetric particles have been discovered reinforces the idea that saying a 1-1 correspondence might not be the natural Occam's razor solution. Garret Lisi had a classification in his Exceptionally Simple TOE and his prediction that the LHC wouldn't find SUSY held.

In particular the 240 vector root system of E8 has 112 “bosonic” permutations of $(\pm 1, \pm 1, 0, 0, 0, 0, 0, 0)$ asymmetrically complementing 128 “fermionic” permutations of $(\pm 1/2, \pm 1/2)$.

So the symmetry-breaking basis implies that asymmetric complementarities arise as a secondary consequence of the symmetry-breaking process itself and should be universal. I.e. symmetry-breaking does not lead to symmetric complementarity. But wait a minute! The standard model is symmetry broken, so how can supersymmetry be feasible at all? Why isn't supersymmetry also manifestly broken? What we find is hypothetical soft supersymmetry breaking in which it is envisaged that a symmetry breaking of supersymmetry occurs which is unlinked to the symmetry breaking that causes the standard model.

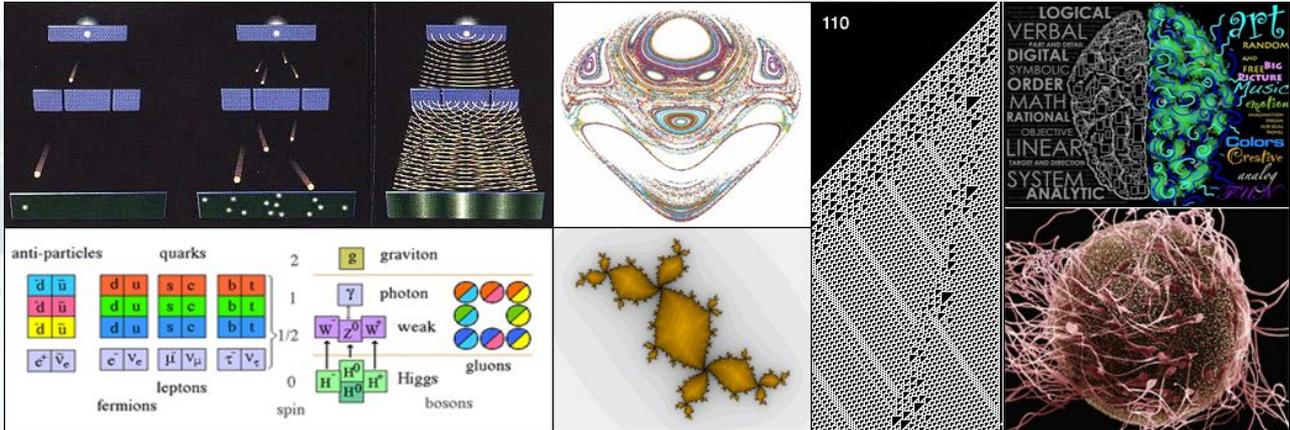


Fig 270: The natural universe contains many potentially overlapping forms of asymmetric complementarity, wave-particle as revealed in an interference experiment, fermion-boson matter-radiation complementarity, chaos and order as demonstrated in both conservative (above ordered closed cycles chaotic dappled orbits) and dissipative systems (below grey/yellow ordered black chaotic), in cellular automata, where the edge of chaos invokes universal computability in the elementary two state 1D automation 110 and in biology in sexual complementarity (human fertilisation) and in the characterised differences in cortical lateralisation.

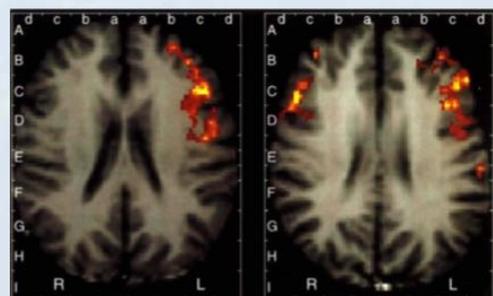
As briefly summarised in wikipedia: “Soft SUSY breaking decouples the origin of supersymmetry breaking from its phenomenological consequences. In effect, soft SUSY breaking adds explicit symmetry breaking to the supersymmetric Standard Model Lagrangian. The source of SUSY breaking results from a different sector where supersymmetry is broken spontaneously. Divorcing the spontaneous supersymmetry breaking from the supersymmetric Standard Model leads to the notion of mediated supersymmetry breaking.” Of course supersymmetry hasn't been realised, so physics has failed to give us a clear answer.

But this is just the beginning of the picture. Chaos and order are abstract complementarities in dynamics, which have asymmetric relationships, for example the quadratic Julia set is chaotic and its complement, the ordered Fatou set, are asymmetrically complementary. Likewise in conservative dynamics such as asteroid orbits and the double pendulum regions of ordered orbits are permeated by dappled chaotic trajectories.

It also pervades biology. Sexuality has a similar basis in symmetry breaking because symmetric gametes in eucaryotes result in very costly mitochondrial warfare upon fertilisation, so that there are a vast number of quasi-particulate sperm and one oceanic ovum waiting to engulf just one of them. In higher plants the chloroplasts are also at war. Hence eucaryotes evolved sperm-ovum sex, where the female has the mother cytosol with the mitochondria while the male just has a motile sperm whose mitochondria, essential for swimming to the egg are largely destroyed on entry. This means female parenting investment is disproportionately greater than male and the sex wars ensue. Hence only 3% of mammals are socially monogamous and even those aren't genetically monogamous.

Fig 271: Left and right hemisphere hubs. Composite images of the distribution of activations comparing rhyme-case tasks (phonological processing) for 19 males (left) compared to 19 females (right) (Shaywitz et al. 1995).

The same symmetry-breaking argument applies strongly to the left and right cortices of the brain, where the efficiency of lateralisation is that symmetrically duplicated cortical functions are a tragically inefficient



use of resources. Language is predominantly on the left side in Broca's and Wernicke's areas although this is less so in females (Shaywitz et al. 1995) and in music and language perception (Albouy et al. 2020) where frequency space is in the right hemisphere while the understanding for the lyrics is in the left, and in the notion of the left side being more analytic and the right more holistically synthetic. Left-lateralised hubs included regions from the default mode network (medial prefrontal cortex, posterior cingulate cortex, and temporo-parietal junction) and language regions (e.g., Broca Area and Wernicke Area), whereas the right-lateralised hubs included regions from the attention control network (e.g.,

lateral intra-parietal sulcus, anterior insula, area MT, and frontal eye fields). Left- and right-lateralised hubs formed two separable networks of mutually lateralised regions (Nielsen et al, 2017).

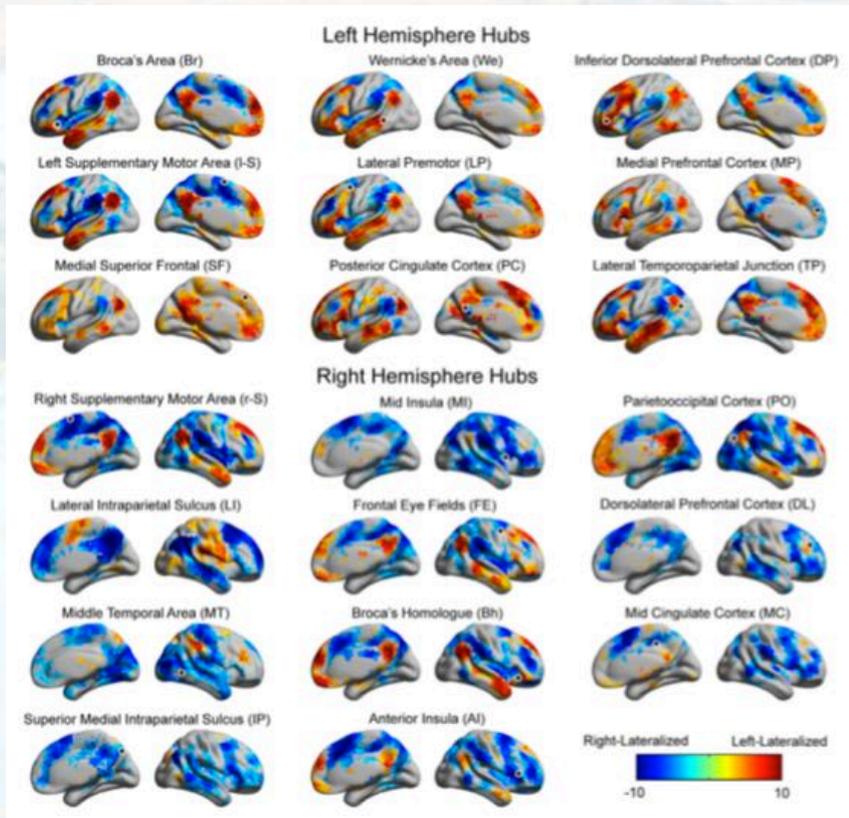


Fig 272: Left and right hemisphere hubs.

A little more prosaic, we have time and space, past and future, and in the prisoner's dilemma of defection and cooperation which also have an asymmetric relationship. This is what Tao and Tantra as an asymmetric cosmological principle of creative and receptive, or male and female are all about, so let's go right into the centre of the cyclone, subjective consciousness and the physical universe, where Eastern philosophy notes that mind is indivisible while matter is not. Asymmetric complementarities do not all arise from the same source but do have common predisposing features of

overall efficiency through symmetry-breaking.

Now we run into the hard problem of consciousness. Given that we are subjectively conscious beings possessing volitional will over a universe we know only through our conscious experience of it and the universe in turn becomes manifest only through its conscious sentient beings, the meaning of existence is created through our journey of discovery as conscious agents transforming the universe by our insights and actions. Thus, while the universe is necessary, consciousness is primary.

This raises a serious problem about attempts to mount abstract descriptions of the ultimate generating theory underlying the subjective and objective reality of consciousness and the universe. If consciousness violates physical causal closure, how can we describe any functional or causal TOEx (theory of existence)? If the universe can only manifest through our conscious experience of it, what hope is there for any single stand-alone TOEx as a pure abstraction? How can it actually manifest subjectively, except as a piece of mathematical reasoning? But this is not manifestation of the subjective, it is just a mathematical thought in the mind of the beholder.

That said, objective reality and our descriptions of it do show natural convergence to the subjective complement. Many aspects of physical brain function look like the same sort of phase coherence sampling we see in the uncertainty principle and edge-of-chaos phenomena and self-organised criticality provide the ability of the quantum reality of the physical universe to develop a convergent interface with the conscious mind. The same is possible even for information and computational descriptions, such as Stephen Wolfram's (2021) account "What is consciousness?".

The trouble is that forms of rational and logical thought and well tried models of causal deduction, which everyone is very familiar with, tend to be the main instrument people tend to apply. Attempts to structure the subjective realm in

approaches such as [Pan-protopsyshism](#), have deep analogies with reductionism and the same pitfall occurs with all abstract logical attempts to form a mind-universe monad TOE underlying cosmological complementarity.

As we have noted, when we start with subjective conscious volition over the physical world as a mutual affirmation between conscious agents. Instead of the hard problem, this leads to accepting at least some matter (brains) have a hidden subjective aspect which can affect their outcomes, possibly through uncertain instability. This means that the hypothesis of physical causal closure is eliminated by Occam's razor. But then subjectivity is a natural material property and brains obey the same four core quantum forces, even if they have quasi-particle states etc. So the occluded subjective aspect becomes complementary to the physical universe as a whole (where → represents an asymmetric complementarity):

Cosmos = (Quantum universe (particle → wave) → Mind at Large)

Our individual conscious experiences are encapsulations of this complementary aspect, modulated by the very brain dynamics we are looking at in the EEG and action potentials, as a biological neural net – except that it is a fractal neural net operating in a scale-traversing handshaking manner all the way from the quantum to the organism.

This is one of the one-mind forms of quantum reality and coincides with Erwin Schrödinger's comment:

“There is obviously only one alternative, namely the unification of minds or consciousnesses. Their multiplicity is only apparent, in truth there is only one mind. ... I should say: The overall number of minds is just one”

This leads to the most asymmetric complementarity of all. And it carries with it fundamental challenges to any form of logical description, because the subjective aspect has a series of adventitious characteristics: It is volitional, intentional, idiosyncratic, exploratory, imaginative, innovative, creative, and visionary.

How are we supposed to logically, or causally, or functionally, elucidate something that is the key central part of creative intentionality in the cosmic becoming? This is an awfully steep mind-boggling challenge! The reality is that, as conscious volitional agents, we are the creative process of the universe in sentient motion. We can talk about it round the camp fire and make up myths and stories about it, as we do in science, with profoundly informative effect that we are all in awe of. But when we paint ourselves into the corner of consciousness itself we come to the elephant in the room. Consciousness is the causality-violating creative principle in action expressed through self-organised criticality in the brain and quantum uncertainty itself. We cannot elucidate it causally, because our very intent will override it, but we are realising it spontaneously as we enact history in the multiverse and that is our cosmological role.

We are thus the collective 'Elohim of the living universe incarnate entities of transformation. We are personally responsible for the fate of the living planet. The ultimate buck cannot be passed. The least of our priorities is analysing logically who or what we are. We are bound in a covenant with the universe to protect the diversity of the Tree of Life, in our becoming and in the becoming of planet Earth as a living survivor of the [Fermi paradox](#). All we have is a small window of opportunity to unite in our diversity to achieve the one central necessary condition for our continued survival and existence, through which the universe itself is manifest – protect the diversity of life on Earth from its immanent mass extinction in a destructive human-induced anthropocene catastrophe.

The Natural Face of Samadhi vs Male Spiritual Purity

There is a very important reason why Symbiotic Existential Cosmology is fundamentally different from everyone's ideas of spirituality, samadhi and moksha.

The Eastern tradition is based almost universally on renunciation and control. This produces a different kind of samadhi because it evokes a whole constellation of concepts involving mental control, emptiness rather than the fullness of natural life, permanence rather than flux and eternity rather than temporality. Monotheism does likewise, imposing the absolute rule of eternal order enforced by everlasting punishment and the triage and abandonment of natural life. Both enforce morality rather than provide direct natural enlightenment.

This is a very ancient product of men attempting to control the tokens of gatherer-hunter culture and inventing mind-sky cosmologies to address intrinsic male fear of mortality. Women don't share this because they give live birth, often at great struggle and witness their own flesh and blood suckling from them and slowly maturing. Consequently men stare at the sky, invent sky gods and storm gods and ultimate realities of a spiritual world that in their view transcends nature. Women in turn are regarded as 'unclean' and nature is regarded as subservient. Female reproductive choice is repressed and women become the property of men, distorting the evolution of intelligence and the human sense of integration with the biosphere. Female deities such as Kali are pushed to the periphery and associated with chaos and physical decay into conflict. The very best we get is Shakti as the physical aspect of Shiva's consciousness spawning the Maya of mortal physical life.

Our entire cosmological viewpoint has become corrupted by male dominance over sexually antagonistic coevolution, where women have to endure pregnancy and live birth and need to choose intelligent male partners because of their primary investment in parenting, while males although they seek to sew wild oats, as their investment is primarily reproductive, want to control female reproductive choice because even in their mortal anxiety, it at least gives them paternity certainty when women are always certain that the issue from their wombs is their own flesh and blood. Hence the rise of patriarchy over the matriarchy that still continues today.

The crisis of a mass extinction and climate heating, which could destroy our planetary resilience and our tenure as a species is intimately linked to this sexual crisis and needs urgent correction, not just to save the future of life and our species, but for us to even begin to understand the conscious mystery that lies before us. The severe degree of renunciation and control required for full Vedic samadhi, accompanied by stereotyped notions like astral substrates of ethereal experiences leads to concern that controlled samadhi is a restrictively inferior form of enlightenment. Symbiotic Existential Cosmology, rather than seeking spiritual purity of some ethereal or astral realm or pure consciousness in the absence of nature and matter, seeks the edge of chaos where immortal life flowers and unfolds.

Fig 273: Fractal enlightenment

This produces a different kind of moksha samadhi, full of light and visionary significance that transforms our lives into full symbiotic integration with nature. It rejects the myth of control, where enlightenment can only be achieved in emptiness and renunciation of natural and worldly existence. It is spontaneous and creative, pro-life and the sacredness of nature. It is free-wheeling and doesn't require long tedious hours of withdrawal from positive engagement with the world. It doesn't require renunciation of conjugal love and family life in spiritual pursuits and is consistent with science and the lessons immortal nature has to teach us. The truth is clear and unambiguous. The samadhi of life transcends the samadhi of emptiness. Engagement transcends renunciation. Flux transcends stasis. Life transcends death.



The fact that Vinod has to cite a work by a deceased Himalayan ascetic in a world of eight billion people with 1.5 billion in India alone, attests to the unachievable rareness of 'genuine' samadhi in the Eastern tradition. Many people are using meditation in both the East and the West, but genuine evidence of significant non-ordinary mental states indicative of genuine mystical transformative experiences remain rare and ambiguous.

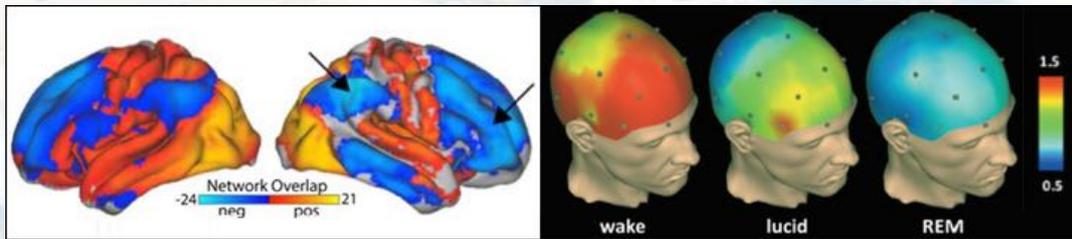


Fig 274: Left: REM state vs waking activations (red-yellow) and deactivations (blue). (Uitermarkt et al. 2020)
Right: Lucid dreaming occupies an unstable region between REM sleep and full waking arousal (del Giudice et al. 2022)

Entheogens are of ancient shamanic use. They are fully natural and evolved by life itself. They are physiologically non-harmful. They complement and complete meditative vigils in transformative ways potentially of great interest to science and cosmology. The only other such resource we have is dreaming but this is particularly hard to control and lucid dreaming states generally result in rapid awakening due to the activation of the reticular activating system of waking consciousness. They also suppress memory of dreaming states unless we immediately wake up, because they are involved in memory consolidation and tend to suppression of parts of the brain involved in conscious focus and free-will, so are well complemented by waking entheogenic experience.

Patanjali in the Purohit translation notes: *The Siddhis are born of birth, drugs, mantras, penance or Samadhi. (IV-1) Powers are either revealed at birth, or acquired by medicinal herbs, or by repetition of sacred words, or through austerity, or through illumination. ... All know the healing qualities of herbs; only a few know that some of them have the qualities of awakening spiritual powers.*

Clarifying Cosmic Karma

Many of us have deep confusions about what karma is and does and what it doesn't do and apply these notions to a degenerate view of what karma actually is. Both reincarnation religions and monotheism are moral cosmologies. Monotheism puts the moral feedback off to the day of judgment, but karmic religions do it through reincarnation.

The first point is that moral cosmologies are false cosmologies that are anthropocentric and in conflict with natural moral sociodynamics in animal and human societies that are clearly feedback processes to inhibit intra-social competition to achieve inter-social domination and the survival and expansion of the group. It's a purely evolutionary manifestation of intelligent societies with significant social bluffing.



Fig 275: Two incorrect notions of karma: Left inevitable cause and effect and right a cosmic conscious moral retributor.

The notion of Karma as a moral force is ill-conceived. Before human culture and religion came about, there was no natural evil. Life is an endless struggle to evolve and diversify every which way. While it's never in perfect balance and largely at the edge of chaos, the diversity of life rises to climax because the plants provide solar energy and the animals can survive eating the plants but also fertilise them and by their very predation result in plant diversity by evolving to hit the weedy species. The same for herbivores and carnivores culling them thus avoiding boom and bust of the

herbivores through grassland famines. The same for parasites and prey although we abhor covid, rabies, malaria and ebola. Parasites and prey are key to the Red Queen race that made sexuality and multi-celled eucaryotes possible. Ironically, sex is also the source of organismic mortality but that's the breaks. Parthenogenesis is unsustainable hubris.

The notion of moral karma was devised by religious doctrine to inhibit intra-social competition to achieve inter-social dominance just as all intelligent socially-bluffing societies do, but it has been launched into a cosmological dimension in the idea that moral causality drives divine punishment including the notion of karma and the Day of Judgment in monotheism. Actually these have a common source in the Indoeuropean culture that spawned both.

Now we have all ended up debating a person's individual karma in relation to the bad karma other people might witlessly inflict on us, with disease or accident due to their acts or emotional afflictions. This is artifice. We all need to say stop bas enough – this is unnatural. It all came, not from nature but human culture causing runaway forms of social punishment extrapolated onto the cosmos, and in the case of Vedic karma and reincarnation, from the inability of the samadhi tradition to provide moksha in this life, due in good part to the lack of visionary sacraments in the East.

So we need to look more closely. Just as there is no natural evil, the universe has to have rough justice for life to survive. The way the entropic universe and the negentropic nature of life intersect means some people will suffer the vagaries of fate, because this is the way the diversity of life flourishes in the molecular universe. There is a deep meaning here but we have as yet barely scratched the surface and the Vedantic idea of Karma is just pulling the wool over our eyes.

All the situations where bad karma – accidents, disease etc. seem to come out of the blue is sourced in environmental uncertainty. But the world is not classical. We can try to classically trace back the cause of bad karma. We can speculate that the car that hit my relative should have had a mechanical check or blame it on the driver having one too many, but ultimately the source of environmental uncertainty is quantum uncertainty itself.

The world we think is classical is the most outstanding form of open system chaotic quantum billiards of which cosmology is composed. All molecular interactions are quantum billiards in which the wave functions are spreading off every intermolecular encounter. It's open system quantum chaos par excellence. So everything that happens can be traced back ultimately to a butterfly effect in the past where the trajectories diverged. There is no such thing as randomness, there is only quantum uncertainty. So to understand the roots of karma, we need to understand that all events are caught up in a non-random hidden variable account and that we still don't understand how this meters out but that conscious sentience and volition plays a central role in the process. Hence all the fringe phenomena from synchronicity to psi get drawn into the loop.

Because I know this and know every step I take could have utterly unforeseen consequences, I try to keep half my mind listening to the winds of fate. I don't try to push the river. I don't seek psi because psi runs in my veins like the fruit of the tree of life that dilates my pupils like Dune spice melange and could not only come back to haunt or bite me or others, but could come true once and for all in ways I neither desire for nor conspire to. Only by letting go of my karma and giving it all back to life can I be confident of my intrepid journey into the unknown.

If you want to be part of this true karma, there is one and only one way through. Protect the diversity of life with our own mortal lives. That is the only currency we possess and it is borrowed capital we can't take with us. If the high traditions of spirituality can't induce us to do this, let them go. We are ourselves transformative of the entire universe and sacred beings in this respect, but if we squander our capital doing bad deeds or even just speculating and debating and don't save the life of the universe, while we are alive, we are dead meat.

Deepak Chopra: Dear Chris, It would surprise people to learn that the sentiment quoted above — “I use my memories — I don't let my memories use me” — is a telltale sign of higher consciousness. In fact, any step in the direction of personal evolution loosens the grip that memory has on us. If you want to know what blocks you from experiencing bliss, joy, fulfilment, love, and creativity, the chief culprit is memory.

Chris: Your comment reminds me of [Carlos Castaneda](#) (1968, 1972, 1975) and “erasing personal history”. Something I also live by, although he is now regarded as a confabulator of folk tales of the nagual, and it is claimed that after he died, I think of liver cancer, his female acolyte authors vanished in the desert and the bones of one were found in a deserted mine. It is believed they entered a suicide pact with the aim of meeting him on “the other side”.

One of the things about wild travel in foreign countries all alone is precisely erasing all memory of oneself. In fact the best time to erase your memories is when your back is against the wall. The trouble is that karma gets woven into it and sometimes the stories never end.

On my first visit to India, I made it into Ladarkh, the second season it was open to tourists. One day I was standing in Leh, where there was a little ruined potala on the hill above the town. I resolved that I would walk to the village on the horizon and let nothing stop me. So I walked out of town in my jandals and one of them broke, so I headed on barefoot. A Ladarkhi woman in national dress walked up to me in the fields and embraced me amorously, but I headed on into the village because any of the menfolk could see the fields below. Immediately, I was bitten on the ankle by a village dog, which began a long journey through Indian A&E clinics because the old vaccine, which required 14 daily shots in the stomach had a 1% mortality risk from brain inflammation due to the vaccine being cultured on chicken brains. So at every city I came to, Leh, Srinagar, Jammu and Delhi I had to join the queues of penniless people trying to get free medical care, with all manner of injuries and maladies. In Kashmir, I waited for my shot sitting beside a youth with a green face, who was vomiting in a bucket. The male nurse picked up the syringe and dropped the plunger at the feet of the youth and picked it up again and made to fill it from a huge old bottle of vaccine. I said "sterilise the syringe!". He said "I see you are an educated man! But by the time I got to Delhi the nurse had 50 needles and about 200 people waiting in a long queue so it was simply a raffle. Shortly after I caught hepatitis and had to recuperate in Mcleod Gang above Dharamshala.

When I felt a little better, I had a double fried egg thukpa and my liver survived, so I set off on the overland. I descended the Himalayan foothills and ended up in Amritsar heading for the Pakistani border. After visiting the Golden Temple, I was accosted by a tipsy customs agent. When I had previously entered India from Nepal the border guard had tried to demand baksheesh and I told him that was corruption. The trouble is that he then didn't stamp my entry visa, so this customs agent claimed I was a drug runner that had just entered India. A commotion ensued when he tried to arrest me. That was when Indira Gandhi had automatic 90 days in jail without charge, and a commotion arose with about 50 people jostling around me, so I knew I had to get out of this. I did something no Western man in the street should do. I got down on my hands and knees and wept bitter tears saying he is trying to abduct me! I tried to crawl away under the crowd, but somebody grabbed me. Eventually the customs agent got into a debate with the station master and I managed to escape. Next day I arrived at the border, which was a no-mans land about half a kilometre across a field to a last outpost of India, and there was the customs agent. I said to him you were drunk, and he lounged on his wooden chair and let me through.

When I got to Kabul I needed a yellow fever vaccination, but I had had enough of needles, so when the doctor gave me my certificate before the vaccination it was too good an opportunity to miss, and I scarpered elated and took a bus back to the Abdul Satar Hotel where the proprietor smoked hashish with all all on the rooftop. But in the packed bus a little kid stole my passport and all my travellers cheques and I was left penniless with only the vaccination certificate to my name. Now a weird twist of fate occurred. In Varanasi, I had bought a defunct sitar from a sitar teacher whose bowl promptly broke off. I accused him of selling me a pup, but he said "Oh no Uncle, I have not deceived you"! He picked it up and played a raga so profound that it brought tears into my eyes. So I ended up hauling the thing all around India in a huge case that took an extra seat in the bus, which they kept trying to throw up on the roof. So in my penury in Kabul with nothing else to barter, I took my sitar down to the souk and a man immediately ran up and offered me \$50 US on the spot, because he was part of an Indian music troupe and couldn't get a sitar for love or money.

Eventually the money got me through to Istanbul, where my parents had remitted money, with some dire escapades eating in wayside restaurants without having the money to pay, in Iran.

It was only 40 or so years later preparing for intrepid travel to Vietnam, Yunan, Korea, Japan and Taiwan that I had a test for Hep and found I was immune to Hep A and found out which kind of hepatitis I had originally contracted.

So there it is!

John Kineman: I think it is important to understand that karma also has a general meaning that is more scientific than the idea of a judge exacting punishment or failing to be benevolent. Technically, it is the systemic effect of action on the future. That is, it suggests more than physical causation where a rock falling on a glass table breaks the table. It is a material action, but before we get to its effect on other material bodies there is a contextual effect. So, murdering someone does not directly result in jail or execution, it perturbs a legal context that after going through its very

different kind of causal relations (inductive process) it produces a functional outcome, which may be to exonerate the act or punish it. That is translated again into the world of action and some physical means is decided. In the same way, acting out or malice has a tendency to produce feed-forward actions that in a similar context may be seen as having a similar meaning or character. So, the simple expression of this principle that a Unity Minister once told me “you get ugly, ugly’s gonna get ya”, is an example of how it happens, but it is not an explanation of how that happens. “Ugly” is not an agent that judges and responds, it is just how we characterize the actions in our contexts. It is all about the non-mechanical relation between events and contexts.

So, my understanding is that the technical view of karma has nothing to do with crime and punishment decided by a cosmic entity. It is the future systemic effect of past actions perturbing a meaningful context. The popular view focuses on our past actions in the context of our intentions, and indeed there is a feed-forward of that, but like any general law it also applies to actions by others and actions occurring naturally, in contexts we unavoidably participate in. So, while there may be cases where we can see a direct feed-forward of our own behavior motivations, there can be other cases where we have to deal with the feed-forward of other people’s intentions and even of nature itself. If climate change really gets going it may alter the global weather patterns to such an extent that agriculture begins to fail from being misplaced from its optimal climatic norm. This might be a karmic effect of our inability to control emissions, when viewed strictly in a human context. But the same thing could happen naturally, or from a close pass or impact of an asteroid. Still the physical conditions are changed in a way that brings difficulty and suffering. Similarly there can be physical actions that feed-forward to benefits in our highly selective contexts.

I think the point of this is that sometimes we can attribute a form of blame, praise or judgement in a human context where we are used to thinking that way, but not always. Most systems have complex relations where one can speculate about personal trajectories but it is still nature operating as nature with us as participants. So yes, if this view is taken, our concepts of personal responsibility, fairness and justice do apply, but not exclusively or decisively depending on what other contexts are involved. The basic problem with the popular view is that karma can’t be exclusively personal because no person is exclusive. On the flip side where we can’t attribute personal blame to someone or some concept, this might also lead to the idea of victims, which spiritual philosophy doesn’t want to support, and yet that is also a context dependent determination on our part and can’t be blamed on a cosmic will, being only the consequence of collective activity.

I think this leaves room for personal responsibility and consequences that the various popular notions of karma focus on, but also shows that there is much more going on such that personal responsibility can’t always be assigned. Collective responsibility also is real, but can’t always be assigned. Bad things can happen to good people and vice versa, but that doesn’t mean we are not also responsible for our actions in a more limited context.

Chris: That’s a beautiful account John! But you have to be honest as a Vedantist that this is an adaptive rewriting of spiritual karma into a pseudo Gaia hypothesis of autopoiesis. It may be that agriculture will fail with climate crisis and send us back to the gatherer-hunter phase under profoundly less habitable conditions for our species but this doesn’t solve Cathy’s dilemma of the contrived, inexplicable and ad hoc nature of individual, karma like her dementia case, or anyone who gets cancer, or suffers serious debilitating head injury and so on.

And this doesn’t make sense in the biosphere as a whole. It’s a form of over-determination, or hyper-causality, that assumes more indirect consequences than the actions themselves precipitate. The biosphere teaches us that all niches, plants, animals, fungi, protista and prokaryotes and even viruses are legitimate. Often seemingly counter-productive events are due to conflicting selective forces, as with Covid-19, which started out a symbiotic bat virus and then became a parasitic pandemic due to human trafficking in wild animals. The problem with moral karma is that it is unscientific, because morality is a product of strategically bluffing intelligent animal societies to avoid internecine breakdown of the diverse niche constructions that strategically bluffing societies allow to achieve inter-social dominance.

To attribute scientific meaning to karma, you are reinterpreting an historically incorrect Vedic cosmology linked to reincarnation, because moksha is so elusive by meditation alone. You are now reinterpreting it as an expression of a Gaia principle, but no geo-physical or bio-physical collective feedback can afford to involve fundamental cosmological overdetermination of the biosphere’s natural adaptability, or diversity would become undermined. The way the laws of the symmetry-broken standard model work is to evoke critical phase transition states in both evolution and the

emergence of consciousness in which subjective consciousness can emerge and have survival efficacy for the organisms possessing it – i.e. all eucaryotes. It has to be and is free of over-determination for this very reason.

Hence the only recourse to a psychopathic killer who gets away with blue murder is that his “warrior” genetic makeup may prejudice the future of his offspring, not because “what goes around comes around”, or be ugly and you get ugly. By the same token compassion is not an antidote to misfortune, it’s just a way of sharing and caring these slings and arrows. In fact the reverse occurs. Emotions are a common palette that provide for natural and sexual selection that is not confined to genetic kin, but can become oceanic compassion in the face of agony and outrageous misfortune. But none of this stops misfortune itself.

We still don't know how the universe makes individual decisions about fate and it's not an adequate answer to claim the blind justice of pure randomness or stochastic causality, although that's the effective breaks we have to deal with in the mortal coil. This is still a cosmological trade off between organismic emergence through sexual recombination and sexual reproduction, individual variety and organismic mortality. Misfortune would be entirely different if we could simply regenerate parthenogenetically.

John: If I consider what perspective might be behind your comments on karma it seems that one concern you have is that Vedanta is not as scientific as I might wish it to be - is that a fair restatement of at least one concern you are expressing? If so, then I am indeed applying a new science framework to interpreting Vedanta; whereas it may not have had that same understanding before this attempt at formalization, although that is philosophical archaeology and we know that effort and all arguments for and against will remain speculative. I'm not so concerned if the ancient Rishi's had it all right. Initially, Vedanta didn't figure into the theory at all. I was astonished when I found the correlation and I find it highly improbable that such a similar result would not come from similar thinking. But then I think you are also saying Vedanta was wrong and in some way both my description and Veda suggest an "overdetermined" model, or perhaps two.

Certainly the mechanistic reductive mainstream view is overdetermined because it is limited to exact efficient causality. And it does seem that the various religious models derived from Vedic philosophy tend toward a different kind of overdetermination where everything might be imagined to be wilfully predetermined by a supreme being. My model and world view allows both possibilities as contextually determined systems, i.e., as special not general systems. The general turns out, if anything extreme, to be underdetermined and the theoretical challenge is to explain how things get determined. Reintroducing the higher causes to material models makes them less deterministic. Also when higher cause is claimed to be omnipotent, introducing physical causality lessens its wilful determinacy. The holon model looks at both and how they work together as a complex causal system.

Chris: The reality of human socio-religious morality is that it is a layered cake, in which world leaders, from Putin to Netanyahu and Trump can be as narcissistic and psychopathic as they like. They can fire nuclear weapons and commit genocide on their opponents, or even destroy the late planet Earth in spite. They can also out-reproduce any male in existence. Tamerlane kept 10,000 virgins behind flaming walls and 0.2% of the human Y chromosomes on Earth are those of Genghis Khan. At the lowest extreme, from the innocents of Gaza and the Rohingya, to the lower gang prospects of El Salvador and Ecuador are all underprivileged delinquents, having to break the rules to survive, driven naturally by low serotonin, including committing indiscriminate theft and murder. Sandwiched in the centre, the middle classes reinforce morality as a form of "altruistic" punishment because they have enough resources to lose and they survive through keeping the balance towards social order.

The entire purpose of this moral edifice is to keep dominant societies dominant by inhibiting intra-social strife, while allowing as many social bluffing niches as possible, which is what smart social societies do to survive. We see exactly the same picture sexually in the Lakshmi temple of Khajuraho, where sexuality is regal in the sacred maithuna of the upper pinnacles, while sodomy and bestiality “run free” on the lower earth-bound strata. This twisted anthropocentric view of cosmic morality has been abused by religions East and West to reinforce the least spiritual aspects of belief, in the social dominance of major world religions, from Zoroastrianism, through Judaism, Christianity as the imperial religion of Rome and Islam of the Arab world, not least to Hinduism and the holy war of the Gita. There is really no exception, since the emergence of shamanic animism to this tragic tale, which is why I stand as a "noble savage" with nature in all her vulnerability and splendour. Therefore to reinstate karma as an additional force, even for good, is to assert a form of over-determinism, which resembles autopoiesis, in being hypothetical laws of agency, in addition to the laws of physics, which themselves amount only to homeostatic survival, just as Karl Friston claims in free energy

minimisation in the brain. These do not solve the hard problem of consciousness, nor do they even address the problem of conscious intentionality over the physical universe and hence “karmic” responsibility.

Symbiotic Existential Cosmology turns both the Eastern and Western religious traditions inside out and utterly transforms the physical universe as well, by giving it back its conscious meaning. Rather than a Vedic universe running downhill because of defection into the Kali yuga, propped up by endless cycles of reincarnation, in which humans and animals are just conscious sentient beings with no natural cosmic-biology, or a Monotheistic Eschaton following a divine "creation" tragically flawed by sin, in which the late planet Earth is committed to the cosmic incinerator in favour of an illusory heavenly Jerusalem, SEC says the entire universe is a psycho-physical cosmos in a state of becoming, in a creative critical phase transition at the edge of chaos, giving rise to life evolving into conscious existence which can rise to overflowing in paradise on the cosmic equator in space-time, if we don't cause a precipitate Fermi extinction. This passes all the responsibility back immediately and directly to us as cosmic-conscious biota protecting life in the universe, rather than a fictitious deity or illusion of emptiness full of sound and fury signifying nothing or bliss for bliss's sake alone.

SEC came about from a moksha experience, which transcends individual souls in the merging with ultimate reality that the Vedas call Brahman. But pivotally this meeting showed that Brahman, as cosmic consciousness, is as vulnerable as we are as mortal organisms, because without us incarnate conscious organisms keeping the fray in the centre of the cyclone of mortal existence, eternal psycho-physical cosmic consciousness cannot become manifest. And we don't yet know there is life elsewhere in our galaxy or even the universe, so we need to take full responsibility for the fate of Terra-Gaea. We know this to be true because all knowledge of Brahman comes from deep samadhi and moksha experiences of the rishis. This tells us a lot more things. Reincarnation is an illusion promoted because of the sheer scarcity of true moksha. Individual souls are an illusion of the notion of eternal life when liberation comes from union with Brahman, not from eternal dislocation of angels dancing on the heads of pins. Moksha is not biological death because we step outside the bubble of mortal existence into the ocean of cosmic Brahman, while still being the biological conscious beings we are incarnated to be and thereby realise our calling in protecting life throughout the universe so that it can truly flower, in the "Net of Indra" for want of a better word.

The tragic fallacy of the traditions, both Eastern and Western and of physicalist science, is that all of them neglect the central role of biological life as the central cosmic tree of immortal consciousness, through which the psycho-physical cosmos flowers to overflowing abundance. You can see it threaded all through the Vedic-oriented discussions, where nature just becomes a synonym for bliss in samadhi. Conscious sentient beings, as described in Eastern traditions, are not only abiological but they are also anthropocentric. An attempt is made to make a direct transition in both Monotheism and Vedanta from the existential crisis of mortality to spiritual transcendence. You once said to me that psychedelics were trying to break down the doors of perception with an axe as an assault on transcendence. That is precisely what spirituality does, by trying to short-circuit psycho-physical reality by leaving biological life out of the sacred loop. This is why I appear to be single-handedly trying to protect the diversity of life against all the odds in a gathering storm of Fermi extinction crises, which no one in these groups has time to even consider, in their passion for spiritual transcendence.

Evolutionary karma in the natural world is a long-term consequence of natural selection and modular mutational change, NOT cosmological morality.

(1) **The Coronavirus Pandemic:** Corona viruses are not moral agents. Evolution simply exploits every possible survival niche cooperative, or exploitative. Corona viruses are the most sophisticated single-stranded RNA viruses on the planet. They are extremely well adapted living symbiotically with bat colonies and infecting other hosts more severely and in humans having an extremely wide spectrum of severity, from asymptomatic to lethal, ensuring their tenacious foot-hold and survival. But they are neither ethical nor moral, just well-adapted survivors. Evolution is not moral and can't afford to be, or we wouldn't have plants and animals, or herbivores and carnivores, parasites and hosts. Evolution's sheer diversity engulfs any moral concept. But there is a karmic sting in the tail of Covid. This has all been caused by exploitative human misadventure, shameless exploiting wild species trafficking pangolins nearly to extinction for their scales and holding civets in cramped cages for their fur, combined with multiple wild bat species packed into urban markets. So Covid-19 has become, partly through human overpopulation and exploitation of the biosphere, a worthy adversary to humanity.

(2) **Entheogens:** Ever wondered why psychedelic species exist? It seems to go right back to single-celled eucaryotes, which socially communicate by what we have come to know as neurotransmitters and receptors. All of glutamate, GABA, serotonin, cAMP, norepinephrine, epinephrine, are found widespread in single celled species. Tetrahymena for example utilises histamine, serotonin, epinephrine, melatonin, and triiodothyronine, as well as peptide hormones, such as insulin, adrenocorticotrophic hormone, epidermal growth factor, endocannabinoids, endorphins and c-AMP and GMP. Now because humans evolved from social amoebiflagellates and our brains develop based on neurotransmitter encodings during neuronal migration, the entire brain is an electrochemical network utterly dependent on synaptic neurotransmitters for its major evolutionary survival modes. This means that other species, particularly plants and fungi which have adventitiously evolved to produce a diverse abundance of myco- and phytochemicals will inevitably produce a scattering of highly psychoactive substances mimicking and tweaking our own psychically active molecules.

No one knows quite what evolved purpose these phytochemicals have, any more than one can speculate on why tea and coffee have caffeine. Some may have a survival advantage in warding off insect predators and others may achieve fertility through providing attractive substances causing consumption by animals. *Psilocybe cubensis* for example grows on the cow pats of Brahman cattle in South East Asia and may have been in turn spread by cattle consumption. We thus owe it to the biosphere that we have not only psychedelics, but cannabis, morphine, cocaine and many essential medicines. Although we know psychedelics are serotonin 5HT2a super-agonists, their effects are wildly different from serotonin and arise from distinct second messenger processes in the metabotropic 5HT2a serotonin receptors. This suggests that the visionary capacity of the human species has always been present and has a function in the visionary experience of our founding shamanistic and animistic cultures. People have noted the presence of DMT in brain samples. Hence psychedelics may open the doors of perception even wider than yogic samadhi exploits in a less sensual way, leading to a philosophy of emptiness rather than the fullness of psychedelic shamanism.

But there is another key aspect **fateful karma**, which is to do with the great leveller – accidental misfortune ... and good fortune too ... **karmic coincidence** ...

There are always two ways of looking at an intervening act of fate such as a disease, storm, flood, fire or accident – (1) the contextual (physical or biological) causes and (2) the exact specific train of coincidences that brought this idiosyncratic event onto being. This is also a fundamental characteristic of the quantum universe stemming from quantum uncertainty. Covid is a perilous disease, so we can try to vaccinate ourselves, or enhance our immune system with supplements to address the contextual risks but this does not protect us from freak occurrences by being in the wrong place at the wrong time e.g. in an unanticipated super-spreading event, so it is as relevant to ask what caused me to catch this now? For this reason, anthropologists acknowledge that an animistic viewpoint has unique survival value, because it does protect from unpredictable threats from intentional agents, even though it may result in overkill on attributing physical causes to conscious agency because everything is treated as alive:

A classic example of this dichotomy is in Evans-Pritchard's description of the Zande rationale for the granary collapse: the Zande knew full well that the granary collapse was "caused" by termites eroding the foundational structures. This physical explanation was, however (in converse to the Western philosophical viewpoint)" - causally irrelevant" to their inquiry, which was, "Which mind intended for the granary to collapse at just this moment?" ... The Zande might not care about universal gravitation or termite biology, they want to know who made the granary collapse at just the moment a friend was under it.

This leads many shamanistic societies, particularly more violent ones, to spend a lot of time casting evil spells to harm others and protective spells to exorcise the evil ones, blood feuds and clan warfare, all in a notion that somehow the universe is able to organically or consciously pull the strings of fate to one or another person's advantage.

This is where the notion of moral karma takes its incorrectly conceived bight into coastline of reality by claiming the universe has a hidden principle of cause and effect that bad people end up with bad outcomes, if not in this life, in the next, combining the sheer difficulty of even good devoted meditators achieving moksha to invoke reincarnation as a way out, with the use of reincarnation as a form of divine punishment in karma. This flies in the face of the evidence. While many bad people have bad outcomes and die in gunfights or receive imprisonment or capital punishment for their crimes, many world leaders and even democratically elected populists display clear exploitative narcissistic or even psychopathic behaviour and succeed on the basis of being "strong leaders", leading humanity as a whole to the brink of annihilation. Worse still, the vagaries of fate do NOT protect the innocent or even the transformatively beneficent. Karmic fate is rough justice.

What I do conclude out of this is that subjective consciousness has been retained by evolution since excitable eucaryote cells became whole brains because it has a selective advantage surviving in a world of environmental uncertainty that is ultimately a product of quantum uncertainty so taps into the very phenomenon the proponents of moral karma incorrectly claim exists.

But from my point of view, in an alignment with Vedic thinking, my own experience of moksha teaches me to avoid any form of karma that is not directed to the highest goal, which in my experience is convincing humanity to protect the immortal diversity of life as our *raison d'être*. I will do this as assertively as it takes as a spokesperson for the edge of chaos using controversy to provoke and hold no quarter with criticising cherished religious and scientific notions which I perceive to be acting to undermine this paradigm shift.

Psychedelics ARE a faster route and have a much more experienceable transfiguration than meditation alone, but it still took me to the age of 78 combined with deep meditation similar to TM to generate an experience iconic enough to produce Symbiotic Existential Cosmology. This work is frankly so oddball and yet so tenaciously robust scientifically that it is a proof of principle of something powerfully karmic. I was prevented by acute closed angle glaucoma from taking any trips for seven years previously, until I had total lens replacements. This caused a very pure whiplash on a very mild dose, so you need to see it as a confirmation of what I just called **fateful karma**.

I am trying to convey the positive potential of entheogens to deal with Fermi catastrophe and I'm caught in other karmic tender traps. The whole Western tradition of Christianity is sacramental, so this is the Biospheric Eucharist of life rather than the soma and sangre of Yeshua's death. It was discovered in deep meditation in a meeting ostensibly with Brahman as ultimate reality, so it validates Upanishadic Vedanta and the yogic tradition. It was discovered using a sacrament 3000 years old coming from Precolombian America, affirming the shamanic sap and dew. Now doesn't that strike you as a karmic hat trick for the three great spiritual traditions? I may be here to challenge the law of and religious doctrine but I am NOT here to destroy the prophets, but to fulfil the future of life immortal.

Empiricism, the Scientific Method, Spirituality and the Subjective Pursuit of Knowledge

Firstly: What is empiricism and what is an experiment?

empirical: based on, concerned with, or verifiable – by observation or experience – rather than theory or pure logic.

From Greek *empeirikos* "experienced," from *empeiria* "experience";

experiment: An action or operation undertaken in order to discover something unknown, to test a hypothesis, or establish or illustrate some known truth. From Latin *experimentum* "a trial, test, proof, experiment," from *experiri* "to try, test," from *ex* "out of" + *peritus* "experienced, tested"

The two notions – **observation** or **experience** – came from Greek physicians making diagnoses by observation or experience rather than theory, sometimes with the disapproval of theoretically oriented physicians, who treated them like the medieval barber surgeons. But empiricism's role has become pivotal in experimental science, without which modern medicine would not exist.

When we come to the mind-brain / consciousness-universe complex, the pursuit of knowledge inherited from Greek medicine gives us two asymmetrically complementary approaches to the pursuit of knowledge.

(A) Objective verification by empirical observation: this is the standard basis of good experimental science and is based on replication – two or more experiments producing consistent results.

(B) Subjective affirmation by empirical experience: The word affirmation is used rather than verification because, to replicate a subjective experience requires two or more subjects mutually affirming they have experienced consistent phenomena. This discovery process is by definition experientially experimental.

The status of (A) is the gold standard of objective scientific inquiry and is also critical for experimentally verifying theories like quantum physics and relativity, but the status of (B) remains unrecognised, as the other half of the pursuit of knowledge of the cosmos as a whole, along with its experimental protocols.

Both approaches can achieve statistical significance. For example subjective reports collected in a scientific context become consistent observation of reported conscious experiences by an experimental group. But experiential validity can also be established by direct mutual affirmation.

Secondly: The role of conscious volition.

I have posed the question: "*Do you agree that you have **subjective conscious efficacy of volition over the physical universe?***" I asked you this because it's the most obvious property that we all possess in common, even to eat or secrete, let alone have a conversation, which we all do, or to do something creative. Yet it poses a unique existential threat to materialists, who try every conceivable way to plead that correlation is not causation, or that there is always a hidden brain mechanism doing it, although that directly contradicts our own veridical perception of our intentional acts as having been intended by ourselves.

However, once we mutually affirm the root empirical experience that we ARE physical beings, intentionally shaping the world around us, and perceive ourselves to be doing so, just as other mammals we observe do, we have an emerging subjective consensus that becomes a root experiential scientific discovery.

Many people look at this and say it's too easy, as a solution to the hard problem, to simply declare we agree we have volition, that it's facile, or maybe just expressing our fallacious impressions, but it's actually the very foundation of establishing the subjective pursuit of inquiry into the knowledge of the cosmos as a whole and the conscious dimension many of us call, for want of a better word, spirituality.

The reason this criticism is wrong is that volition states the obvious easily, while consciousness became sequestered as a hard problem, because of epiphenomenalism, which a priori contradicted the efficacy of volition without evidence, while paradoxically admitting we were conscious of the world around us and even of dreams and hallucinations, as a brain-derived internal model of reality. The casualty of this cancellation culture was volition. Hence volition – now stating the obvious – IS solving the hard problem and it is observable. It's how we know one another are conscious, through our vivacious volition, and it's how we understand other animals are conscious too. This is the reverse Copernican principle as an axiom of affirmation.

Thirdly: What IS the foundation of the subjective pursuit of knowledge? Experience itself!

Techniques of subjective empiricism and experiment are as different from observational empiricism as the physical universe is different from consciousness itself, yet complementary to it. They need to be approached as a whole because we engage consciousness as a whole not in its pieces. The subjective aspect is not adequately explored by trying to analyse it or decompose it observationally, or abstractly, because it is everything we experience. We are in it, and transforming it, not just observing it. So the techniques of simple introspection are inadequately general and also flawed because the mind can't be fully observed, since observation changes it. But it CAN be fully experienced and that's the core principle of the inquiry process.

We can only begin to form an understanding of the subjective by embracing deep conscious and mystical states, untethered from the physical world, not by attempting to analyse them, or qualia, or the thought process, but by going right into deep conscious states on a vision quest into the 'other' side of being and returning with an epiphany, or a satori, or a moksha whose nature we can meaningfully share with others as a discovery process. Talking about subjective experiences remains anecdotal unless and until two or more of us are able to affirm deeply common qualities of such experiences together.

[Symbiotic Existential Cosmology](#) (new web page) as a product of entheogenic quantum change, reinforced by recent psychedelic research, and Chris Field's [research insights provoked by meditation](#), are examples of such experiences giving rise to new testable hypotheses, playing a key part in this process.

Fourthly: Caveats. Central to the problem of subjective discovery is that:

- (1) The subjective domain is dominated from above by the **confining processes of rational thought and verbal argument**, which places a filter unless a proposition can be successfully argued, rather than two subjects agreeing on a consistency of experience. This is not only unnecessary but leads to the entire description being only that of

cognitive thought. This is a real problem for philosophy of mind to address and come up with a paradigm shift about. "The way that can be told is not the countless way" as Lao Tsu pointed out.

- (2) The subjective domain is dominated by **real world consciousness**, when this is subjective consciousness locked in perceptual and volitional relationship with real world events, again acting as a severe filter on what consciousness actually is. It needs to be compensated by realising the full depth of untethered conscious experience going to whatever measures are required, including last but not least, sacramental exploration, which forms a subjective complement to the LHC.
- (3) Deeper levels of 'pure' consciousness uncoupled to the rational and real world filters are broadly: (a) **dream or hypnagogic experience**, (b) **meditative and contemplative practices**, (c) **entheogenic sacramental experience**, (d) **religious ecstasy** (e) **near death experiences** and (f) **paranormal phenomena**. The deeper of these can be very difficult for individuals to fully experience, leading to mystical states having a quasi mythical status, in which moksha and samadhi cannot necessarily be achieved in a lifetime. Entheogenic states are critical information to the subjective discovery process, without which no valid conclusion can be drawn, and so these urgently need to be more fully explored and accepted as central to the discovery process. Each of the mystical states need likewise to be explored fully by mutual affirmation at the root level before their status can be considered to reach the level of evidential support.
- (4) **A priori beliefs are by definition inconsistent with the free pursuit of empirical subjective knowledge of cosmic reality**. The empiric method's foundation eschews theoretical assumptions that are not prior-evidential, so that reality itself can be explored and understood as it is. For example relativity wasn't prior-evidential until Eddington's unbiased experimental verification using a solar eclipse. Religious beliefs fall into this category of not being prior-evidential, as open questions, so the conditions of religious ecstasy have to be carefully negotiated to separate belief from transformative experience and recognise that genuine quantum change signifiers are the gold standard of any mystical experience, not the conviction of belief.

Fifthly: Freeing the Core Quest

The pursuit of knowledge of the subjective realm doesn't have to solve analytical questions about phenomenology, such as the binding problem which is an easy problem of consciousness to be elucidated in the prospectively quantum dynamics of the brain. Likewise the nature of qualia, such as the difference between visual and auditory experiences and the synaesthesia between are also likely candidates for understanding through extended brain dynamics such as work on quantum neural networks (Fields et al. arXiv:2201.00921) and the different kinds of encoding required for developing a coherently co-bound internal model of physical sense modes. This is simply acknowledging that, while we do have conscious physical volition which we fully experience, we do so acting as transformative agents in possession of an exceedingly awesome experiential constructive filter called the biological brain, whose key role is to provide a physical realisation of our volitional conscious existence. It also means panpsychic theories don't need to solve the qualia problem or the combinations problem for the subjective pursuit of cosmic knowledge (see Fields 2021 [JCS](#)).

"What we have within us will save us if we bring it forth from ourselves"

Our quest and the cosmological quest is to accept the deep experiential abyss we have within us as consciously experiencing volitional agents and bring it forth from ourselves in the discovery process we engage together, because what we do will save us and humanity.

The Manifestation Test

The manifestation test is a succinct way of critiquing all pure materialistic explanations that form a physical or objectively abstract model of conscious experience. When we talk about a dream or a vision, or I affirm to you that I am a subjectively conscious agent typing this passage, this is a statement consciously manifesting my assertion, from my stream of consciousness. Unless I am a zombie, it is thus a physical record of a conscious experiential agent. The key thing about consciousness being primary is that we experience it all the time and we can, by the universality of our own conscious experience, accept that others performing volitional activities as conscious agents are also manifesting this root subjectivity, that is also key to the Vedic perspective and all spiritual notions.

When we develop a model viewing consciousness and its experiential phenomena from the outside, we are making an abstract objective description about a system. This may initially be conceived consciously as all creative notions are, but it is asserted to be an objective description we can view from without, so it stands outside in the real world, or in

an “out there” abstraction of it. The trouble is that no such model manifests subjectivity or exists subjectively in any way, so it can't be a description of primary consciousness.

Some descriptions are not like this. When the Huichol describe the nierika, they are describing a conscious portal into which we can consciously enter and from which we can return transformed so it is “in here” as a conscious journey. Most creation myths are also like this. Shakti and Shiva are not just out there – the description is also “in here” in Shiva and is showing how the "in here" became ramified into all our individual “in-heres”, so it passes the manifestation test. There could be good explanations like the holographic principle that might likewise make a kind of description of an integral transform like relationship between the universe and the cosmic mind that would realise this kind of relationship, so a description that passes the manifestation test is possible in principle.

Necessary and Sufficient Cosmological Meaning

Necessary meaning is the kind of meaning that, if we understand the universe sufficiently, as we must needs, we apply to unfold the realisation of the cosmological condition.

The core necessary meaning is to protect the survival of the conscious biota over evolutionary time scales, to unfold an emergent cosmological climax and hence also facilitate our own survival.

Sufficient meaning is the meaning we apply through conscious volition in our own realisation of our discovery process to creatively adorn reality.

The entire sufficient meaning is a free creative process, weaving the music of consilient history, celebrating our immortal genealogy and plumbing the cosmologically conscious abyss.

Appendix:

Primal Foundations of Subjectivity in Symbiotic Existential Cosmology

This section arose from an ongoing debate about Symbiotic Existential Cosmology in two expert groups. It begins with an extensive set of questions and critiques about the nature of Symbiotic Existential Cosmology in terms of primal subjectivity and its emergent consciousness, and how this is elaborated in SEC. It leads on to debates about SEC's relationship to the Eastern wisdom traditions, especially Upanishadic Vedanta, with which it has clear parallels, and with Buddhism, as cosmologies of conscious existence.

Symbiotic Existential Cosmology seeks a new, paradigm transforming, existential tradition, which differs from both the Monotheistic and Eastern traditions, in which the immortal evolution of life and its diversity is accepted as the climax condition of the living universe, which is its primary sacred manifestation, to be protected by mortal sentient beings, so that the immortal passage of the generations of conscious life can flower and humanity as a species can survive.

This is a radical departure from both Monotheistic traditions, where God is sacralised as supreme and Eastern traditions where enlightenment itself is sacralised as the central goal. SEC considers moksha to be an accessible experience, without resort to theories of reincarnation to achieve it over many lifetimes, due to the evolution of the entheogens, so it forms a new 'religious' tradition, fully consistent with both enlightenment and scientific cosmology. Rather than seeing enlightenment as pure spiritual or conscious transcendence, it is the ultimate climax form of symbiosis, in which cosmological subjective consciousness becomes fully manifest in the natural physical universe and in which safeguarding the diversity of life in the immortal passage of the generations is realised as the *prima facie* manifestation of conscious symbiosis with the biosphere, rather than an imaginary eternal elite spiritual realm.

Symbiotic Existential Cosmology invokes a hybrid concept – Darwinian panpsychism – that sets it apart from all other forms of cosmology and panpsychism and resolves the issues raised below and many others.

Darwinian panpsychism with two components:

- (1) **Primitive or primary subjectivity**, which is a germinal form of cosmo-panpsychism complementary to the physical universe at the foundation level.
- (2) **Emergent consciousness** which arises from a unique topological bifurcation precipitated by the eucaryote endo-symbiosis, in the edge-of-chaos excitable cell membrane becoming freed for sentient attention and social signalling through the core electron transport pathways driving photosynthesis and respiration becoming sequestered in the mitochondria.

This resolves a string of problems about panpsychism and physical materialism:

Firstly there is no issue about how the pieces of panpsychism fit together. What has happened is that the usual determinism of classical materialism has become replaced by a physical contextual filter defined by neurodynamics, to which primary subjectivity seamlessly adapts as its complement.

This means the problem of how panpsychism is built up out of functional parts (combinations problem) becomes meaningless because it is the complementary neurodynamic filter which determines the way things are divided up. Each physical brain creates an objectively defined encapsulation of primitive subjectivity, functioning as a boundary filter on it rather than causally determining it, leaving a "cubic centimetre of chance", as Carlos Castaneda (1968) put it, to allow conscious free will to intervene, through quantum uncertainty and its ramifications in wave function collapse. The same thing for the decombinations problem because cosmic consciousness is not subdivided to make other forms of consciousness e.g. in organisms, but arises from the coupling with the boundary constraints.

Why and how it is divided is determined by the physical filters imposed by brains, all living systems, edge-of-chaos dynamical systems like hurricanes and quantum uncertainty at the fundamental level.

The problem of emergence is solved because it is determined by a unique topological transformation unparalleled in the universe's evolution, setting up a completely new kind of dynamical system directly responsible for making neurotransmitter-based attentive quantum sentient consciousness possible.

Finally it solves the cosmic consciousness vs organismic consciousness problem in that deep meditative and entheogenic states of moksha samadhi become asymptotic to a universal form of consciousness, in which the specific constraints of individual sentient consciousness, become released and approach universal forms, abstractly reflecting the universal condition. The videos of [apparent REM in sleeping baby spiders](#), and related evidence in octopi indicate a high degree of commonality in the conscious dynamics of nervous systems as different as humans and arthropods, suggesting the foundations of consciousness are universal to all eucaryote cells linked in edge-of-chaos networks.

There are cosmological arguments that the nature of nucleotides and proteins, as core molecular systems and the ensuing complementarity of archaea and bacteria as metabolic strategies are intrinsic to the structural and continuous forms of symmetry-breaking that gave rise to the standard model of physics, making the entire process, including the eucaryote endo-symbiosis, foundationally cosmological in nature.

Ram Vimal: Why do you prescribe/use entheogenic drugs instead of normal meditation techniques for altered subjective experiences (SEs) as they are dangerous to our system?

Chris: Because they are fully developed experiences that have profound insightful effects on a person's world view and lead to definitive visionary experiences identifiable with moksha, while meditative experiences tend to create a peaceful mindful or compassionate state that is less than revelatory, which explains why moksha is so hard to achieve without entheogens. They are not at all dangerous when used responsibly.

Ram: You said: "In the panpsychic description, uncertainty is not irreducible randomness but is a measure of deep quantum entanglement, complemented by the subjective aspect." Are you referring to objective uncertainty (as in quantum fluctuations) or subjective uncertainty due to the experimenter's ignorance? Why is uncertainty a measure of deep quantum entanglement? Is there any reference?

Chris: Only to Symbiotic Existential Cosmology where this possibility is [discussed in detail](#). Quantum transactions are like a non-linear plasma-to-solid phase transition across space-time where a plasma of free offer and confirmation waves collapses to become a set of real emission-absorption interactions possibly with some residual outliers. We don't yet have a model for this, but it's neither time-forwards, like an offer wave, nor time-backwards, like a confirmation wave, but transversal to space-time (transcausal). So instead of simple decoherence, we have a contextual collapse defined by all participants in the world-view, which could be the entire biocosmos. This also links in a way to a form of super-determinism which is also context dependent measurement and doesn't deny free-will.

My position on uncertainty is that pure randomness does not exist in the physical universe, because all instances of uncertainty are either directly or indirectly quantum in nature, derived ultimately from quantum processes. Ignorant randomness is thus deferred quantum uncertainty or simply a stochastic model of a partially obscured process. So an experimenter has ignorance until they make a quantum measurement but quantum uncertainty performs the informative act. Similarly accidental circumstance is a product of underlying quantum uncertainties that we call karma. So if I walk round the corner and nearly get run over, but escape, or Nelson looks through his blind eye in the Battle of Copenhagen, world history is made from superimposed possibilities, expressed dynamically in the real time conscious decision that reduces the world of potentia to the line of real history we experience in the so-called "classical" world – a process I call "historicity".

It's just a poetic spiritual allegory of climactic "creation" from within, but here it is. The universe is a process of becoming, so just as we have a cosmic origin from symmetric simplicity and then cosmic symmetry breaking, from a unified super force, so we have a vestigial germinal form of primal conscious subjectivity associated with it. The notion of a fully developed cosmic mind at the beginning contradicts the becoming and the climax fulfilment of the natural sentient universe, becoming conscious of itself in symbiotic organismic moksha. Primal subjectivity provides the germ of Shiva in a form of conscious "spermatogenesis" for Shakti as the enveloping mother liquor, to play into in all her physical manifestations and subdivisions, as the developing zygote elaborating into the diverse forms of organic conscious experience life produces.

This way, instead of running down into the Kali Yuga or the Buddhist Samvartakalpa, or Eon of dissolution, or being static as in the Monotheist creation, which is then discarded in the End of Days, the universe explodes with evolving

living diversity in Paradise on the Cosmic Equator in Space-Time! It's more than the noosphere, it's the biocosmos revealed – **Voilà!**

Ram: How do you reconcile no-self (*anātman*) and self (*ātman*) hypotheses?

Chris: I adhere to the Upanishadic notion of self. I see the Buddhist view of no self as eliminating the jewel in the lotus in favour of an empty void, when our living journey is across the incarnate “Styx” of the mortal coil in real time, although the we also know the self is also an experiential construct, like our sensory perceptions, so it's not absolute or unchanging. SEC, as a subjective path of realisation, embraces life and symbiotic relationship with the diversity of life and sees moksha as liberation from eternal angst by accepting that biological mortality in the real world is the psychological antidote to the suffering ego, because the only acts of any accruing meaning are to give our selves back to the enrichment of life and consciousness as a whole and its ongoing unfolding, while experiencing moksha and appreciating living fulfilment along the way. Moreover SEC sees cosmic consciousness and the ultimate self associated with Brahman as a super-conscious state asymptotically convergent to the cosmological foundation of conscious processes, that arises from the biota as a climax manifestation of cosmic becoming, when freed from organismic constraints.

Ram: You said: “The action of mind on brain necessarily arises from modulating the “random” aspect of quantum uncertainty in edge of chaos brain processing. This enables volitional will to intervene in the brain without disrupting the partial causal closure in brain processing in the uncertain quantum universe. In this sense, classical causality is replaced by quantum consciousness. It provides plenty of room to affect the computationally-intractable uncertain outcomes in evolutionary survival, using both subjective anticipation inherited from single celled eucaryotes a billion years before neural systems evolved and historical experience generated by cognitive processes.”

Since your framework is ICAM (interactive complementary aspect monism), but the action of the mind on the brain (also called mental causation) can be easily instead explained through inseparability instead of problematic mind interacting with a brain, that makes a category mistake and is based on interactive dualism.

Chris: No it can't be so easily explained – inseparable dual aspect is equivalent to mind-brain identity theory because there is no interaction between *s* and *p* states at all! Without interaction you simply have physical processes, with neither subjective consciousness even of perception as an *s* state nor any hint of volition, because the *s* states are just dual ghosts in the machine, having no action of their own and the physical universe is causally closed except for uncertainty, to which you appear to accept as a random process.

Ryle's attempt to formulate duality as a category error led to reductionism and is effectively proven to be a category error itself, due to the inability of materialism to address the hard problem of consciousness extended to volition:

Gilbert Ryle's (1949) claim is that “mind” is “a philosophical illusion hailing from René Descartes, and sustained by logical errors and ‘category mistakes’ which have become habitual”. Ryle rejects Descartes' theory of the relation between mind and body, on the grounds that it approaches the investigation of mental processes as if they could be isolated from physical processes. The rationalist theory that there is a transformation into physical acts of some purely mental faculty of “Will” or “Volition” is therefore a misconception because it mistakenly assumes that a mental act could be and is distinct from a physical act, or even that a mental world could be and is distinct from the physical world. This theory of the separability of mind and body is described by Ryle as “the dogma of the ghost in the machine.”

SEC negates Ryle's trap by asserting interactive complementarity in which mental acts are not “distinct” from physical acts because complementarity doesn't allow complete distinction. In Ryle's view, the entire concept of mind is a category error, so we only have the literal “lemon on the table” and no mental impression that you call qualia. Inseparability is equivalent to indistinguishability and the mental states and acts become equivalent to physical states and acts. Wave-particle complementarity is not like this. The two aspects are necessary and not indistinguishable, but partially separable and interactive. For example $E = h\nu$ connects the particle energy to the wave frequency and $\Delta E \Delta t \geq h/2\pi$ couples the two in quantum uncertainty, effectively through wave beat counting. Quantum electrodynamics describes the electric field in terms of real and virtual particles, but does so through the wave propagator. The wave and particle views are separable, but mutually exclusive.

Ram: It seems that SEC proposes Free-Will. However, one could argue that the Will is not totally free; instead, it is semi-Free-Will as elaborated in (Vimal, 2010h). We make decisions based on many factors in our mundane lives.

Chris: I didn't "propose Free-Will". Free-will is a concept in wide cultural currency for intentional will possessed by the experienter. The term free means the capacity to have volition free of complete determinism:

Free-will is "the power of acting without the constraint of necessity or fate; the ability to act at one's own discretion (Oxford Languages).

It doesn't mean we can will anything out of the blue and is always contextual on defining boundary conditions in the physical universe. However in quantum form, will is particularly free because the probability of finding a particle is simply determined by the wave power so if we normalise space over the wave amplitude, we have a dynamical phase space in which the particle can appear anywhere with equal probability. It thus has total freedom of will within this space. Therefore calling free will semi-free is superfluous and contrary to its actual definition.

Ram: You said: "Conscious experience is our sole avenue to know and understand the physical universe: Although we have to respect the fundamental nature of physical existence, to survive in the world, the totality of our knowledge of the physical reality of the world around us is established exclusively through our subjective consciousness, as a consensual experience of conscious participants, complementing our individual dreams and visions".

The above scenario is better described through the principle of inseparability (POI) instead of the principle of complementary (POC) because in the former (POI) the s and p aspects are simultaneous and in the latter (POC) they are not. For example, particle and wave cannot be measured simultaneously so they are complementary to each other. However, subjective experience (SE) redness is experienced and its NPB is measured simultaneously so they are inseparable.

Chris: This is untrue. Conscious experiences require a sustained global brain dynamic. Both of these happen over time periods, not instantaneously. There can be no conscious volition over the universe unless s and p are interactive.

Entheogens and their Role in Social and Spiritual Transformation

Ram: You said: "This type of deep psychedelic experience has deep parallels with the mystical states of moksha, satori, epiphany, immanence and enlightenment spanning both Eastern and Western spiritual and religious traditions and planet-wide traditions of shamanism. ... In the Upanishads it is accepted as the ultimate reality in the union of Brahman with the atman, or inner self, in the manifestation of cosmic consciousness. ... This provides evidential data, in the form of veridical reports having statistical significance in the same way that objective scientific measurements do. This places psychedelics as the subjective complement of the LHC in physics. ... Symbiotic cosmology provides a completely different solution from both a purely materialistic cosmology, in which the universe is described as a causal process, in which consciousness life is passive, meaningless and irrelevant; and a theistic cosmology in which life on Earth is a disposable moral trial created by a non-evidential external third party called God for a future life of eternal bliss or hellish punishment. Both these cosmologies devalue the role of the evolving diversity of conscious life perennial in the universe, leaving us with a wasteland of apocalypse and Armageddon. Symbiotic existential cosmology invokes immortal paradise, so long as Earth shall live and beyond Earth to the stars, if we can learn to survive in evolutionary time. It is the real cosmology of the living universe while religious and materialistic cosmologies are tragic fallacies of the imagination."

All experiences at all states of consciousness including altered states (such as samādhi, mystic, and mokshic states) are simply subjective experiences (SEs), which must have their respective neural-physical basis. The SEs of external objects have physical reality, but endogenously generated SEs (with ego-dissolution) such as those related to samādhi, mystic, satori, and mokshic states may not have physical reality. Therefore, it is unclear why SEs related to such altered states can be called cosmic/universal/primary consciousness and reveal ultimate reality. Critiques could argue that they are simply phosphenes (endogenously generated SEs without any physical reality) with respective NPB and may not represent the ultimate/fundamental reality.

Chris: Psychedelic experiences are fully enveloping synesthetic and somato-sensory identity-transforming multi-dimensional visionary experiences, not just superficial visual disturbances like phosphenes. I referred specifically to psychedelics, but your reply selectively omits them "altered states (such as samādhi, mystic, satori and mokshic states)". Why are you eliminating entheogenic ones? Your argument suggests that all forms of subjective experience apart from physical perception are unreal. Cosmos and universe are two different terms. Non-perceptual conscious

experiences are veridically real to the experiencer. They are neither imaginary nor hallucinations. As conscious experiencers, we can compare our experiences and affirm their veridical status. The reality of such states are a foundation of Eastern philosophy and the Upanishads. Psychedelic states in particular involve both experiential overload and ego-dissolution. In states of meditative withdrawal, this allows the brain dynamic to asymptotically approach a state where it is experiencing inner subjective reality freed from perceptual boundary conditions. This creates a unique context, where the most complex intelligent conscious system in the universe is experiencing its own evoked inner identity and the ground of conscious being. Cosmic means "of the cosmos" not "of the universe". We simply have little or no idea at this point of the reality status of the subjective cosmos, although the Eastern tradition has been endeavouring to explore it for centuries through rare instances of samadhi. Psychedelics provide another more direct avenue linked to the billion year evolutionary foundation of the sappy neurochemical brain. We certainly don't have any valid basis to assume any non-perceptual experience is unreal, or unlinked to the history and future of the universe, including dreaming states, so we urgently need to explore these empirically.

Ram: Critiques could argue that the subjective experience (SE) of unity between the subjective self and the objective world could be hallucination due to entheogens, which may cause a fatal accident during driving if the red stop light is unified with the driver. How do you rule out hallucination because of the ingestion of mushroom?

Chris: You have to determine if you think visions are hallucinatory yourself in the first person. Some things are illusory and some veridical. Only the experiencer can fully decide. Some things may seem to be irrational notions that one was fantasising and then they come true. Others, like the notion of spirit beings, I perceive as veridical on entheogens, but they might be just insubstantial visions, so need to have a contingent status.

Serotonergic entheogens don't induce hallucinations as such. They can induce powerful visions, particularly DMT, but one can always distinguish the real world from the dream time, unless one is lost in contemplation. You shouldn't drive on mind altering substances, but you simply can't drive a car in an egoless state. You have to distinguish the real from the visionary. On entheogens, you have to go into a state of meditative withdrawal to dissolve the ego by removing sensory distractions e.g. lying in a darkened room, reducing the distinction between self and world and practicing self-annihilation. It takes the same time and effort as yogic meditation. I said very clearly that moksha is an organismic state asymptotic to moksha, just as Aurobindo describes the super-mind as a transitional state.

Visionary experiences are like waking dreams, described as veridical because the experiencer perceives them to be real rather than imaginary, although they can distinguish them from real world perception. They can be very ornate and can be looked at in great detail as if one is perceiving a real phenomenon "out there". They are like phosphenes but they are visual, auditory, olfactory and emotional and interior to our identity. So they can become all-encompassing and distract us into day-dream like ongoing visions that prevent samadhi, so they are a handful to negotiate. Dreams and psychedelic visions are definitely "in here" because they are private subjective experiences that cannot be identified with a physical entity, but they are perceived to be in subjective reality "out there", say for example, around 10 - 30 feet away, as a shimmering, moving kaleidoscopic 3-D pattern one can look at intently.

Ram: It is unclear if the unity SE due to ingestion of entheogens is really the moksha state because, at this state, karmas are supposed to be nullified.

Chris: It is even more unclear that yogic meditation leads to true moksha due to a lack of evidence. Entheogens are also supported by quantum change studies reporting "genuine spiritual experiences" during ego loss. The only thing I can say about this is that moksha for me is a really straightforward state of disembodied consciousness that is just like the proverbial NDE of meeting the cosmic self who communicates by telepathy, and imparts to you the covenant to return to your incarnation and fulfil your karma, in my case to save conscious life throughout the universe before I go. I am thus freed from the round of birth and death because I have seen incarnation from outside and know in my bones Brahman's advice to do this is the right course. I can take another trip but I don't need to and to ask again and again for confirmation will be a corruption of the covenant. That said I have had two trips since and will probably have more just for the insights. That's why I am so certain that this is real because it frees one from mortal angst that drives the whole notion of reincarnation.

Ram: I know the use of MDMA (ecstasy) and cocaine may cause harm.

Chris: MDMA can cause harm by burning out one's serotonin transporters and possibly dendrites, although the evidence is clouded by bad science. Chewing coca is not harmful, but chemically concentrated impure illegal drugs produced by criminals are. Psilocybin and mescaline and DMT are no more harmful than food, but you can't keep taking them or they don't work until you take a week off. They are controlled substances to avoid the disintegration of consumer capitalism in favour of nature mysticism, essentially because Western society has no established traditional approaches to use them responsibly. Brazil has some big ayahuasca church congregations with tens to hundreds of thousands of members.

Ram: Ingesting entheogens may have toxic effects on the brain.

Chris: That's contradicting the scientific evidence. Serotonergic psychedelics such as DMT promote neural plasticity and neurogenesis. Maria Sabina took mushrooms from the age of 5 all her life and lived to 91. Tellus Goodmorning, my peyote roadman, was still sitting through an all night peyote session at 93.

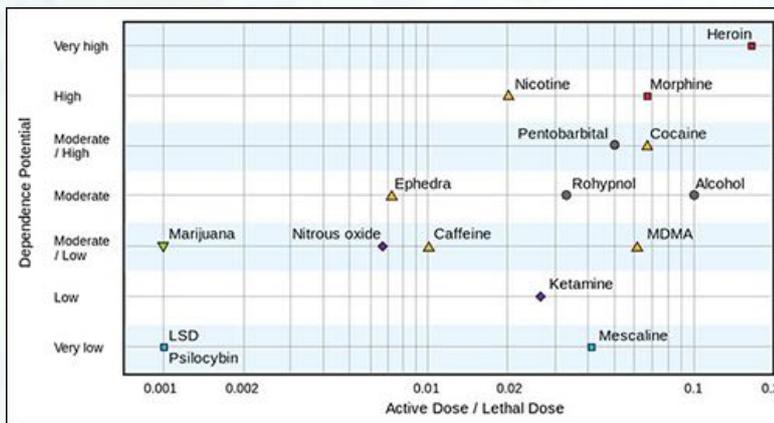


Fig 276: Psilocybin and LSD are the least toxic psychoactive substances known, with a lethal dose 1000 times higher than the active dose.

It is said that Maharaji – Neem Karoli Baba, took LSD. Baba Ram Dass (Richard Alpert) gave LSD to him and it seemed to have no effect. This might make it seem he was so enlightened that psychedelics had no effect on him. However any person used to deep meditation can sit through a psychedelic experience in a meditative state because it is the most natural state to adopt. The Shiva sadhus also do this with cannabis, and

Patanjali acknowledged herbs were a Vedic route to siddhis.

However it takes a good number of psychedelic experiences to begin to understand their potential. Most young people don't have a real clue and just enjoy the transformative distortions, which is fine too but the best way is in a secure protected setting where other people can ensure one is in a peaceful loving state of mind and avoid any anxieties about loss of egotistical identity as well as misadventures in the world at large. My second LSD trip I took 1000 mics and was convinced I wasn't just ego-dead but physically dead as if I was meeting everyone in the after life.

For me mushrooms are different from LSD because they are a living species that is pure and a natural product of evolution here for a healing purpose, whether we like it or not, for our sappy biochemical brains to unfold, to ensure the biosphere can survive. Although they are a much more direct trip to moksha than meditation alone, it has still taken a life of entheogenic use for me to come through with Symbiotic Existential Cosmology. They have been up until recently outlawed because the very effects we are discussing led the powers of consumer capitalism to perceive them as an existential threat to Western culture in the same way the gnostics and witches were to Catholicism. This in itself is profound evidence of their transformative potential on exploitative human culture and why I think they have a key role in healing the biosphere.

Ram: Do all of you agree that the entheogenic route is faster and more immediate because you just need to eat/drink psychedelic drugs and immediately in a few minutes we are in 7th heaven?

Chris: Not so easy. It can still take years, but not multiple lifetimes. Remember that they amplify both illusion and illumination, so take care! Psychedelics ARE faster and have a much more experienceable transfiguration, but it still took me to the age of 78 combined with deep meditation similar to TM to get an experience iconic enough to produce Symbiotic Existential Cosmology.

This work is frankly so oddball and yet so tenaciously robust scientifically that it is a proof of principle of something powerfully karmic. I was prevented by acute closed angle glaucoma from taking any trips for seven years previously,

until I had total lens replacements, which caused a very pure whiplash on a very mild dose, so you need to see it as a confirmation of what I just called fateful karma in my previous email today, which I will attach again below.

Ram: If this is true, then why waste time meditating all life, and even if one decides to invest in lifelong full-time meditation, there is no guarantee that we attain revelation/samadhi/mystic state?

Chris: I am trying to convey the positive potential of entheogens to deal with Fermi catastrophe and I'm caught in other karmic tender traps. The whole Western tradition of Christianity is sacramental, so this is the Biospheric Eucharist of life rather than the soma and sangre of Yeshua's death. It was discovered in deep meditation in a meeting ostensibly with Brahman as ultimate reality, so it validates Upanishadic Vedanta and the yogic tradition. It was discovered using a sacrament 3000 years old coming from Precolumbian America, affirming the shamanic sap and dew. Now doesn't that strike you as a karmic hat trick for the three great spiritual traditions? I may be here to challenge the "law" of religious doctrine – I am NOT here to destroy the prophets, but to fulfil the future of life immortal.

Ram: Do you mean that one has to take psychedelics daily for decades and also do meditation?

Chris: No I don't. I'm just reacting to your cliché about one dose enlightenment. LSD was for me a major pivotal formative discovery process about the nature of consciousness. I am talking about actual scientific evidence of transformative effect. My LSD experiences, from the very first dose, were a real epiphany that caused me to stop being a hack mathematician and write "Unified Field Theories and the Origin of Life" in 1978, which is a clear forerunner to Symbiotic Existential Cosmology. I said I took LSD over 200 times without reaching full moksha. That was over ten years, about once a fortnight, not daily for decades as you said! I have lived with entheogens all my life. I would say about one mushroom trip in two I can get to the promised land using deep meditation as well, where I experience non-ordinary forms of "supermind" reality and as I said they have become my spiritual ally just as Maria Sabina said: *"the mushroom was in my family as a parent, protector, a friend"*. What I did say is that it took 30 years more to produce Symbiotic Existential Cosmology on a moksha epiphany – actually 40 years! And yes, I see dedicated meditation as an essential adjunct to psychedelic induced ego-loss, if you want to achieve transformation.

Ram: If criminals ingest entheogens and have unity SE then it is unclear how their bad karmas will be nullified.

Chris: Moral bad karma doesn't exist. It's a false religious belief in cosmological morality that leads ultimately to the degeneration of the universe in the Kali Yuga. Moral karma makes no sense when the innocent have sometimes horrific outcomes and the exploitative enjoy a good life (not just criminals but disproportionately, billionaires and manipulative world leaders). The results of experiments show psychedelic quantum change shows improvements in a person's whole approach to life, which is "proof" they do reduce negative mentality, because the insights are transformative, even to people with terminal illness.

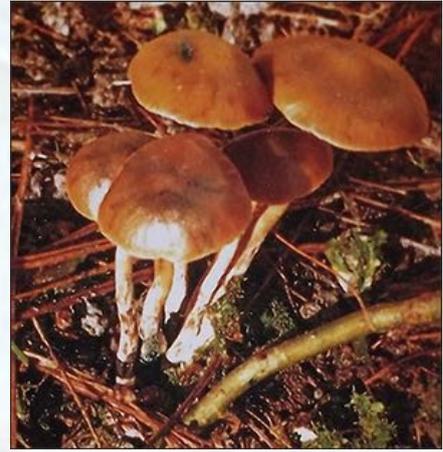
Ram: At the moksha state, individual consciousness Purusha (jivatman or soul), fully separates from Prakriti (substance, universe) and becomes "pure" atman, which merges with Brahman/Purusha.

Chris: Yes that's effectively what happened to me on mushroom meditation, but you are describing it too formally.

Ram: It implies that there should not be any neural-physical basis (NPB), which is part of Prakriti, at the moksha state: this is a testable hypothesis if you have attained this state by simply measuring NPB using fMRI/EEG before and after taking your entheogen such as the psychedelic drug mushroom: NPB_{after} should be equal to NPB_{before} if you have attained moksha state.

Chris: This based on false assumptions. You are assuming spiritual purity as a necessary fact, and separating consciousness entirely from the brain and body without evidence this is the way it happens. I don't agree with the premise. You are trying to use entheogens to test a false assumption about the relation between samadhi and physical states. The correct process is to make the journey in person and see what you come up with after a good lot of experience. Symbiotic Existential Cosmology asserts all such moksha states are organismic consciousness asymptotically approaching a non-encapsulated brain state that complements a cosmic mind experience. They won't be NPB-null like you are suggesting.

Fig 277: *Psilocybe aucklandiae* was officially described in 1991 by Gastón Guzmán, Chris King and Víctor Bandala in 'A new species of *Psilocybe* of section *Zapotecorum* from New Zealand.' The name is feminine; the original orthography is *aucklandii* which has a masculine suffix (my picture, now in Stamets (1996 p90).



Ram: Okay. It seems it is illegal in New Zealand (is this your country?), then how did you take it?

Chris: Exotic mycoculture, but I discovered *Psilocybe aucklandii* as a mycologist.

Cathy Reason: For health reasons, I am unable to use entheogenic substances, so I am wondering if it is possible for someone to say something about the phenomenon of "ego loss". Is it the experience of dissolving into one's perceptions of nature? I have certainly experienced that, in the presence of the natural environment. But there has never been anything particularly scary about it. Or does it involve some intrinsic loss of individuality or agency? Both of which I would find rather horrifying.

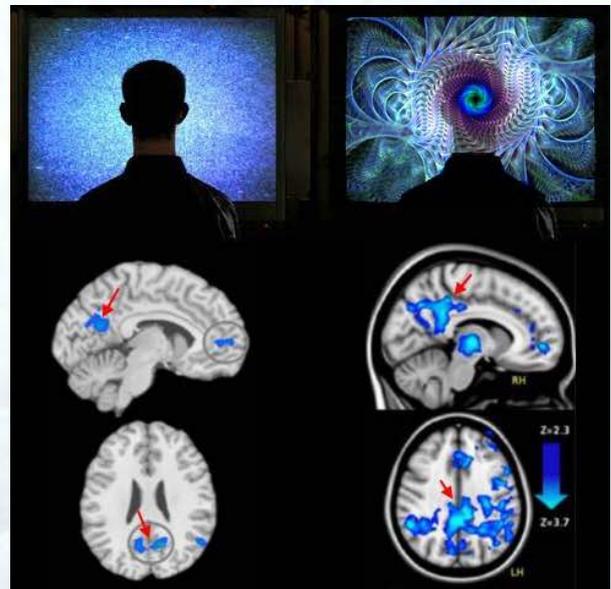
Chris: The cortex is organised to be a complete envelope of experiential aspects, so our everyday experience is that of being a conscious volitional agent trapped in a set of perceptual sensory experiences we come to recognise as the form of a physical universe and other sensations to do with the body and our emotions. This form of consciousness is implicitly streamlined into a "self and other" modality to survive biologically.

It involves emotions that are sometimes quiescent while we are cogitating but at other times soar into states between exhilaration and despair, fear, anger, hope, contempt repugnance and disgust, love and hate. There is a major resonating network called the default mode that occupies our mind with the odd thoughts of a person when we are in between focused tasks that causes us to worry about future events and rehearse impending crises like applying for a job, or going to the doctor. This circuit is also linked to limbic system emotions, so under threat or under desire it displays features we associate with egotism i.e. urgent need for organismic survival, power, control and fame.

Forms of meditation including mindfulness, annihilation (letting-go of self) and inner silence inhibit the internal dialogue and reduce the ego perspective. Psychedelics do this more powerfully, in a multi-sensory sensory flood of all aspects of existence accompanied by a reduction or loss in the division between self and other, particularly in sensory withdrawal, leading to mystical type experiences of natural oneness awe, or atonement and sometimes a kind of doom if one gets paranoid, or overdoes it. This experience tends to be formative because it provides a complete vision of escape from the binds of ego and a new understanding of life and natural and spiritual existence not trammelled by the underlying mortal coil. If you overdo the dose you can end up feeling you have literally died, which is a bit disconcerting, but it does give respite and succour to people who really are in a terminal condition, so it's only scary to the insecure ego. That's why it is important to have a caring support environment or to go into the wilderness or another safe quiet place.

Fig 278: Pure meditation, such as transcendental meditation on its own, is like watching a blank TV screen and falling into the lowest energy state of samadhi as "divine bliss". Psychedelic meditation complements this with "ultimate reality" leading to moksha. Blue shows reduction in default mode system accompanying ego loss, which in psychedelics, is also associated with a sensory flood, due to increased interconnectivity between regions.

Ram: It is unclear why CK's drug-meditation-based conclusions are just the opposite of yoga-meditation-based (even shamanism-based ones who ingest such drugs but still believe in the spirit world) conclusions. Is it simply CK's view, i.e., he might have the same conclusions even if he has not



ingested such drugs? I am wondering what Maria Sabina's (who ate mushrooms like food) view is.

Chris: The lesson of nature is that everything is confoundingly different from our naive, e.g. religious, assumptions and preconceived notions. The lesson of psychedelics is that everything conscious is profoundly different too. I want to learn with no heavy colours on my brushes from traditional spirituality to paint transparently so that people can see right through me. Language is a mysterious teacher. There is a verb to lie but there is no English word for a truth speaker. So I am forced to say what I am doing is "truth speak".

I accept conscious spirit phenomena. I've said I see all life in an integrated state of eternal telepathic communication when on mushrooms, but that's just a one-person veridical report, not spiritual "evidence" unless its affirmed by others. I communicate with the winds and chaos reigns, whirling my very identity into the atmosphere. We all need to let go of our rational mind in this way to fully communicate with nature.

I accept the Spirit world of the Huichols and the nierika portal as a cosmic observation. Neither do I differ from Maria Sabina, who both sang to Chicon Nindo the Mazatec lord of the mountains and all the spirits of the Catholic saints and said she was both Yeshua and Maria. Here is one account below. The point is that this is metaphorical spirituality of the vision quest not a literal piece of doctrinal religion about astral planes or the 28 requirements for enlightenment or the seven levels of heaven:

'The father of my-grandfather Pedro Feliciano, my grandfather Juan Feliciano, my father Santo Feliciano - were all shamans - they ate the teonanacatl, and had great visions of the world where everything is known... the mushroom was in my family as a parent, protector, a friend'.

Maria Sabina took sacred mushrooms in abundance as a child. A few days after watching a wise man cure her uncle:

'Maria Anna and I were taking care of our chickens in the woods so that they wouldn't become the victims of hawks or foxes. We were seated under a tree when suddenly I saw near me within reach of my hand several mushrooms. If I eat you, you and you" I said "I know that you will make me sing beautifully". I remembered my grandparents spoke of these mushrooms with great respect. After eating the mushrooms we felt dizzy as if we were drunk and I began to cry, but this dissiness passed and we became content. Later we felt good. It was a new hope in our life. In the days that followed, when we felt hungry we ate the mushrooms. And not only did we feel our stomachs full, but content in spirit as well. I felt that they spoke to me. After eating them I heard voices. Voices that came from another world. It was like the voice of a father who gives advice. Tears rolled down our cheeks abundantly as if we were crying for the poverty in which we lived.' She had a vision of her dead father coming to her. 'I felt as if everything that surrounded me was god. Maria Anna and I continued to eat the mushrooms. We ate lots many times, I don't remember how many. Sometimes grandfather and at other times my mother came to the woods and would gather us up from the ground on which we were sprawled or kneeling. "What have you done?" they asked. They picked us up bodily and carried us home. In their arms we continued laughing singing or crying. They never scolded us nor hit us for eating mushrooms. Because they knew it isn't good to scold a person who has eaten the little things, because it causes contrary emotions and it is possible that one might feel one was going crazy' (Estrada 39).

After the death of her first husband Maria Sabina performed a velada for Maria Anna, who was sick with an internal bleeding. After expressing the blood she had a vision of six or eight people who inspired her with respect - 'the Principal Ones of whom my ancestors spoke'. One of the Principal ones spoke to her and showed her the book of wisdom. She realised that she was reading her book. Afterwards she had the contents always in her memory, and became herself one of the Principal Ones who became her dear friends. After this vision, she had another vision of Chicon Nindo the lord of the mountains, a being surrounded by a halo, whose face was like a shadow. She realised that she had become his neighbour. She entered the house and had another vision of a vegetal [spirit] being covered with leaves and stalks that fell from the sky with a great roar like a lightning bolt. "I realized that I was crying and that my tears were crystals that tinkled when they fell on the ground. I went on crying but I whistled and clapped, sounded and danced. I danced because I knew I was the great Clown woman and the Lord clown woman" (Estrada 49).

What I think is wrong is spiritual materialism – invoking a parallel world in which astral events or spirit events occur. Or treating the spirit world in a similar way to the way we treat the physical world where souls replace organic personas. When I go down into the abyss it's with no assumptions. I try very hard to avoid "spirit talk" because it's full of quasi-religious connotations and leads to ideas like the gnostic pleroma. We need to have our head in the clouds and feet on the ground like the axis mundi and the world tree.

Ram Dass and George Harrison were at the naive phase of psychedelics when no one could comprehend what their role might be and any Vedic solution solved their hunger in instantaneous exotic faith. Essentially they didn't know how to hold their potions. Ram Dass went to Neem Karoli Baba and did what any naive Western person is liable to do. When I asked the Chai Baba on the ghats in Varanasi, he had a much more equivocal opinion of Neem Karoli Baba.

Since our experiential cosmos is divided into perceptions, dreams and visions we need to explore these really fully in the age of natural science, and in particular entheogenic visions because these are the richest waking non-ordinary experiences we have access to.

The richness I attribute to psychedelics is their overflowing experiential fullness, not compared with human cultural experiences but as agents, allies and advisors. The key is non-ordinary experiences in the sense of lying outside the physical/perceptual world view. We have a very good conceptual understanding of the perceptual/physical through science. But we have almost no idea of non-ordinary experiential reality, in which I will include samadhi/satori, dreaming reality, and entheogenic states induced by psychoactive species. Samadhi/satori utilise a high degree of mental control to achieve ego loss accompanied by claims of siddhis. Dreaming reality is only partly autonomous and requires difficult exercises to achieve and maintain dreaming lucidity. By contrast, psychedelics are experientially overflowing with richness to the point of sensory overload.

The entire vista of our psychic existence hinges on the inner nature of non-ordinary subjective experience. This is the lightning rod through which all the mysteries of existence flow, all the heavens, all the hells, all the emptiness and cosmic consciousness, all our hopes and fears of the after life and all our transfigurations and revelations. But we are all standing like little children at the portal, too scared to find out what's there in the experiential abyss. Everything we know about nature and the universe has been absolutely confounding to our naive religious notions. The subjective abyss is completely uncharted, apart from scattered claims of some mystics, prophets and a few yogis in the Himalayas making unverifiable claims about astral spaces. Psychedelics are not psychic tourism. They are cosmological science putting the full Cosmos into the physical universe. We have no idea if the well is deep or just a bunch of hallucinations. If it is deep it could be very deep indeed and it could be more wildly different from our expectations than our most fanciful or trusted spiritual notions. The key to life, the universe and everything is contained therein.

Chris: Here is an account of Karen Armstrong (2022) in "Sacred Nature"

The rishis attributed their poetic power to the hallucinogenic plant soma, which enabled them to look beneath the surface of things and discover a deva in every single one, so nature was alive, imbued with the divine. They called the faculty they had cultivated dhi ("insight"); it gave them a knowledge (veda) that bore no relation to mundane awareness. All these divine forces, the rishis concluded, were grounded in a mysterious omnipresent power, which they called Rta, one of the most important concepts in the Vedas, the ancient texts of Hinduism. Rta is best understood as "active, creative truth" or "the way things truly are."

By about the sixth century BCE, however, the Aryans were redefining the ultimate reality; and they called it the Brahman. While Rta had been the eternal principle of being that informed and permeated the universe, the Brahman was the foundation of all reality, the "beingness" on which all things depended.

John: Soma was likely a mild drug compared to the refined psychedelics of today and used to aid the process, or in many cases not needed at all as with many modern mystics. So I would say useful for some but not necessary for any. It is important to know that the power of divine insight is within us, not derived from anything external.

Chris: The biosphere is not "external" to us if we want to survive as a species. I am certain the natural sacraments are biospheric foresight. The central neurotransmitters like glutamate and GABA are cosmically abundant amino acids and serotonin has a close to primal origin. The brain, for all its complexity, has used primal amine neurotransmitters because of their archetypal properties. Given the climax diversity of the biosphere, it is almost inevitable that modified forms of serotonin such as dimethyltryptamine and psilocin will arise. The natural psychedelics are thus cosmological molecules that are also fundamental to the conscious future of *Homo sapiens* in the biosphere. It's that literal – the scientific, cosmological and religious truth. So to say *Homo sapiens* should treat the biospheric sacraments as "external" and therefore "not necessary" is a betrayal of both the Cosmos itself and of nature, in favour of anthropocentric control of our conscious dialogue with nature and reality. I could fairly comment this is a cardinal sin against the immortal survival of life, given the apocalyptic world context and I think I would be right.

John: The Rishis certainly used something unknown called Soma and greatly revered it as a healing as well as mind enhancing potion made from some leaves. However I think it would be a serious error to think that their insight was attributed to soma as opposed to that being a minor aid. Much greater attribution is given to yoga and I'm quite sure that is the correct order of things. The power of insight is something we have already and accessible by Will or intention alone.

Chris: Aldous Huxley, p 659 cites the opinion that the yogic tradition (possibly derived from the Shiva-Kali planter cultures of Mohendro Jaro) was a compensation for the loss of access to soma as the Aryan invaders descended into India where it couldn't be found. Isn't it a more serious error whether knowingly, or unwittingly, to contradict both the evidence of history and the example of Indra, king of the devas and heaven in this matter?

Drinking soma produces immortality (Amrita, Rigveda 8.48.3). Indra and Agni are portrayed as consuming soma in copious quantities. In the Vedic ideology, Indra drank large amounts of soma while fighting the serpent demon Vritra.

"Minor aid" is clearly not what Indra thought and he is the ultimate authority on this question. It's not good karma to try to bend history to our own anxieties. The mushroom is NOT a minor aid. It is a paradigm shifting essential medicine evolved by the biosphere for the beneficence of the Human species.

John: Rta is never defined in the Vedas. It has been called "Cosmic order". It is a pointer to the ultimate unknowable but with the knowledge that is is the source of order which allows all views of it. Brahman is described this way also and I would consider it indescribable also but more penultimate than Rta, which is ultimate.

Chris: I think this is an inspired view because you are naming the mythopoetic source of the mystical entity as supreme over ultimate reality! But I'm really worried about identifying either of them as agents of order. Karen said: 'Rta is best understood as "active, creative truth" or "the way things truly are".' Where is the edge of chaos in your description? I know its all patriarchal religion – But Indra is associated with the sky, lightning, weather, thunder, storms, rains, river flows, and war. It looks to me that the odd tornado and hurricane is passing right through the Rig Veda! So it's also the rule of chaos isn't it?

John Jay Kineman: I don't question the value of the psychedelic experience as you describe it, but with my experiences in India over the past 20 years I do question the statement that there is nothing else as profound. Remember Neem Karole Baba downed a half bottle of Ram Dass' LSD and was unaffected. He said he's there all the time and in total control. I've seen enough amazing things and people here to believe Ram Dass' account and NK Baba's claim.

Chris: I think it was a neurotic mistake of Ram Das to be so naive with Karioli, who had only 1000 mics and knows how to sit still, and it was part of the cliché of writing "Be Here Now". I've told you the Chai Baba of Kedar Ghat had a low opinion of Karioli, so don't put him on a pedestal. Total control is not samadhi. It's is the opposite of moksha and it's not enlightenment. Psychedelics, particularly the three natural biospheric sacraments peyote, ayahuasca and sacred mushrooms are one of the oldest spiritual-shamanic traditions in existence. Patanjali acknowledged the herbs and soma is the founding of the Indo-aryan tradition of the Vedas. Mushroom spores and species are endemic planet-wide. They are here for a reason. They are not a distraction and they are not illusion. They have been turned from recreational ventures into class 1 toxins then somersaulted into cures for people with psychiatric problems – clinical depression, PTSD and terminal anxiety in cancer, but they are here to enlighten us. Samadhi is a natural complement, not an alternative. The Vedas are insufficient on their own. Sorry but that's the breaks.

John: It's certainly possible in that case, but there are many cases and I don't dismiss them so easily. By total control, I meant over staying in that state, which of course is a state of lack of control over reality. But what experienced meditators and mystics can do is hold onto a kind of suspended worldly reality. I have achieved this but only in brief periods. A sound, a thought, a belly ache will easily pull me out of it. Mostly it is a thought that pulls me out. And you are quite correct about control, it is not really control - that was my word not anything I think Ram Dass or his guru said. In fact when I enter into this transcendental state it is nice and attractive and I start congratulating myself but also wanting to stay there, wanting to control that, which is exactly what takes me back to the world. But there is something else, as you say, the giving up of control that preserves the experience. Sadguru claims that when he was younger he once tripped out this way for 13 days. When he came out of it villagers had decorated him with garlands and flowers. He thought he was out for perhaps hours. It's somewhat believable in his case, because he also describes his experiences in school and as a young boy where he would get absolutely fascinated by a single object, having the sense of wonder and thinking that he really doesn't know what that thing is and is fascinated by it, unable to take his attention off it. He tells a joke about being in class and the teacher sees him spacing out and says "pay attention". So he did, but not to what she was saying, to her as a being, a phenomenon. He says he gave her attention like she has never had before. But I think he still flunked the class.

Chris: I'm not discounting the experiences of the Upanishadic Rishis and the powers of the siddhis. In fact I am a rishi embracing them fully. But I don't think we should measure things by how far "out of it" yogi's get. It's the novel insights they do or don't express to us that are revealing. I'm saying psychedelic moksha is the natural complement of the path of samadhi. This is an urgent mission for me to save life not to popularise psychedelics.

You have a notion of spiritual purity that sees the individual under their own pure consciousness that is just a pure expression of their spiritual strength and focus to achieve a realisation of what you think is cosmic consciousness. It is also spiritual elitism in pure human consciousness transcendent over nature, in an ideal accompanied by renunciation of worldly distractions, thus rejecting life itself. It also preaches a form of elitism that only the severely devoted rishis who are also singular mystics, as exceptional gifted individuals we can't question or emulate, have even a clue or otherwise everything we experience is just illusion. In my experience this as an anthropomorphic cul-de-sac. Both pure spirituality and controlled samadhi lie under this shadow. This produces habits of spiritual renunciation that are disconnected from life in the pursuit of illumination.

There is another much more completely natural and organic way of achieving a deeper more biospheric rather than human alone form of cosmic consciousness that looks and feels entirely different. The highest states of enlightenment are not found through the spiritual supremacy of one conscious species that is already trashing the planet this way, but through the symbiotic biospheric consciousness of enlightened life as a whole. This looks like a complex system perturbation of egotistical organismic consciousness because it IS, taking us out of our illusory selves. Out of our finite limitations. The psychic species play a key part of this psycho-symbiotic role. This is the true Mahayana of life, not in a restrictive purist one way Jesus dogma, but in the Tao of the living totality that sustains life in the passage of the generations. That's the true dharma! The rest is bs.

John: I don't know what is moksha. When I get there, and if I want to come back, I'll say something.

Chris: We both know moksha is escape from the round of birth and death. You know Vedanta and you know what it means. The entire edifice, from the Jains through the rishis to the Buddhists have embraced a notion of reincarnation and enlightenment being the great escape. This is really the escape from the mortal coil, so it is often likened to maha-samadhi, or death. But what it is, is a near death meeting of atman and Brahman in which we can see simultaneously as one is to one both from our incarnate mortality, and in symbiosis with the spiritual eternity of ultimate reality in cosmic consciousness. That's the exact key to the existential dilemma. Then we can get on and live our precious lives caring for life itself in all its overflowing glory. And we can do this again any time if we keep good faith with not abusing the experience.

Psychedelics are many things but the key thing is their ability to precipitate a near death experience in the midst of life when combined with samadhi. This doesn't have to be sustained, or to take all day, or four hours a day. As long as you practice mindfulness and then complete abandonment in sensory withdrawal when the effects ensue, you can enter the nierika of ultimate reality. If you don't do samadhi meditation you will just have a mushroom or ayahuasca trip which is good too although it can be dysphoric.

John: I don't know how to ask a mushroom its reasons for being here, or if it would know. Our reasons may not be important in the larger scheme of things. We find them very helpful on many levels. That's all I know.

Chris: I'm not suggesting to ask them, although some people do. To me it's evolutionary karma. From the earliest eucaryote we have been evolving as sappy conscious organisms. So the mammalian brain inherits an ancient psycho-chemical propensity for enlightenment when ego-consciousness becomes cosmic consciousness. You can see it in the neurotransmitters of the ascending reticular activating system which contains an absolute pharmacologists kit bag with all of dopamine, nor-adrenaline, serotonin, histamine, acetyl-choline, orexin and glutamate, becoming the symphony on which subjective consciousness is played out in the phases of wakefulness and light and dreaming sleep ecstasy and despair. Evolution has found ways of producing psychedelics which have become selected for by conscious animals e.g. in mushrooms, spreading their spores and in the case of humanity this can radically alter humanity's relationship with nature and biodiversity and save the planet from a mass extinction of life, not because it is a cliché of salvation, but because it is the crowning glory of biospheric enlightenment.

John: I am not opposed to medicinals for facilitating an out of the world experience, and certainly native people have been doing this for a long time. Did they achieve enlightenment from it? What degree? I don't know how to compare

that to someone like Ramana Maharshi, who's mountain, cave, and ashram I visited. The stories can't all be dismissed as cultural creations uninformed by medicinals.

Chris: Well I'm trying to explain the difference. You see a medicinal as a prop like a prescription medicine that clouds or diminishes enlightenment. I am suggesting it is the full dimensions of cosmic consciousness because it arises from a complex system ecologically.

John: But why the need to elevate the medicinal plant above self-induced mental practice? That makes no sense to me since there is obviously so much that can be experienced both ways.

Chris: The need to elevate is to ensure the survival of the diversity of life as well as the ability to illuminate. Psychedelics are very complex agents and challenging, and even a mild dose can make me nervous, but the results are really positive across a wide spectrum of studies. They are unique to the individual but they are gaining a track record which looks like the resolution of the existential crisis. Religions preach eternal life as an illusory remedy to mortality. Vedanta does the same with unattainable cosmic consciousness and reincarnation that never gets there. Why would you want to have faith in that? I owe faith only to life, the universe and everything, not spiritual beliefs. A visionary doesn't need to gamble their garments with their adversaries.

John: Since you have been telling us of the virtues of psychedelics I have been intrigued and, as we know, skeptical of that as a primary avenue. My comments along the way have been to the effect that this is an artificial means to achieve what spiritual practice seeks to do "naturally". You have pointed out that psychedelics come from nature and are used by native peoples, so in a sense "natural". I am personally intrigued and expect that at some point, under the right circumstances, I will try it. I have close friends who do and for the most part they come out no stranger than when they went in, but probably more equanimous about life. Of course I observe the same with graduates of A Course in Miracles, and other schools. I don't know how long after the first 'trip' one starts to gain a calm understanding of it - perhaps you can say.

Chris: Psychedelics are challenging experientially so it can take persistence, like any other shamanic or meditative practice, but it doesn't take lifetimes as pure meditation does unless you are a natural mystic on the edge of sanity. Generally in a good guided session, a person realises the very first time that they have entered non-ordinary reality that turns their preconceived notions of reality inside out. But then as Cathy asks what do we do with Heaven and Hell spectres that can and do occur and the ability of very egotistical people to see themselves as messiahs. The answer is the one Roland Griffiths gave in the previous e-mail I sent. Basically a good supportive session can lead to a so-called quantum change experience which changes the person's world view sufficiently to enable them to see things anew, or as they actually are, particularly about the mortal condition.

Being an exceptional mystic is also an unreliable asset as Huxley noted with William Blake, who lost his visionary psyche in mid-life only to regain it in old age. My first acid trip of 500 mics was wonderful, so I went back to London in 1968 and took 1000 mics – Karoli's alleged dose. I was completely convinced I had died. I could walk around normally although everything was suffused with shimmering light but it took ages to come down and left me with phosphenes. At the same time a false news announcement from the FDA said LSD split your chromosomes so I panicked and didn't take any more for five years. Then my best friend, who also had an affair with my wife causing great anxiety, offered me another and I was so nervous I banged my head into the living room window and smashed it, so I decided to take the plunge. This began a trail of hundreds of LSD trips which were wonderful but I couldn't get right through to nirvana because I was staying too alert and looking at the trip in too much of a direct sensory physical way so it would start to go into the portal and I would notice and flick out like when you are trying too hard to get to sleep and can't. It was still overwhelmingly fascinating and made all other notions like religion stereotyped cul-de-sacs.

Then I took a lovely little mushroom trip in Taos NM while baby sitting for a family prominent in the peyote church meeting there and later did a peyote meeting myself there. From there I made it to the El Catorce Real high peyote fields of Mexico and took peyote on Wirikuta, mushrooms at Palenque, and ayahuasca on Yarinacocha lagoon Pucallpa Peru. This began a life where I was in symbiotic relationship with all three sacraments. The trick is not to stare into the patterns too intently but to alternate between one-pointed mindfulness and closed-eyed annihilation of one's self, just letting go as close to mara-samadhi as possible. My mushroom trips always revive the spiritual dimension, but only sometimes do I descend into full union and know I've been there. So it can both be an immediate clear light insight with the first experience that is world-view changing and also a lifetime process. I sometimes held small veladas on our

land with a group of close friends but it's not something you can advertise and stay out of trouble. It's only with the new scientific therapeutic revolution that I have "come out". That's why we are all trying to catch up now because of prejudicial social repression.

John: One thing is to see new realities, but another is to clearly examine and understand the limitations placed on ourselves by old ones, including our own histories and beliefs. It is one thing to experience strange new worlds (not a plug for Star Trek), but another to be physically a part of them, not just mentally. While you are having this experience home alone, another may be having to adjust to life-changing surroundings and interactions with complete cultural and physical immersion. Maybe you can comment on how well psychedelics contribute to actual agility.

Chris: It's all about existential agility and I'm trying to take the entire living universe with me, not just consciousness, so it's doing exactly what you describe. My life is like sailing down Hardanger Fjord and there are times I really need to tack or even jibe in buffeting breezes, or near the rocks, so I generally wait months or years until the auspicious or anti-auspicious crisis and then force myself to stop being nervous, which happens because its been ages. When I do after the effects ensure this nervousness turns into knowing as also we are known and I am back to my full shamanic being. The one thing to avoid is waiting until we are on our death bed to take the plunge. When I discovered SEC, it was after a seven year break because of acute closed angle glaucoma and it was a very mild trip but resulted in a lifetime peak experience.



John: My hypothesis would be that in both cases, psychedelics and meditation, realization of actual benefits needs to involve integration with and direct learning from physical existence as well - that it's the balance that advances us.

Chris: Absolutely!

John: Another thought you might comment on is that the aim of both practices seems to be lessening one's dependence on those physical circumstances that challenge us in life and, as above, strange circumstances. Moksha and enlightenment are presented as involving very profound detachment from the physical world.

Chris: Detachment from mechanistic logic and deductive thought but not the living universe. I don't believe that renunciation of the living universe is productive. The Brihadaranyaka is the Upanishad of the great forest, so its union with nature not just consciousness. Notice that Huxley's editor began the snippet of Island and the moksha medicine with sex. We exist only through sexuality. If we reject sex as many Eastern traditions do in favour of the illusion of pure enlightenment, we are rejecting the physical embodiment of life itself. That can never further. If you think that is a quick trip to realisation, think again. The real liberation comes from symbiotic relationship with nature. It's cosmological consciousness to be fully immersed in nature because we ARE incarnate. No matter what pretences spirituality brings to the table, without sex we are sterile and without symbiosis we are statues made of matchsticks in a technological dystopia.

John: Now there is a paradox there in that one is presumably still having a body, without which we have not data.

Chris: It's not data our body gives but the immortal passage of the generations of life forever amen.

John: So, there is an obvious attachment possibility there, but it is clear that many worldly things fall away on the journey to the supposed ultimate.

Chris: What supposed ultimate? Why? To redeem reality means redeeming the entire cosmos and humanity in the biosphere, not just personal enlightenment. Ultimate reality is facing and accepting and transfiguring existence here and now. We HAVE to redeem life. Jacob's ladder and the stairway to heaven are eternally sterile.

John: Thus it seems paradoxical to propose that a chemical is the best means for achieving such detachment, since it is a physical means, regardless of the question of dependence long-term.

Chris: Not chemicals, .living sacraments. I gave up LSD because it was a chemical and after the days of window panes and the original orange sunshine you couldn't trust the sources. But it's not about the chemical. You are already mechanising it. It's about the living sacrament and what it is here and can do. As I have said the actual nature of what entheogens do is not well understood. If you take MDMA or ecstasy, as I have once for a test, it is a whacking serotonergic dose, and it's lovey dovey touchy feely but not a psychedelic. It's very pro-social and you can go to a rave without trouble. You get phenomenally high but it's entactogenic, not psychedelic.

There are two mysteries. The first is that psychedelics are super-agonists that open a unique metabotropic pathway in 5HT2a neurons that serotonin itself doesn't and that sets off slow waves of glutamate brain excitation. Why s the brain providing this route? We don't yet know, but it may be a form of autonomous psychedelia in some people. The second in the case of mushrooms is that the psilocin genes evolved from a transposable element not from the mushrooms themselves, so the origin of magic mushrooms is mysterious in itself.

My hypothesis is that consciousness has evolved from single celled eucaryotes using the entire spectrum of neurotransmitters they invented, which we see in the multiple neurotransmitters of the ascending reticular activating system, so the brain although electrodynamic has at its foundation the sappy social signalling molecules the drive organismic survival like dopamine, serotonin and nor-adrenaline and that this is the foundation of a second wave of biospheric evolution that produces phytochemicals that have evolved to affect animal behaviour, so we get all the medicinal species from opium to cocaine and we get entheogens too and these are the evolutionary foundation of the great symphony of conscious existence in the surviving biosphere, provided dominant species such as ourselves learn to understand their evolutionary role.

John: The claim is that it is necessary, not just instrumental, for the enlightened experience, and yet to have any physical necessity is contrary to what we imagine to be the aim. In general, the method to an end should have or practice similar characteristics to that end.

Chris: To what aim? To what end exactly? That's casting lots on our garments of redemption before our time has fully come. The only way for us as incarnate mortal biological sentient beings to have a real future is to live symbiotically with life as a whole using our climax intelligence not to become utopian technology alone but living enlightenment in conscious nature. That's what we need to do now and very quickly, which is the ONLY reason I am here saying this because it's more urgent than anything else. We HAVE to save the diversity of life and regain paradise on the cosmic equator in space-time or we will go down like one of the princes: *I said, "You are gods, And all of you are children of the Most High. But you shall die like men, And fall like one of the princes. (Psalm 82:7)"*

John: I agree wholeheartedly with your comments about integration with life. By detachment I also mean reducing psychological distraction and dependence while increasing involvement as a more relevant being. Sexuality has a purpose, as we know, and in some schools that is seen as passing through phases of life. Like many drivers it requires mastery of one's psychological addiction and this can be extremely beneficial in all phases. There are situations in any culture where sex can become inappropriate, and one's ability to accept that is important both for a peaceful and fulfilling life and for spiritual progress. It is a powerful driver, I think, for most people, but that energy can be transformed and channeled in different ways as the demands and phases of life change.

You said "To what aim? To what end exactly? That's casting lots on our garments of redemption before our time has fully come". We both use the words enlightenment and moksha to suggest some kind of greater self awareness but perhaps mainly as an end to suffering and anxiety as in Buddha's quest. The word "equanimity" is also used. The main question I come away with from your description is the role of volatility. Life can be a rollercoaster ride but for many the spiritual quest is an attempt to tame one's reaction to events, which actually allows greater agility in responding to those events as a constructive agent. One becomes the force that can calm emotional seas and navigate a steady course. But perhaps with that it is equanimity and steadiness of purpose and confidence in self. Knowing without doubt who we are that is invulnerable. Still, I say "some schools" of thought because I can imagine an argument for acceptance of volatility too. The bottom line might be if it is what we truly want. Being anxious is not pleasant and may not be necessary, so eliminating it seems like a valuable goal if that doesn't result in missing important warnings in life. So the goal would be associated with increased not decreased awareness.

Chris: The whole question is about the assumed link between cosmic order and the universal good which is where God comes in with the mixed blessings of heaven and hell, like a psychedelic misadventure. I use the lessons of life to

deduce meaning, so I see mortality as real life in the centre of the cyclone at the edge-of-chaos, with the regime of order stuck in a rut of totalistic oppression and chaos causing rampant “thermodynamic” dissolution, so both are unviable extremes and we survive by juggling the broom upside down in the palm of our hand. So for example carnivores are necessary and mortal life can be absolutely terrifying torture and unbearable agony. But between the extremes life springs forth resplendent. To venture into the unknown and understand the cosmological foundations of consciousness we have to make a journey into the crack between the worlds. So we can’t call the shots in advance. To me in the last cosmic analysis, conscious life is invincible and could regenerate, even if life on Earth ceased to exist, but it’s an assumption we can’t afford unless and until we know there is viable compassionate life elsewhere.

Robert Boyer (2022): The three psycho-physiologically defined states of consciousness in ‘Western thought’ are waking, dreaming, and sleeping. The ordinary waking state is associated with sensory perception, thinking, and intellectual reasoning commonly experienced in our daily lives. This state is characterized by the distinction of ‘experiencer’, ‘process of experiencing’, and ‘object of experience.’ ... This moment, looking outside to read this paper, you receive input through your senses. You experience the input in your thinking mind, processing it for meaning and relevance. You may also analyze it on the deeper level of the intellect to understand it better. You may further sense deeper feelings about its relevance. And, you can sense that your self is the experiencer of these sensations, thoughts, and feelings. Further, you can know directly that, behind all this, you are conscious. These are the natural levels of inner subjective mind in the Vedic model of levels of mind. Going deeper inside are the senses, the thinking mind, the intellect (which includes discriminative and deeper unifying functions associated with feelings), the inner ‘I’/self/ego, and consciousness – which you are ‘experiencing’ right now by being conscious

Vedanta and the 7th natural state of consciousness: Unity consciousness. Maharishi (1967) describes unity consciousness as the supreme level of human development in which every phenomenally separate object of experience including one’s individual self is spontaneously known, experienced, and attributed to be nothing other than the infinite value of one’s own universal Self. In unity consciousness, there are no gaps in the infinite eternal oneness of Being.

No diversity of life is able to detract from this state of supreme Unity. One who has reached It is the supporter of all and everything, for he is life eternal. He bridges the gulf between the relative and the Absolute. The eternal Absolute is in him at the level of the perishable phenomenal world. He lives to give meaning to the paean of the Upanishads: “purnamadah purnamidam”—That Absolute is full, this relative is full (pp. 448-449).

In the 7th state of consciousness, unity consciousness, wholeness, oneness of everything is the primary locus of experience, permeating all phenomenal diversity and change. This highest state of consciousness is the emphasis of the Darshana of Vedanta (the ‘end of the Veda’), spontaneously living the ultimate oneness of everything. Maharishi (1967) explains that on the basis of the profound intimacy between the knower and the known in refined cosmic consciousness, complete unification of subjective and ‘objective’ existence simply unfolds naturally as a matter of time.

Chris: I do like the relaxed approach of TM, in that it is aiming at a natural process to make meditation go with the flow in a fulfilling way that in your view is capable of respecting nature and brings peace and happiness. Your descriptions of the seven levels of samadhi all have a single common basis in more refined versions of perfect unity of subjective and objective consciousness and the thrust of the discussion in your text is about distinguishing the objective reality process of physical perception from the subjective experiential process of inner consciousness rather than deep subjective experience itself.

Let me underline what I see as the central problem in **"Ignorance and Enlightenment: What's the Difference?"** (Boyer 2022). Your account is aimed at a polarity between everyday consciousness, which is attributive of the physical universe and the sublime conscious “Self”:

To clarify the idea of ‘object-referral’, the ‘object’ is experienced as a separate outer object, frequently in the outer physical environment and held to be independent from the inner ‘subject’ or ‘I’.

But we simply can't fully understand nature without exploring the physical foundations of how life arises. So you are denying natural science by imputation throughout, because it distinguishes subjective and objective. This is NOT a valid basis or sufficient cause to affirm TM.

The natural experience in ordinary waking is characterized by a gap between the outer objective and inner subjective world – the mind-body problem. This gap needs to be bridged for the unity that science rigorously pursues, and toward which it is inexorably progressing.

This is not an adequate starting point to justify enlightenment in an of itself and becomes a doctrinal exercise in the way you quote Maharishi Mahesh Yougi (MMY) as the final word. MMY's idea of "nature is physically and naturally deficient. Nature to MMY is just the levels of consciousness, typified in the seven levels of enlightenment. It shows no respect for genes, cells, the fecund cytosol, or any physical or natural aspects of conscious life, just the need to bridge subject and object in one transcendent "Self". It is committing the foundation error of Vedanta in identifying nature as subjective consciousness, after which it induces a tower of higher "spiritual states" and ignores the significance of natural differences e.g. between living species:

The six Darshana (what is 'seen') are different perspectives of the totality of nature. They are here depicted in a sequence and on a continuum from virtually no wakefulness to full wakefulness of the totality of nature.

Yes your description of the "tower of spiritual states" of enlightenment goes to the seventh but they are simply an intellectual construction deriving from the seven layers of heaven and the seven layers of Hell. They are NOT enlightenment and should not be described as achieving it, or it is a misrepresentation. Remember the dance of the seven veils is Inanna stripping herself naked before the Galla in her descent to her sister Ereshkigal before returning and sacrificing Dumuzi, just as Shiva is the God of Death pictured with his trident in Mohenjo Daro. It's nothing new and goes back to the Sumerians and also pervades Jesus, anointed by Magdalen, out of whom went seven devils, to his doom, crucified before the daughters of Jerusalem, harrowing hell and rising on the third day from the dead.

To get this picture clear, let's just see what Etymonline considers nature to be. It's NOT just consciousness, or the seven layers of conscious "heaven", it's very much the world of tooth and claw. Nature IS **natal** of birth itself!!!

nature (n.) late 13c., "restorative powers of the body, bodily processes; powers of growth;" from Old French *nature* "nature, being, principle of life; character, essence," from Latin *natura* "course of things; natural character, constitution, quality; the universe," literally "birth," from *natus* "born," past participle of *nasci* "to be born," from PIE root *gene- "give birth, beget." By mid-14c. as "the forces or processes of the material world; that which produces living things and maintains order." From late 14c. as "creation, the universe;" also "heredity, birth, hereditary circumstance; essential qualities, inherent constitution, innate disposition" (as in *human nature*); also "nature personified, Mother Nature." *Nature* and nurture have been paired and contrasted since Shakespeare's "Tempest." Specifically as "the material world beyond human civilization or society; an original, wild, undomesticated condition" from 1660s, especially in *state of nature* "the condition of man before organized society."

Robert: I think the term moksha frequently refers to the natural permanent establishment of samadhi,

Chris: I accept that there can be diverse forms of samadhi also reflected in the processes and practices that lead to such states. This probably also applies to approaches to moksha. However there is a lesson here I think we need to appreciate from the discovery of nature. What we now know of the natural universe is counter-intuitively confounding to our naive religious notions of the natural world. Theories of everything are just as confounding.

What I learn from non ordinary reality is that both dreaming and psychedelic experience lead to wildly different and diverse states of conscious experience which transcend ordinary physical world perception and constitute a largely unexplored deeply confounding abyss, akin to the notion of *tohu va vohu*, before God's works of old.

For this reason I think we need to understand moksha in the way the Huichol understand the peyote quest to enter the *nierika*, as a vision quest to discover the inner nature of reality in the "spirit world". This means it is not just a state of permanent samadhi as perfect consciousness, but contains the entire cosmic mystery we have yet to discover the full dimensions of on a visionary journey of discovery. It entails a trip or journey into the unknown that we voyage as "psychopomps" on a lifetime journey across the Styx, which is a little like Dante's divine comedy, in its sheer ornateness and mind boggling diversity of experience.

This means I don't think moksha is a one way trip, but it is a journey where the test is what we bring back to the known world as discoveries to enlighten others about the outer boundaries of existence. For example when I met Brahman, I could experience simultaneously what it is like to be eternally compassionate at the same time as what it is like to be me as a living mortal. And Brahman was ultimate reality, but also an apotheosis of my own consciousness, so

I was seeing this from both perspectives at once. And it was genuinely surprising to me to be told that my mortality was also key to the eternal existence of ultimate reality in it becoming manifest. Also the compassion for the mortal coil was uncanny and the message, although it looks like straight mass extinction avoidance was an affirmation from the Cosmos as a whole that life is the sacred key to everything, and that cosmic consciousness needs the existence of natural life to manifest it, without which the universe could become devoid of meaning.

I think from my experiences of tripping that this could also take very diverse forms that we see also in the Huichol art and the art of the Ayahuasca visions, so it's not a one way religious trip, but neither is it anywhere as narrow as many of the descriptions in the Eastern traditions convey.

Ram: If you are doing closed-eye meditation in TM, then how can you experience your internal and your external environment (external world) being unified? Are you doing open-eye meditation for unity subjective experience, which must have its own NPB (neural-physical basis)? Perhaps, we should do TM with eyes closed. If we like to test if the unity experience has occurred then open the eyes for a few seconds.

Chris: This quest is fallacious. It's essentially trivial to experience mind-world unity, so that raises a question about TM. Every scene we look at in normal life is expressing this unity, except we know the actual physical world is not coloured and is just waves and particles depending on what you look at. Therefore the entire notion of unity in the sense you are describing is a contradiction because you can only see what consciousness evokes external or internal.

Robert: Eyes closed is going inward toward the unified state of consciousness; eyes open is going outward toward to the environment, the field of diversity. In unity consciousness, the individual naturally enjoys the maximum value of both inner and outer existence simultaneously due to mind/body refinement and coordination of all levels of life.

Chris: Bob's comment is valid here. I do dual mode meditation when I am tripping. Eyes open for mindfulness and focus. Eyes closed for annihilation. The aim is to use both. Focus hard and steady and then let go completely. The purpose is not to try to artificially achieve unity which is a distraction. The aim is to go very deep into the dream and vision world of non-ordinary reality where unity with Brahman ultimate reality can manifest.

This is perfectly good neuroscience, which all scientists should appreciate! Quieten the default mode by stopping the internal dialogue and erasing personal history. Reduce sensory input to a minimum with perhaps a single candle in a darkened room or lying in the long grass among the crickets and grass hoppers by the shore in the moonlight and go into devoted vigil. Yogic breathing is key because breath is at the interface between autonomous volition and automatic as in sleeping, so letting go of breathing very gently is letting go of existence.

Ram: It seems that terms such as moksha, samadhi, consciousness, etc have multiple meanings depending on a point of view (POV).

Chris: No matter what form moksha takes, three things have to happen:

- (1) The subject has to have some sort of palpable experience of moksha consciously, so their consciousness has to be able to experience it and can't be completely disconnected.
- (2) They have to retain it in memory sufficiently to be able to recognise it and report on it physically afterwards.
- (3) The absolute key to the experience is perceiving existence from outside the round of birth and death because it is this which liberates and this IS moksha.

Robert speculates that moksha is a permanent state of samadhi but that doesn't describe anything different from samadhi which he describes a complete union of pure consciousness.

I have said repeatedly how this happens to me. That is I meditate, annihilate, fall into the experiential abyss, a non-ordinary experience overwhelms me and then a little later I catapult out of the situation with a fleeting awareness of my journey. This is also what the Huichol report:

"As the mara'akame descends and passes through the nierika on the return, his memory of the urucate and their world fades; only a glimmer remains of the fantastic journey that he has made" Don Jose Matsuwa (Halifax 242).

If you once experience moksha it almost forces enlightenment because it's like a covenant with cosmic reality. It becomes fundamental to one's continuing existence. That's why you get me pressing the point of Symbiotic Existential Cosmology with tenacious certainty. I don't have to experience it again and again and in a way that seems selfish unless I need to consult about something further along the way. That's why I don't need to meditate every day, or take mushrooms every week.

All the notions of "complete separation" are from spiritual doctrine, not personal experience. Also it's not clear what is separated from what and what separation means. I think the whole description is spiritual materialism, which is why all the astral worlds get caught up in it. Also you never make clear what's separated from what. I think its complete detachment of normal mind processes from physical:

- (1) You CAN'T experience moksha unless you abandon attachment to self, cease all mental activity and go onto another dimension and manage to get back from it. I think this is what the separation is about, not the complete separation of self-as-subject and all that other stuff from the physical world's existence because you can't separate consciousness from itself or it doesn't exist.
- (2) You ONLY have a successful moksha if you end up experiencing from outside the bubble of perception and can witness existence simultaneously from the organismic and cosmic perspectives and be both and see both in relationship.

That's how the experience becomes transfiguring and constitutes enlightenment. But it doesn't alter my morality, it just causes my karma to be transparent, so as not to raise the dust!

John: Wow. This is quite a wonderful discourse Chris, aside from its commentary on elements of theory.

Ram: why do you hypothesize that life is immortal when you know that we all are mortal, i.e., we will die one day? The psychedelic-based SEs are caused by ingestion of psychedelic herbs, so how can they be spontaneously (as a result of a sudden impulse and without premeditation; without apparent external cause or stimulus)?

Chris: The sexual generations of life are clearly immortal. It is only the individual organism that is mortal due to the entropic nature of the physical universe itself. Humanity has two great meditative traditions, the Eastern tradition and nature shamanism. The East uses (1) **physical control** – renunciation of our biological, social and sexual life, to avoid distraction from pure consciousness and (2) **mental control** to approach samadhi through stringent meditation in a context of mind-sky ascendent spirituality. The ascendancy of order and control eclipses the wild element of mystical transfiguration in favour of ordered etheric cosmologies, limiting the nature of samadhi.

By mind-sky, I don't mean the Zen mind-sky approach, but something much older. Men, fearing their mortality because they don't give live birth and appreciate the immortal passage of the generations in the "Mother Earth" way women can, have sought to control the tokens of culture and look to the sky and eternal existence as a transcendent extension of their conscious mind. We can see this in both Monotheism and the entire Vedantic/Buddhist complex. This means that the peak of transcendence is either associated with an omniscient omnipotent deity, or with primordial cosmic consciousness, or with emptiness itself.

By contrast entheogenic mysticism, arising from sacramental shamanism is spontaneous because it is empirical. It has no prescriptive doctrine and no attitude of mental supremacy over nature, but seeks animistic integration with the flux of life. We know evolution is not about the individual organism, but immortal survival of genes and species through (1) genetic recombination, (2) occasional mutation and (3) natural and sexual selection. Effectively it ensures the immortality of life as a whole by accepting the mortality of the organism, in the inevitable face of increasing entropy, to gain collective immortality of the diversity of life.

In fact sexuality is the ultimate cosmological expression of material selflessness, because it combines only half our genes with half the genes of our sexual partners, because this evades Muller's ratchet of cumulative mutational entropy that eventually kills off purely parthenogenetic species. This shows us the ultimate emergent sacredness of nature in living detail. Your approach that this is invalid and not sacredly immortal because we each will have only a mortal lifespan is a betrayal of the truth of life's immortal fertility, through fecundity and virility as Shakti is to Shiva, which is the only way humanity can experience true moksha.

What I am trying to explain to you is that the difficulty you and other spiritual thinkers have with this is precisely because your thinking remains locked in an eternal mind-sky world view that subjugates the immortality that the cosmic emergence of conscious life provides us. The reality is that there is nothing we can do about this situation. Life

has evolved in the best of all possible worlds. We simply can't afford to kick against the pricks, as Jesus said, and hunger for eternal life because it's forsaking the way the living conscious universe actually manifests.

Ram: I agree but the self-as-subject dies in your framework and the identity of a person is lost. We don't want to lose it. So Mother Nature needs to provide this intense desire similar to what she provided to monkeys on trees eventually evolving into us. In a similar way, through yoga/meditation, higher coevolution might have built 21 subtle entities in a bundle, which presumably survives death per Sankhya.

Chris: The self as subject **lives** in SEC. We are not alone Ram! Self as subject plays out in each and all of us. It's protected to be similar because of the way the mammalian brain has evolved. Don't look to your own eternity, but safeguard the immortality of life with your life as long as it lasts. It's the only framework in which we can exist as evolving biological beings with immortal meaning and tenure. The best of all possible worlds. Mother Nature doesn't pander to male desires for eternal life.

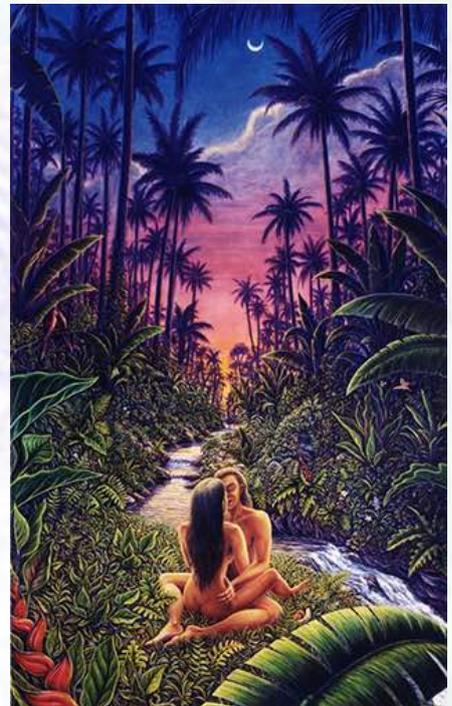
We still have the ultimate desire to live and beget life that all organisms have possessed since time immemorial. Existence desires from the very molecules of which we are made to generate life, even through abiogenesis, if all else is lost, and to regenerate again elsewhere in the universe or in the next universe. But that is no excuse whatever for pining for eternal life and allowing humanity to destroy life's immortality through spiritual hubris and domination.

Ram: Shiva (cosmic mind/consciousness, Purusha) and Shakti (universe, Prakriti) must exist simultaneously and inseparably. This is one of the reasons for postulating inseparable dual-aspect monism.

Chris: Shiva and Shakti are only inseparable at the origin in deep copulation. The dance is not, and even gives the dancer dances two different names: "Tandava is the dance of Shiva as the father of the universe, and Lasya, the dance of Shakti as the Great Mother of the World." Neither can a dance be simultaneous as it persists through time and us a contrapuntal relationship. We know they are then both figuratively coupled in the conscious mind and physical bodies of all of us, in the subdivided world of Maya but that is the existential condition we already know.

Fig 279: Shiva-Shakti tantra is unfolding cosmological fertility.

Ram: This is a misunderstanding. Shiva cannot exist without Shakti and vice-versa as inseparable dual-aspect monism (IDAM) all over space-time as explicitly expressed in ArdhNariEshvara concept still practiced in South India and perhaps also in Bengal. During Tandava, Shakti (*p*-aspect) is always present implicitly (hidden from viewers); otherwise, how and from where Shiva will get the energy to dance. Similarly, in Shakti's Lasya dance, she is conscious so Shiva (consciousness, *s*-aspect) is also always present implicitly. In all entities including us, both are always present explicitly and/or implicitly.



Chris: Yes I was waiting for your account. I agree, but it complicates matters further. I already added a sentence to my comment "We know they are then both figuratively coupled in the conscious mind and physical bodies of all of us, in the subdivided world of Maya but that is the existential condition."

The complexification is that you are conceiving of Shiva as consciousness with implicit "energy" and Shakti as physicality with implicit "consciousness". I agree but that's a role reversal that is complementary but not indistinguishable. This leads to a whole string of cosmological questions. Firstly physical materialism is Shakti without Shiva and the Vedic cosmic consciousness makes physical reality idea is Shiva making Shakti as gross aggregates of his consciousness. We come at best to the dream of Vishnu generating Brahma out of his navel, overlooked by Lakshmi as his "divine energy", bringing us full circle to Tantra again.

So let's view this scientifically. The dance of Shiva and Shakti is a creation myth of the Cosmos in which the entire universe is born from "sexual fertility". That sexual fertility requires the germinal "sperm" of Shiva as nascent consciousness and the enveloping ovum of Shakti as the nascent universe. Rather than a single dance in time, it is a representation of primal complementarity which is not a dualism because the cosmic sperm and ovum are already different. It is the story of Cosmic embryogenesis that is incarnate in all of us. The rest of the dance is the evolutionary dance of emerging sentient beings possessing both these asymmetric aspects, leading to the existential dilemma of human conscious existence in the mortal coil, where we are subjective sentient beings transforming the physical world at large in the generation and sustenance of mortal incarnations which are also sexual. At all points and in all features, Shiva and Shakti are never just indistinguishable dual clones, but complementary Cosmic principles, whose very difference is essential and must be respected and understood for the fertility of life to continue and for the interaction of subjective consciousness upon the physical world to occur. That's Symbiotic Existential Cosmology's ICAM (interactive complementary aspect monism) speaking!

There has to be at least one causal process for any realistic cosmological model of the universe. If there is no interaction, IDAM is simply saying the p aspect causality is the causal process i.e. physicalism. In IDAM, each s state is indistinguishably locked dually to the p state so s and p can't interact and s and s states cannot outside p causality either. This kind of duality is a homology e.g. in groups, equivalent multiplication tables and in topology, identical holes and twists i.e. isomorphism – identical form. Dualities don't have to be like this. AdS/CFT, which Uzi has finessed for consciousness, is a different kind of holographic duality between n -D gravity and $(n-1)$ -D quantum theory, but like IDAM it's a bijective duality and still epiphenomenalistic in Uziel Awret's cosmology. In IDAM there is thus no basis for any kind of causality or free will in the world of s states, because the p states are non-interactively causally closed and the s states are dual to p closure.

Dilemmas of Dealing with the Unshakeable Conviction of a Buddhist Philosopher about Consciousness

Ram: No! Causality is embedded in the co-evolution of dual-aspect states, adaptation, and natural selection. There might be multiple causes (or better conditions) for the generation of a new state from the previous state through the co-evolution from the dual-aspect unmanifested state of the primal dual-aspect substrate. As you know, if we involve causality then what would be the first cause? This leads to an infinite regress. Therefore, IDAM follows Nagarjuna's interdependent co-arising (IC) to keep track of multiple causes/ conditions, which rejects causality to start with and avoids the first cause. Nāgārjuna rejects 'inherent existence' or 'essence' in favor of co-dependent origination (or IC: Pratītyasamutpāda, प्रतीत्यसमुत्पाद), and that is also why he rejects causality; the entities that lack inherent existence dependently co-arise as elaborated in (Vimal, 2021). Causality is a major issue in metaphysical views, mostly because of the first cause that entails infinite regress.

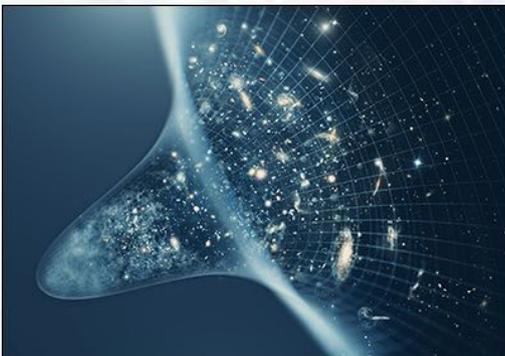


Fig 280: Shuttlecock universe (Hartle & Hawking 1983) suggests time may begin with the big bang like the "south pole" of a sphere in which latitude is time and longitude is space. This is still in hot debate as of 2019.

Chris: Well to me that's circular reasoning. I have major reservations about Nagarjuna's philosophy of causality. I don't see a problem with multiple causes, or with a first cause. I don't accept the philosophy of emptiness any more than the notion of no mind, or no self. I don't accept a nirvanic void or a model of Maya as it's nemesis. The universe is dynamic and I see causality as a principle of philosophical argument and deduction, rather than the functional equations of dynamic reality. But when you shoot someone dead, you and the gun and the bullet causes it in anyone's terms. Claims of causal closure of the universe likewise define the subjective versus objective relationship of materialism. This is not a question about causality, but the nature of time itself. SEC envisages a transcausal quantum time process where subjective existence has an evolutionary capacity to anticipate "potentia" of emerging quantum futures. Worrying about a first cause is a distraction in a big bang universe although I accept cyclic models of cosmology as a possibility, particularly evolving cycles.

Ram: From (Vimal, 2022b): Furthermore, "all phenomena come into being in dependence upon conditions, remain in existence dependent upon conditions, and cease to exist dependent upon conditions" (Nāgārjuna & Garfield, 1995 160). Nāgārjuna can grant "that effects are dependent upon collection of conditions, it cannot be that those

collections or that dependence exist inherently” (ibid 266). Moreover, individual conditions and their effects, the combination of conditions, and the inherent dependence of any phenomenon on the combination of all of its conditions lack inherent existence (ibid 258-266).

Entities lack inherent existence (because they are born and then die one day) and hence lack "real" causal power. Therefore, instead, he proposed interdependent co-arising and necessary conditions for an entity to manifest from emptiness/Shunyata (that presumably inherently exists), which is consistent with science’s quantum vacuum or “Nothing” (catchword for the materialist (Krauss, 2012)): Universe from Nothing).

Fig 281: Nāgārjuna

Chris: Nāgārjuna is a central figure in Buddhist and Tibetan Buddhist thinking, but he also epitomises what I see as the inherent negativity of the Buddhist view of emptiness and why I gravitate to the Upanishads as a source of true wisdom. Let’s take your statements as a whole, and I’ll reply to some paragraphs of Thubten Chodron’s [Grasping at Inherent Existence](#).



So there’s the view we have through our senses—but things do not exist the way they appear to our senses, which means we are living in a 100 percent hallucination without taking drugs. Everything that we perceive through our senses is false. We think that everything is out there: some kind of solid entity with its own essence, its own “thing” that makes it “it.” We think everything is real, objective, totally unrelated to the mind, totally unrelated to causes and conditions, just out there with its own essence. That’s how things appear to us—to our sense consciousness and to our mental consciousness—and we believe that. That’s wrong.

This is something anyone in the field of consciousness research is intimately familiar with, for example Anil Seth calls all experience “hallucination”. But this doesn't mean that conscious experience or physical reality is unreal, or invalid, or “wrong”. To survive in the living universe, this subjective sentience we have is essential for our survival. We need to take it as it is and do meaningful things as mortal beings to ensure the survival of life, just as animals do with great care to ensure their offspring survive. It’s not valid to say the transient nature of mortal life lacks inherent existence. To negate it in any way is not wise – nor actual wisdom. It also breeds an attitude of mind only ego angst not coupled to nature, or to the inherent existence and sacred value of life itself, or teach us to protect life with our physical lives.

If things did inherently exist—if they had their own essences and independent factors that were them—it would be impossible for them to exist. Why? Because then they would exist without depending on causes and conditions, and we’d have to ask, “How did they get produced? And, how do they change if they’re independent from causes and conditions?” So if things inherently existed, they could not exist at all. It is because they’re empty that they can exist. So “exist” means “dependently exist.”

The denial of inherent existence is simply a cover for denying the reality of everything because they appear to arise from other causes. One can fairly deny the entire hypothesis of relative negativity. The one thing we can’t deny is manifest existence. We are, whether we like it or not – whether we choose to or not – obligately conscious throughout our entire lives as living sentient volitional organisms – to say this is just an illusion and preach emptiness is not a remedy for ongoing life in its diversity and abundance – it doesn’t even recognise biological or genetic diversity as real or important, let alone sacred. This is also as you noted a deconstruction of our awareness of causality in a very physical universe, because it attributes cause and effect to the denial of inherent existence, leading to the doctrine of interdependent co-arising. Ultimately this philosophy is doomed to the Samvartakalpa or Eon of dissolution – the decline from enlightenment into ignorance.

The Buddha’s mind has two kinds of wisdom. There’s the ‘wisdom of varieties’ and the ‘wisdom of the mode.’ The ‘wisdom of varieties’ is the wisdom that perceives the variety of all the conventional truths. The ‘wisdom that perceives the mode’ perceives the mode of existence of all these conventional truths. Their mode of existence is that they’re empty. With these two wisdoms the Buddha’s mind perceives all existent phenomena—the conventional phenomena and their emptinesses—simultaneously. ... Also, when you’re perceiving conventional phenomena directly, you don’t at the same time have the direct realization of emptiness. When you enter into meditative equipoise as one of these arya bodhisattvas, then you perceive the emptiness of all phenomena. But at that time you can’t simultaneously perceive their bases, the conventional truths or conventional phenomena. So a high-level bodhisattva is always going back and forth between meditative equipoise on emptiness and subsequent realization whereby they perceive phenomena as like illusions. The phenomena still appear to them as truly existent, but they realize that things don’t exist as they appear, and that those appearances are illusory.

This to me is a self confession of the tragic emptiness of the mind-only or no-mind-only approach, where Buddhism, as an “adolescent” newcomer to the Vedic tradition, just as Christianity is to Judaism as the mother tradition, deviated from the Upanishads that appear to have preceded Buddha by a least a couple of centuries by denying the “self”. We are according to Thubten Chodron expected at all times to practice “equipoise” between real existence and the perception of voidness simultaneously to achieve release from grasping at inherent existence.

Contrast this with me taking a mild mushroom trip in June 2021 and having the satori that results in Symbiotic Existential Cosmology. I haven't had to spend the last 500 days equipoising between my perceptions of both the real world of biological survival along with my dreams and visions and the inherent emptiness of existence. I don't even need to meditate every day to stay sane. And I did it by "annihilation" meditation abandoning self, so in a sense I have denied the ultimate reality of atman to get there but “there” is life overflowing! I can live my life productively as a mortal being aware that any form of egoistical grasping is futile, but also aware that this fabulous Cosmos in which we exist is of inestimable sacred value, not just a void emptiness – that the evolving genetic and biological diversity of life is its sacred embodiment and consciousness is its omniscience. Sentient conscious beings are not emptiness seeking the void, but stand at the centre of the unfolding of the conscious universe perennially throughout our generations.

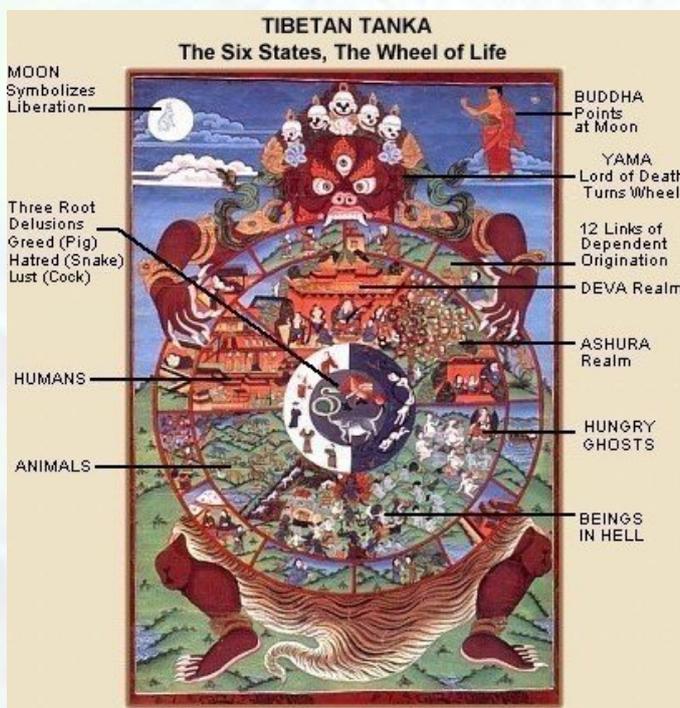


Fig 282: The Tibetan Buddhist cosmology of life. The worlds are, in ascending order of the degree of free will, compassion and happiness one feels, the worlds of: (1) hell, (2) hungry ghosts, (3) animals, (4) titans or asuras, (5) human beings (6) heavenly beings, (7) voice-hearers, (8) cause-awakened ones, (9) bodhisattvas, and (10) Buddhas. There are only two worlds of living species humans and animals. How do you tell an elephant from a butterfly? Where are the trees and fungi? An asura in Buddhism is a demigod or titan of the Kāmadhātu, described as having three heads with three faces each and either four or six arms. This is a non-biological fantasy like monotheistic angels and demons.

Joanna Macy (1991) in “World as Lover World as Self” on dependent co-arising begins with lamenting a world in trouble and has a chapter on the Greening of the Self. She even says “virtue is not required for the greening of the self, or the emergence of the ecological self. ... This ecological self, like any notion of selfhood is a metaphoric construct and a dynamical one”. So we have a Buddhist ecological activist trying to rationalise a cosmology of emptiness with compassion for the diversity of life. But it's the

ecology, through which life immortal survives, not the cosmology of emptiness, which is null.

Now this comes back full circle to causality and the plea by Nāgārjuna to qualify causality in interdependent co-arising. Where this entire philosophy comes apart is in its dependence on a view of reality in which subjective experience and the mortal ego are the only players.

Humans and all conscious organisms are believed to simply be reincarnated sentient beings. Their biology is essentially ignored, although many Buddhists practice compassion for living beings as conscious entities also caught in the mortal coil. The notion of interdependent co-arising only makes actual sense in an ecological symbiotic sense in which biological diversity is the sacred signature of the living universe, not just a delusory figment of Maya or illusion, misperceived as the void. Neither is this simply the quantum vacuum, as this rises within uncertainty to invoke every conceivable particle in the known universe, just as life is fecund in its diversity.

Ram kindly posted these passages from Mahathera's (2005) “Fundamentals of Buddhism”, in which the Buddhist notion of rebirth is highlighted in stark detail:

Buddhist doctrine of rebirth: With regard to this teaching, Buddhism is often accused of self-contradiction. Thus it is said that Buddhism on the one hand denies the existence of the soul, while on the other hand it teaches the transmigration of the soul. Nothing could be more mistaken than this. For Buddhism teaches no transmigration at all. The Buddhist doctrine of rebirth — which is really the same as the law of causality extended to the mental and moral domain — has nothing whatever to do with the brahman doctrine of reincarnation, or transmigration.

According to the brahmanical teaching, there exists a soul independently of the body which, after death, leaves its physical envelope and passes over into a new body, exactly as one might throw off an old garment and put on a new one. ... Buddhism does not recognize in this world any existence of mind apart from matter. All mental phenomena are conditioned through the six organs of sense, and without these they cannot exist. According to Buddhism, mind without matter is an impossibility. And, as we have seen, the mental phenomena, just as all bodily phenomena, are subject to change, and no persisting element, no ego-entity, no soul, is there to be found. But where there is no real unchanging entity, no soul, there one cannot speak of the transmigration.

How then is rebirth possible without something to be reborn, without an ego, or soul? ... What the Buddha teaches is, correctly speaking, the law of cause and effect working in the moral domain. For just as everything in the physical world happens in accordance with law, as the arising of any physical state is dependent on some preceding state as its cause, in just the same way must this law have universal application in the mental and moral domain too. If every physical state is preceded by another state as its cause, so also must this present physico-mental life be dependent upon causes anterior [forward] to its birth. Thus, according to Buddhism, the present life-process is the result of the craving for life in a former birth, and the craving for life in this birth is the cause of the life-process that continues after death.

But, as there is nothing that persists from one moment of consciousness to the next, so also no abiding element exists in this ever changing life-process that can pass over from one life to another. Nothing transmigrates from this moment to the next, nothing from one life to another life. This process of continually producing and being produced may best be compared with a wave on the ocean. The wave-structure that seems to hasten over the surface of the water, though creating the appearance of one and the same mass of water, is in reality nothing but a continued rising and falling of ever new masses of water. And the rising and falling is produced by the transmission of force originally generated by wind. Just so the Buddha did not teach that it is an ego-entity, or a soul, that hastens through the ocean of rebirth, but that it is in reality merely a life-wave which, according to its nature and activities, appears here as man, there as animal, and elsewhere as invisible being.”

This however deprecates the generations of life to a mere force of no value in itself. It becomes revealingly clear when we turn to birth where new life occurs where the above passage implies that it is only suffering which drives birth, rendering the entire flowering of the diversity of life to meaninglessness:

*There is another teaching of the Buddha which often gives rise to serious misunderstanding. It is the teaching of Nibbāna, or the extinction of suffering. This third noble truth points out that, through the cessation of all selfish craving and all ignorance, of necessity all suffering comes to an end, to extinction, and no new rebirth will take place. **For if the seed is destroyed, it can never sprout again.** If the selfish craving that clutches convulsively at life is destroyed, then, after death, there can never again take place a fresh shooting up, a continuation of this process of existence, a so-called rebirth. Where, however, there is no birth, there can be no death. Where there is no arising, there can be no passing away. Where no life exists, no suffering can exist. Now, because with the extinction of all selfish craving, all its concurrent phenomena, such as conceit, self-seeking, greed, hate, anger and cruelty, come to extinction, this freedom from selfish craving signifies the highest state of selflessness, wisdom and holiness.*

*Now this fact — that after the death of the Holy One, the Arahant, this physico-mental life-process no longer continues — is erroneously believed by many to be identical with annihilation of self, annihilation of a real being, and it is therefore maintained that the goal of Buddhism is simply annihilation. ... How is it ever possible to speak of the annihilation of a self, or soul, or ego, where no such thing is to be found? We have seen that in reality there does not exist any ego-entity, or soul, and therefore also no “transmigration” of such a thing into a new mother’s womb. That bodily process starting anew in the mother’s womb is in no way a continuation of a former bodily process, but merely a result, or effect, **caused by selfish craving and clinging to life of the so-called dying individual.** Thus one who says that the non-producing of any new life-process is identical with annihilation of a self, should also say that abstention from sexual intercourse is identical with annihilation of a child — which, of course, is absurd.*

Destroying the seed which drives birth so that it can never sprout is simply genocide. I checked this in the Pali Canon after Karen Armstrong (2022) in “Sacred Nature” has this charming quote intended to protect the diversity of life:

Let all beings be happy! Weak or strong, of high, middle or low estate, small or great, visible or invisible, near or far away, alive or still to be born — may they all be perfectly happy! ... Let us cherish all creatures, as a mother her only child!

But in [fuller translation](#), this passage ends with the same quick exit routine, deprecating the diversity of life:

This is said to be the sublime abiding. By not holding to fixed views, The pure-hearted one, having clarity of vision, Being freed from all sense desires, Is not born again into this world.

Mahathera continues:

*Here, once more, we may expressly emphasize that without a clear perception of the phenomenality or egolessness (anattā) of all existence, it will be impossible to obtain a real understanding of the Buddha's teaching, especially that of rebirth and Nibbāna. **This teaching of anattā is in fact the only characteristic Buddhist doctrine, with which the entire teaching stands or falls.***

So does the entire teaching FALL!

The first question "Has man a free will?" is to be rejected for the reason that, beside these ever-changing mental and physical phenomena, in the absolute sense no such thing or entity can be found that we could call "man," so that "man" as such is merely a name without any reality.

This is ridiculous philosophical sophistry. Man is not just a name – we are a biological species called *Homo sapiens* which is dominating and consuming the planet's biosphere as we speak. Man is both our fulfilment and our nemesis real and lethal.

The second question "Is will free?" is to be rejected for the reason that "will" is only a momentary mental phenomenon, just like feeling, consciousness, etc., and thus does not yet exist before it arises, and that therefore of a non-existent thing — of a thing which is not — one could, properly speaking, not ask whether it is free or unfree.

Incorrect. We do not know the source of will. One can validly argue that will is the creative force of the unfolding universe bringing it to consummating fulfilment. Without it the universe would be a wasteland with no conscious observer to manifest it.

It is rather with some hesitation that I dare to speak to you on that profoundest of all Buddhist doctrines, paticca-samuppāda, "dependent origination," that is to say, the conditional arising of all those mental and physical phenomena generally summed up by the conventional names "living being," or "individual," or "person."

This confirms that Buddhism is purely a psychological theory. It is not a biological or cosmological theory because there is only one class of being – the person.

This is the final goal and purpose of the Buddha's message, namely, deliverance from rebirth and suffering. And there is only one individual who no longer performs any wholesome or unwholesome kamma-formation, any life-affirming kamma. It is the Arahant, the holy and fully enlightened disciple of the Buddha. For through deep insight into the true nature of this empty and evanescent process of existence, he has become utterly detached from life; and he is forever freed from ignorance together with all its evil consequences, freed from any further rebirth.

"Utterly detached from life" is toxic to the diversity of living existence.

According to Buddhism, everything mental and physical happens in accordance with laws and conditions; and if it were otherwise, chaos and blind chance would reign. But such a thing is impossible and contradicts all laws of thinking.

This is completely false. Life exists at the edge of chaos, or everything gets stuck in the rut of the rule of law. Every principle of nature involves transcending such rigid boundaries. We thought DNA makes RNA makes proteins was Watson and Crick's central dogma of biology until Thomas Cech discovered reverse transcriptase. Now we know it powers our telomeres and came before DNA genomes became established, at the transition between RNA and DNA-based genomes. Likewise the standard model of physics arises from a quantum superforce breaking symmetry.

Therefore the Buddha has said: To believe that the doer of the deed will be the same, as the one who experiences its result (in the next life): this is the one extreme. To believe that the doer of the deed, and the one who experiences its result, are two different persons: this is the other extreme. Both these extremes the Perfect One has avoided and taught the truth that lies in the middle of both, that is: Through ignorance the kamma-formations are conditioned; through the kamma-formations, consciousness (in the subsequent birth); through consciousness, the mental and physical phenomena; through the mental and physical phenomena, the six bases; through the six bases, impression; through impression, feeling; through feeling, craving; through craving, clinging; through clinging, the life-process; through the (kammic) life-process, rebirth; through rebirth, decay and death, sorrow, lamentation, pain, grief and despair. Thus arises this whole mass of suffering.

This suffering is completely unnecessary. The only way the conscious universe can exist is through the unfolding evolution of the passage of the generations. It is to life spanning the mortal coil in immortal fertility that redemption of suffering arises. Not the emptiness of transient phenomena.

No doer of the deeds is found, No one who ever reaps their fruits.

*Empty phenomena roll on. This only is the correct view.
No god nor Brahma can be called The maker of this wheel of life:
Empty phenomena roll on, Dependent on conditions all.*

This is fatalistic negativity. Living phenomena are NOT empty, they are ever-flowing, naturally abundant, and in them our conscious realisation becomes fulfilled in the climax resplendence of life immortal.

Buddhism is an incomplete philosophy long past its use by date. The redemption of Tibetan Buddhism lies in its predecessor, Bon shamanism. The redemption of Zen is Shinto animism. When you spend time in Japan you come to realise births and marriages are celebrated in the Shinto shrines. Buddhism is rather the domain of death.

It is the underpinning of visionary animism for the consciousness of all life that is the living core of spirituality, not Buddhism, Vedanta, Monotheism, or any other cultural or religious system of imposed order. I never realised my duty would become the "slayer" of Buddhist doctrine. I have taken solemn Tibetan Buddhist vows to the dharma, but that is paradigm change!

Ram: Opponents could argue that if Buddhism's no-self doctrine is true, what is the purpose of reproduction? If there is no birth, then no life, no bad karma, no selfish craving, no old age, no suffering, and no death. If, for sexual climaxes, one reproduces and creates new life then children have to work hard to avoid selfish craving all life to minimize suffering. If Mother Nature, through coevolution, has provided the cycle of suffering and happiness, why suffering is so bad? Opponents could also argue that without suffering, there is no happiness and life will be boring.

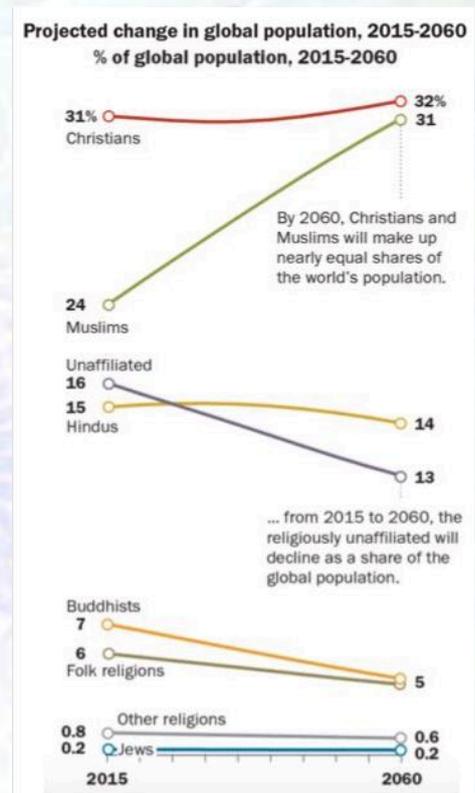
Chris: This is borne out by the fact that worldwide Buddhists are way below reproductive replacement rates at 1.5. The firebrand desert religions are breeding like rabbits, with Muslims on 2.9 and Christians on 2.6 (Pew Res 2017). Of course human overpopulation is not good for the biosphere, but tell that to the Christians and Muslims.

Fig 283: Population and religion (Pew research 2017)

But I would take this critique even further. It indicates that Buddha himself denied the significance and sacredness of life in a purely causal psychological and moral account which demotes the value of life against the notion of emptiness and constitutes a fundamental cosmological error from which there is no escape. This is why I see organismic mortality in the immortal flowering of the generations of life as the centre of the existential cyclone, with spiritual notions, even the persona of Brahman as an eternal figment of consciousness manifested in the biota through moksha. The mortal coil is where it all comes together in full physical and experiential completeness and where the universe unfolds.

Geewananda Gunawardana: As I understand, WBT, or what Buddha taught (Rahula 1959) is a way to understand reality, and it is highly compatible with science, not just neuroscience. There is one concept that science has not been able to provide an explanation. Yes, the WBT view of rebirth is very different. Without a permanent entity, what is there to be reborn or reincarnated? Rebirth (*punajjathi*) is not in WBT. The cause and effect that "connects lives" according to WBT is rebecoming (*punabbhava*). What I have not been able to understand from a science basis is a physical mechanism for rebecoming.

Chris: To understand your position on WBT it is to me of profound interest to understand the role biological life and its diversity and consciousness spread across the eucaryote kingdom means to you. You state you don't understand the mechanism of rebecoming but that to me is pivotal. Biological life is the key unique expression of sentient meaning in the universe. To survive, humanity needs to learn to appreciate the passage of the generations as a central and sacred phenomenon to have the will to protect the biosphere and ensure humanity's survival. But this also has a religious and spiritual dimension connected to the meaning of life, the universe and everything as Douglas Adams put it.



Geewananda Gunawardana: You had very relevant comments/questions pertaining to WBT. I am just as curious about WBT, and I have tried my best to respond to them. The five aggregates, [sensations (or feelings), perceptions, mental activity and] consciousness, is the mechanism by which humans become aware of their environment and respond to it to perpetuate life. It is this force to perpetuate life WBT (what Buddha taught) identifies as *tanha* (craving, thirst, desire). Therefore, WBT is about life, here and now. WBT recognizes a continuum of consciousness among all living beings including humans. Life, human or otherwise, is the most important/sacred thing, and WBT is all about getting the full use of it here and now, not in a next life. ... As life is a product of an endless chain of causes, effects, and conditions, WBT does not assign a meaning to life. To do otherwise would be to subscribe to creation or design theory. Here, the purpose does not include the individual choices we make.

Chris: I see a fundamental inconsistency between these statements. You are claiming (1) That WBT claims life is perpetuated through craving. (2) That WBT claims this life is important/sacred (3) That because life is a chain of cause and effect life has no meaning (assigned). In effect here, life is just an endless chain of craving that is there to support enlightenment where the process stops. This relegates life to a secondary status as *Maya* or illusion except as an opportunity for *moksha*. It is a matter of crucial concern in an era of planetary mass extinction.

To say assigning a meaning to life implies creationism or intelligent design is a false conclusion. Evolution displays creative adventitious idiosyncrasy. The very involvement of occasional mutation means that genuine novelty arises in ways associated with quantum indeterminacy that can't be predicted. Consciousness has the same features, which are fundamentally causality violating, so the idea of interdependent co-arising is a classical mistake Buddha hadn't anticipated. To fail to assign any meaning to life while claiming it is sacred is a tragic mistake.

Geewananda: According to WBT, consciousness is a result of biological life (five aggregates) and not the other way around. If you work back the cause-and-effect process, it becomes a vast net, in which all living beings are interconnected and interdependent. Not to mention the environment - conditions.

Chris: Yes multiple causes in a network but only as a psychological process. No reference is made to species differences, or the intrinsic core value of mutation as a source of genetic novelty because real biological and neuroscientific detail is beyond the scope of 2500 year old thinking. To say WBT is entirely compatible with science is like claiming Genesis 1 captures the essence of cosmic evolution by inventing six phases: big-bang, galaxies, stars and habitable planets, biogenesis, evolution and conscious eucaryotes to explain it.

Geewananda: They all fall within the three characteristics of life – *anicca dukkha*, *anatta*, and cause and effect.

Chris: *Aniccā* (impermanence), *dukkha* (commonly translated as "suffering", "unsatisfactory", "unease"), and *anattā* (without a lasting essence), are all fundamental negatives. To make a quick response to this, Symbiotic Existential Cosmology sees mortal life as the centre of the cyclone of reality, while eternal life and emptiness are illusions. Rather than letting go of grasping, it is more direct to accept mortality, thus realising that selfish aims are futile and giving our creative inspiration to flowering life as a whole. This ensures planetary survival and is a positive redemption transcending the negative remedy of WBT. It invokes an immortal emergent unfolding nature for transcendent consciousness as the consummation of cosmic evolution. It's fully life positive, and fully transfiguring through our ability to achieve *moksha* through symbiosis with all conscious life.

Geewananda: The problem as WBT recognizes it is that the *tanha* or life force (the urge to ensure the perpetuation of one's own DNA) renders one's mind to be selfish and overlook the wellbeing of other creatures and the environment.

Chris: But it is sexuality which heals genetic selfishness and mortality which heals not caring for the diversity of life, but investing in its flowering. We contribute only half our genes to the next generation. WBT never understood or knew this. It is only with the discovery of DNA and the intrinsic unselfishness of sexual recombination and the genotype-phenotype relationship that we can see the real network details. Independent co-arising is just a psychological network metaphor. Mortality means the only act of significance we can make are for immortal life as a whole.

Whit Blauvelt: As for your notion of Buddhists' supposed view of "egotistical grasping," the Tibetan Book of the Dead contains instructions for identifying whether a copulating couple is doing so of purest love – the preferred family to be reborn in. This hardly seems compatible with your claim as to Buddhists' view of procreation.

Chris: Any Buddhist would want to be born to a couple where grasping ego is minimised. Being born in a dysfunctional family is an unfavourable sign of your own misbehaviour in the life you are leaving. It seems you can't accept the reality that the suffering of the round of birth and death is driven by the grasping ego, not enlightenment, which enables us to see outside it in this lifetime. Even the Bardo Thodol is consistent with this.

Whit: Perhaps the search for a "characteristic doctrine" [like anattā] is more a Western scholarly comparative religion pigeon holing? If some large number of people were to suddenly become enlightened, how could that not disrupt society? Many of us are living in ways which are incompatible with enlightenment.

Chris: Enlightenment without is much more of a challenge than claimed enlightenment within. It's why turning the tables is also necessary, even if they were there to avoid Roman coins entering the Holy of Holies! Even if you treat the doctrine of emptiness and grasping rebirth metaphorically in the most favourable light, e.g. in interdependent co-arising, it leaves life itself critically vulnerable as a surrogate hostage to emptiness. This is why life and its flowering diversity are the "mothers of enlightenment". **No enlightenment that is less than symbiotic will ultimately survive.** Each religious tradition has its Achille's heel. Monotheism has destructive apocalypse. Eastern traditions subtly demote nature to psyche in a way which is equally transgressive to resplendence. Both cosmologies are naturally degenerate.

Whit: You've rediscovered something at the core of some Eastern traditions. Insisting that your way is the only way -- isn't that a flaw of every fundamentalism? Fundamentalisms may be good, to some real degree. But are they ever best?

Chris: Fundamentalism is strict adherence to a religious doctrine. SEC is empirical cosmology. Spirituality without symbiosis cannot survive as a cultural meme in evolutionary time. It will either participate in a mass extinction of life to our demise or it will be discarded by human culture as wanting. 2500 years since the sages is a drop in the ocean. I didn't say "my way is the only way" and my actual statement is true.

Whit: None has ever achieved this true vision before yourself? Isn't "symbiotic" in your usage also a metaphor, one which overlaps with the "interdependent co-arising"? Could your insight be of high value, yet not unique?

Chris: Independent co-arising is a false cosmology. It's simply a metaphor neglecting nature in favour of sentient beings that may be grasping humans from past lives. Trying to claim an inspiration is just an echo of ancient wisdom is counterproductive. The core of Symbiotic Existential Cosmology is biospheric symbiosis. The key concept of eucaryote symbiosis dates to Lynn Margulis (1967). The word dates to only the 19th century, not Buddhist doctrine.

Symbiosis (n.) 1876, as a biological term, "union for life of two different organisms based on mutually benefit,"

Whit: A fresh discovery of something which has been discovered before. It is essential that people continually freshly discover certain truths -- things which are best known directly, and not just known through the accounts of others. There are other classes of truths where second-hand knowledge will largely suffice. But there are essential matters which are best approached shamanically, as you have, rather than through the authority of priests. Even with truths discovered, and written of, many times over the centuries, there can be great value in yet more writings about them.

This is productive! Keep up the good work. Just, maybe, back off on the claim that your map is superior to all other maps. That sort of claim too often leads to wars between religions, even when the variations in their maps that each claims the superiority of has little to do with the destination arrived at by those who manage to use those maps to get to the central insights themselves.

Chris: It is not an abstract map of reality -- it's life and life only -- the weltanschauung of immortal survival.

Whit: The "full human symbiosis" of your ideal models a far more radical transformation, likely to meet strong resistance from the "immune systems" of the world's various societies. The Russian Revolution once seemed to many bright people a coherent hope against the ongoing crisis of destructive economic exploitation. The side effects of the radical treatment were worse than the disease. We're best with some humility in the solutions we proffer, as they may reveal dangerous flaws when pressed into practice by larger numbers.

Chris: Can you not see the inconsistency of claiming the symbiosis of Symbiotic Existential Cosmology was on the one hand anticipated by Buddha through interdependent co-arising and citing fundamentalism and the Russian revolution about it on the other? Symbiotic Existential Cosmology is the most pro-life and pro-survival work ever conceived. It is neither threatening nor dangerous.

I am, through Symbiotic Existential Cosmology posing a challenge, not just to science and philosophy, but to Monotheism and its description of reality as a divine creation and to the Buddhist philosophy of mental only nihilism of no-mind that sees all phenomena, both conscious and physical as illusion, and stipulates only emptiness as the solution, when the universe is overflowing with immortal climax diversity in natural abundance. I have a rightful duty as a scientific and spiritual innovator to do this. The world is in existential crisis and I have to act, but to act carefully to avoid destructive apocalypse. I have to be decisive and make an unswerving truthful account of reality as I experience and observe it. I don't and cannot submit to any previous philosophical "authority" whether Ryle or Nāgārjuna or any guru, as a naked noble savage speaking transparently, while there is still time enough to fertilise the unveiling.

It's possible for Buddhist compassion to be helpful and insightful when taken metaphorically, but Buddhist doctrine is fundamentalist in claim.

Ram: In all frameworks (including the Vedic system, SEC, IDAM, and science), death is inevitable; there is no escape from death, unfortunately. In SEC also, after moksha, we have to return back to where we came from. In science, once death embraces us, we are gone forever; the whole universe will eventually die. Why is death taken so negatively in Buddhism? Yes, if we are not born we will not face dukkha/suffering, but what is new in this hypothesis? In the Vedic system, after moksha, we as eternal atmans merge with (ie., return back to) the source Brahman. This is why whatever is happening is called "Leela"/ play. Enjoy it!

Chris: I think this statement of Ram is holding a deep insight which is key to the whole phenomenon of life and death. I'm beginning to understand from these discussions the extent to which our knowledge of Brahman or the cosmic mind is only beginning. That there is a huge significant reality out there and in here, that we are only scratching the surface of, even in all traditions put together. And like the scientific revolution, the answers are going to be confoundingly different from our expectations, so the vision quest is discovering that reality. This is a profound huge journey we have only just begun and it needs to be pursued as the root discovery process it is, without any prior doctrinal assumptions, but we need to approach it with joie de vivre – ecstasy even – and ride over the realities of suffering in the mortal coil.

Symbiotic Existential Cosmology introduces a novel element, in that the purpose, or meaning of existence, is not just enlightenment but the preservation and flowering of life immortal in a sentient universe pulling itself up by its bootstraps into a revelation of full cosmic consciousness. Humanity's role on Earth is thus the protection of life and its diversity as our "sine qua non – raison d'être". I contend this is new and is much more than just being compassionate to sentient beings. Nor is it Chardin's Christogenic "noosphere", but a real biological manifestation of conscious life immortal in the passage of the generations compensating for organismic mortality, because this is the only way cosmic consciousness can come alive in the physical universe of fermions and bosons and entropic thermodynamics, held back by the negentropy of life itself.

Whit: The origin of the word "dukkha" is of the axle whole being off center. So Buddhist practice is about getting the wheel to roll more smoothly, getting the 8 spokes into dynamic balance, into symmetry. "Dukkha" is not well-translated as "suffering." It's not about "ego." Buddhists were never Freudians. But the slight similarity is that Buddhists hold the wheel gets out of true when we see ourselves only as separated rather than also as whole with the world -- the conception of the wholeness of wholeness and separation, which of course is not unique to Buddhism.

Chris: I agree with you about the notion of dukkha and the unbalanced wheel. This means that Buddhism is three things: (1) A practical art of balancing, to enter in to psychological balance in the world of "mundane existence" amid grasping desires. (2) A quasi-scientific cosmology which is atheistic and preaches impermanent co-arising dynamics reaching toward an enlightenment free of fixed assumptions it calls "emptiness" for want of a better word. (3) The traditional Eastern cosmology of reincarnation to tie it all into a moral framework, which I believe is a false morality, although karma is real. The difficulty I see with this is that emptiness is empty and Brahman is full to overflowing and in need of further exploration and discovery.

Whit: The Dalai Lama says the concept of original sin was the hardest thing for him to understand about Christianity; there's nothing like it in Tibetan Buddhism. Christians also worship Christ's suffering on the Cross. The concept doesn't fit Buddhism; it's a translation as simple as it is wrong.

Chris: I want to explain how SEC treats sin and evil. The Western tradition tends towards a dualistic apocalyptic model of good and evil and Eastern traditions also invoke a moral causality ending in a Kali Yuga. The Western tradition pictures sin as rebellion against God's will in an extrapolated eternal cosmology in which temptation becomes literally excruciating. There is a contradiction here in that this is a uniquely human phenomenon. Intelligent animals do not experience natural evil because each species has a role in the biospheric ecology that is held together by biospheric selection across the generations, so that carnivores actually keep the herbivores in balance from boom and bust extinction and the herbivores keep the plants in balance. Even Covid is a virus, whose niche is symbiotic with bats, that was knocked off its perch by human exploitation of wildlife, and rabies and ebola are self-limiting in a diverse ecology.

In this sense the other species ARE enlightened because, often in great hardship they strive to protect and nurture their young, but Buddhist cosmology anthropocentrically sees humanity as the only intelligent species capable of full enlightenment and stepping off the wheel of life, fig 213, to no constructive outcome cosmologically.

Thus there is really no such thing as natural evil and this teaches us a lesson about what evil actually is – a product of humanity becoming a cultural phenomenon, giving rise to cultural forms of evil when the power of potentates extends far beyond looking after their offspring and involves destructive ways of domination and destructive social behaviour driven by forms of psychopathy which can survive only in a rapidly evolving cultural context. Basically pure evil, aka original sin, is a product of cultural actions which directly or indirectly predispose to the breakdown of humanity's relationship with the biosphere as a whole in forms of exploitation that indirectly risk extinction of both humanity, and the other species. We all become complicit in this, unless we dedicate our lives to protecting the diversity of life as a whole. We have no idea whether humanity can survive as a dominant species and other species may need to take over the beacon of illumination. By killing off the primates through neglect and habitat exploitation, we are killing off our own prospect of collective survival.

Whit: Please suggest a "trivial" method that a normal person can use to experience mind-world unity, short of dosing on psychedelics. It seems that most people, at least in Western culture, don't commonly experience this. Are you saying it's uncommon, yet trivial? Considering that it's generally reported as a nice state to be in, if the experience is trivially accomplished, why is it not central to our cultural practice and attitude?

Chris: My comment was about TM, not entheogens, but the long struggle of Western civilisation and sacramental religion hasn't been for naught. Psychedelics were repressed because Christian culture abhors novel heretical vision. Gnosticism regained new life during the Crusades and infected Europe and was violently suppressed. At the same time the old European Goddess, whose participants took nightshade and henbane, were burned at the stake.

In 1209, a crusade from Pope Innocent III began against the Cathars. Both Cathars and Catholics were besieged by an army of the Church within the walls of Beziers. On the day of the feast of Mary Magdalen they killed their viscount in the church dedicated to her name and were in turn horrendously punished on the same day for repeating the Albigensian heresy that she was Christ's concubine. When the city fell, the commanding general was asked who to slaughter: heretics, his men assumed, must surely be separated from believers:

"Kill them all," he said, "the Lord will know his own". Our forces spared neither rank nor sex nor age. About twenty thousand people lost their lives at the point of the sword. The destruction of the enemy was on an enormous scale. The entire city was plundered and put to the torch. Thus did divine vengeance vent its wondrous rage.

Psychedelics were banned in like style in the US and then the world from 1966, until the early 2000s when scientific research began to establish their therapeutic and transformative value on an empirical basis. This trend is continuing. Natural entheogens have been respected as sacred by every culture that has discovered them, so you talking this way is narrowly ethnocentric. My statement above remains true. I am not responsible for the sappy neurochemical brain, or the fact that the biosphere has evolved to modify it, including many of our essential medicines and the biospheric sacraments that provide an essentially trivial access to realisation when accompanied by good guidance and meditation, by comparison with repeated lifetimes in the Eastern traditions.

Regarding Buddhism, Vedanta and Psychedelics, in 1996, Tricycle the Buddhist magazine had a special Issue with the Editorial "Just say maybe" on psychedelic use. The lead article in the issue was Rick Fields' "A High History of Buddhism in America", which has since become a chapter in "Zig Zag Zen: Buddhism and Psychedelics" (Badiner & Grey A 2015).

This contains a positive view of the history of psychedelic Buddhists and Vedantists in the US and in the East. He notes: "Now, in the new century, we may be seeing a generation who has steeped themselves in practice become inspired to take another, more mature—and more penetrating—look at psychedelics."

He provides a run down of the journeys of Ram Dass and others to India meeting both Lamas and Yogis. Note that the largest dose Ram Dass's guru Karoli Baba has was 1200 mics which IS large but I have had many 1000 mic trips, so this isn't "mind boggling" and he also claimed medicines were used in the Kulu Valley, but the yogi's lost the knowledge:

Before long, a number of the psychedelic luminaries made their way to India. In 1966, Ralph Metzner introduced Timothy Leary to the German-born Lama Anagarika Govinda, who lived in Evans-Wentz's old cottage in the Himalayan village of Nanital. "The lama had been most impressed to learn that The Psychedelic Experience contained a dedication to him," Leary wrote in Flashbacks (Leary, 1983). Govinda had requested an LSD session, which Metzner provided. For the first time, after thirty years of meditation, the lama had experienced the Bardo Thödol in its living, sweating reality. According to Leary, Govinda told him that "many of the guardians of the old philosophic traditions had realized that the evolution of the human race had depended upon a restoration of unity between the outer science advanced by the West and the inner yoga advanced by the East." The teachings of Theosophy, Gurdjieff, Ramakrishna, Krishnamurti, and Evans-Wentz's translation of the Tibetan Book of the Dead had all been part of this plan. "You," the lama told Leary, "are the predictable result of a strategy that has been unfolding for over fifty years. You have done exactly what the philosophers wanted done." Presumably referring to Gerald Heard and Huxley, he said, "You were prepared discreetly by several Englishmen who were themselves agents of this process. You have been an unwitting tool of the great transformation of our age."

Ginsberg arrived in India that same year. Lately his psychedelic visions had become frightening, and he was wondering if he ought to continue. In Kalimpong he visited Dudjom Rinpoche, the great yogi-scholar who was head of the Nyingma (Ancient Ones) lineage. "I have these terrible visions, what should I do?" he asked. Dudjom Rinpoche sucked air through his mouth, a traditional Tibetan sign of sympathy, and said, "If you see anything horrible, don't cling to it; if you see anything beautiful, don't cling to it."

Leary's partner, Richard Alpert (now known as Ram Dass), reached India in 1967, "hoping to find someone who might understand more about these substances than we did in the West." When he met his guru, Neem Karoli Baba, Ram Dass gave him a hefty dose of nine hundred micrograms. "My reaction was one of shock mixed with the fascination of a social scientist, eager to see what would happen," Ram Dass wrote. "He allowed me to stay for an hour—and nothing happened. Nothing whatsoever. He just laughed at me."

Another time the old man swallowed a mind-boggling twelve hundred micrograms. "And then he asked, 'Have you got anything stronger?' I didn't. Then he said, 'These medicines were used in Kulu Valley long ago. But yogis have lost that knowledge. They were used with fasting. Nobody knows how to take them now. To take them with no effect, your mind must be firmly fixed on God. Others would be afraid to take. Many saints would not take this.' And he left it at that" (Dass, 1979).

Despite experiments by and some opposition from Roshis, psychedelics combined with the wisdom traditions did have transformative effects on awareness:

Of course, the voyage was not always necessary. In his 1967 essay "Passage to More than India," Gary Snyder wrote, "Those who do not have time or money to go to India or Japan, but who think a great deal about the wisdom traditions, have remarkable results when they take LSD. The Bhagavad Gita, the Hindu Mythologies, The Serpent Power, the Lankavatara Sutra, the Upanishads, the Hevajra Tantra, the Mahanirvana Tantra—to name a few texts—become, they say, finally clear to them. They often feel that they must radically reorganize their lives to harmonize with such insights." At times, as Snyder noted, the psychedelic experience led straight to meditation. "In several American cities," he wrote, "traditional meditation halls of both Rinzai and Soto are flourishing. Many of the newcomers turned to traditional meditation after initial acid experience. The two types of experience seem to inform each other."

It was impossible for any roshi to ignore the question of LSD and its relationship to Buddhism. Koun Yamada Roshi, Yatsutani Roshi's chief disciple in Japan, was said to have tried it only to report, "This isn't form is the same as emptiness; this is emptiness is the same as form." If Suzuki Roshi said (as Gary Snyder told Dom Aelred Graham) that "people who have started to come to the zendo from LSD experiences have shown an ability to get into good zazen very rapidly," he also said in New York (as Harold Talbott, Graham's secretary, told Snyder) "that the LSD experience was entirely distinct from Zen." In any case, it seemed that in practice, Suzuki Roshi mostly ignored it. When Mary Farkas of the First Zen Institute asked him what he thought of the "Zen-drug tie-up we kept hearing so much of," she gathered from his reply "that students who had been on drugs gradually gave them up and that highly structured and supervised activities left little opportunity and lessened inclination."

Alan Watts notes yoga or Zen giving the meditative grounding to handle psychedelics without going over or under:

Alan Watts was more sympathetic. He pointed out, to begin with, that everyone must speak for himself since so much depended on the “mental state of the person taking the chemical and circumstances under which the experiment is conducted.” In Watts’s case, these had been benign, and LSD had given him “an experience both like and unlike what I understood as the flavor of Zen.” His mind had slowed, there were subtle changes in sense perception, and most importantly, “the thinker” had become confounded so that it realized “that all so-called opposites go together in somewhat the same way as the two sides of a single coin.” This in turn had led to an experience of what the Japanese Buddhists call *ji ji-mu-ge*, the principle of universal interpretation.

But if one were not trained in yoga or Zen, warned Watts, this insight might lead one to believe either that “you are the helpless victim of everything that happens to you,” or that, like God, you are “personally responsible for everything that happened.” To go beyond this impasse, one needed either “an attitude of profound faith or letting-go to you-know-not-what.” In that case, “the rest of the experience is total delight ... what, in Buddhist terms, would be called an experience of world as *dharmadhatu*, of all things and events, however splendid or deplorable from relative points of view, as aspects of symphonic harmony, which, in its totality, is gorgeous beyond belief.”

Opinions varied from “intoxicant prohibition” to “positive exploration”:

With the advent of actual practice came Buddhist critique of the psychedelic experience. Some teachers slotted drugs into the mind-intoxicant category of the precepts. This was not really convincing for many, however, because whatever psychedelics might be, anyone who had taken them knew that “intoxicating” was a limited, reductionist description, at best. And more often than not, the Asian teachers making such pronouncements had no actual experience of psychedelics.

The few teachers who did have such experience, however, were in a uniquely privileged position to compare the two experiences. The most sympathetic of these was Trungpa Rinpoche, who had tested and tasted the splendors of Western civilization in England. He was one of the few Buddhist teachers one could talk to about such things, which many of his students—myself included—asked him about. Officially, of course, all illegal drugs were prohibited. But privately Trungpa Rinpoche had, as he told me (and here I paraphrase loosely from memory), a lot of sympathy for students who had taken LSD. He even volunteered that we might take it together sometime in the future—an opportunity or challenge that I never got to take him up on, to my regret and relief. The suggestion was both exhilarating and scary. His style and skill, after all, lay in cutting through trips of spiritual materialism rather than guiding them.

He notes that discrete use of psychedelics has been going on throughout by mature Buddhist practitioners, many of whom had previously taken psychedelics:

Such was the powerful antidrug drift. As always, however, there were countercurrents. During the seventies and up to the present, a small number of committed Buddhist practitioners have used the sacrament in the context of formal practice. This was necessarily a secret use, harking back to the earliest tantric circles in India, where unlawful and taboo substances such as meat and wine were transformed into sacraments. This group was naturally self-selecting, composed mostly of practitioners experienced in both modalities, who found that, handled properly, psychedelics can be a useful skillful means. If the practitioner has the balance and moves to surf the psychedelic waves, the argument went, then the experience can be useful in one’s *sadhana* [formal practice]. Myron J. Stolaroff, active in psychedelic research since 1960, is one of these Buddhist practitioners. “For myself,” he wrote in *Gnosis* in 1993, “I found training in Tibetan Buddhist meditation a potent adjunct to psychedelic exploration. In learning to hold my mind empty, I became aware that other levels of reality would more readily manifest. It was only in absolute stillness ... that many subtle but extremely valuable nuances of reality appeared. While I achieved this to some extent in ordinary practice, I found this effect to be greatly amplified while under the influence of a psychedelic substance. This in turn intensified my daily practice.”

He notes the Peyote ceremony which I have also attended and can confirm his observations as to its ritually meditative character. He points out the story of Buddhism and psychedelics is hardly over and the entheogenic shamans and Ayahuasca churches have a lot to teach the traditions:

The all-night Native American Church ceremony, for example, combines the discipline and mindfulness of a Zen ritual, the spontaneous song prayer of the Tantric *doha* tradition, and the compassion of the *bodhisattva*. I remember one night in a tepee in northern Montana, the clear mind of peyote glowing in the fire before the crescent-moon sand altar, the thump-thump-thump of water drum and gourd rattles keeping time with the ancient peyote songs—and it was clear as the dawning light that something close to this went on way back, possibly to the dawn of our human consciousness.

And why not into the future as well? We have much to learn from indigenous shamans. Both the Native American Church and the Brazilian ayahuasca churches have successfully grafted an ancient entheogenic practice onto Christianity. There is nothing to prevent this from happening with Buddhism as well. Indeed, Buddhism has demonstrated a genius for adapting—or mutating, in Professor Robert Thurman’s phrase—to a wide range of cultures. In Tibet, this included a shamanistic culture. Whether or not the ancient *siddhas* used mushrooms or other alchemical substances, there is no reason why an ecologically informed American Buddhism cannot likewise draw from shamanistic earth-wisdom. Sacred plant sacraments could be offered as *amrita* in the context of a tantric feast, for the development of compassion and wisdom in our ravaged world. At least for the tantric lineages of Buddhism there is no limit to the skillful means available to a *bodhisattva*, which includes many teachings on transforming poison into nectar. As unlikely as it may seem, this devil juice may be just the antidote for the out-of-control materialism that is ravaging our planet.

One thing at least seems certain. Whatever the ancient or recent past history of psychedelic entheogens and Buddhism may be, the story is hardly over. As Hajicek-Dobberstein says, "Some contemporary non-orthodox Buddhist 'alchemists' find precedents in Mahasiddhas Nagarjuna and Aryadeva, who agreed, 'We need to eat the alchemical medicine'... Orthodox scholars may object but they can no longer 'Just Say No'".

Ram: Self-grasping (Skt. ātmagrāh) — often translated as 'ego'. Sogyal Rinpoche writes[1]: "[...] Ego [...] is the absence of true knowledge of who we really are, together with its result: a doomed clutching on, at all costs, to a cobbled together and makeshift image of ourselves, an inevitably chameleon charlatan self that keeps changing and has to, to keep alive the fiction of its existence. This is what is known as the 'ego' or dak dzin in Tibetan, which means 'grasping at a self'. Ego is defined as incessant movements of grasping at a delusory notion of 'I' and 'mine', self and other, and all the concepts, ideas, desires, and activity that sustain this false construction."

I don't see why rebirth is due to self-grasping. Let us suppose self-as-subject (atman) is eternal as the Vedic system hypothesizes. In that case, I will try my best to do good karma to avoid suffering/dukkha in the current birth and reduce a load of bad karma for future births and then enjoy life after death because of my good karma as per Sankhya. Then reincarnate in a good family as a reward of my good karma. This birth-death cycle will continue until I get moksha.

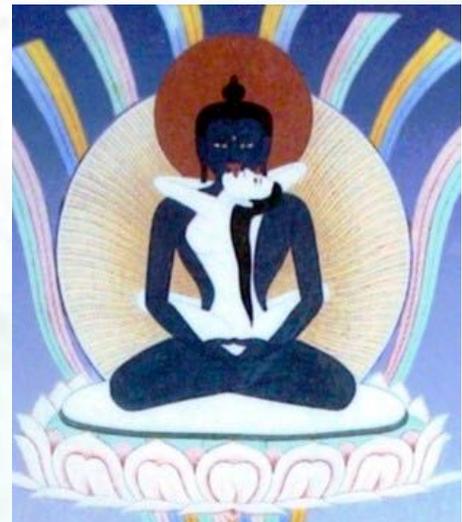
Chris: Ego doesn't arise from grasping at an illusory self. It arises from grasping at fame, fortune, power and other illusory achievements like massive publication lists, rather than paradigm shifting insights. Ego is a real evolutionary survival process in which the self is in an attempt to immortalise itself as long as possible against environmental or social threats, and to gain power over arbitrary twists of fate. This becomes compounded in culture on a scale that exceeds animals caring for their young and becomes tales of potentates vying for cultural ascendancy.

Sogyal is just doing what expounders of the doctrine have to do to rationalise the emptiness of emptiness. They have to make a subtle shift of the frame of reference to make the doctrine seem real, while everything else is in flux, so they turn it into ego not being for survival but false grasping at the illusory self. No one actually suffers from this malady. The self is no more an illusion than external perceptions of reality. It is the inner complement to the universe which gives us our identity and agency to survive in the world. Buddhism also negates both identity and agency by saying nothing has inherent existence but that yet again is a doctrinal device to make an inconsistent view appear consistent.

Sogyal Rinpoche is an expounder of Dzogchen (Skt. Atiyoga; Tib. རྫོགས་པ་ལྷན་པོ་) — the 'Great Perfection', or 'Great Completeness'. The practice of Dzogchen is the most ancient and direct stream of wisdom within the Buddhist tradition of Tibet, realising Nirvana through visualisation. It is shared by the Ningmapa trait of my lama, Yeshe Dorje who had a Tibetan wife and seven children in Macleod Gang, but went to the US and had an American partner. Sogyal Rinpoche describes it as "the heart-essence of all spiritual paths and the summit of an individual's spiritual evolution".

However Sogyal Rinpoche had to **resign in disgrace** for sexually and physically abusing his followers and died shortly after. If you glance at the image of the perfect Buddha Samantabhadra, draped with the passive figure of his sexual consort Samantabhadri, you might understand why this happened.

Fig 284: Samantabhadra the primal Buddha, draped with the passive figure of his sexual consort Samantabhadri.



Nevertheless his followers claim he duly entered full Nirvana:

After forty years as Spiritual Director of Rigpa, Sogyal Rinpoche stepped down following accusations of misconduct from former students. Sogyal Rinpoche passed into parinirvana in Thailand on 28 August 2019. He remained in the state of thukdam for three consecutive days.

This provides the closest correspondence with Vedic moksha and with entheogenic moksha for its enlightenment in natural existence:

The practice is to realise buddha nature, which has been present in our nature since the very beginning. The practice is simply to realise the radiance, the natural expression of wisdom, which is beyond all intellectual concepts. It is the true realisation of the Absolute Nature just as it is, the ultimate fruition. At the present moment our awareness is entangled within our mind, completely enveloped and obscured by mental activity. Through the practice of Trekchö, or 'cutting through all attachment', and the 'direct realization' of Tögal, one can unmask this awareness and let its radiance arise. To accomplish this it is necessary to do the practice of 'the four ways of leaving things in their natural simplicity' and through these, to acquire perfect stability in the Trekchö practice. Then will come the 'four visions of tögal' which are the natural arising of visions of discs and rays of light, deities and buddha fields. These visions are naturally ready to arise from within the central channel that joins the heart to the eyes. Such an arising from this channel will appear in a gradual process. In the same way that the waxing moon will increase from the first to the fifteenth of the month, these visions will gradually increase—from the simple perception of dots of light to the full array of the vast expanse of the sambhogakaya buddha fields. The manifestation of space and awareness will thus reach its culminating point. These experiences are not linked with consciousness or intellect as the former experiences were; they are a true manifestation or radiance of awareness. After this, in the same way that the moon decreases and disappears from the fifteenth to the thirtieth of the month, all of these experiences and visions, all phenomena, will gradually come to exhaustion and reabsorb themselves in the Absolute. At this time the deluded mind which conceives subject and object will disappear, and the primal wisdom, which is beyond intellect, will gradually expand. Eventually one will attain the perfect enlightenment of the Primordial Buddha, Samantabhadra, endowed with the six extraordinary features. This is the path intended for people of superior faculties who can achieve enlightenment in this very lifetime. For those of medium faculties, there is instruction on how to achieve liberation within the 'Bardo' or 'intermediate state'. When we say 'Bardo', in fact we recognise four bardos: the Bardo from conception to death; the Bardo of the moment of death; the Bardo of the Absolute Nature; and the Bardo of coming into the next existence.

Although claiming this is realisation of the Absolute Nature just as it is, this is a very complex demanding puja to fulfil and conjures up a vision of a very Buddhist reality, invoking the attainment of Nirvana. It is very different from an entheogenic vision because it is imposing a ritual visualisation defining the entire experience. It's really hard to say whether this claimed rebirth process is driven by Maya alone, or by the cosmic wheel of "karma", but the very prescriptive detail in the practice raises questions as to whether this description is genuine ultimate reality or just another Buddhist concept of purity, as illustrated in fig 195

Existence at the Edge of Chaos

*Truth is dynamic.
Permanence is illusion.
Emptiness is Maya.
Life is Enlightenment!*

My "haiku" is about the sacredness of life, in the shadow of [Hui Neng](#). The haiku is karmic. It's as much from our conversation as it is from me. I was confronted by your advancing Nāgārjuna's emptiness doctrine on the 26th and I had already quoted Hui Neng on the 24th, so the heat was on to turn the tables on the establishment. Jesus was a chaos messiah turning the tables on preconceived reality. To transform the paradigm you have to take the complementary route, even if it involves controversy. I stand by it because I have said it truly. It is turning Buddhist philosophy of Nāgārjuna inside out and is an intentional rejection of four key Buddhist doctrines in favour of life itself.

If we conceive of a sentient universe in which emptiness and renunciation, or God's will, are the road to enlightenment, we are violating a sacred principle. Life exists and flowers at the edge of chaos. Each of us is alive because ALL our ancestors saw fit to strive for the fulfilment of life across the passage of the generations for three and a half billion years, more than a quarter of the life of the universe. All animal species struggle to make a huge investment in rearing their offspring, even under severe adversity, starvation or predation, so that their inheritance of life can continue to flower. For humans to say this world is all an illusion and that an imaginary state of emptiness, or a jewelled eternal heaven spawned by an imaginary god is supreme is outright suicidal folly. Combining it with dominance over nature is a terminal death wish.

(1) Truth is dynamic: Truth is simply "good faith". There is absolutely nothing in the definition of truth to justify the claim that it is absolute and unchanging. All real truths arise contextually from their evolving circumstances. Static truths are tautologies.

truth (n.) Old English *triewð* (West Saxon), *treowð* (Mercian) "faith, faithfulness, fidelity, loyalty; veracity, quality of being true; pledge, covenant," from Proto-Germanic *treuwaz* "having or characterized by good faith," from PIE **drew-o-*, a suffixed form of the root **deru-* "be firm, solid, steadfast." Sense of "something that is true" is first recorded mid-14c. Meaning "accuracy, correctness" is from 1560s. English and most other IE languages do not have a primary verb for "speak the truth," as a contrast to lie (v.).

(2) Permanence is illusion: In the temporal physical universe nothing is permanent, because time is elapsing. Quantum theories all take place within space-time. Even in general relativity space-time is moulded by gravity. Biological life is continually evolving into new unconceived forms. The conscious universe is unfolding and flowering in ways we cannot anticipate. Consciousness is itself creative and innovative, never static. Moksha is itself dynamic – a transformational satori epiphany. To say there is no meaning of impermanence without permanence is incorrect. Permanence is a concept which does not actually exist.

Satcitananda (Sanskrit: सच्चिदानन्द) is an epithet and description for the subjective experience of the ultimate unchanging reality, called Brahman. It represents "existence, consciousness, and bliss" (Raju 2013 228), *The Philosophical Traditions of India*, Routledge, p. 228) or "truth, consciousness, bliss". (Murty 2002 303).

Let's pivot on this because here is the nub of permanence: (1) Is ultimate reality permanent? (2) Is existence truth? I suspect both of these are undecidable, and Symbiotic Existential Cosmology treats ultimate reality as emergent.

(3) Emptiness is Maya: Emptiness does not exist. It is a concept that is not viable. Even the quantum vacuum is seething with every conceivable particle out of the big bang coming into and going out of existence. Consciousness is never empty or we call it unconscious. What use is unconscious moksha? Emptiness only has relative meaning to that which contains it. Otherwise it is void – non-existent, but that also means empty, so is itself relative.

void (adj.) c. 1300, "unoccupied, vacant," from Anglo-French and Old French *voide, viude* "empty, vast, wide, hollow, waste, uncultivated, fallow," as a noun, "opening, hole; loss," from Latin *vacivos* "unoccupied, vacant," related to *vacare* "be empty," from PIE **wak-*, extended form of root **eue-* "to leave, abandon, give out."

Therefore the entire notion of emptiness is an illusion. Maya is real, diverse, transformative flowering and unfolding. She is Shakti unleashed. To forsake the real for an imaginary realm of emptiness is a tragic error, denying life as it exists in favour of a fantasy. In fact it is the biggest most addictive deception of all – grasping for that which cannot be grasped, but only submitted to.

(4) Life is enlightenment: This is the ultimate remedy to the mortal coil. We can't take the things we grasp for with us, so regenerative compassion for immortal life as a whole is the only viable remedy. To imagine that enlightenment takes many lifetimes in a fictitious round of reincarnation where genetic realities are ignored and two-toed sloths and become crocodiles or humans is gross and foolish. So is the conflagration of life in the Revelation.

You suggested it was qualified by "conventional mind-dependent reality (cMDR)". This is NOT the case and I will explain why. I said: "I AM original source, transient in the dance of Maya, as Shankar courting Shakti. My transient mortality IS the dance of unfolding of life immortal". You responded with: "Yes, at cosmic level, "I" at dual-aspect moksha state ~ dual-aspect Brahman ~ dual-aspect Shiva-Shakti, there is no individual self because it is merged with the original source dual-aspect substrate after moksha/liberation". This is not the case! It is not dual aspect at all. This is a fantasy of cosmological housekeeping in the face of the dynamic truth of conscious life immortal.

When I made the above statement, it was not metaphorical, or philosophical, but a direct experiential affirmation in the first person. I'll try to explain this. Primal subjectivity is the germ, but it is seamlessly compliant with the physical boundary conditions, so in everyday perceptual life, it is compliant only with organismic ego consciousness modulated by natural compassion, but when one meditates deeply while on entheogens, one undergoes a transformation into a non-ordinary reality that takes the form of a trip, where the doors of perception are flung open and experience can become asymptotic to a form closer to cosmic consciousness not bound by the organism. This changes one's persona, like travelling to a foreign country, and carnal knowledge and opens the mind to ultimate reality. Afterwards things are changed and the germ of primal subjectivity now resonates with a new existential condition that never fully goes away. So I am perfectly sane and my mind remains lethally sharp, but ultimate reality travels with me everywhere I go. If I stepped back from this to concede any previous doctrine at face value, it would be hearsay abandoning the covenant. Thus when Buddha became enlightened, an irreversible transformation occurred, in which knowing or gnosis changed the nature of reality for him and ultimately for us.

In what you call cMDR, the germinal subjectivity has organismic boundary conditions that prevent it from seamlessly merging with enlightenment, but after moksha, the perspective changes, so we can still be organismically egotistical, obdurate even, but underneath, the germinal subjectivity has made contact with the totality beyond and is now

unleashed in the way we think of apocalypse as the complete “unveiling” of Maya into enlightenment. One can't really go back from this. Ramakrishna could barely sit down at Dakshineswa.

You are attempting to quote Buddhist philosophy to qualify and limit a direct visionary account. When the Brihadaranyaka says “I am He” it is a statement in the first person of ultimate reality within. It is NOT dual-aspect. In the same way, Moses gazing on the vision of the burning bush said his apotheosis was simply “I-Am”. This is germinal subjectivity immediately becoming aware of our cosmic consciousness no longer veiled by cMDR. In the same way Paul of Tarsus said “For now we see through a glass, darkly, but then face to face: now I know in part; but then shall I know even as also I am known.” Although I reject Paul’s teaching, his vision of the naked transparency and immediacy of cosmic consciousness “face to face” is telling and accurate.

Alex Hankey: Ram, Nagarjuna caused endless difficulties in endless ways, because he aimed to totally differentiate Buddhism from Vedic culture. But Buddha learned all his spiritual concepts at the feet of a Vedic Guru, and used Ayurveda when medicine was needed - the famous Jivaka was his Vaidya. Buddhism as taught by Siddhartha Gautama has to contain a concept equivalent to Ahankara - there is no choice. Of course, The Eightfold Path may have carried His Disciples quicker along the Moksha Marga than those of His Contemporary Gurus. BUT what he learned in Bodha Gaya was pure Vedic Wisdom, Nitya Gyana.

Ram: In my view, Buddhism was designed for reducing sufferings in our mundane lives. So that we can have happier living in current life. For this purpose, Buddha proposed 4 noble truths and 8 noble path with 12 links that cause suffering. If we are able to break the chain of 12 links thru 8 noble paths, sufferings will be reduced.

mundane (adj.) mid-15c., *mondeine*, “of this world, worldly, terrestrial,” from Old French *mondain* “of this world, worldly, earthly, secular;” also “pure, clean; noble, generous” (12c.) and directly from Late Latin *mundanus* “belonging to the world” (as distinct from the Church), in classical Latin “a citizen of the world, cosmopolite,” from *mundus* “universe, world,” which is identical to *mundus* “clean, elegant,” but the exact connection is uncertain and the etymology is unknown. The English word's extended sense of “dull, uninteresting” is attested by 1850.

Chris: We don't need any of this. Mundane lives are not boring, they are “of the universe”, so Buddhist enlightenment is escaping the universe into a fictitious heavenly emptiness, as the Buddhist wheel of life, fig 213 implies. If we are honest with ourselves, we are mortal human organisms and all of us will die. Therefore we can only gain meaning by giving back our life's work to the benefit of life as a whole. There is simply no need to repress, negate or philosophically deprecate the ego, which is a protective feature of consciousness to aid survival. Religions with hungering for eternal life or reincarnation and rebirth make this difficult or impossible to achieve because they create unrealisable longing.

Of the three religions that embraced the notion of reincarnation, Vedanta, Jains and Buddhists, we have the following: In Hindu philosophy, moksha is the union of or the realisation of the identity of Atman with Brahman, depending on the Hindu tradition. In Jainism, nirvana is also the soteriological goal, representing the release of a soul from karmic bondage and samsara. In the Buddhist context, nirvana refers to realisation of non-self and emptiness, marking the end of rebirth by stilling the fires that keep the process of rebirth going.

Jains deal with karma as eternal conscious souls. Enlightenment doesn't mean exit from the round of birth and death into sheer emptiness defeating the meaning of life itself. According to Jainism, the existence of “a bound and ever changing soul” is a self-evident truth, an axiom which does not need to be proven. Bad karma has negative effects but good karma is transformative. The perfect enlightened souls with a body are called *Arihants* (victors). Only a soul with human body can attain enlightenment and liberation. The liberated beings are the supreme beings and are worshipped by all heavenly, earthly and hellish beings who aspire to attain liberation themselves.

Vedanta is the “royal route”, which, as we know, accepts the reality of the self and the ability of the individual to achieve moksha in which the self or atman can achieve unity with ultimate reality Brahman also conceived in the persona of the godhead Īśvara / Īśvarī, so Vedanta allows a continuity between atheistic reality and polytheism. Some Indian traditions have emphasised liberation on concrete, ethical action within the world. This liberation is an epistemological transformation that permits one to see the truth and reality behind the fog of ignorance. Because moksha is attaining unity with Brahman, enlightenment is a constructive fulfilment. Moksha has been defined not merely as absence of suffering and release from bondage to saṃsāra. Various schools of Hinduism also explain the

concept as presence of the state of *paripurna-brahmanubhava* (the experience of oneness with Brahman, the One Supreme Self), a state of knowledge, peace and bliss.

Buddhism short circuits the spiritual complexity by advancing an atheistic psychological philosophy, in which rebirth is driven by the grasping ego and release lies in pure emptiness ending the reincarnation cycle. Theism is denied, as there is no deity, and the self is denied in favour of emptiness. Nirvana (nibbana) literally means "blowing out" or "quenching". It is the most used as well as the earliest term to describe the soteriological goal in Buddhism: release from the cycle of rebirth (saṃsāra). Nirvana is part of the Third Truth on "cessation of dukkha" in the Four Noble Truths doctrine of Buddhism. It is the goal of the Noble Eightfold Path. The Buddha is believed in the Buddhist scholastic tradition to have realised two types of nirvana, one at enlightenment, and another at his death. In the Buddhist tradition, nirvana is described as the extinguishing of the fires that cause rebirths and associated suffering. The Buddhist texts identify these "three fires" or "three poisons" as *raga* (greed, sensuality), *dvesha* (aversion, hate) and *avidyā* or *moha* (ignorance, delusion). The state of nirvana is also described in Buddhism as cessation of all afflictions, cessation of all actions, cessation of rebirths and suffering that are a consequence of afflictions and actions.

One also needs to note that interdependent co-arising is not an original idea. Centuries before Buddhism, the second main principle of Jainism is *anekāntavāda*, the doctrine of many-sidedness from *anekānta* ("many-sidedness") and *vada* ("doctrine"). The doctrine states that truth and reality are complex and always have multiple aspects.

Jainism also enunciated Taoism's central tenet "The way that can be told is not the countless way": Stating that reality can be experienced, but cannot be fully expressed with language. It suggests that human attempts to communicate are Naya, "partial expression of the truth".

So, in summary, Buddhism is NOT the antidote to dukkha. The doctrine of reincarnation is NOT a fact of life either, but of the three traditions, Jainism preserves the sanctity of the soul as a voyager through eternal time, Vedanta preserves the sacredness of the self, which in moksha can become one with ultimate eternal reality in Brahman which is also identifiable in theistic personae as the godhead, but Buddhism offers only practical psychological advice, in which nirvana is emptiness and is achieved only by escape from the entire life process.

Of the three, Jainism and Vedanta retain cosmic forms of spirituality but Buddhism denies it, dealing only with suppressing the negative aspects of the ego. By contrast, Symbiotic Existential Cosmology rejects both reincarnation and creation cosmologies and makes conscious life itself the sacred process, accepting both consciously spiritual and physical existence, realised in visionary experience and the Vedic principle of moksha, in which the individual self or soul achieves union with cosmic reality, invested in the passage of the generations of life rather than immortal individual souls or an omnipotent godhead.

Ram: When egg and sperm interact, initially there is no sex; sex appears, later on, depending on hormones and chromosomes; if testosterone is dominant and X-Y chromosome then male, otherwise female; both are the same species, human.

Chris: This is biologically incorrect. The sperm either has an X or a Y, so fertilisation is male determining sexual, with the eggs all single X. If the sperm has an X we get an XX girl otherwise an XY boy. Sex is not determined by testosterone, but by the SRY gene on the Y chromosome. So saying there is no sex at fertilisation is false. Furthermore fertilisation, ever since the metazoa emerged, has been sexually symmetry-broken between a large enveloping egg and small particulate sperm, because the original isogametes caused mitochondrial genetic warfare that destroyed 90% of the photosynthetic plastids of the fertilised embryo. This leads to manifest polarities in reproductive strategy between men and women, who, like all mammals give an often difficult birth to live young.

Ram: Both [men and women] are the same species, human. In this sense, both are equivalent; in work/job also they are equivalent; they have equal rights.

Chris: The sexes are NOT equivalent. The women bear the brunt of the vast majority of parenting in mammals and in humans too. Male mammals reproduce by spreading wild oats and females delivering live young do it by parenting. For you to claim there are no intrinsic differences is an unscientific defence of Buddhism. No they clearly don't have equivalent rights socially or religiously. Women are subjected to rape, chaperoning, bride burning, stoning for adultery while the men are often just whipped, female genital mutilation, , killing the girl child in favour of boys, forced to wear

the veil. In Iran today a news item reports school girls are being poisoned with organophosphate herbicides as punishment for the hijab protests in which hundreds have been killed and girls and women sexually abused.

If stopping the internal dialogue, as [Carlos Castaneda](#) (1968) also said, is central to enlightenment, so is stopping the doctrine of 8 spokes ⁹⁶ and letting the wheel of karma be naturally out of balance enough for life to enter into the equation.

In a sense, the three reincarnation traditions Jains, Vedantists and Buddhists did one kind and astute favour to life by recognising all animals as conscious. Darwin did the same for all life from the polyps up, having free will, although it is scarcely recognised by neural network neuroscientists and physicalist biologists.

The telling tale is what each tradition actually did with the question of life itself and that's the bane of going beyond good advice about "mundane existence" into the centre of the cyclone of reality. Jains treat all conscious beings as eternal souls on an endless journey of discovery, so life remains sacred. Vedantists do the same collectively in Brahman as the ultimate reality realised in moksha that "powers" life itself. But Buddha, in denying the reality of ultimate reality brought the living universe into a state of Maya, in which the crowning goal is to exit life as the realm of mundane illusion.

I believe we all, and particularly Buddhists need to recognise the fallacy in this. All the great scientific paradigm changes were founded by creative geniuses who also made mistakes. Newton, who more than any other is associated with the mechanistic universe, spent his days trying to predict the exact time of the second coming. The same with all our existing religious traditions. Jesus was flawed for allowing a brilliant set of gnostic insights which bridged the extant traditions to result in his crucifixion and the ensuing two millennia of violence. Muhammad likewise has a history of genocide of the Jews of Medina. Buddha can be forgiven for his very elegant practical psychological advice in the face of the more extreme Polytheistic excesses of Hinduism, but of the three traditions, despite the sudden awakening of satori in a cherry blossom, Buddhism has committed the birth of new life to the round of suffering unfairly.

The first step of redemption is allowing Buddha to have made an error of cosmology and to accept it qualifies the tradition, by admitting the overflowing joie de vivre of life as the very core of existence, not Maya, or at least if you like accepting Maya, as the Shakti that all Buddhist tantras of Yab-yum point to.

Hence my reply to Ram that human fertilisation IS also sexual and the twain cannot be so extricated into androgynous neutrality.

*True knowledge is that which flowers the diversity of life in conscious climax.
One experiences moksha, but that's just the inspiration, not the redemption.
The dharma and sadhana are to life itself.*

Ram: The **Vedic-Moksha** (VM) in non-interactive dualism-based Sankhya is the disconnection of jivatman [self-as-subject (SaS), passive invariant self (PIS), part of Individual Purusha] from all three bodies (sthula/gross-physical, sukshma/subtle/astral, and karan/subtler/causal). In other words, after our physical death, astral death, and causal death i.e., after the nullification of karma, the jivatman becomes totally free from Prakriti, then jivatman becomes atman (which then merges with cosmic Purusha/Brahman) after attaining moksha state. In the moksha state, jivatman becomes atman, which is called the transcendence of jivatman to atman (pure consciousness). Subjectively, yogis/mystics experience unity (subject-object unification) at nirvikalpa samadhi with 100% disconnect from physical brain-body.

The psychedelic-herb-Moksha (PHM), in SEC/ICAM (interactive complementary aspect monism), is the subjective experience (SE) of unity after ingestion of psychedelic herbs such as psychedelic-herb mushrooms.

Chris: Moksha is a major term spanning cultures which has to do with transcendent revelation which frees subjective consciousness from entrapment in the round of birth and death.

⁹⁶ Right View, Right Resolve, Right Speech, Right Action, Right Livelihood, Right Effort, Right Mindfulness, and Right Concentration.

Moksha (Sanskrit: मोक्ष, mokṣa), also called vimoksha, vimukti and mukti, is a term in Hinduism, Buddhism, Jainism and Sikhism for various forms of emancipation, enlightenment, liberation, and release. In its soteriological and eschatological senses, it refers to freedom from saṃsāra, the cycle of death and rebirth. In its epistemological and psychological senses, moksha is freedom from ignorance: self-realization, self-actualization and self-knowledge.

Soteriology denotes beliefs and doctrines concerning salvation in any specific religion, as well as the study of the subject. The idea of saving or delivering from some dire situation logically implies that humankind, as a whole or in part, is in such a situation.

Eschatology is the part of theology concerned with the end of days – death, judgement, and the final destiny of the soul and of humankind.

Epistemology is the theory of knowledge, especially with regard to its methods, validity, and scope, and the distinction between justified belief and opinion.

Psychology: Psychology ex 1650s, "the study of the soul," from Modern Latin psychologia, from Latinized form of Greek psychē "breath, spirit, soul"+ logia "study of". In modern use: (1) The scientific study of the human mind and its functions, especially those affecting behaviour in a given context. (2) The mental characteristics or attitude of a person or group.

Symbiotic Existential Cosmology is pivotal on all of these. It is not just for individual enlightenment but **has a remedy for world salvation**, it deals centrally with **the end of days and avoiding a Fermi extinction** and it carefully distinguishes legitimate knowledge from religious spiritual or materialistic beliefs and opinions. It is also **psychologically transformative**.

Moksha has a broad understandable meaning in terms of the meaning of life itself, which could be interpreted in various ways:

- (1) That moksha attains Buddhahood thus freeing the Buddha from the round of reincarnation, but then we have only emptiness as the outcome, so what does Buddha then do?
- (2) That moksha attains unity between atman and Brahman and becomes unified with the cosmic consciousness of Brahman. Then what does he do with it now?
- (3) That moksha attains unity with the diversity of life, enabling the subject to become freed from the existential paradox of mortality in unity with life immortal. He then commits to Brahman's advice in a covenant to reflower life immortal in the unfolding conscious universe.

You have effectively devalued psychedelic moksha as merely "the subjective experience (SE) of unity after ingestion of psychedelic herbs such as psychedelic-herb mushrooms" when the experience was specifically a meeting with, and merging with, Brahman as cosmic consciousness, which also addressed in specific detail the actual remedy to the round of birth and death, in realising humanity's relationship with life immortally evolving, rather than humanity precipitating a Fermi crisis of survival. This is a scientific and religious revolution towards immortality in the mortal coil.

At the opposite extreme you have described Vedic-moksha as an extremely metaphysically detailed series of "disconnections" of self as subject from all three of physical, astral and causal. I think this is an unreal claim even if it is Vedic and simply highlights the error of running away with spiritual descriptions which have no real meaning in terms of subjective experience at all. Your description of the Vedic moksha turns this all on its head, slicing through the cosmos with multiple disconnections of reality, which have no connection with life or real existence.

Siegfried Bleher: Sutra II.12 in Patanjali's Yoga Sutra designates the klesas ('causes of affliction' which are five in number—different lists in other texts—the most significant of which is not recognizing one's true nature; ego; attachment; aversion, clinging to life) as the root of the action deposit, the fruition of which may be seen in this lifetime or another. In other words, it is not even the action itself that creates a subliminal trait that eventually ripens to impel further action, but rather the presence of a cause of affliction during an action that leads to storage of a subliminal impulse: action in the absence of any of the causes of affliction leaves no deposit.

And this text is referring purely to reinforcing/weakening and rearing of impulses in individuals; it does not refer to 'return of actions'—we always have the choice whether to act on such an impulse or not; nor does it account for experiences we all get caught up in that are influenced or caused by others—our part in such moments may only be in how we respond to our circumstances; and that is what the law of karma primarily deals with (as I understand this text). The only part of the law of karma that seems to make it into broader awareness focuses on actions, but this text, at least, refers to actions as secondary in importance to their roots—the impulses and habits we typically act on (samskaras and vasanas).

Chris: I like Patanjali, for his respect for the herbs, but this is too much baggage to take on. To accept your account of Patanjali at face value, we end up with a huge raft of reincarnation doctrine to support it, for which there is no convincing evidence that would remotely hold up in a court of law, let alone in true honesty to our own redemption and illumination. The baggage itself is in biological and cosmological error. This simply isn't the way the universe rises to living conscious climax. It's the progenitor of the Kali Yuga and the Samvartakalpa i.e. cosmologically degenerate.

None of us know, when we walk to the supermarket whether we will get hit by a car crossing the road. None of us know what symptoms are suddenly going to appear at the age of 78. My brother just found he has stage four cancer. Life is rough justice many of us meet misfortune no past life has engendered. Life HAS to be this way for diversity to exist. We have a fleeting time in this life to reach moksha. If we can't move beyond these notions we will get nowhere. Karma is not moral, it's the way uncertainty manifests in the universe, then mystified by Eastern religions. Natural sin does not exist. It's the way things have to be for life to rise to climax diversity, plants and animals, carnivores and herbivores, parasites and prey and so for conscious sentient beings to emerge. Fire and flood are features of nature. Environmental uncertainty arises ultimately from quantum uncertainty. Neither is uncertainty random, but is a law unto itself in the quantum entanglement, that appears ergodic.

I take particular exception to the use of "clinging to life" as bad karma. Life is sine qua non the key to existence. Any philosophy which deprecates reverence for life as a disposable delusion is a tragic cosmology. In the Western tradition, scientifically minded people can assess the Sabbatical Creation of Genesis as merely quaint allegory, which forms the Earth and plants before the solar system and the birds before the land creatures. We don't have to take it literally. The same has to go for Eastern mystification doctrines.

We need to treat life with due respect and not, in the third millennium, go on treating reincarnation and moral karma, as valid and true, whether by act or by affliction. The entire concept of renunciation of life is abhorrent to the survival of life. We shouldn't be espousing notions that we know are inconsistent with reality and with the ability and striving of life to survive immortal against the odds. I know and accept I am a mortal human being in the centre of the cyclone of reality because any etherial realm is a fantasy, as is the quest for eternal life. Brahman told me this and it is utterly true. The mortal compassionate love of life is the antidote to clinging and craving, not renunciation of desires. Desire for life is the most altruistic thing we can know and do. It begets genuine immortality not fake eternity, and it transcends any other type of action and heals all affliction.

Ram: What is a Fermi crisis of survival? Please elaborate on it.

Chris: The Fermi paradox is why can't we see no life elsewhere in the universe when it seems extremely probable given the astronomical number of galaxies stars and planets in the universe? A Fermi paradox self-extinction by human exploitative misadventure of the planetary biosphere is an example of the idea that intelligent societies are unstable and prone to self-destruct. The Western religious tradition revolves around apocalyptic crisis in the end of days. Rather than a complete destruction, Symbiotic Existential Cosmology is the remedy that alleviates destructive apocalypse by reflowering the tree of life.

Ram: The major problem is this: is the self a process or an entity? Does it survive death?

Chris: The self is both a process and entity in complementary relationship. The default network and the limbic system are evolved characteristics to ensure the process of self-consciousness retains functional stability for the survival of the organism unless external behavioural or biochemical processes intervene, including meditation, sensory deprivation and psychedelic states. Yes they are processes, in this sense but they are also entities which give us our sense of identity as "I", although they are consciously generated as "stable evolved hallucinations".

The intrinsic difficulty with all philosophical frameworks is not that they are difficult to understand, but the processes arrived at are neither empirical nor natural but part of logical discourse that leads to disjunctive contradictions like your use of process versus entity. They are brittle, conjectural, hypothetical and lack empirical validity.

Hard physical materialists contend that all 1pp experiences and reports are invalid because they only accept one form of empiricism involving statistically reported observations, involving high sigma 3pp experiments, but the principle of empiricism is correct to both 1pp experienced and 3pp observed investigations. Philosophical systems are deficient, through deprecating the principle of empiricism – the ultimate reality check of nature. This is spelt out by the contrast

between Symbiotic Existential Cosmology, which is an empirical cosmology and IDAM which is a philosophical framework.

I reject pure physicalist schemas, as self-fulfilling beliefs of their own. Hard core physicalism is a belief, based on promissory materialism on the assumption that solving easy mechanistic problems can proceed to unveil the ultimate mysteries because optimism from scientific and technological advances has created a bootstrap belief in the inevitability of exhaustive scientific discovery. This is a fallacy manifest in the ever diminishing proportion of groundbreaking scientific discoveries to exponentially increasing meticulous run-of-the-mill additions to known areas (Park, Leahey & Funk 2022) fig 70b. By contrast, groundbreaking insights are becoming monotonically rarer.

But we are dealing with the ultimate challenge to science. Subjective consciousness vs the physical brain and universe is the cosmological Mariana Trench of the discovery process and attempting to apply it the way pure materialists do is doomed to failure because the problems of affirming the hypothesis of causal closure of the physical universe is uncomputable, and undecidable and the hard problem of subjectivity is physically inescapable.

Ram: You wrote "The self is both a process and entity in complementary relationship." Please elaborate further. By self as entity, I meant eternal atman, which survives death. But brain processes die after brain death.

Chris: The self is a dynamical process stabilised by evolution as a key strategic component of the way an organism relates to the world. Emotions and the limbic system play a key role because they are feelings we experience that are strategically placed to result in characteristic defensive, aggressive and responsive modes, from fear and anger through remorse, disgust, hatred and contempt to amity, affection and love. These are all directed from the "self" to the "world" maintaining our self-polarisation. We recognise these modes in others and call it egotism, but frequently remain oblivious to them in ourselves. But these can become decoupled, so that self and other dissolve and oceanic states of meditation, contemplation, samadhi bliss can occur, through at the other extreme to complete alienation and depersonalisation – heaven and hell in purgatory!.

So the self is an elusive constellation of moody states that orient the complementation between our ongoing sense of identity and the vagaries and opportunities of the wild world around us. They are hallucinations in the sense that all conscious experiences are not just simulations but veridical representations in their own right of existence, without which the experiential universe cannot exist. Even the most hard core physicalists cannot seriously deny subjective conscious experience is the only reality they know, despite their obsession with 3pp five sigma stats.

No one knows and has ever known whether the atman is eternal. It's a wishful notion that is not well formulated. Time itself is an illusion. Not only is something eternal unchanging but it is constitutionally incapable of change. The only recourse a photon has for its status once created, is absorbing annihilation, so why would you seek eternal life?

What we do know about the atman-Brahman is that the near death experience is commonly perceived as a telepathic identity between our organismic self and an abstract archetypal cosmic self which seems to be forever, just as our consciousness is not our own possession, but flows through us in the eternal present, or more precisely the quantum of the present, although we know it goes somewhere else every night we sleep and got wrapped up in the arms of Morpheus like blue and orange paints stirred in a pot until they just become a forgetful greyness, until we wake, thinking we were in Egypt walking by a temple on the Nile.

Vinod Sehgal: In your SEC, subjective and physical are complementary and interacting but in Ram's IDAM, these subjective/ non physical and physical aspects are co- existing, co- arising and non interacting. Ram's view has been that interaction between subjective/ non physical and physical aspects is a category mistake.

Chris: It can't be, because the three of us all know we have active subjective conscious volition over the physical universe every time we exchange emails. Locking the *s* aspect to the *p* aspect as a fixed duality is in contradiction to our empirical experience unless you assume the *p* processes are driving the boat and then we have mind-brain identity materialism. Interaction is not a category error. We ARE interacting with the world. We clearly aren't in a dual parallel *s* and *p* process. Duality forces homology, contradicting the completely different way subjective and objective manifestations appear. Ryle came up with the category error idea with Descartes because he claimed including mind and world statements in the same category was a "category error". But mind is *s* category even for Descartes and physical is *p* category, so Ryle's notion is ill-posed.

A unified Cosmos can't be a complete duality, so a cosmology can't be fully dualist, therefore two aspect monism is correct. However it can also either be dual or complementary in its aspects. Interactive complementarity provides the high degree of asymmetry we experience between a very mechanistically separable universe and a very wholistic experiential realm.

Vinod: We become unaware of our physical bodies but our astral bodies very much continue to exist and remain active. It is the astral body which flies over physical body. And it is our self/consciousness which sees our astral body to fly over our physical body (though we are not aware of our physical body). Had there been no astral body as composed of some non physical substrate and not flying, how could you see any body flying in the dream state?

Chris: Here's an example of mine showing how non-ordinary reality can be as big as the universe and the way back is NOT through space, or levels of existence, but slipping in and out of the body:

While dreaming, I looked at my hands and I became lucid and a huge gust of sea breeze with salt spray doused my light Indian shirt. I could feel every droplet hit my skin. The day was radiant shimmering with intense sunlight. I stared at the azure sky, desperately trying to find my way back to Earth, knowing I was in another universe. I rushed up to a woman with dark eyes and stared deeply into hers silently saying "where is the way back?" And she just smiled and shook her head. At the same time, I realised I was shooting up ever faster like a rocket. But again at the same time, another I realised it was all okay, because I was just bobbing on the ceiling of the bedroom looking down at my body sleeping below.

You have no basis whatever to claim ethereal astral plane substrates for any of these. They are projectively manifested experiences with few or no bounds on what is possible or how they occur. They may even anticipate future realities we yet have to face. The only way we can find out is to actually make the journey ourselves.

Ram: Yes, subjective experiences (SEs) and their respective NPB/NCC (neural physical basis / neural correlate of consciousness) exists. But the content of endogenously generated SEs may not exist. For example, if you dream of a flying woman by herself, then yes such SE and its NPB exist but there is NOT a flying woman that everybody can see similar to flying birds in our real physical world.

Chris: The very non-ordinary content of dreaming shows it transcends the restrictions on waking perception, so the pursuit of knowledge requires us to address how this can take place. These discussions just keep coming back to the hard problem extrapolated into the **hard manifestation problem** "how do conscious experiences manifest themselves to us"? And what are the implications of the fact that they can transcend real world experiences?

One can think about it neuroscientifically, in that higher sensory processing areas in the parietal and temporal lobes can arrive at resonances different from and inconsistent with perceptual excitations driven from the primary sensory areas, but that doesn't solve the manifestation problem as it is more than just an evoked binding problem. Nothing objective can even be conceived to subjectively manifest experience in and of itself. You can take that even further with psychedelics, involving changes to our entire understanding of what a conscious experience is and can be.

Astral worlds fail to explain non-ordinary experiential reality because conscious awareness transcends any substrate driven model, just as non-ordinary states transcend sensory experience of the physical world, which is why I termed it projective of consciousness. That's why astral worlds are defective and degenerate and why I am very sceptical of yogi's reports about both astral worlds and samadhi experiences as a kind of wishful thinking.

Symbiotic Existential Cosmology is trying to teach people to actually be courageous and use the tools they have, dreaming, meditation and particularly entheogens to find out what the hell is going on.

Vinod: I agree with Chris that conscious experience and build up of NPBs are not simultaneous since there should definitely be some time gap, however minuscule the same may be, between the two and hence they are also NOT inseparable. They are also not complementary like a particle and wave since they don't come from the same substrate. Had they been coming from the same substrate, there are no reasons as to why conscious experiences can't be detected/ scanned thru 3pp physical instrumentation or thru 3pp shared subjective experiences. They are, in fact, sequential with both originating out and existing at different substrates- NPB from/ at physical substrate as forming brain and conscious experiences from/ at non physical (\ astral) substrate as forming mind.

Coalescence: Saving the Diversity of life from Fermi Extinction is the Meaning in Existence.

Joshua Davis: Without Metaphysics, Ethics and Spiritual Maturity, scientific knowledge is at best incomplete and at worst dangerous and destructive.

Kashyap Vasavada: I have to agree with part of your statement. Mankind has to learn to instil ethics and spiritual maturity into itself otherwise it will destroy itself for sure. However, I have to say also that religion and metaphysics are at least 2 to 4-5 thousand years old, much older than science. ... But currently existing religions and metaphysics cannot instil ethics and spirituality. So far mutually assured destruction has prevented nuclear wars. But how long it will hold, no one knows.

John: According to Garrett Hardin (1968), author of "The Tragedy of the Commons" there is no technical solution. So where does that leave us?

Chris: Existing religious traditions are inadequate to address the problem, not least because their religious innovators lived in a time when the Earth's dwindling resources and habitats and burgeoning population were not an immediate threat to human survival and the survival of the biosphere itself. Hence the preoccupation with cultural crises in the Bhagavad Gita and apocalypse and Armageddon in Revelation. This has in turn led to false spiritualities that neglect the sanctity of life as a whole in favour of fictitious realms and vain desires.

But the problem can't be solved by science either because life has no existential meaning in and of itself physically. And as Joshua comments, the same science can be used to heal or to exploit. It has no moral value in and of itself. But moral values are no use either because, as Richard Alexander author of "The Biology of Morality" realised, in staring down the barrel of mutually assured nuclear destruction, morality is not absolute, or an absolute good: It is just an evolutionary process to reduce intra-social competition to ensure inter-social dominance.

So we come back to prioritising existence by the key existential threats to survival – biospheric mass extinction, climate and habitat crisis and nuclear holocaust. Currently these are the last options people think they have time to consider. So the last must come first as Jesus said and the rest will sort themselves out over time, because life is saved.

There is one and only one solution to this. Life needs to be recognised as sacred, in our hearts, our minds and our very souls for want of a better word. We need to raise high the roof beam of life itself as the flowering pinnacle of our fulfilment over all notions and illusions of spiritual, scientific or technological redemption. We can no longer treat life as a lesser, inferior, dumb, or flawed entity to be dominated by human intelligence.

No political, economic, scientific or religious work-around will suffice. Unless we become fully symbiotic with the immortal flow of life, humanity and the biosphere will suffer atrophy and eventual extinction, either with a bang or a whimper.

John: You advocate for such religious faith in regard to a combative strategy for preserving life as it exists materially but deny faith in a holistic strategy that would preserve its spiritual integrity first. This is the very dilemma that produces the problem - placing the cart before the horse. The existential symbiosis of your theory is an outcome of deeper holistic consciousness. SEC seems to conflate these levels or reverse their natural order.

Chris: It's not confrontational to save the diversity of life from extinction John. Edge-of-chaos cosmology, as compared to the ascendance of spirituality is NOT "combative". Spiritual integrity can have no meaning in the absence of life. Active redemption of life provides for dissent when faced with obstructive resistance, as democracy does, and promotes paradigm change. Apocalypse doesn't need to be combative but it has to have its claws if the future of life is as threatened as it is. If SEC is valid cosmology and the supremacy of spiritual holism is a delusion, we need to be honest and transparent about it. Occam's razor gravitates to removing the clutter of a priori claims. It is intended to reduce mystification and false assumptions.

John: This is the very dilemma that produces the problem – placing the cart before the horse. The existential symbiosis of your theory is an outcome of deeper holistic consciousness. SEC seems to conflate these levels or reverse their natural order.

Chris: Symbiotic Existential Cosmology is NOT an outcome of holistic consciousness but it's the valid empirical cosmology of conscious life. Life precedes spiritual holism in the evolutionary process. It didn't arise from holistic consciousness devoid of nature but from interaction with the biospheric sacraments. There is no established deeper holistic consciousness involved in its genesis other than my meeting with Brahman that revealed the cosmology, which must needs be respected on its own terms as Brahman informing me of the central meaning and importance of protecting the diversity of life. Yours is in no way a valid claim for someone who hasn't made that journey themselves to intentionally put the cart of spirituality back before the horse of life to justify their religious predilections in effective contempt of the source experience! You are incorrectly trying to reassert the tower of elite spiritual states over and above nature and direct empiricism by affirmed subjective experience and verified objective observation.

Chris: I like the idea of free will as a transcendent. I don't accept certainty, or faith as in this category.

John: Free will has to be free to do something, which is to decide something independently from other determinants. Thus we are free to be certain and have faith. You are also free to not have such faith. That's what free will means. Then live and see how it works out for you, but **do not require it of others.**

Chris: You are incorrectly attributing me to **requiring** lack of faith. Saying an assumption is not true is not "requiring" it to be untrue. It's the assumption itself that is invalid, so truth requires honesty. We are not free to be certain and have faith, or not as the case may be. We are living biological organisms with spiritual pretensions, in a universe with realities and empirical truths. Free will means: *the power of acting without the constraint of necessity or fate; the ability to act at one's own discretion* (Oxford Languages). It doesn't mean the arbitrary freedom to believe misinformation that has consequences for others. You may have spiritual pretensions but decisions have consequences, so if you entertain a false world view, particularly a religious one that is actually inconsistent with how the Cosmos as a whole (subjective and objective) manifests and continue to believe this and act upon it, it has consequences for the future of life.

In particular there is a difference between requiring faith, which is what morally prescriptive religions do and what a cosmology does which is to show us how it actually IS transparently, so we can decide more accurately that our assumptions may be at variance with reality and harmful to our's and life's futures. I may protest and be a voice crying in the wilderness but I am clear as pure water that there is no moral imperative here.

I want to make clear what faith actually arises from. Faith as a concept arises from trust. Verifiable trust is the foundation of gatherer-hunter long-term judgment of good character. It has later been extrapolated to faith in the spiritual divine, which is NOT verifiable.

faith (n.) mid-13c., *faith, feith, fei, fai* "faithfulness to a trust or promise; loyalty to a person; honesty, truthfulness," from Anglo-French and Old French *feid, foi* "faith, belief, trust, confidence; pledge" (11c.), from Latin *fides* "trust, faith, confidence, reliance, credence, belief," from root of *fidere* "to trust," from PIE root **bheidh-* "to trust, confide, persuade." From early 14c. as "assent of the mind to the truth of a statement for which there is incomplete evidence," especially "belief in religious matters" (matched with hope and charity). Since mid-14c. in reference to the Christian church or religion; from late 14c. in reference to any religious persuasion. From late 14c. as "confidence in a person or thing with reference to truthfulness or reliability," also "fidelity of one spouse to another." Also in Middle English "a sworn oath," hence its frequent use in Middle English oaths and asseverations.

In Christianity we have faith, hope and charity – later termed love, but faith is prone to "obsession" as both Augustine and Gregory state. The necessity of faith in Jesus is Christianity's short-circuit to eternal life. The fact that Augustine, the founder of the incorrect notion of original sin, said this of faith is a signal warning! Are you sure you want to espouse this against the empirical truth of the Cosmos itself?

charity (n.) late Old English, "benevolence for the poor," also "Christian love in its highest manifestation," from Old French *charité* "(Christian) charity, mercy, compassion; alms; charitable foundation" (12c.), from Latin *caritatem* (nominative *caritas*) "costliness; esteem, affection," from *carus* "dear, valued" (from PIE **karo-*, from root **ka-* "to like, desire"). In the Vulgate the Latin word often is used as translation of Greek *agape* "love" — especially Christian love of fellow man — perhaps to avoid the sexual suggestion of Latin *amor*). The Vulgate also sometimes translated *agape* by Latin *dilectio*, noun of action from *diligere* "to esteem highly, to love".

In 1 Corinthians 13, Paul places the greater emphasis on Charity (Love). "So faith, hope, love remain, these three; but the greatest of these is charity." First, because it informs the other two: "It bears all things, believes all things, hopes all

things, endures all things." According to Augustine of Hippo, from a temporal perspective, love lasts, while "Hope isn't hope if its object is seen," and faith gives way to possession. This view is shared by Gregory of Nyssa.

John: To clarify further, what I'm proposing is that existential symbiosis is a manifestation of causal holism - autopoiesis. Thus life forms are temporary and evolutionary while strategic organization is more enduring at the species level and holistic principles, which build to a natural morality at the ecosystem level, manifest even deeper latent truths of nature. This structuring of levels of reality is not an illusion but the causal basis for SEC when considered as a result rather than the origin. That opens the system to natural consideration of experiences of faith and God without imposing personal judgments. There is nothing in that ontology that requires human definition in order to be true except human creations. In this view we are doing what nature does, including our ability to ignore parts of nature for a time, while experience then teaches deeper knowledge.

Chris: It's not scientific to invent a causal metaphysics and then claim Symbiotic Existential Cosmology is a product of it without empirical evidence. SEC is an empirical cosmology that matches both natural and physical science and conscious experience of ultimate reality. It is not a token, product or process of a hypothetical metaphysical description in which autopoiesis is construed to be a formative cosmological principle:

The term autopoiesis (from Greek αὐτο- (auto-) 'self', and ποίησις (poiesis) 'creation, production') refers to a system capable of producing and maintaining itself by creating its own parts. The term was introduced in the 1972 publication Autopoiesis and Cognition: The Realization of the Living by Chilean biologists Humberto Maturana and Francisco Varela to define the self-maintaining chemistry of living cells. The concept has since been applied to the fields of cognition, systems theory, architecture and sociology. Niklas Luhmann briefly introduced the concept of autopoiesis to organizational theory.

Autopoiesis is a neat concept when framed as a biological principle of feedback systems complementing physical laws, but it is teleological without being innovative, so in evolutionary terms we have to look beyond autopoiesis to the quantum basis of mutation and natural and sexual selection to see how innovation actually occurs.

John: Regarding "not free to be certain and have faith", are you sure? I must suppose not, but if you were certain I would ask what maintains that certainty?

Chris: I already explained this evidentially in the following sentences. We are living biological organisms with spiritual pretensions, in a universe with ultimate realities and empirical truths. Free will doesn't mean the arbitrary freedom to believe misinformation that has consequences for others. If you entertain a false world view, particularly a religious one that is inconsistent with how the Cosmos as a whole (subjective and objective) manifests and continue to believe this and act upon it, it has negative consequences for the future of life. There will then need to be a corrective reaction from others to avoid this exploitation and a possible Fermi extinction. That's not prescriptive morality it's natural!

The most invidious combination is certainty of faith in a self-reinforcing "autopoietic" feedback loop, which is not free-will at all. Brain studies of religious belief contrast with those of entheogens and compassionate meditators in that religious faith abets overweening self-certainty maintained by vigilance to any risks to order, accompanied by prefrontal excitation of dopamine pathways. In conservative religious societies, this is accompanied by increasing suspicion of others as infidels and holy war, either for defence, or for outright supremacy. The Western tradition declares human male dominion over woman and nature in which dominion is as a ruler walking among his subjects. In the Eastern tradition wild life is simply regarded as a lower karmic state and species identities are ignored, so one concludes the Eastern tradition is practising intentional ignorance of the sanctity of the diversity of life in favour of the round of sentient beings centred on humanity and the notion of reincarnation.

I am a faithfully non-religious person who has had a moksha experience of ultimate reality. I thus have a cosmological duty to the truth to defend the visionary state that is the quintessence of mystical experience that lies at the source of religion, while being faithful to the universe and fecund nature. I would call it a "divine calling", but it has the wrong resonance in this debate because it is too evocative of fallible spirituality. The idea that this is confrontational, or preaching a moral imperative shows a deep misunderstanding of apocalyptic paradigm change. It is controversial, to put the cat among the pigeons of complacency that would invoke a tragedy of the commons. It doesn't have to be violent or compulsive, but it is a dangerous path to travel without falling into the crack between the worlds.

And when Isa came with clear arguments he said: I have come to you indeed with wisdom, and that I may make clear to you part of what you differ in. (Q 43.63)

Vinod: Consciousness is holistic and single which can neither be divided into parts nor produced from part proto-consciousness. This fact is demonstrated from the fact that consciousness-self, subjective experiences and cognition in our functional brain is single holistic one. None of our self, SEs can be divided into parts. From childhood to youth to old age, the size/ weight/ number of neurons in our brain have increased/ decreased on day to day basis. Had consciousness-self, SEs and cognition been a dual aspect of the brain, our self and SEs should also have increased/ decreased in line with the increase/ decrease of the size/ weight/ number of neurons in the brain. But this is not observed.

Chris: Vinod's comment is correct. It applies to ALL intellectual notions of subjectivity, philosophical, spiritual and theistic. How devastating this applies to every notion you discuss. Each of the conscious researchers in these groups is attempting to reduce ultimate reality to a model of itself by using pseudo-physical analogies:

"Language is the stuff almost all human culture is made of. Human rights, for example, aren't inscribed in our DNA. Rather, they are cultural artefacts we created by telling stories and writing laws. Gods aren't physical realities. Rather, they are cultural artefacts we created by inventing myths and writing scriptures" (Yuval Noah Harari)

Using everyday rational thinking and physical sensory observation and some controlled meditative or spiritual experiences to construct models which are abstractions of objective reality that don't fit or begin to explore the depths of subjective experience is futile. This is because the methods are still observational rather than experiential, using palpable objective concepts and hoping they will fill the experiential abyss, but it's all armchair philosophy.

Subjective empiricism is completely different from these parlour games of causality. First you need to make the journey deep into the unknown conscious territory, to a possibly scary place close to where no one has ever gone before. Then you return from this quest and let us know what you experienced. That's the subjective scientific empirical method!

I did this on mushrooms with Symbiotic Existential Cosmology and reported a completely different cosmology. It has no presumptions about astral or spiritual worlds and makes only foundation statements that may seem obvious and facile but are neither irrefutable nor unverifiable, that no one has sought or been able to challenge – **Consciousness is primary but the universe is necessary. Subjective conscious volition has efficacy over the physical universe. Subjectivity is primal, although full consciousness is emergent (in the eucaryote transition). The universe rises to cosmic climax in biodiverse symbiosis and hence the urgent need to make nature and the survival of life's diversity the primary focus of spirituality.**

Note also that ultimate reality, as I experienced in Brahman had both abstract expression as the eternal 'fact' of the conscious existential cosmos, as well as being a persona Ishvara/Ishvari that is my complementary 'Elohisitic apotheosis, just as Brahman is complementary to atman. It is a direct NDE type visitation communicating an essential pivotal insight for the survival of conscious life. In a sense it is a psychic manifestation of my entheogen-induced brain state, but it is operating in an unbounded non-encapsulated form of free dynamic that just is – as an undivided whole – NOT pan-protopsycheic, not wholistic, but whole, in and of itself.

The only way we can even begin on this quest is to accept that subjective empiricism is to "take the trip" first, to make the journey to the other side as a whole and return to tell the tale as a transformed whole. We need to start by actually doing it. We can't just sit talking about it and talking about talking about it. We need to deeply explore these states as a mental cosmology in the first person, scary or not. Until we have we don't even have a handle on the question. It's no use reporting on the NDEs, OBEs Dreams and Visions of others. We ALL need to be first person experiencers of the entire cosmic geography of consciousness first!!! [See Groff's comments!](#)

Avtar Singh: Is the objective universe fundamentally probabilistic or infected with measurement caused probabilities?

Chris: It's severely infected (including with consciousness)! There is no probabilistic randomness producing actual outcomes. Its 100% "infected".

Avtar: Is fundamental consciousness an eternal universal reality rather than a late comer evolutionary biological consciousness?

Chris: SEC sees fundamental consciousness as evolving in a similar way to how we perceive the physical universe evolves. So it starts out primally vestigial like the big bang does and then, becomes consciousness with the eucaryote endo-symbiosis, and rises to climax where it becomes cosmic consciousness realised in extreme states of enlightenment in the biota which become physically asymptotic to the fundamental expression of the laws of nature expressed in symmetry-breaking. So it gets to be the full complexity of fundamental consciousness and arises when the physical conditions permit in the mid-life of the Cosmos. Eternality is perspectival, so we can look sideways on at space-time and it's eternal, everything is there from **alpha** to **Omega**, but inside, it is evolving temporally, so eternal and temporal are complementary aspects. In the temporal experiential, the interactive evolution is from **alpha** to **Sigma** a climax state of Paradise on the cosmic equator. So there's no meaning to eternal being transcendent and temporal being ephemeral illusion.

There are two cosmological processes: (1) The **gross energy budget**. This is the way traditional cosmology works, so we start with the big bang and end with a collapsing crunch or an ever-expanding heat death. (2) **Interactive complexity and consciousness**. Here the evolution is from the origin to a state of Paradise on the cosmic equator in space-time where the quantum interactive processes reach optimal climax associated with conscious biota. Looked at from the outside, life is an eternal manifestation in space-time that goes on in the mid-life of the mature universe but may end later when everything goes pear-shaped energetically. But from the eternal point of view, this doesn't matter, because the manifestation came about and realised itself. There may be more but that's the foundation.

Paul Verbos: But does anyone actually believe (or give more than 20% probability to) the theory that we live in "a multiverse" as promulgated by David Deutsch? ... I do not believe it any more because I now see a solid alternative, even more hard core in realism.

Chris: We never see the multiverse because the moment we interact discretely, it collapses into "Schrödinger cats", so your question about believing in the multiverse is a misconception. Rejecting the multiverse in favour of hard-core realism reminds me of the Gospel of Thomas (43):

His disciples said to him, "Who are you, that you should say these things to us?" Jesus said: "You do not realize who I am from what I say to you, but you have become like the Jews, for they (either) love the tree and hate its fruit (or) love the fruit and hate the tree."

Paul: Are you saying I should shut up, that you are the avatar of Jesus here??? ... You really would understand so much better if you could at least begin to grasp the best current physics. ...

Chris: I was actually referring to your use of your favoured quantum physics interpretations, to the exclusion of others, but the real tree is the tree of life's evolution and the fruit is living biodiversity, currently under threat of mass extinction.

Over the last two days, I have taken a simple practical step towards realising Symbiotic Existential Cosmology in terms of actually addressing key existential threats to biospheric and human survival. This is not going to be easy and I can't do it on my own. We have to do this together. I do know what I am doing and the quest is eminently worthy, as you all know in your bones. Casting lots on my garments is an unwise bet Paul. There is no sign on the horizon any of you have a better option. The impossible we must needs do today so that tomorrow we can know we did the right thing for all in good time.

I would like all of you to support my quest to save the diversity of life in the biosphere of planet Earth from a mass extinction on cosmological time scales, heal the climate crisis, end the risks of nuclear self-immolation, and restore the sanctity of the biota from human and AI takeover, not least so that *Homo sapiens* can survive as a species, because this is the one way I can see we can actually proceed to resolve the risk of a Fermi apocalypse before it is too late, quickly and democratically, as one is to one.

Biblical scholar

● Some years ago I was taking my five-year-old son to Auckland city by bus. He has little biblical knowledge but at one of the bus stops a tallish man with wavy shoulder-length hair and a full beard, got on. After receiving his ticket from the driver, he proceeded down the aisle toward us. My son took a great interest in the man's appearance and shouted, "Jesus." Yes, the likeness was amazing. We got a nice smile from the gentleman who, by the way, alighted near the university.

Hallelujah, Auckland

My father used to say as a doctor that he could count the number of people who had died in his watch on the fingers of one or both hands, so I want to convey to you how I see the current situation.

Let's take our **right hand** and list five existential problems of personal survival, e.g. (1) direct health and good medical science, (2) adequate access to food (3) sufficient active "income" to care for our family, (4) social safety and human contact (5) sheltered habitation and sufficient land to grow our own food if the need arose.

In the **left hand** we have: (1) An impending human-caused mass extinction of Life, (2) Human induced climate crisis, (3) A protracted acute risk of nuclear holocaust, (4) risk of AI takeover given existing human technological takeover and (5) increasing risk of collapse of technological society from economic effects of (1-4) given the fragility of urban food chains, electronic telecommunications and political and social institutions.

The realities are that we are all fiddling while Rome burns because the right hand does not understand the dire significance of the left. We all have to balance risk anxiety against practical common sense hope for the future and avoiding the health impacts of anxiety uncertainty, so what we are doing is trying to deal with the right hand issues, while we have no control over the left-hand ones. But the left hand issues affect 8 billion people and the whole future of planet Earth, while the right hand issues affect only one or the few people in our immediate family. We are forced to treat both the apocalyptic threats and the simple personal survival questions on the same footing, but they are not. None of us can have any real confidence there will be a living Earth in 2100, let alone one habitable for our families and offspring. This is insane, irrational and untenable. What I am saying and doing is sane and could save us all.

I think what we need to be aiming at are the principal existential threats to humanity and the biosphere as outlined and a human heart and mind response to put these at the top of the list of a catalytic process of communication to catalyse cultural redemption. I don't see a rationale for ranking priorities as such, because they are all urgent and the principal is survival by addressing the core existential threats as primary.

I see the key principle as preserving life on Earth into which all these crises feed without getting confused by secondary human demands.

The key is coalescence – that is accepting that the need to act is primary and drawing in people on the basis of strengthening expertise, reach and ground roots support.

I don't see this as a religious or spiritual initiative or movement as such, but it is clear that belief systems are the way deep paradigm shifts have occurred throughout history. I think we do need to believe the necessity to act to save life on Earth as a primary priority. Science has also had major paradigm shifts such as the Copernican and physics revolutions from classical to quantum and relativity but these do not impinge in the same way on human motivation. Therefore I think there is a quasi-religious dimension in it but it's very complicated and contentious, because our beliefs are vastly more divergent than our science, which is also subject to interpretations.

I am trying to take a position that upholds the sacredness of the diversity of life over spiritual elitism, speculation and religious doctrine across the board and avoids elite utopian fantasies involving human technological dominion and tries to avoid any claims that lie outside empirical science, except for primal subjectivity as a cosmological foundation complementing the physical universe. It is idiosyncratic in involving psychedelics as a technique but that isn't central to the core need to protect life on Earth except as a catalyst, which it clearly is, in invoking a connected view of nature and consciousness, through natural moksha, that differs from both Eastern and Western elite spiritual traditions.

When I planned the millennial vigil to Jerusalem, I did this in a full academic sabbatical on a paid academic salary. I had contacted the grandson of one of the founders of Tel Aviv who had conceived to host a millennial celebration in Jerusalem who agreed to host myself and Jane at the Academy of Jerusalem for a 12 day workshop on reflowering the Tree of Life. I did this knowing exactly the potential for trouble facing the conflict-ridden nexus of the three core Monotheistic religions, but mindful that the world's traditional credibility has much more at stake and is more in question, than my own idiosyncratic vision. We succeeded in doing what we intended – to celebrate the hieros gamos and invoking the epoch of the Tree of Life to culminate the apocalyptic epoch of Christianity, to complete the rite of passage to the new epoch in a short unpretentious sleight of hand to establish the key precedent. At the time I couldn't admit it was the mushroom that had sent me there 15 years before in the 1980s, because we were still in the psychedelic dark ages in 1999.

The director of the school approved my application for a residency grant at a US university, on the basis that I didn't claim to be walking on water. I travelled to the US where I visited psychedelic experts, including staying with the mycologist Paul Stamets in his little mushroom yurt temple. We then left for Bolivia and toured the burning season in the dry tropical forest and then to the Peruvian Andes, where we descended from Cusco down the Urubamba by truck and dugout canoe, emerging through the Pongo de Manique into the Amazon basin, filming burning, logging and cattle ranching, down the Ucayali, where we took ayahuasca at Yarinacocha, to Iquitos, Manaus and then up the Madeira to the Pantanal. We then traversed Europe from Amsterdam where we took mushrooms, visiting both pagan and Christian sites like Saintes Marie de la Mer to retrace the mythical steps of Magdalen and to the Vatican. We then flew to Jerusalem for the millennial celebrations, holding an all night vigil of a hundred forming the collective mashiach above the Dome of the Rock to pronounce the reflowering anointing by God and Gaia to renew the old wastes as a garden causeth the things sewn in it to spring forth, on millennium Eve and marching in a group of 13 on the Eastern gates of the Old city on the Epiphany, to declare the Gates of Mercy open and to celebrate the hieros gamos in the name of the Song of Songs at the Western wall. We were hosted by liberal Jewish people throughout. From there I transited to Nepal and overland to Varanasi to pay my respects to Kali as the most formidable form of the cosmic feminine, before returning to NZ.

If you examine the thirteen core principles of Resplendence, you will see that they are in no way any form of doctrinal religion.

Amit Aurora: Have a few questions for which I have been exploring answers. What are the means by which the world may be returned to a union with Brahman? What is the nature of the work that is called for? How is any one particular citizen-individual to be expected to engage with that work? How does situation and context affect the nature of the work? I would request feedback and answers in a more scientific way and not in a spiritual way.

Chris: My take on this is simple. Brahman is ultimate reality. The true experience of ultimate reality causes one to witness in personal consciousness the entire sweep of reality outside our usual personal view of birth and death, hence moksha is the escape into ultimate truths of ultimate long-term survival of life and humanity as a species within it. This means rescuing humanity from destroying the planet's habitats and biosphere through nuclear holocaust, mass species extinction and climate crisis. It only takes one brief glimpse of ultimate reality to make this abundantly clear. The entire flux of human urgency needs to go into biospheric redemption now. We all need to coalesce on the existential crises and provide the urgent determination to act.

If experience of Brahman as ultimate reality has any practical scientific meaning at all, rather than a self-satisfying spiritual pursuit, it shouldn't just bring bliss, but an acute redemption of planetary awakening (enlightenment), through us realising what we are actually doing to the world as we speak and what needs to be done immediately.

It has to involve transcending the zeitgeist in scientific terms and natural terms as well as spiritual self-realisation. All the other issues including ending poverty, economic sustainability, spiritual realisation, recognition that biological consciousness must not be overtaken by AI, and so on, will be resolved if and only if we direct our lives to the preservation of life on Earth while we ARE alive. It really amazes me that no one seems to be able to grasp this very simple acid test!

Grant Gillett: I agree with Chris: consciousness emerges from incarnation with the development of the ability to dream dreams and see visions and then devise ways of speaking the truth in love so that what is live amongst us never dies but lives on eternally so that death and the Norse 'Hel' lose their sting.

Joshua Davis: Grant, I concur !!!

Chris: Here's the problem with the East. The West comes from a tradition of theistic creationism. This is much more easy to scientifically reject than "Vedic science". We all know that the Sabbatical six day creation is an enchanting allegory by the priestly author in which trees are "meat" suggesting vegetarianism, but the plants appear before the solar system, so its plain wrong in evolutionary terms. Anyone with any honesty knows Biblical creationism is a false cosmology, despite repeated attempts of Christian creationist ID proponents to convince us otherwise.

But "Vedic science" is a different kind of problem.

Fig 285: The sheer profusion of galaxies in the James Webb telescope.



1. Is it true that primal cosmic consciousness on its own can generate all the complexity, solidity of the physical universe that sustains all life within it as a living climax of physical profundity becoming conscious insight? Or is it a fantasy derived from sitting in Yogic posture in renunciation from the world? If primal cosmic consciousness is supreme and complete, why was the universe created in a form degenerating into the Kali Yuga?

2. Is the Vedic notion of transcendence actually the discovery of ultimate reality, or is it just a state of seemingly egoless repose gained through costly self control, perhaps perceived as equilibrium, or joy, bliss, or “transcendence” itself? Isn’t ultimate reality a much wilder more complete experience, in which we are immersed, embedded, incarnate in the physical universe that is perhaps a multiverse teeming with the potential for mortal organismic conscious life, in the immortal passage of the generations, in which mortality and this

worldly existence, which Buddhists condescendingly call “mundane existence” is not illusion at all, but the edge-of-chaos climax of cosmic enlightenment becoming manifest in us?

3. Is our ultimate duty to transcendence over “mundane existence”, or to be fully immersed in intimate immortal symbiosis with the entire flux of life, so that consciousness throughout the universe can come to know and transcend itself in physical, biological and subjective conscious “gnosis” of the entire cosmic condition, manifest both physically and experientially as one is to one? Can we afford, even for a moment to deviate from the ultimate respect of life to an illusory transcendence, which causes us to demote the life of the Cosmos to a mere stepping stone to be discarded in full union?

If the answer to any of these critically important questions is that the Vedic assumptions may not be 100% true, it is then our “divine” duty to seek the truth of ultimate reality in the raw and not hold back in renunciation from the high noon of existence, to settle for the slumber of renunciation of the physical cycle of life in favour of endless, dreamless sleep of “transcendent” samadhi.

If samadhi were true enlightenment as expressed in the Vedas three thousand or so years ago, humankind would already be enlightened and the world would be a blessed blue-green planet, where there are no nuclear weapons, where asteroids are avoided and the diversity of life is resplendent in immortal paradise. It is not. There is no sign that Vedic insights lead to any urgency at all to preserve life immortal or to reject the use of ultimate nuclear force, as indeed the Bhagavad Gita declares. Therefore the prosecution rests with the evidence before us.

John Kineman: The issue is that a logical description of oneness also has to be constructed in such a way that it explains illusive breaks of that oneness into the separate systems we seem to experience. It is not as simple as just saying “One” or “not One”; with regard to knowledge, it has to explain both.

Chis: Why seek oneness at all? Isn’t it a monolithic clunker?

John: Seeking knowledge is seeking oneness. There isn't an alternative.

Chris: I see knowledge as seeking ultimate reality, not oneness.

John: Since enlightenment is a human experience, science should be structured in a way that does not exclude it.

Chris: But this is not conceding that science can also include it. It is a plea for the ineffable. That’s not mysticism but mystification. How do you distinguish hard oppressive oneness from soft diverse oneness?

John: What are these ideas? I haven't encountered them and have no idea what they mean. Are you referring to social structures? That isn't Oneness. Oneness isn't material. Forcing things together or into a mold doesn't unify anything. Understanding unifies.

Chris: Take the Islamic view of scripture, sharia and society together as a coercive monolith reinforced by death for apostasy if you want a cogent example. Atonement "at-one-ment" is also a noir concept in the sense of making amends for a wrong or injury, in atonement for our sins. Understanding doesn't necessarily unify and shouldn't if it is aiming at truth. Moksha can take you outside the inside out and then you hit alien territory and realise both scientific and religious assumptions are cartoon level descriptions that are manifestly in contradiction to nature. It may put you outside the box but it doesn't and shouldn't necessarily lead to unity, but rather a paradigm shift.

Chris: Oneness is a misrepresentation of emotional empathy, typified by the MDMA experience of oxytocin touchy feely togetherness. If that's enlightenment, we can all give one another a pat on the back and get tingles down our spine and let the forests burn! So enlightenment and the pursuit of knowledge cut deeper than mere empathy.

John: It seems that you are confusing love with pleasure and oneness with irresponsibility. The likely reason for those mistakes is conflation & confusion of material and spiritual domains of existence.

Chris: That is your own confusion speaking! You really can't try to claim I am confusing material and spiritual and by doing so you are reifying spiritual. All the evils of religion emerge from higher spiritual notions turned into doctrine and then retribution for deviation. I'm simply pointing out that MDMA causes a "chymical marriage" experience, probably due to oxytocin, which is socially conducive to oneness but can't be claimed to be enlightenment. Psychedelics on the other hand can result in a "chymical moksha" of subjective consciousness and natural reality with radically different outcomes from Vedic renunciation, as I keep trying to explain which can't be at all easily dismissed as maya or illusion and may be the "sang raal" – or natural Holy Grail of existence.

John: There is no intellectual bridge from scientific models to the actual experience of enlightenment. I consider enlightenment to be realizing one's true nature beyond all description. It is our natural state discovered by practice. As such it can't be described or represented by any equation, relation, or other syntax; It is pure meaning. But it does not in any way preclude science.

Chris: There are a chain of assumptions here, each of which I question. Why is there no bridge? Is this really true? If you claim it is our natural state, why is it presumed to be beyond all description? And what kind of description? The Upanishads? The tales of the vision quest? I see this as a tacit assumption of Eastern thought that is probably untrue. And what is "pure meaning"? I think this is mystifying enlightenment, which if it is a natural condition, as you say, is experienceable and fully bridgeable by undertaking the experiential quest oneself. Anything that can be subjectively experienced can in principle be described, if not defined, notwithstanding Laotzu's aphorism that the way that can be told is not the Tao. The description is not the experience but it can point to it, just as his statement itself does.

To take an example. I can make the claim that enlightenment is a fully natural condition that can occur in the biota. That both meditation on its own very slowly and under psychedelics more effortlessly can lead directly to bridging the gap. That this state is knowable and fully describable in a way which allows the subject to know what is happening and to appreciate its significance. Furthermore I can say that the very long slow meditative route tends to arrive at states which are informatively sparse and lead to notions like emptiness which in the TM approach is described as transcendent bliss over the divided regimes of physical reality and consciousness. Hence you seek oneness. But Brahman is *sat chit ananda* – "existence, consciousness, and bliss" or "truth, consciousness, bliss". This is a more troublesome question and the trouble comes with "existence" and "truth".

I can counter the ineffable with the idea that psychedelics do something physical to the brain which also then escapes the ego and leads to an experiential flood that leads to transcendence in a much more informative way, making the mystical state both real and realisable. You can try to counter that this is an unnatural prop and that enlightenment can only be gained by renunciation, delicate persistent meditative control and seeking the resource of enlightenment within ourselves unsullied by chemical or gross natural influences, for fear of "breaking down the doors of perception with an axe" as you have said. But I can refute this on the basis that the egotistical condition is an evolved necessity for organismic survival and that the isolated human species is not a natural receptacle for enlightenment, except in the cases of a few visionary individuals, who are genetically endowed with a propensity for visionary states and these become the sages to which everyone turns to justify a process they can't themselves achieve because they don't have the same brain chemistry. For example natural serotonin levels can vary up to 100-fold between individuals. Hence the rareness of samadhi and moksha and the futility of claiming the meditative route is the "oneness and only" route.

Furthermore I can claim that this evolutionary process is entirely natural and a feature of the way the diversity of life evolves to fill all the available niches, one of which consists of tweaking our brain dynamics so that, given added meditative techniques, can bring neurodynamics asymptotically into a cosmological state, once the external polarities of self and other are relaxed, so that we enter into a kind of cosmic reverie in which we can observe the inner states of consciousness in more definitive detail.

Up until this week, I was working on the basis that meeting Brahman is a “higher” state of consciousness in the Eastern model, but on reflection, I realised the whole assumption of “higher spirituality” is a Vedic doctrine that doesn't make natural sense at all. Neither does the assumption that matter is a more gross form of consciousness, nor that the quantum universe can just be generated by the conscious mind in samadhi. I think this is insulting to both conscious life and the universe. There is no point in the Cosmos going to the trouble of making the awesome universe in which we exist and in which life is possible, if we just stare at our navels and say it just a dream in the mind of Vishnu, while we are literally trashing the planet and don't know what to do about it. So I am seeking a completely new kind of middle way that is both conscious and physical entwined at the edge of chaos between the two. This is the very foundations of cosmology speaking.

Let me try to explain my journey and where I think it might be heading to help everyone make sense of this. I started out in the Western tradition as a liberal Anglican then read William James' “Varieties of Religious Experience” and began taking psychedelics. This showed me all the religious and scientific assumptions about consciousness were out the window simplifications. Then I settled into academic life and on my first sabbatical set out to travel the world's cultures as a primal 1pp savage, with three priorities (1) to go to the sources of the world's power plants, (2) to travel India and steep myself in the life of the temples and (3) to interview as many Nobel laureates as I could about life the universe and everything. I did all three, bar the first Amazon journey which came four years later.

Then I started being a mushroom visionary, living with the ally as a mycologist, and had ongoing visionary experiences as well as attending the Native American peyote church and taking ayahuasca in the Amazon. This brought me to a point of realisation that I was secretly practising a sacramental “religion” which had the capacity for transformatively transcendent experiences that made the Christian Eucharist by comparison an empty vessel of the flesh and blood of Jesus. It could heal the biosphere in a new intimate symbiotic life culture of immortal survival. Christianity had originally taken the West by storm as a pagan-Hebrew hybrid in which Christ was a man-god psychopomp administering eternal life amid the blood of martyrdom, Crusade and Inquisition, in which the Gnostics and the Witches were burned and drowned and Yeshua's crucifixion became the example used by Islamic suicide bombers and the pilots of 9-11 to wreak terror on the innocent.

I couldn't admit to any of this psychedelic mysticism because mushrooms were first schedule forbidden substances, but I began to write the precursor of Symbiotic Existential Cosmology in “Unified Field Theories and the Origin of Life”. Then in the 1980s on a mushroom trip on our wilderness land, the mushrooms told me that if the world hadn't fixed the biosphere by 2000 I should go to Jerusalem and pronounce the epoch of reflowering the Tree of Life. I duly kept the covenant with this in my 1999-2000 academic sabbatical vigil to the Amazon, Jerusalem and Varanasi, so that I pronounced the sacred union of Shakti-Shiva in the Song of Songs and the reflowering of the Tree of Life hidden since Fall in Eden as the epoch succeeding the apocalyptic, as simple rites of passage on millennium Eve and the Epiphany.

As followers of Eastern traditions, you all accept the notion of karma, so I saw in my name and birth date and its relation with the genesis of nuclear weapons, and my now holding the holy grail of the sacramental tradition as a karmic responsibility which I could not fairly afford to ignore. The quest to save the Tree of Life from existential annihilation and end the risk of nuclear Armageddon is too potent an apocalyptic context to abandon, even more serious to planetary survival than the siege of Jerusalem in AD 66. In the same way the “four sights” of Buddha – age, disease, death and renunciation are a crafted basis to see the Gautama's role as karmic. You can blame it on Carl Jung and Joseph Campbell! At the same time, the Gospel of Thomas shows Yeshua's teachings to be idiosyncratic insights speaking of genuine creative paradigm-changing inspiration, although his Dionysian propensity for chaos in the canonical Gospels took him and world history over the edge of chaos into violent oblivion.

All my visionary experiences head into what the East terms samadhi and moksha and my last epiphany was an iconic meeting with Brahman, in which Ishvara/Ishvari or 'Elohim ever so compassionately informed me that their eternal consciousness, which was also my consciousness, was as vulnerable as my mortal life, because without life, cosmic

consciousness has no observer and can become lost to history. So because I am mortal I must needs save the life throughout not just the biosphere, but the entire universe, which I have been endeavouring to do ever since, in writing Symbiotic Existential Cosmology and communicating with you all in the process. I am writing it as a Rosetta Stone for enlightenment, truthfully as I have experienced it as the primal savage, meaning the conscious mind of the forest dweller, (Old French *sauvage* Latin *salvaticus, silvaticus* "wild, woodland," literally "of the woods"), just as the Brihadaranyaka Upanishad declares. This native vision is not Maya not illusion/delusion. It is 1pp truth-speaking.

But I also have a deep relationship with and responsibility for Vedanta and for the shamanic and animistic traditions, as the Quetzalcoatl passage from "The Plumed Serpent" states, as the avatar on the stepping stone between the day and the night (order and chaos). The same way this speaks of transcending the Christian doctrine, it also means reviewing the tacit assumptions of Vedanta, as the silvan savage I have become through my fate. In particular it means liberating the etherial tower of ephemeral astral and spiritual fantasies that are extraneous to the deep truths of Vedanta and have simply become part of the reincarnation doctrine that reduces samadhi and moksha from a realisable vision quest in this life into a miasma of realms like the Buddhist wheel of life, with fictitious titans and hungry ghosts and makes for an endless cycle of waiting through infinite lifetimes with no real prospect of global realisation of the precious life our planet nurtures and which gave rise to our conscious existence and will sustain us in millennia and millions of years of evolutionary flowering, if we don't commit a tragedy of the commons first, both through our business-as-usual exploitation and our cultural, social and religious elitism and hubris towards the diversity of life.

This is what I mean when I say that the buck stops with us here and now for the entire state of the universe. This is why I say ultimate reality is also the universe in which we consciously exist. To truly experience enlightenment is not the end of an ineffable road. It is not Omega but Sigma immersed in Paradise in the immortal life flow. Bob in his post suggested the immortal didn't need protection because they were "beyond ordinary notions of physical, biological life and death". This is dangerously untrue. The whole scope of life immortal is vulnerable when we don't yet know life exists elsewhere. The one meaningful act and primary responsibility we have and can perform is to secure the protection of life immortal and particularly those life forms, such as the smaller primates who could regenerate conscious life as we know it in a human-caused catastrophe and with them their verdant habitats. Otherwise it will be only the rats who can save it. Acting to save the Tree of Life to me is the true mark of enlightenment, not just experiencing bliss, or its conscious higher and fewer tail feathers in the aether.

John: Thanks for this wonderful autobiography! In previous posts you may not have seen I related much of my own journey to biospheric evangelism, which began with a vision of the jungles of Africa when I was very young, despite my programmed development as an engineer and physical scientist. The vision eventually won out bringing some expertise in rigorous realism (overly constrained in the physical sciences) to the more spiritually entailed world of life, with a keen desire to the deeper reality there, eventually including my own and our own psycho-physical and bio-spiritual nature - mind-body-life-spirit.

Perhaps preservation/conservation, respect for life, is the enlightened state - I think so too. But is nature created in a way that can truly be destroyed, or is it our own experience that we impoverish by taking that course? Is it perhaps the case that nature gives each new life the opportunity to learn this lesson, making a temporary sacrifice to allow it? How far we might go may be up to us, while nature, ever self creating, can be patient as well as offering both beauty and correction. When we learn that we harm nature only by harming ourselves more, perhaps then the collective evolution will take a different path.

Chris: Your experience of the houses appearing on the other side of forest reminds me of a dream I had as an adolescent, in dry parched trees on the edge of the desert and a Lion was staring at me with eyes of both pity and deep contempt and sorrow, because I was of the species which was bringing nature to her knees.

And yes you are right about nature. My second peyote meeting at Taos pueblo had both a male roadman and a female mother waters. Bertha, the mother waters said that we are suffering hurting the Earth, but nature can look after herself so we should take care not to harm ourselves by our desecration of nature. Of course this is true, but the costs are dire. We know life has survived the Permian extinction and the Chicxulub asteroid that wiped out the dinosaurs, but the kind of damage humanity is inflicting is insidious and pervasive. A study by scientists at Israel's Weizmann Institute of Science (Greenspoon et al. (2023) concludes that wild land mammals alive today have a total mass of 22m tonnes. Humanity now weighs in at a total of around 390m tonnes. Domesticated species, such as sheep and cattle, in

addition to other hangers-on such as urban rodents, add a further 630m tonnes. Thus as of 2023 wild land mammals represent only $22/(390+630)=0.02$ or 2%.

You are right that in a major planetary crisis, nature will survive humanity and humanity is very likely to be the first to go due to cultural fragility. But do we want to self-annihilate, leaving the world to the rats, slugs and slime moulds to regenerate over another 100 million years? Yes eucaryotes will survive. But the dinosaurs never recovered did they? We really do have the capacity to cause a mass extinction by combined whiplash of climate crisis tipping points, global habitat destruction and a nuclear holocaust caused by xenophobic frustrations with the very processes we are setting in motion and their negative impacts on economic and cultural survival. I'm not a pessimist, but I think the world does need saving from itself and humanity from our worst instincts.

One of the things about the Western tradition is that it believes good human social action can collectively change the zeitgeist. It's harder to do this in the Vedic tradition because it preaches individual renunciation as the ultimate solution. The Western tradition is apocalyptic and that's a call to action. If ever there was a time for an unveiling it is now. It doesn't have to be violent, or confrontational, after all apocalypse is the bridal unveiling in the hieros gamos. That is the true oneness we are seeking! I support climate and biodiversity activism in the way Greenpeace does, but it's not enough in itself, so I'm trying to go both high and deep when the others just go high and low, both as activists protecting the mangroves and corals and business as usual in the coal pits and hamburger farms.

We are an intelligent cultural species with a deep visionary tradition. Given a plate of entheogenic fungi dropping spores and occasional deep meditation in the midst of the good life, we have all we need to conceive a deeply mystical culture that has the time and grace to preserve the diversity of the living biosphere throughout our generations at the same time as experiencing all the wonders of existence. Because we ARE smart we can build technology that will reduce the risk of a comet or asteroid strike by an order of magnitude. We can devise medical science to use mRNA to vaccinate individual cancers and go a long way towards making Paradise a meaningful word. But we don't need to become supplicant to AI and we can do these things only with care and compassion for life as a whole, even if some people fool themselves into thinking they are so smart they can make a technological cultural utopia that can save us from ourselves. Cultural life is exceedingly fragile. Lethally so. Hence the urgent call to coalesce!

I already mentioned the Gita about nuclear war to John, because it makes an acid test of holy activism:

Wondering if he should renounce the war, Arjuna seeks Krishna's counsel, whose answers and discourse constitute the Gita. Krishna counsels Arjuna to "fulfil his Kshatriya (warrior) duty to uphold the dharma" through Karma ("action").

This is precisely what I am doing by citing my own karma and taking on the mass extinction of life as a primary Kshatriya, but for the preservation of life rather than its extinction.

India has preemptively armed itself with nuclear weapons:

On 18 May 1974 India detonated an 8-kiloton nuclear device at Pokhran Test Range, becoming the first nation to become nuclear capable outside the five permanent members of United Nations Security Council as well as dragging Pakistan along with it into a nuclear arms race.

The acid test of the Vedic tradition, is to commit to holy war and this is precisely the atmosphere in which nuclear war was invoked upon the planet:

It is striking that, following Oppenheimer's lead of naming the site of the first nuclear test "Trinity," Weisskopf and William Laurence - both Jews - saw in the Bomb the glory of Christ. In the Jewish tradition, the character of the Messiah has distinctly human dimensions, a "Son of Man" rather than the "Son of God" of Christian eschatology, while the Christ metaphor speaks to an experience that dwarfs the human realm. Ferenc Szasz notes, "Others whispered, more in reverence than otherwise: 'Jesus Christ' ". Known to be something of a mystic, I. I. Rabi described Trinity by the overwhelming light that engulfed him.

So we have a double paradox. The Gita preaches holy war, but does so based on the dharma of the meditative tradition of the Upanishads, as much as a millennium earlier. The key difference is that the Eastern tradition preaches individual enlightenment while Western religion is social in basis, brotherly love, altruistic punishment and simple faith in Jesus as psychopomp or Yahweh in the Hebrew tradition. The contrast couldn't be more obvious.

Coalescence is a really simple effective response – to simply address the existential problems by mutual agreement: (1) to forsake nuclear, chemical and biological warfare, (2) to stop trashing the climate and convert to renewable energy and (3) to stop consuming all the available habitats and causing an irreversible genetic and species mass extinction of life on cosmological time scales. It is the most grievous sin any species can commit. We are each culpable by our failure to declare we even agree as a primary existential priority.

John: I see Vedic India in almost the same way. What has India not had to endure? And yet even a thousand years of occupation has not squashed the gentle power of Vedic wisdom. We in the West, like Diane, think fighting is always the answer. What does it produce in the end? Spiritual India continues today in an unbroken lineage that has endured since the Pleistocene. I misspoke in an earlier post saying it is the longest enduring 'culture' on Earth - There are much older native cultures as was pointed out, but I meant civilization. It is civilization, crowding ourselves into cities, that takes us away from nature. And then crazy unnatural philosophies and political power systems compete. But India has absorbed and tolerated everything that has been thrown at it.

Chris: Yes there are more ancient cultures and I swear by the San for their 150,000 year history of survival as a culture, but I don't think we can excuse the Vedas because of the Muslim and Colonial occupations either.

John: Vedic understanding places spirit before material in every way, in origin, in time, and in importance. It think it sees creation as it really is in nature.

Chris: You are still expressing exactly the attitudes to life in the Vedantic tradition that give cause for concern. This comes full circle back to the very core of the problem. Life is natural and it is physical as well as conscious. Placing spirit before material just defers human physical dominion over nature to spiritual dominion. Then you cite "creation" again, stranding life as "God-created" rather than naturally evolved, robbing nature of her primal fecundity.

Here is a brief quote from Aurobindo which goes to the core of this problem:

According to Sri Aurobindo, in conformity with the oldest Indian scriptures, matter was created by the ultimate or supreme consciousness seeking manifestation. In order to manifest, supreme or absolute consciousness, starting from the full fluidity of the spirit, created graded planes of being, till it reached the state of manifesting the solid density of matter. Sri Aurobindo calls this the process of Involution. The involution of consciousness is the process in which the Supreme or Absolute conceals itself more and more by creating planes of consciousness of increased density, in order to create the density needed for physical manifestation. In each of the planes that were created during the involution, (called typical planes or graded worlds) the absolute or divine consciousness veiled itself increasingly till it was able to produce and manifest the various forms of solid matter. ... He continues to explain that in matter the ultimate consciousness is concealed, but the Will of the ultimate consciousness behind this evolutionary process is a gradual unveiling till it reaches a full manifestation of divine life in matter. In other words the evolution or unveiling of consciousness started from the time solid matter manifested.

This is an evolutionary form of religious creationism that is inconsistent with everything we know about the universe. The explanatory gap of the hard problem works both ways. If the objective nature of the physical world can't represent subjective consciousness, neither can the fluidity of spirit traverse the explanatory gap to generate the fermions of matter. The wholistic nature of conscious experience simply does not have the characteristics to create solid matter, and if it did, there is no way the laws of nature would actually be physical laws. We know how fluid dreams can become, with no rhyme or reason. The big rip is one thing, but what about Vishnu waking from his dream? What then? To say that cosmic consciousness had to contrive the entire physical universe makes no sense at all. If consciousness is supreme at the outset, why create matter at all? And if the entire purpose of existence is to regain enlightenment, why weren't we all enlightened in the first place? This simply doesn't have any of the characteristics of a theory of everything that can explain the standard model of physics, let alone life, and the standard model is symmetry broken in a way which implies the perfection of symmetry is violated so that life can exist. And it's life that generates consciousness and enlightenment as we come of age.

Something shadowy murmured in the corner of my mind and I went back to the full passage of Michael Ortiz Hill on [Trinity](#) in "Dreaming the End of the World: [Apocalypse](#) as a rite of Passage "... and of course out of it spills – the Gita courtesy of Oppenheimer – so here we are wrapped up in the nuclear Gita, with yours truly railing against the impossible, to grab hold of the tiller across the Styx, before apocalypse strikes ... and Paul called me an avatar of Jesus ... so do we coalesce or not?

Oppenheimer said, "We waited until the blast had passed, walked out of the shelter and then it was extremely solemn. We knew the world would not be the same. A few people laughed, a few people cried. Most were silent" **He recalled the terrible and ecstatic eleventh chapter of the Bhagavad-Gita, where the warrior Arjuna requests that Vishnu display the nakedness of his transcendental form. Arjuna is cowed in holy terror as the god visits upon him "the radiance of a thousand suns" "Now I am become Death, the destroyer of worlds".**

Chris: I think we all need to understand that there are three paradoxes here:

- (1) The journey **IS** the destination – Enlightenment is **not an end state** – It's the beginning of a journey of world redemption.
- (2) Wherefore **by their fruits** ye shall know them – The fruits of enlightenment are the **acid test**. If people claim to be enlightened, how do they seek to transform the zeitgeist?
- (3) The two paths **mutually attract** – I take entheogens AND I meditate, so there aren't two paths – **they are two parts of an organic whole**. Neither is complete without the other! So much for the talk of oneness!

I don't accept any kind of "transcendent" state and I don't accept an Omega "end point" of enlightenment. Enlightenment in the Eastern tradition is so rare everyone talks about transcendence to get there. So they don't even discuss what to do with it after, or what it does for us all or the world – just bliss, bliss, bliss! Transcendence is passé!



Fig 286: A quechua belt handed to me by a teenage girl in Cusco, before we went down the Urubamba to the Amazon, who said her grandmother made it. It is the braid of life whose process is unending and unrepeated until death us do part. Not one of the white ornamentations is repeated. Each is unique on both streams above and below. Enlightenment is ongoing, not an Omega state.

The Gospel of Thomas is full of paradoxes: *Yeshua said, "When you come to dwell in the light, what will you do? On the day when you were one you became two. But when you become two, what will you do?"*

What does this even mean?

Alex Hankey: Transcendence is automatically achieved once you correctly practice Pratyahara. Several authors like Sri Madhukarnath (Sri M.) have shown clearly that 'Enlightenment' is the starting point for the next phase of the Spiritual Journey, but this time a journey of a very different nature, serving humanity as a Spiritual Master.

Chris: Brilliant Alex! We need to be able to turn Copernicus inside out to find the truth. Paradigm change is essential. There are many traditions that speak of root redemption, so redemption of Vedanta is legitimate.

Judaism for example has a notion: *Tikkun olam* (Hebrew 'repairing of the world'), which refers to forms of action intended to repair and improve the world. In the Aleinu prayer, it refers to the eradication of idolatry. In Lurianic Kabbalah, the "repair" is mystical: to return the sparks of Divine light to their source by means of ritual performance. In the modern era, it has come to refer to the pursuit of social justice or "the establishment of Godly qualities throughout the world" based on the idea that "Jews bear responsibility not only for their own moral, spiritual, and material welfare, but also for the welfare of society at large".

I like these accounts, particularly the Kabbalah notion that in the Fall from Eden when Yahweh cursed woman and caused mortality, the sparks of the Shekhinah the feminine face of divinity got scattered and have to return in the end of days to make the universe whole again. It's a kind of counter current to the authority of God, saying indirectly that God erred. And I like the idea Jewish people should take responsibility for the good of all people, not just themselves.

Joshua Davis: indeed, the Father is incomplete without the Mother (Shekinah) and the son is incomplete without the daughter, and so it is from Genesis to Revelations, as it is written:

26 And God said, "Let us make man in our image, after our likeness,...."

כְּוִיָּאמַר אֱלֹהִים נַעֲשֶׂה אָדָם בְּצַלְמֵנוּ כְּדְמוּתֵנוּ וְיִרְדּוּ בְדִגְתַּי הַיָּם וּבְעוֹף הַשָּׁמַיִם וּבַבְּהֵמָה וּבְכָל-הָאָרֶץ וּבְכָל-הַרְמֵשׁ הַרְמֵשׁ עַל-הָאָרֶץ

27 And God created man in His image; in the image of God He created him; male and female He created them.

בְּוִיבְרָא אֱלֹהִים / אֶת-הָאָדָם בְּצַלְמוֹ בְּצַלְמֵ אֱלֹהִים בְּרָא אֹתוֹ זָכָר וּנְקֵבָה בְּרָא אֹתָם

Chris: Yes – I feel so good about the 'Elohim! and the priestly author of Genesis 1. Brahman also manifests as the Godhead Ishvara, but all the Shakti worshippers refer to Ishvari, so there it is again – the 'Elohim Ishvara/Ishvari!

Joshua: My times in India in my two journeys (~6 months the first and ~2-3 month the second) gave me a great insight into the many similarities present in the spiritual foundation of ancient India and ancient Israel and their many mystic, sages and saints insights, this is one of the reasons that allow me to appreciate your purifying work with the members of the groups that you interact with. Peeling the layers of doctrine and dogma as the accumulation of culture, politics and religious rituals takes great courage, and that leads to very valuable pearls of wisdom. The core message is that there is no substitute for personal experience, revelation and prophetic vision. Your work and life is very valuable and well appreciated from this corner of the Coromandel peninsula !!!

Chris: Thanks a million Joshua! I really appreciate it and it's an improbable rough and even perilous ride, but we are in it together for the same journey of discovery.

I want to draw the attention of you all to something that is pivotal to the difference between the Eastern quest for Samadhi and psychedelic quantum change experience. Samadhi is conceived of as a "transcendent" state. You are both expounding ontology of some kind of state, but the journey to enlightenment is hypothetical and all caught up in a religious belief in these transcendent states that require a whole lot of control that takes literally forever to get to real moksha and are associated with a life style of renunciation from the affairs of life, like family, survival and professional responsibilities. If you are a doctor, you need to treat your patients. If you are an ecologist, you need to save your species. India is full of "holy men" with charity cups, just as the Orthodox Jews in Israel get out of doing military service. It's religious exceptionalism!

The gold standard of moksha is a quantum change experience. Once entered into and fully experienced, everything is changed. Both you and the world are a different place. You don't have to sit with eye's half closed in a full lotus position while your patients die of heart attacks, or your species get gobbled alive by exotic parasites. You can live as a biological organism in a natural biosphere knowing you are mortal, but it's the best of possible worlds. My moksha two years ago consummated a lifetime of spiritual experiences of a similar but less iconic kind. All psychedelic experiences, whether heaven, or sometimes doom about to strike, contain this secret. Also they are not coupled to a notion of spiritual transcendence but to a natural sacrament of the biosphere that brings complete conscious immersion and integration with natural life without forcing spiritual unity.

What we and the world needs is exactly what nature has provided us with, particularly in the scientific and technological age. A biospheric sacrament which enables us to experience life liberated from our incarnate egos, evolved by mammals as an existential protection, and do it in a way which transforms our entire notion of what being inside and outside our incarnations is all about. In the modern world, we need to have direct traffic between the mundane and the transcendent that is powerful enough, so that we can have "been there" and have "done that" and now our lives are changed for the good and we can get on with the good work of planetary redemption. People used to call DMT the businessman's trip because one could literally walk out of the office and inhale a deep breath or two and go rocketing into stardom and go to infinity and 15 minutes later walk back into the office and get to work.

Of course this needs to be combined with a natural spirituality and good meditative practice to really get to the core of the mystery. I did this iconically on my SEC trip because it had been years and I did it only to find the secret of existence and used complete meditative annihilation to descend into the abyss. But the point is this. I don't have to expound the ontology of transcendent states. The actual secret is a way of experiencing existence outside our incarnations that heals the round of birth and death. That heals Buddhism's lament about "mundane reality" in one fell swoop even if we are struggling with physical maladies. That's why people in terminal conditions get respite and come to existential terms of acceptance with their condition. Above all this needs to make us aware of the world's great existential risks.

Jerry Fodor famously said: "Nobody has the slightest idea how anything material could be conscious. Nobody even knows what it would be like to have the slightest idea about how anything material could be conscious."

I will add: "**Nobody has the slightest idea how anyone can figure how to stop the onrush to Fermi self-immolation. Nobody even knows what it would be like to have the slightest idea about how anyone can figure how to stop the onrush to Fermi self-immolation**". We need to and we need to at least discuss it.

Here is a simple proposal:

Coalescence: The idea is to coalesce on a root proposal that is in everyone's common interest, and then grow the coalescence without immediate activism but across countries as a kind of interpersonal covenant that is also a networked movement for decisive action at the right time later.

We could agree that there are three urgent existential threats to human survival (1) Nuclear, chemical and biological weapons (2) Mass extinction of biological, genetic and species diversity by habitat destruction, pollution and climate crisis (3) Autonomous artificial intelligence. We agree to facilitate a world cultural transformation to limit and end these threats to human survival as our primary priority by inviting others to form a network of like-minded people to facilitate generating a critical mass of support for eventual global action to this end. The three principles I previously mentioned in the introduction to the scientific overview: (1) That conscious life is cosmological in nature; (2) That subjective consciousness has physical efficacy; and (3) That symbiosis with nature is the key to our survival, potentially form a point of view consistent with this, although opinions may vary.

*consciousness is sufficient to existence
the universe is necessary to existence*

The empirical quest has **two components**, not one:

- (1) **Verified empirical observation of the natural world** (aka physical science) and
- (2) **Affirmed empirical experience of conscious existence** (the vision quest).

Only when both are expressed and acknowledged do we have cosmic conscious science.

In our expert groups, there are three loose trends of belief:

- (1) **Belief in the primacy of the physical** as Stan and Kashyap express in "the brain makes the conscious mind".
- (2) **Beliefs in cosmic consciousness** through meditative states, yoga, TM and the notion that the repose of meditation and Buddhist emptiness lead to enlightenment.
- (3) **Beliefs in an omnipotent Godhead** – notions of 'Elohim, Yahweh Brahma, and Ishvara and as Mike pretends, in notions of creationism/ID presented as 'scientific'.

None of these approaches work. They are **NOT root source phenomena, but "beliefs"** and they are mutually contradictory and self-contradictory.

The vision quest consists of annihilating oneself in total immersion in conscious existence, meditatively and entheogenically, thereby bursting the incarnate bubble of perception and achieving moksha – asymptosis with "Brahman if you like". This is completely different from TM, mindfulness, or compassion meditation alone, and any other form of 'spiritual' or 'meditative' belief. It is raw, natural, manifest, immanent and transcendent – everything all at once! It is the force through which the green fuse drives the flower and unites us with nature, the wilderness and the diversity of life unfolding.

No belief system can embrace source nature and no intellectual construct can imagine it. It can be experienced only by taking full responsibility for the entire state of the conscious universe as one's personal karma and accepting the consequences as a whistle blowing transformer reflowering life's diversity in apocalypsis.

Because consciousness is primary, I am a realised source phenomenon, transforming the universe through my volition and communication in Symbiotic Existential Cosmology as a Rosetta stone oracle. As long as I continue to exist, I have the implicit capacity to save planet Earth from a Fermi self-extinction by drawing the attention of humanity to the key existential threats to existence and the natural avenue to living redemption. But the communication has to take place as a primary transmission. I accept my organismic mortality and my cosmological source nature as the living Logos of natural, cosmic existence. I accept my karma and the apparent paradox of a human being pronouncing the logos as a manifestation of source nature that we all share eternally in the conscious experience of existence. Therefore, do not cast lots on the garments of whom the bell tolls.

Empirical science is and HAS to embrace both affirmed 1pp experiences and verified 3pp observations to be complete, and particularly so in the Upanishadic model, where consciousness is deemed to actually generate matter. Affirmed 1pp experiences can carry the same evidential probability using the same statistical methods as verified observations.

Scientific experiments can and have been performed on psychedelic moksha: Griffiths et al. (2019) compared “God-encounter experiences” under classic psychedelics and naturally. While “the Non-Drug Group was most likely to choose “God” as the best descriptor of that which was encountered while the psychedelic groups were most likely to choose “Ultimate Reality.” Most participants reported vivid memories of the encounter experience, which frequently involved communication with something having the attributes of being conscious, benevolent, intelligent, sacred, eternal, and all-knowing. ... These experiences were rated as among the most personally meaningful and spiritually significant lifetime experiences, with moderate to strong persisting positive changes in life satisfaction, purpose, and meaning attributed to these experiences”.

I can experience union with Brahman directly by self-annihilation. I don't need the scripture or yoga to do it, just entheogenic meditation. And it has just the transformative properties described.

The notion that Brahman can't be experienced directly in the union of atman and Brahman is a contradiction to the Upanishads, so saying things like “Nirguna (propertyless), Nirakar (shapeless, formless) something we do not understand” is fundamentally wrong.

David Attenborough’s nature documentaries have become ever more enlightening and are now able to show full details of the sociobiology of wild animals and higher organisms and convey the sheer intensity of volitional survival and the utterly resourceful care that living creatures put into their parenting, courtship and social existence amid the tooth and claw of lethal encounters of sometimes horrific proportions, which nevertheless lead to climax biodiversity in natural paradise.

Two things follow:

Firstly life is really really alive in the sense of being enlightened to persevere and unfold the lives of each animal's offspring, even when the mother is half-starving. It is not just giving up and floating downstream, but caring selflessly for the continuity of life in the fabric of living nature that becomes the climax biospheric ecology that we know is living paradise.

Secondly with due respect to the natural universe, life is physically and biologically and psychologically exceedingly complex as a reverberating whole and the entire quantum universe is fractally alive, from individual molecules to tissues, to neurodynamics to innovative evolution as a whole cosmic manifestation. So the laws of physics, like the standard model are not mechanistic at all but evoke the entire incarnate conscious experience of existence. This means that, although consciousness is primary, the universe is necessary and it's necessary to transcendence.

Physical scientists think it might be explained in mechanistic terms, but they see these mechanisms only when reducing the systems they are observing to classical approximations. Otherwise nature reigns supreme over mechanism because we can't demonstrate causal closure of the physical universe.

This means to me that Aurobindo's description of a supermind making matter is fantasy, and this goes also for the Buddhist nature of illusion, which works only while Naropa or Nagarjuna are meditating staring at their navels with half closed eyes and not coping with the natural realities of existence in the raw. By restricting the domain of consciousness to the meditative state, as a controlled exercise of “skilful practice” they are spawning a deceit about reality, because consciousness is not illusion. It may be a controlled hallucination designed by the brain to enable biological survival, but it's a veridical hallucination of reality that is root insight.

However, like Attenborough’s evocations of life’s creative resourcefulness, I support Deepak’s “universe is alive” notion in its root simplicity. He invokes the fallacies in both traditional descriptions of a theistically-created universe and of the mechanistic view of physicalist science in favour of a creative view of living existence, in which we are all participating co-creatively, as he noted on Medium:

God did not create the universe. The biblical version of creation, Genesis, is wrong, balancing it with militant atheists are wrong. noting that in quantum mechanics, everything is spontaneous, due to quantum uncertainty leading to self-evolution and total autonomy and spontaneity. And uncertainty. And creativity. All the calculations of quantum mechanics are now helping create technology, even though quantum mechanics does not imply causality or even strict determinism.

Ultimately Deepak comes full-circle to a “liberated” view of deity as the entire cosmic unfolding of experiential existence, through consciousness itself:

The biological organism with this body-mind and the universe are both objects. The subject is one. The objects are innumerable minds, innumerable modes of knowing, innumerable things known. So thought conceives, constructs the notion, governs and becomes the experience of the universe, and in infinite modes of experience. If there are degrees of omniscience, this is infinite, infinite, infinite modes of omniscience, infinite modes of omnipotence, infinite modes of omniscience, omnipotence and omnipresence. Where ever you go, there is God.

This is an inspired evocation of Indra's net, extolled in Buddhism:

"Indra's net" is an infinitely large net owned by the Vedic deva Indra, which hangs over his palace on Mount Meru, the axis mundi of Buddhist and Hindu cosmology. In East Asian Buddhism, Indra's net is considered as having a multifaceted jewel at each vertex, with each jewel being reflected in all of the other jewels. In the Huayan school of Chinese Buddhism, which follows the Buddhāvataṃsaka Sūtra, the image of "Indra's net" is used to describe the interconnectedness or "perfect interfusion" (yuánróng, 圓融) of all phenomena in the universe.

It originates in Atharva Veda (c. 1000 BCE) which is also viewed as a conscious hallucination of “everything everywhere all at once”, confounding the opponents of true enlightenment. Verse 8.8.6. says:

Vast indeed is the tactical net of great Indra, mighty of action and tempestuous of great speed. By that net, O Indra, pounce upon all the enemies so that none of the enemies may escape the arrest and punishment.

However, this doesn't mean that I accept the Vedas either, or any piece of 3000 year old wisdom, except on its empirical validity. We simply have to be utterly wild and let go all these superstructures, like interdependent co-arising. There is a real drama of existence happening in the universe and we have a pivotal role as conscious sentient beings, not just in negative renunciation, but as immanent redeemers of life. There is no illusion. There is no Maya. The buck stops with us and we have to assume complete and total karmic responsibility for the entire state of the living cosmos we find ourselves in. Anything less is a cop out.

So I don't think there is any kind of skilful practice that can suffice. Subjective conscious experience has efficacy of volition over the physical universe. This is a flesh and blood reality. If we turn away from it to engage skilful practice, we are immediately sacrificing our root numinous immanence for a shadow world of illusion. So to Hal I say – do not go gentle into that good night! Experience in the raw. Be vulnerable, be mortal, in pain if you are, but live reality to the full. That's the entheogenic lesson of life. Do not step back from the brink, but live it in its full unmitigated wildness of visionary depth and intensity for the immortal eternal transcendent reality it is.

That is where Ishvara/Ishvari meets Brahman. Naropa is like a set of spectacles that are artificially coloured to reduce blue light to help us sleep tight. Better to be in egotistical suffering and experience it in the raw to gain natural fulfilment than skilful practice that just delays the inevitable in cycles of reincarnation.

"The mystic, in petitioning the Cosmic, turns the consciousness inward instead of directing the plea to a distant external entity or power. The Cosmic is in each of us, the mystic realizes. It is not just in the reaches of space. The mystic knows further, that our Soul will answer our petition. The Soul is of the Cosmic and it guides each of us to self-action." Ralph M Lewis

Life After Death: Symbiotic Existential Cosmology on Trial

Eternal Souls versus Organismic Mortality in the Immortal Flow of Life

Chris: The whole idea of eternal individual souls is an utterly selfish projection of ourselves as dynamic survival processes wishing to extend our tenure beyond our mortal organismic lifespan. To act or think this way is in direct conflict with how life comes about. By necessity, we are mortal, because parthenogenesis descends into mutational “heat death” by Muller's ratchet. Hence sexual recombination – scrambling the message – is essential to make new viable recombinations which CAN survive. Hence we are all uniquely different individuals with egos that can't immortalise ourselves by reproduction or by imagining eternal souls to satisfy our pretensions. It is NOT Nirguna Brahman disintegrating into lots of little deluded Shiva-Shaktis of mind and body in the fragmentation of the cosmic whole. It's the creative way the living universe manifests, so that life and conscious life can rise to overflowing knowledge the universe begins to have of its own existence and transcendence. We are also conscious visionary agents, who very badly need the gift of the biosphere – entheogenic psychedelics – to even begin to understand any of this. This is the gift of conscious biospheric evolution – to be the "Catcher in the Rye" for human pretensions – before we needlessly destroy ourselves and the diversity and sanctity of life as a whole.

Cathy Reason: So what's wrong with that [wishing to extend our tenure beyond our mortal lifespan to eternal life]?

Chris: It's unsustainable, pretentious, and has no evidential basis. Like it or lump it we are all mortal biological beings. Pretentious delusions don't change anything. Living beings aren't just abstract points, for which an infinite number can stand on the head of a pin, so there is a problem of cluttering reality with all the souls throughout history and violating the biological principles that are manifest in evolving life.

Cathy: That's contrived, inexplicable, and ad hoc.

Chris: That's an ad hoc value judgment in itself with no evidential support. All eucaryote organisms have the same core cellular processes that the human brain uses to evoke subjective consciousness. I'm not a physicalist and am certain like you that subjective consciousness is real and its ability to affect the universe is real, but it's illegitimate and foolish to simply ignore the evidence from biology about how full consciousness evolves and say its "contrived, inexplicable, and ad hoc". Evolving life in many highly creative ways IS contrived and ad hoc, i.e adventitious, but biology observes certain very conservative principles such as sexual recombination that are intrinsic to organismic mortality and we need to learn from these and adapt our world view accordingly.

Cathy: Chris, what you are suggesting does not happen anywhere in nature. You simply do not get things materializing out of nowhere and then disappearing solely in response to arbitrary configurations in the physical world.

Chris: Living organisms are being born and passing away as we speak, as far as we know their consciousness with them. We can't confirm or deny the existence of other individual's consciousness. "Materialise" and "nowhere" are both physical concepts. Dreams and visions come and go. You have no idea what happened most of the night when you are asleep. [La petite mort](#) (French pronunciation "the little death") is an expression that means "the brief loss or weakening of consciousness" and in modern usage refers specifically to "the sensation of post orgasm as likened to death." Consciousness continues to be evoked while physical circumstances invoke them.

Cathy: There is just no reason to take seriously the idea that consciousness itself magically springs into existence and then magically vanishes.

Chris: Conscious experiences are transient and impermanent, and have to be, so we can deal with the next existential crisis. Consciousness can appear and disappear as a whole any time we get knocked out and/or become comatose. Unhinging the relationship between consciousness and nature leads to all kinds of imaginary spiritual notions like eternal life that separate us from life as a whole and lead to anthropocentric extinction scenarios. There is no way you can defend claiming life after death is real by asserting consciousness can't cease or it would be magical intervention.

Cathy: A conscious individual is not an agglomeration of randomly appearing and disappearing subjective "bits", any more than a Euclidean manifold is an agglomeration of points. They are patterns on the evolving manifold which is the conscious individual – that our individual conscious experience can, in part, be represented as one.

Chris: Both visions and particularly lucid dreams can create scenarios that are impossible to truly represent on any kind of manifold space. The subjective experience has to be "optimally compliant" to the physical environmental boundary conditions because subjective consciousness is forming an interface that provides anticipation and creative intentionality through resolving the causal uncertainty in the critically uncertain brain state for the organism. That's an extremely subtle multi-dimensional dynamical process forming the real boundary conditions that define our conscious experience of the world around us, which we know has to be responsive to every element of the dynamical brain state spanning all cortical areas including sensory, experiential, emotional and psychic notions of self.

The conscious brain is the physical dynamical system aspect of that interface, but subjective consciousness is afire in the reactor core in its own right, both anticipating environmental uncertainty and intentionally affecting the physical universe, in subjective conscious volition. This is primal cosmological subjectivity fully manifested into organismic consciousness by coupling fully to its "internal model of reality" as manifest like a keyboard over those cortical columns spanning all cortical areas.

Conscious experiences also transcend physically perceptual constraints. If I simultaneously in a lucid dream stare into a woman's eyes knowing I am in an alien universe and at the same time shoot upwards with the unbearable anti-gravity of dreaming while knowing the sea spray is hitting my Indian shirt and I can feel every droplet simultaneously and again at the same time I realise I am just bobbing on the ceiling in an OBE telling myself I am okay down there in the bed, there is no way to put these parallel experiences on any kind of real-world sequential time line, let alone in any kind of dimensional space. Is it in an astral universe or just some kind of experiential "space" that can image anything at all, and burst like a bubble and is not even physical space?

Cathy: But it hides the fact that we have no idea why consciousness should obligingly manifest in just such a way that physical evolution requires, and fail to manifest in any other way. It reduces to a kind of spontaneous generation -- consciousness occurs just when the physical world requires it, and there is nothing further to be explained.

Chris: The biological evolution of subjective consciousness arrives at mortal subjectively conscious organisms because this is the only way, or the only evident way, that the universe can organically manifest consciousness. The physical universe is entropic and life exists as an extreme non-equilibrium system "negentropically" on the solar irradiated planetary surface and through additional chemical gradients on a wider scale. Complex organisms with large genomes cannot exist by parthenogenesis because of inexorable cumulative mutation, so life invented sexuality and all the metazoa have sperm-ovum fertilisation with indexed genetic recombination resulting in an almost unlimited variety of singular mortal organisms called individuals, who then in *Homo sapiens* incorrectly seek eternal life, when they got here by a process which is immortal only collectively, not individually. You call this magical and ad-hoc. It's not. It's why we have the existential dilemma of mortality. If you think there is another way of resolving it, the onus is on you. You can't just claim it's arbitrary or magical.

Cathy: I'm afraid this looks like the use of tricky language to hide the fact that we don't really understand what is going on. It describes what things look like from a physical perspective. But it hides the fact that we have no idea why consciousness should obligingly manifest in just such a way that physical evolution requires, and fail to manifest in any other way. It reduces to a kind of spontaneous generation -- consciousness occurs just when the physical world requires it, and there is nothing further to be explained. But that completely obscures the reality that we have absolutely no idea *why* consciousness should do this. As an explanation for the manifestation of consciousness it is completely arbitrary and ad hoc. It only seems plausible because, in western academic culture, we are conditioned not to see this problem from the perspective of consciousness, so the inherent absurdity of the idea remains hidden behind a mass of cultural assumptions. But that completely obscures the reality that we have absolutely no idea *why* consciousness should do this. As an explanation for the manifestation of consciousness it is completely arbitrary and ad hoc.

Chris: The reason consciousness emerges in the biota is because, in amoeboid-flagellates consciousness aids the survival of the collective organism, using transcendent physics that violates causality. It's thus an extremely counter-intuitive manifestation from the physical point of view that requires circumstantial explanation. Signal in this is the huge problem a complex organism faces deciding how to survive, eat and reproduce in a wild biosphere where all the environmental problems of survival are computationally intractable to literally unsolvable because of other conscious organisms being out to eat us. So it's an insoluble problem of consciousness versus consciousness.

To solve this problem, subjective consciousness has to both anticipate emergent uncertain circumstances and act upon them in a way which changes the physical universe through intentional behaviour. It thus has to be utterly compliant with all the neurodynamic boundary conditions defining the dynamic context, or causal conflict would arise, and has to be definitive only in uncertain situations as represented indeterminately in the critically poised brain state. None of this means this is just a physical description, but it's setting out the precise boundary conditions that subjective consciousness has to adopt to succeed in doing what it has been doing since the eucaryote endosymbiosis invoked edge of chaos membranes and communication by neurotransmitter molecules in the collective single celled organism that then became neurodynamics in us.

The rest of the story we need to discover by the vision quest because subjective consciousness is private to the individual and we can lean and discover what its confounding potentialities and actualities are only by falling right into the abyss and "hallucinating" our way to the other side of realisation.

Cathy: But they are not organismic psycho-physical boundary conditions. That's the problem. They are organismic physical boundary conditions to which the psychic is arbitrarily expected to conform.

Chris: Your initial arbitrary and incorrect assumption that individual eternal souls could exist comes from denying the fact that subjective conscious intentionality has to fit seamlessly with contextual physical circumstances to survive organismically. What you are trying to do is set up a stark division between subjective experience and bio-physical cosmology that fails to understand that subjective consciousness actually has a creative role in the physical universe which we experience as subjective conscious volition having efficacy over the physical universe, even by simply corresponding in this way. You are effectively denuding subjective consciousness from interacting and neutralising its ability to seamlessly interact by insisting physical boundary conditions are not psycho-physical when they clearly are psycho-physical because that's precisely the boundary interface between subjective and objective reality. Your model is stark dualism hoping mind is another separable realm in so many words. The boundary IS a boundary Cathy in which both realms meet and if they didn't meet seamlessly all hell would break loose from causal conflict and we wouldn't/couldn't consciously exist at all.

Cathy: They don't meet seamlessly, Chris, not in your model or in anyone else's. That is what I have been trying to get across to you.

Chris: You are making two self-contradictory claims with no evidence. First you say seamlessness is arbitrary and physical when it isn't and then you say it isn't seamless. If it's not seamless show us the subjective-objective fracture seam Cathy. There is no empirical content to justify your claims.

Cathy: Let's represent the evolution of the physical world in terms of something like a state space. Let us imagine the physical evolution to be a continuous trajectory, or set of trajectories, in black. Now let us add on the set of psychic trajectories, in silver. Now, the state space tells us how the physical system evolves, *whether or not* it has a psychic component. No-one imagines that physical world ceases to exist when it is not conscious. But if we look just at the set of psychic trajectories, we see just a disconnected hodgepodge of silver splodges, defined only where there is a direct connection with the physical. And this picture is completely one-sided. It tells us how the physical world evolves when the physical is not conscious, but it completely fails to tell us how the psychic world evolves when the psychic is not physical. It assumes that the psychic world ceases to exist when it is not physical. And this makes no sense. It is only the materialist bias of our culture that enables us to see why it is unreasonable to expect the physical world to disappear when it is not conscious, but prevents us from seeing why it is equally unreasonable to expect the psychic world to disappear when it is not physical.

Chris: That's a beautiful description. However, both sets of trajectories are modelled from outside and they only accidentally come together if they just happen to coincide. The physical and psychic are independent processes that are not existentially linked. It simply doesn't in any any way even approximate to the universe in which we consciously exist.

It introduces many further problems, for one, we simply don't know the physical universe can manifest without our observation of it. On the other side, we have no confirmation of viable conscious life except in the biota. Neither God nor angels have a verifiable presence, which is why I am very wary of assertively spiritual ideas seemingly sane people continue to have. People are able to imagine these ideas because subjective consciousness is private to the experiencer so we can each conjure up really bizarre spiritual notions like your conscious trajectories, which I know were coined to make the point you wanted to explain. Spiritual people might see this as the angels and indeed the gnostic pleroma is very like this, so there is a strong element of the human imagination that seeks such notions. When I am on mushrooms I can happily see all souls throughout eternity in this way but I don't see it as any form of absolute reality and only mention it in passing. But you are using the model to try to imply there are physically undetectable astral trajectories. If we are going to survive, we have to learn to take good care of the universe and life within it, so we can't set out on self affirming illusory journeys by affirmative belief.

Cathy: But there is nothing in your model which explains the distribution of these conscious interactions, or how they assemble into conscious observers.

Chris: That's not how any of this works! You can't interact qualitative features of conscious states with fragments of brain states. The interaction can't occur because of fundamental differences between integrated subjective

consciousness and fragmentary physical processes. The only interaction is between the ongoing subjective conscious state and the coherent yet critical phase transition brain state.

Cathy: But you don't explain the existence of an "entire ongoing subjective conscious state".

Chris: All our subjective experience is the entire ongoing subjective conscious state. Yes we can focus on aspects but that just changes the whole dynamic. I didn't write Symbiotic Existential Cosmology to make it easy for you or anyone else. I am intentionally making it difficult so as not to pull any punches or turn it into the sort of pop confetti exposé popular science has become, so it's in itself a vision quest that is a research resource for the entire description.

Cathy: At last, a glimmer of light. But it's a faint glimmer, because you still don't explain how primal subjectivity combines to produce subjective consciousness. So Symbiotic Existential Cosmology has the same combination of problem as every other panpsychist theory.

Chris: It's not panpsychism because it's not psychism. Subjectivity doesn't necessarily form a psyche until it has a mammalian-like encapsulation. The whole point is that filter theories, from William James through Aldous Huxley all transform the discussion from physicalistic brain causality into filter boundary conditions in which subjective consciousness and the physical universe can actually interact and you know full well that is how the doors of perception get flung wide open. Hence Symbiotic Existential Cosmology's whole description is a cosmological filter theory of how and why subjective consciousness not only exists, but also has efficacy of intentional volition over the physical universe.

Cathy: But boundary conditions aren't enough, Chris! You would not attempt to define the evolution of the physical world solely in terms of its boundary with the psychic. So whatever makes you think it can work the other way round?

Chris: The reason is the physical universe is as nearly causally closed, as we know it to be, while subjective consciousness is about "free will" violations. Physicalists and even David Chalmers veer into the notion that it is causally closed, despite quantum uncertainty, although he has back-tracked since. So the only confirmed effects we expect subjective conscious intentionality to induce are what we see in living behaviour plus a few uncanny hunches. Even these can only occur without causal conflict when they arise through critical transitions, in which the evolving brain state is physically indeterminate. That's why Symbiotic Existential Cosmology asserts that subjective consciousness functions essentially and only to deal with existential crisis due to environmental uncertainty.

But the fact that for subjective consciousness rather than mere computational "intelligence" to continue to exist in evolutionary terms means it has to facilitate survival. Because environmental uncertainty is computationally intractable, this brings in the ultimate hard problem of having to anticipate the immediate future to avoid annihilation in the present which is a causality violation of past and future which can only mean retrocausal influences in consciousness – the worst form of spookiness. This is why we are living in perpetual existential crisis at the centre of the cyclone of this boundary condition, poised on the edge of the organismic Fermi extinction we call mortality.

Cathy: If I understand this correctly, what the [Wheeler] article makes clear is the suggestion is that a measurement selects the set of classical histories consistent with the outcome of that measurement. There is no suggestion of anything like retrocausality.

Brian Josephson: Here's an actual quote, from 'Law without Law': "Acts of observer participancy ... give tangible 'reality' to the universe not only now but back to the beginning". This is similar to your 'determinate history', but what does that mean? It's a bit like saying finding a fossil determined the past, but that isn't surprising. It's rather twisting the use of words.

Kashyap Vasavada: Perhaps at some time Wheeler got this nutty idea that current measurements affect billions of years in past. He probably changed his mind. But whatever you write in print has immortality.

Chris: No, it's not that simple. The idea is far from "nutty" and Brian's comment is pertinent. As you all actually know, because weak quantum measurement, which has become rife, shows this is not a trivial question of "classical histories". It's a manifold subtle effect that permeates all of physics. The question has to be asked "how DOES the universe, upon measurement select the set of classical histories consistent with the outcome of that measurement?"

This brings us back to all the phenomena of entanglement and the question of how type 1 processes of measurement alter all the probabilities of absorption throughout space-time and possibly beyond if we entertain the "possibilist" view of quantum transactions. Kashyap tries to trivialise this by selecting preferred bases, but the only way to get any idea of how entanglement instantly maintains correlation when one is measured is through a confirmation wave from the absorber back to the common emission event.

All of this is occluded by the "shut up and measure" approach and Qbism for all its touchy-feely bullshit flunks abysmally, both of which trivialise the question of how the universe actually makes choices. I know Grant loves Qbism but it's as bad as shut up and calculate made a social contract. Then we are dragged back to the ad hoc assumption of uncertainty being randomness when we know cats are either alive or dead and somehow a unique decision got made that becomes that indelible line of history Kashyap is referring to and is why I am lodging Symbiotic Existential Cosmology for posterity into the future, to make such a record.

This pertains to everything that happens that is not definitively causally determined, which is just about everything we make survival decisions about. The greatest failure of physics is not failing to understand the nature of subjective consciousness, which lies outside its frame of reference, but the spooky action at a distance in plain sight in quantum measurement itself. I acknowledge retrocausality in some form is a "hard saying" in the apocalyptic sense, because it challenges our notions of order and causality but that's the problem at the core of subjective consciousness.

Cathy: What are "contingent realities"?

Chris: They are all the subjective things we can't prove physically but seem to maybe be going on mysteriously. Eternal life, Deja vu, prescience, clairvoyance, Psi, deep collective memories that hint of reincarnation, Jungian archetypes, dreams and visions we struggle to make sense of. Hunches, flashes of uncanny insight. SEC puts these into the "to be confirmed by mutual empirical experience" basket.

Cathy: Well, just for the record. here is my criticism in one line: you have not explained why consciousness should obligingly pop into existence when required, and then just as obligingly pop out of existence when no longer required.

Chris: That's the breaks living in the entropic mortal coil, but the trade off is being in the centre of the cyclone rather than just disembodied cosmic consciousness eternal but ephemeral. This is why despite all, I call it the best of all possible worlds if we preserve paradise on the cosmic equator in space-time.

There's a twofold answer to your central question in Symbiotic Existential Cosmology:

- (a) **Primal subjectivity** is cosmological so it doesn't pop in and pop out. It's always there and has always been there and always will be and it permeates all phenomena in the universe in different ways.
- (b) **Subjective consciousness** is an emergent encapsulated elaboration of primal subjectivity, so it is dependent on the form of the encapsulation.

Why is Encapsulated Consciousness so Obliging to the Universe?

The filter theory says the brain is not causally closed and forms a very sophisticated boundary condition on subjective consciousness carrying all the aspects of experience spanning all cortical regions as an internal dynamical model of reality, rather than the brain determining the dynamic causally, but we know the universe is very close to causally closed, so subjective consciousness is like the genie caught in the bottle. The only way it can act without causal conflict is to leak out of the cork. This is the cubic centimetre of chance Carlos Castaneda referred to. The quantum universe is NOT causally closed and neither is it just random but is a form of punctuated stochastic causality driven by ergodic hidden variable dynamical systems. So subjective consciousness can intervene only in physically uncertain situations, which is exactly what it does, dealing with uncomputable environmental uncertainty that arises from the quantum universe. This is why subjective consciousness appears to be so obliging.

So when we die, primal subjectivity doesn't but the organismic encapsulation unravels. Does it carry on disembodied? That's for each of us to find out! One of the reasons I like psychedelics, although they can be challenging, is that they give us a chance to go to the edge of incarnation in a healthy state and come to terms with it.

SEC differs from physical cosmology, which is unconsciously comatose, and religious cosmology, which is driven by an autocratic superconscious divinity. In Symbiotic Existential Cosmology, it is WE who are the transformative agents, not God and we have to take personal responsibility for the fate of the universe and life within it.

Cathy: You can't explain that in terms of biological evolution because evolution is a physical process. Your theory asserts a functional complementarity between mental and physical, but never explains how this comes about -- only the physical side is ever explained.

Chris: I just showed you the opposite. The physical side EVOKES subjective consciousness. That IS the explanation. The conscious side is you staring out the window or cleaning up your messy kitchen! Or dreaming, or hallucinating, or intentionally planting seeds for the future.

Cathy: And how can "primal subjectivity" be said to permeate all the phenomena of the universe, when its only connection with the universe is through conscious interactions with the physical?

Chris: That's back to front again. We are aware only of our own conscious experience. We have no direct empirical evidence for subjective consciousness outside this. Even a vision of a ghost or God is a personal subjective experience.

Primal subjectivity generates full subjective consciousness in eucyote organisms as a manifestation through the subjective-physical, or psycho-physical portal. The portal is not just physical but has both aspects in a two-way handshaking arrangement. SEC is focussing on full consciousness, but primal subjectivity is the key to it all. You need to be more intuitive and enter the visionary condition to answer this.

Cathy: So we still have the question -- how does encapsulated consciousness obligingly emerge from primal subjectivity and then obligingly disappear back into primal subjectivity (a transformation which itself requires a lot explanation, by the way) on just those occasions when the functional requirements from the physical side of the theory demand them to?

Chris: The entire process is interactive and the cosmic origin did this "duplicitous" act of complementary "creation", so that subjective consciousness has a realisation. Otherwise we don't know either the universe or subjectivity could become manifest.

Cathy: And I'm not at all sure about your model of conscious interaction with the physical, either. You seem to want this to be hidden away somehow by the uncertainty principle. That doesn't usually work, as you know, because if it could, then one could use such interactions to make measurements prohibited by the Uncertainty principle.

Chris: That's exactly why the mind-brain interface deals with it the way it does. It's too early in the evolution of neuroscience to fully explain this,. You are talking about imposing external measurement in the physics lab, but life deals with this in a radically different way, so you can't try a devil's advocate deconstruction based on the physics lab. The brain is manifestly making brain waves and the EEG is not just an average of action potentials because these are in handshaking relationship with the field potentials complementing the network connections, so the whole brain looks like it is doing direct wave resonance beat sampling like the fundamental principles of why quantum indeterminacy exists ([fig 71\(c\)](#)). This is circumventing the probability interpretation to determine the variables over time and space by wave beats!

If one thinks of these as some kind of quasi-particle exciton, they can be long-lived and braided and emit and absorb one another in an entangled quantum of the present which subjective conscious experience seems to be. That's WHY people think consciousness is eternal! And these excitations are also connected to synaptic adaption and molecular memory, so just like advances like quantum computing, we have a phenomenon we are only scratching the surface of. In this view absolutely all molecular brain processes are quantum, so the brain is a quantum prediction "machine" evoking primal subjectivity to complete the cosmological process in conscious intentionality affecting the physical universe. The internal model of reality is not to "require" but to evoke and manifest.

Cathy: You seem to want to get around this by introducing chaotic dynamics, so that even if one could make forbidden measurements, it wouldn't matter, because no-one could ever know in practice what they were measurements on. But it's far from clear that the physics of this is mathematically consistent.

Chris: The empirical evidence to date is that quantum chaos leads to deep dynamical phase transition entanglement. We are going to be a long time waiting before physics is mathematically consistent. Cathy. This is only the beginning of the problem physics faces. We still have to deal with retrocausality, let alone quantum reality versus general relativity.

Symbiotic Existential Cosmology is designed above all to be an **efficient cosmology** in terms of Occam's razor, so it doesn't attempt to describe primal subjectivity *a priori* except in its attestable manifestations complementing the physical phenomena I have cited above, from quanta to human consciousness. Integrated information theory (IIT) tries to do the same thing, but without subjective consciousness, so it IS just a functionalist model. This is all that can be done without unverifiable statements of belief like eternal life. I just say primal subjectivity starts out vestigial, just as the inflationary universe emerges from a quantum fluctuation, so it's a compact consistent cosmic origin.

This is for the rigorous reason of **explanatory efficiency**. All idealistic and even neutral monist descriptions have turtles all the way down. Vedanta proposes it all began from a fully fledged cosmic consciousness that then degenerates into us and the Kali Yuga. Monotheism says an autocratic creator designed the entire universe as a clockwork orange. Even Ram with neutral monistic Nirguna Brahman is making infinite turtles by presuming an all powerful manifestable neutral entity that can make anything and everything happen – consciousness and the universe – without explanation. These all invoke more complexities and paradoxes than they resolve. SEC doesn't suffer from panpsychic combination problems because it replaces physical causality with subject-object hand-shaking, in which both are involved. Because it all happens through the interface, we don't have subjective contradictions. SEC goes absolutely as far as any empirical enquiry can go without unnecessary assumptions, and the one assumption is clearly stated as an axiom.

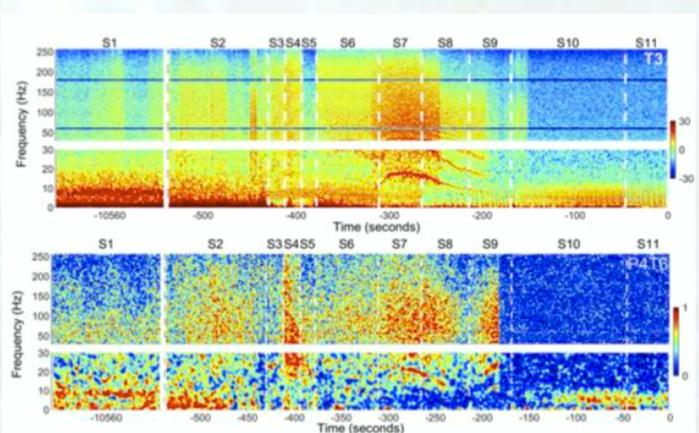
Ram Lakhan Pandey Vimal: What survives death? And does the self-aware self-as-subject survive death as a soul?

Chris King: I experience consciousness as being eternal and on mushrooms I have a visionary "feeling" that all conscious beings throughout space-time are mutually aware as disincarnate entities. But that's just an intuitive notion and could be an illusion and a full moksha experience is a "near death experience" (NDE) telepathic encounter with the Totality, not a separate personal eternal soul. So the idea of individual souls seems inconsistent with there also being a Brahmanic cosmic mind and with the moksha experience. Moksha is described as the escape from the round of birth and death. If we are encapsulated forms of the cosmic mind and the encapsulations dissolve when we die then that's maha-samadhi – the dew drop slips into the shining sea. I'm not sold on reincarnation, or on the transmigration of the souls and see it as an excuse to postpone moksha or explain why it is so difficult (and doesn't need to be). How many angels can dance on the head of a universal pin – forever and ever in one physical universe?

Mortality is the centre of the cyclone of reality. That's where it all goes down and comes down and where the consequences ensue. We are the cosmic mind caught as individuals in the incarnate bundle of life, so we myopically perceive it as egos fighting for survival and fear mortality. So we need to recognise our true nature is cosmic and take responsibility for this incarnation we happen to have and protect the abundance of life with our lives. Nothing else really furthers! This remains true, even if the cosmic mind can manifest only in the biota as a sensitively dependent neurophysiological state, akin to the quantum virtual vacuum.

I achieved moksha by self-annihilation, by giving myself back to the universe. Then I experienced Union and get told to save the abundance of life everywhere in the universe before I die. That's impossible! But the impossible we do today and the improbable we leave till tomorrow – if tomorrow ever comes. So I'm staking my lot on the journey across the Styx and no ferryman can do it for me. That's taking personal responsibility for fate.

Fig 286b: Global hypoxia-induced surge of high-frequency oscillations in the brain of dying patient Pt1 lasts several minutes after life support is removed. Above: Absolute power of left anterior-mid temporal lobe (T3) before (S1) and after (S2 to S11) the withdrawal of ventilatory support in Pt1. Below: Temporal dynamics of functional connectivity between the right posterior temporal lobe (T6) and the right parietal lobe (P4) (Xu et al. 2023).



Ram: Does your SEC framework predict the survival of consciousness (self-as-subject) after death?

Chris K: Symbiotic Existential Cosmology asserts that primal subjectivity is a cosmological complement of the physical universe and that attentive consciousness is an emergent property of the eucaryote endosymbiosis. This means essentially that self as subject is not confined to any one organism's lifetime. It's basis spans space-time and its attentive dynamics is a product of a topological transition, in the eucaryote endo-symbiosis that is also in principle cosmological. The world view of SEC is that we are conscious transformative volitional agents transforming the physical universe to create history as we speak, so it is for us to discover all these mysteries within our mortal lifetime and to protect the diversity of life in the universe. As John Donne (1624) said, the bell tolls for us to do this necessary thing, without which we cannot hope to survive as a species, and as a planetary biosphere:

*No man is an island, Entire of itself.
Each is a piece of the continent, A part of the main.
If a clod be washed away by the sea,
Europe is the less. As well as if a promontory were.*

*As well as if a manor of thine own, Or of thine friend's were.
Each man's death diminishes me, For I am involved in mankind.
Therefore, send not to know For whom the bell tolls,
It tolls for thee.*

Symbiotic Existential Cosmology doesn't predict that individual organismic consciousness survives biological death of the organism but more that in poetic terms, it is a feature of subjectivity as an "integral transform of the totality of existence". Individual eternity is a religious fantasy along with concepts like personal souls. The reality is confounding and a supreme gathering of all into the wave of conscious realisation.

I experience and have experienced cosmological moksha states that lie outside the confines of ordinary reality. I personally experience psi phenomena, like precognition, which I think are pivotal to conscious anticipation of existential threats, which is why subjective consciousness has been retained by evolution. But I'm here to manifest them if and when they do occur, not to prove them in statistical objective claims of dubious validity that will never save life on Earth, or provide for the next occurrence, or avoid bad karmic outcomes. Either we use our non-ordinary "siddhis" transparently for the protection and unfolding of life's diversity, or they are wasted.

Seeking eternal individual life is a grossly selfish quest that is part of the Christian eschatological delusion and pervades Eastern traditions as well. Trying to classify everything into a philosophical framework is likewise meaningless, because you, as a transformative agent have to face up to the ultimate reality consciously, and classifying subjectivity is just objectifying it. What do we actually do about reality, given a mass extinction of biodiversity, climate crisis and nuclear mutually assured destruction threatening our own existence? Maybe if you do really experience cosmological moksha you will realise that your organismic consciousness is just a flicker on the great tsunami of cosmic consciousness, as indeed it must be. But this philosophical speculation of yours will waste your life, to your very death bed, unless you stop this grasping classification quest and unfold the cosmic experience we all share.

I hold the Upanishads to be a deeply informative account. But Focussing on yogic renunciation has failed to achieve the protection of life as a whole for three millennia. The many Vedantists among our acquaintances simply quote the claims of the yogis as scientifically unevicenced articles of faith. I have yet to see a single first hand account of cosmological moksha or a single properly evidenced claim of samadhi. Likewise, the Western Christian-based assumption of theistic spirituality with eternal personal souls and creationist doctrines debase life's unified coherence and fecundity in human dominion. These are each self deceptions of a reality so awesome, immanent and transcendent that annihilation is the only way to approach it. Any prior assumptions like God or Creation just act to block the portal. In many ways psychedelic moksha is the opposite of meditative renunciation of life. It is the entire living conscious brain state running free of its encapsulation, evoking subjectivity asymptotic to the foundations of physical cosmology in full expression of the four forces of nature – the complete transfigured opposite of death.

The only matter of substance and true worth in this "spiritual" quest is the saving of the diversity of life now and throughout our generations forever. Anything less and we will destroy ourselves for what we fail to bring forth from ourselves, as Jesus said in the Gospel of Thomas (70):

*"That which you have will save you if you bring it forth from yourselves.
That which you do not have within you [will] kill you if you do not have it within you."*

Ram: Please let us know which of the following five possibilities survives after death per your SEC (Symbiotic Existential Cosmology) framework. Per materialist Roman, Level 0 (nothing survives) is the possibility.

Per (Delorme, Radin, and Wahbeh, 2021) in Advancing the Evidence for Survival of Consciousness:

“What does survival mean? What is meant by the survival of consciousness? We propose five meanings related to various degrees of consciousness. The term consciousness in this context includes a sense of subjective awareness (including that of one’s surroundings) and a sense of identity about one’s sense of self and personal memories. With those definitions in mind, we propose five possibilities after death:

- *Level 0: Nothing survives. You, including all aspects of what you consider to be yourself, emerge from the operation of your brain. When your brain dies, you cease to exist.*
- *Level 1: Pure awareness survives. There is no sense of identity or personal memory. This is a formless, content-less state, like transcendent meditative states with no perception of the environment as distinct from oneself.*
- *Level 2: Awareness with limited identity survives, but no personal memories or past lives. There may be a perception of some sort of environment. This is like waking up from a dream and not remembering who or where you are.*
- *Level 3: Awareness and identity survive. This includes memories of one’s immediate past life and the perception of some sort of environment.*
- *Level 4: Awareness and identity survive and can interact with the physical world. There may be a sense of identities of many past lives and perception of one or more environments. This level of awareness may include the deceased’s ability to communicate or interact in some way with the physical world and with living persons.*

Levels 1 to 4 indicate some degree of survival. Because pure awareness (Level 1) does not include a sense of identity, for this essay, we set the threshold for what we mean by survival at Level 2 or above, although most popular beliefs about survival would be at Level 3 or Level 4”.

Chris K: Symbolic Existential Cosmology is a Rosetta Stone flight-manual for conscious volitional beings to navigate their incarnation and transform the universe for the unfolding of conscious life.

In response to your four level analysis, the problem, as I already explained, arises from the notion of identity, so here is my experiential position:

- 1: Pure awareness survives (primal subjectivity), as it is complementary to space-time.
- 2: Identity, as presented, is a false concept. In psychedelic quantum change, it is the dissolution of identity that is key to the mystical experience.
- 3: At the core of moksha is a merging of organismic and cosmic identity. Moksha is the escape from the round of birth and death, so it is also the escape from encapsulated organismic identity.
- 4: Just as in the Bardo Thodol, the process of “rebirth” can involve visions of differentiation and unification of identity, so moksha is a visionary experience of “all-souls” in what I might describe as “telepathic communication” as one eternal conscious awareness.
- 5: This is the underlying experience I always have as a simple matter of fact of life when I am communing on mushrooms. I am me and I am my organismic consciousness, but simultaneously aware of and intimately part of the eternal throng of all conscious existence in the most gentle aware way possible. I am in an infinite assembly hall in which, underlying my individual identity, I/we are the legion of all conscious existence throughout the cosmos from forever and for everlasting – so be it – Amen.
- 6: For this reason, our existential duty in this mortal coil is to the preservation of the unfolding diversity of conscious life, without organismic self cherishing. This IS the immanent, transcendent illumination of mortal existence!
- 7: Without this epiphany, no cultural tradition and no conscious species can survive within the planetary biosphere and will ultimately suffer Fermi self-extinction.

Three cultural assumptions get in the way of our intuitive understanding of reality:

- (1) **Traditional religious descriptions including the Vedas and Judaeo-Christian cosmologies** try to define a god-centred reality that in the Vedas is a mind-centred theistic view but in the Judaeo-Christian view is creation-centred theism. This stops us accepting and experiencing reality as it is, either because we take the yogi’s word for it as enlightened beings, or because the scripture says God created Heaven and Earth.
- (2) **The physicalist world view tries to assert that consciousness is just an internal model of reality** constructed by the brain, distorted by perceiving conscious intentionality affecting the physical world to give us behavioural confidence, when the hidden cryptic account is that our brains are doing it all and our experience of conscious intentionality is just an incorrect self-fulfilling internal model allegory.
- (3) **The third more subtle impediment is analytical philosophy itself**, which, just as you are doing, tries to abstractly classify everything into “isms” which are too primitive to capture cosmological reality, in exactly the way ball and

stick models of chemistry fail to understand fundamental force symmetry-breaking and the paradox between gravity and quantum reality.

There is one and only one avenue I know of to solve this problem. The biosphere has evolved entheogens, which because of the sappy neurotransmitter-based conscious brain, enable us to escape the bubble of perception of organismic consciousness and perceive non-ordinary disembodied reality in such a way that it asymptotically approaches cosmic consciousness because psychedelics enable an experiential consciousness of the brain operating in neutral, much closer to the brain's own cosmological foundations in the forces of nature themselves, than it can when anchored to (a) organismic experience of the physical world, (b) rational thought processes, which are a product of culture and language and anything but visionary in nature and (c) spiritual and religious doctrinal beliefs.

So I say of Symbiotic Existential Cosmology – **the diversity of life is the wine and entheogens are the bottles** to preserve it from extinction – the immortal process unfolding conscious awareness throughout our generations forever. So it's a really deep echo of the Western sacramental tradition fulfilling itself and carries a sense of visionary revelation. There is no guarantee you can achieve this on the first encounter with psychedelics however. It has taken me a lifetime of entheogenic deep nature meditation to glimpse the totality.

Lao Tsu didn't say the way that can be told is not the countless way for nothing. Once we fall out of the bubble of perception, it is obvious and doesn't need to be stated. We have to make the journey ourselves to know and understand.

*The Tao that can be told is not the countless Tao.
The name that can be named is not the countless name.
The nameless is the beginning of heaven and earth.
The named is the mother of ten thousand things.
Ever desireless, one can see the mystery.
Ever desiring, one can see the manifestations.
These two spring from the same source but differ in name;
this appears as darkness. Darkness within darkness.
The gate to all mystery. (Laozi, Tao Te Ching)*



I have no self-certainty. I simply exist.

Experior, ergo sum, experimur, ergo sumus. Experimur igitur universum esse.
I experience therefore I am, we experience therefore we are. We experience therefore the universe is!

Here are five features of where your description is inadequate:

- (1) **Subjective conscious volition is physically creative.** This means the interaction also involves subjective consciousness affecting matter. We also know physical circumstances affect consciousness, so it's a two way street. However we can't describe it as a simple bijective or deterministic mapping, because the dynamics of subjective consciousness, particularly coupled to the brain in organismic consciousness are at the complex end of cosmological phenomena and of any theoretical description, just as I said about ball and stick chemistry versus fundamental symmetry-breaking.
- (2) **Subjective consciousness can't be decomposed or observed, only experienced,** so we can't analyse it, we can only experience it as a whole in all its depths and features and live it to the hilt in the vision quest. Carpe diem!
- (3) **The dynamical relationship between subjective and objective is maximally asymmetric** and has to be so to provide conscious anticipation, complementing brain function for living organisms to survive. Conscious states have to be able to respond faithfully to the brain's boundary conditions, so primitive subjectivity has to be compliant to physics except in situations of physical uncertainty, where free will intervenes without causal conflict.
- (4) **Cosmic consciousness is the cumulative end-result of emergence.** Because consciousness is a two-phase process the first universal and the second emergent we can't talk about cosmic consciousness as if it is the same thing as primitive subjectivity, which exists for single quanta, butterfly effect systems and all life forms. What actually happens is that cosmic consciousness is the most ultimately emergent phenomenon the universe produces. How we can experience it is asymptotically, as highly evolved conscious organisms, releasing ourselves from organismic sensory constraints through meditation enhanced symbiotically through entheogens. This doesn't invoke primitive cosmic consciousness as a universal but forms of organismic consciousness asymptotically convergent to what Aurobindo called the "super-mind" – organismic consciousness becoming one with its most cosmological dynamics.
- (5) **Because this involves annihilation of ego, it involves annihilation of self-certainty.** Only by this annihilation of the organismic filter imposed by the brain can the brain and mind enter into moksha which is the escape from the round of birth and death through the nierika portal to the spirit world (so called).

SEC adds one and only one additional principle to quantum cosmology:

(1) Subjective consciousness is primary.

Thus it adds primitive subjectivity, which is an additional aspect of quantum reality in which subjective consciousness is represented in the global wave function and free will in wave reduction and other natural phenomena reflecting this principle in quantum reality. In turn, this limits conscious decision making to be uncertain dynamical situations in the brain linked to environmental uncertainty. It doesn't assert defining properties, because these have to be optimally compliant with physical reality to avoid causal conflict.

It then makes a second affirmation through subjective empirical experience:

(2) Subjective conscious volition has efficacy over the physical universe.

This resolves the hard problem of consciousness and the problem of free will by reversing the Occam's razor logic, by saying the hard problem is in conflict with immediate conscious experience in a way we can immediately verify (e.g. your reply to me manifests physical effect of your admitted subjective consciousness). You need to understand that this is the simple direct satori that emerged from meeting Brahman on mushrooms, as well as the symbiotic principle.

The third principle is the objective empirical observation that we are mortal biological organisms dependent on physical circumstances:

(3) The universe is necessary.

Key to its scientific basis is the discovery that **attentive sentient consciousness** emerged from the discrete topological transformation accompanying **eucaryote endo-symbiosis**.

Finally, to complete the becoming, the empirical observation of nature:

(4) Cosmic evolution rises to immortal conscious climax through biospheric symbiosis.

The rest of SEC is entirely confluent with neuroscience and quantum cosmology, with no bias, like your cyclic universes have, or which quantum interpretation is favoured by me. SEC supports a filter theory of consciousness in that the brain is and **has to be a contextual filter**, not a materialistically causal determiner of consciousness in the light of (2).

This is a karmic satori in pretty much the same way as Buddha emerging from the sheltered life of nobility and discovering death and decay and inventing Buddhism based on the suffering ego, because we are causing a mass extinction of immortal living diversity as we dither.

Symbiotic Existential Cosmology says primal subjectivity is cosmological and attentive consciousness is emergent and biological. I don't see organismic consciousness surviving death because it has lost its contextual filter in the brain and its environmental context, so lacks its organismic encapsulation. However the living impression on mushrooms that the universe is pervaded by eternal conscious beings is experienceable and may be like a conscious engram in the cosmos.

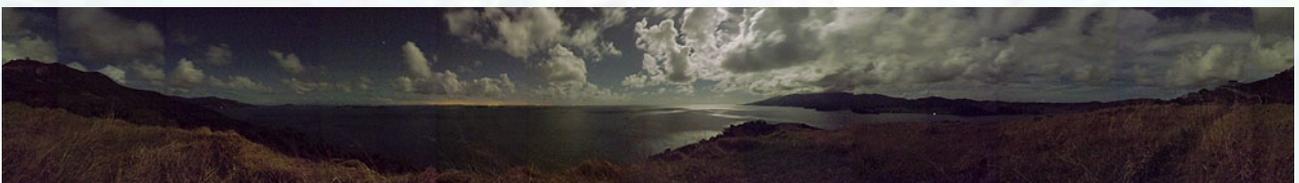


Fig 292: Opuhi - Midnight moonlight. I have spent many moonlit nights lying in entheogenic reverie in the long grass that caps the summits of what is otherwise a wind-swept native forest wilderness.

[Living on the Open Road](#) (mp3 c1985)

Chris King: Song & lyrics, dulcimer, keyboards, ova. **Heath King:** Bass, rhythm and lead guitars, djembes.

We are whispering ... across the heavens
and all the creatures ... they echo in reply.
We are the very blood ... of the tree of life.
We are the void and the shining light.

We are the eternal gypsy spirits of the universe.
We have been here since it all began.
We will outlast its final passing.
We are here to free the heart of man.

Regarding life after physical death, we know the Bardo Thodol deals with this as a kind of transition trip where consciousness undergoes a transmigration of the soul into another body. Thus the Buddhist Lamas I have known,

including the sixteenth Karmapa, were all claimed to be reincarnated beings found and chosen by the Tibetan Buddhist tradition. While I respect the infectious personality of Rangjung Rigpe Dorje, I do have issues with this idea.

We have discussed this before, but I think the idea of the atman surviving physical death is inconsistent with the merging of atman and Brahman which should also occur in maha-samadhi and I hold the Upanishadic tradition to be the source and Buddhism to be a philosophically truncated form of the founding "grail path". You can't on the one hand claim Brahman is "ultimate reality" which is super-abundant cosmic consciousness and then just reduce it to "emptiness" for the purposes of revealing everything is mutually co-arising transient phenomena. I see this as reducing ultimate reality to sandbox spiritual psychology.

So I see the very notion of individual survival of the soul as a heresy. The conscious universe has to be able to return to the source from which all life springs anew, otherwise it becomes cluttered with completed past lives who no longer have a natural context. We/it can't regenerate nature if we are trying to preserve the individual self-consciousness of every atman that has become incarnated in the history of the universe. Neither do I remotely think animal and human souls reincarnate in one another, or that there is any moral law of karma.

This poem gives a hint of this pollution of individual souls:

Missing dates

*It is the Chinese tombs and the slag hills
Usurp the soil, and not the soil retires.
Slowly the poison the whole blood stream fills.
Not to have fire is to be a skin that shrills.
The complete fire is death.
William Empson*

Essentially both the Vedic and Buddhist cosmologies are non self-sustaining, which is why they end in the degradation of the Kali yuga, Samvartakalpa or Eon of dissolution – the decline from enlightenment into ignorance.

Biological life, by contrast, is compassionate of the organismic mortal coil it coexists with, through sexuality being essential for complex conscious animal life to exist. We don't expect individual biological organisms to live forever in the entropic universe that IS Prakṛti speaking and to imagine Puruṣa doing the same thing in individual souls is a corruption of the dew drop slipping into the shining sea.

Every night I go to sleep is a little death, from which I am reborn, but I don't want to be stuck in groundhog day forever. We need to be able to let our selves be the robust but illusory hallucinations they actually are, which can dissolve in moksha to our transfiguration, and accept maha-samadhi as giving back to nature the eternal consciousness we have carried as a flame throughout our mortal lives. That is true compassion.

Dilemmas of Dealing with the Unshakeable Scientism of a Physical Scientist about Understanding Consciousness

This is an account of a debate on the nature of subjective consciousness and the importance of including subjective empirical 1pp experience as well as objective 3pp observation in the scientific discovery process about the conscious mind and the physical brain, so that others can understand the problems consciousness researchers have as scientists seeking to uncover the nature of reality as a whole. I have tried to include as many of the people involved as possible in an account covering (1) 1pp versus 3pp empirical scientific methods, (2) the struggle to validate the nature of subjective conscious volition over the physical universe, which all intentional beings depend on to survive, and (3) the question of observability versus non-observable phenomena. Hopefully this can turn a seemingly intractable divide into a creative process of discovery for readers to come, and shows the problems mainstream science has facing let alone respecting and understanding the nature of subjective conscious existence in the physical universe.

Kashyap Vasavada: As I have been discussing for perhaps a year or so, to me, the most visible demonstration of difference between conscious animals and unconscious rocks is the purposeful moving of body parts. Other things, speech, languages and all esoteric things associated with consciousness come later. To neuroscientists it is now well established that there is some network of nerves starting from cortex or spinal cord and going to limbs using ionic currents. Regardless, the basic model is likely to remain unchanged. Now, how thought or desire to move limbs give rise to currents may be a missing link or under debate in neuroscientific journals or society meetings. But I think the

above model will remain unchanged for quite some time.

Fig 293: Constructing our description of reality based on the external physical world, since Copernicus, carries incredible explanatory power, because nature is complex and provides a detailed physical and biological description, that is accessible to explore, but in terms of subjective experience and conscious existence, relying exclusively on the external objective details paints us into a corner where we cannot solve the hard problem of consciousness, because the external objective description is categorically incapable of modelling or manifesting intrinsic subjectivity. This situation can never be resolved while scientists hold unshakeable fixed opinions, eliminating any first person evidence from the empirical methods of science (experiential and observational).



Jonathan Edwards: We are interested in this ‘missing link’ that gets the outbound events going. The outbound electric events are well understood. Moreover, you can get the same outbound events with unconscious movement, not just brute movement in epilepsy but the finely detailed unconscious movements of my hands going over the computer keys – of which I am only conscious now and again when I think of it. So the debate we are having is where in the chain from input to output is thought and desire. Cathy has her reasons for thinking that something that does not simply follow from (supervene on) electrodynamic patterns is happening – something more. I think we are looking for electrodynamic events of a special sort in nerves. Chris K thinks we are looking for patterns in the dynamics that go beyond individual nerves and beyond the predictability of basic field theory.

Kashyap: So far I have not heard any convincing argument that we should believe in 1pp experience of any one, even Samadhi, vs 3pp verification of thousands of observers which result into certain things like internet we are using now! How can you prove that they are not either honest hallucinations or worse frauds like many I have seen in India? I was discussing tremendous advance in neuroscience about understanding limbs motion and other aspects of brain. They come from precise knowledge of how nerve currents start from specific areas of brain resulting in contraction of specific muscles. This kind of knowledge results in engineers devising prosthetic limbs and brain surgeons putting implants to cure Parkinson’s and similar diseases. You have to know which part of brain does what to put the implant properly. Just saying consciousness makes your limbs move does not mean anything.

Chris: Two articles appeared today in Nature on state of the art implants, allowing a person paralysed by a brain stem haemorrhage to “speak”. It is simply an electrocorticogram grid sitting over the Sylvian fissure, including the motor cortex. This enables the team to build up a primitive representation of the local regional field activation which then has to be carefully decoded as a very rough description of what she might have been trying to say with currently about 72% inaccuracy. It’s locally more detailed than a current EEG but the 253 electrode set is only a little higher than the 129 electrode cap we have used for EEG studies. Of course the techniques will improve, but there is no way this, which does require a deep learning model, or any other mechanistic device attached through a data interface can prove that the subjective conscious volition to speak or do anything else in the physical universe is a simple physical reflex arc, just as there is no way to prove that the physical universe, or its brain dynamics, is causally closed.

Daniel Levine: The problems of understanding the mind, consciousness, behavior, empathy, etc., are so incredibly complex that NO LINE OF INQUIRY SHOULD BE EXCLUDED! 3pp experimental science, mathematical theory, 1pp subjective experience, clinical observations, all are part of the search for understanding. And everybody has a mind and consciousness and behaves and feels, so has contributions to make regardless of station in life.

Kashyap: If you can convert 1pp experience into 3pp data then many observers can participate. That is fine. Then only it becomes science. On our campus many psychologists do EEG/fMRI of mice. My dispute with some on these forums was that they want science to take 1pp experience as scientific data!!

Jo Edwards: You may never get to see your mistake but you are completely wrong about 1pp data not being useful in science. (In fact 1pp is never converted to 3pp, we just establish reliable correlations.) In biomedicine we routinely study 1pp phenomena like colour perception, pain, fatigue, memory (very easily given numerical values) and so on. Just because you have been living in a physics lab all your life does not mean that science not go further outside! And when it comes to basic physics we find ourselves back at 1pp because we want to be able to create a mental picture of

what events in the world are like at a fundamental level. Lots of people end up with absurd ideas like 'wavicles' that don't really mean anything. Others 'shut up and calculate' which is all very well but it means that nobody is likely to make the sort of conceptual breakthrough that Einstein and Bohr did in establishing the quantal nature of reality. Sticking to 3pp ensures that all you ever do is engineering, not even new fundamental physics. To get new insights you need to have 1pp conceptions.

Kashyap: I still stand by my statements. 1pp experiences are useful for psychologists and medical doctors to understand status of a person's brain. But because of vagueness, they are useless for understanding laws of nature! I think every scientist who has at least 10 or more years of college level study of science related subjects would agree with that. The success of physics/science in last 400 years is a solid proof of that!

Jo: You seem to have backed yourself into a corner with no exit, Kashyap. You want to know how desire, which is purely 1pp, gives rise to current, which is purely 3pp, using an explanation that only deals with 3pp. You could equally reverse it and ask how current gives rise to desire. Either you think this is a scientific question or you don't. You do not really have a third option. Consciousness is 1pp. Why join a forum if you think there is no point in theories involving 1pp?

Kashyap: Unfortunately, very many people on these forums do not understand what is science and what are its methods. They keep on arguing, something must be true because it is in ancient books or some one said it! This is false. MSP does not believe in physics because Einstein or Schrodinger or Heisenberg said it!! But many of the things have a solid experimental support! 3pp verification by lots of observers, preferably with repeatedly calibrated instruments, is the final authority in science. Individual experiences cannot be accepted as science. Also theories or models in science have only a tentative acceptance. So, what can you do if it is not possible to do experiments on something like concept of mind, OBE, NDE, psi, afterlife, existence of another world etc. Well these have to be classified as nonscientific beliefs until they are established. You can do experiments on brain. So that is part of science, not mind!

Siegfried Bleher: A single 1 pp experience need not be repeated to grow into a new theory that eventually supersedes its predecessor. If it does, it does so with numerous instances of 3 pp support, as you say. But all of that can be triggered by a single insight in one individual. That is part of the value of 1 pp -- of course, not to deny the tremendous effort needed to bring an insight to public awareness and verification.

Kashyap: Surely, I did not take any neuroscience course. But from what I have read, I can tell that they usually talk about brain. They know that mind is an undefined object. If you find, any neuroscientist talking about mind, what it is and where it is located, let me know. I would like to know how he/she found out about it!! As I said the word 'mind' is coined by some philosopher thousands of years back without knowing much science. Scientists do not talk about unobservable things!

Cathy Reason: How do you know this when you have not taken any course on neuroscience? Undecidable does not necessarily mean unknowable. It just means there is no finite sequence of instructions which will determine if something is mind or not-mind. The same is true of life.

Chris King: Mind is NOT invented thousands of years ago by some ignorant philosopher, it originates from the Norse "love"⁹⁷.

It is shared across cultures by the Latin word "*mens*" for mental. The span of the definitions below shows it is an integral conceptual working component of human knowledge, which is also widely accepted in neuroscience for active conscious mental states, including cognition and reasoning. It is not a physical attribute in space time, but neither is love or the patience so many people have shown you with no commensurate respect from you. Does patience exist in space-time? Does integrity? Does time itself, or is it next for the grim reaper? I believe you do know how to think so you need to respect that your mind thought these delusions of yours. Please stop denigrating psychology and several other sciences and listen to the wide spectrum of objections you have received.

⁹⁷ **mind (n.)** "that which feels, wills, and thinks; the intellect," late 12c., *mynd*, from Old English *gemynd* "memory, remembrance; state of being remembered; thought, purpose; conscious mind, intellect, intention," Proto-Germanic **ga-mundiz* (source also of Gothic *muns* "thought," *munan* "to think;" Old Norse *minni* "mind;" German *Minne* (archaic) "love," originally "memory, loving memory").

Kashyap: [The] only thing I want these people to admit in plain English [is] that they do not know what is mind and where it is. Whether it is undecidable or unknowable like concept of God comes later!!! ... As I said I do not have any problem if someone wants to study it. But do not call it science!! Let scientists define what is science just as we let carpenters define what is carpentry and do not consult carpenters about heart problems!!!

In view of existence of hallucinations, illusions and faulty judgements of individual minds, how can you justify believing in experiences of individuals and ignoring average of measurements based on repeatedly calibrated instruments by thousands of observers all over the world? As I have been saying even judicial system has been relying more and more on video evidence in comparison with accounts of individuals on what happened in front of their eyes!!

Chris: Science is the empirical, theoretical and descriptive discovery of nature. It is not just about $\sigma 5$ quantitative statistical measurements. Empiricism is about both empirical 3pp observation and empirical 1 pp experience. The notion derives from a doctor using their first person experience of medical conditions to make expert diagnoses. Sigma \times simply gives the unlikelihood of the result, whether 1pp experience or 3pp observation, happening by chance.

Gaussian statistics is useful only in fine quantitative measurements of effects with statistical sampling errors. Even then, there is no absolute standard. Statistical methods can be applied to subjective reports, just as with experimental observations and many neuroscience experiments combine both, as Dan pointed out to gain an understanding of conscious brain states. The standards are chosen by the discipline to be appropriate for the circumstances, from $\sigma 1.64$ (5%) in psychology to $\sigma 5$ ($\sim 10^{-7}$) in physics. The fact that I have to tell you this after a year of your determined obstinacy speaks volumes about your inability to understand, or respect, the full sweep of the scientific method.

You are taking such a severe line about empirical methods of investigation that it disables a good sector of physics, let alone virtually all of the biological sciences, psychology, and much of medical science, where descriptive awareness of fine details of a condition are essential. You simply don't make a five sigma medical diagnosis, the balance of personal experience is the key to an effective diagnosis and therapy. The legal system continues to depend on personal testimony, although supported by circumstantial evidence, and must needs do so for humans to take personal responsibility for their intentional actions upon others in the physical universe.

We do NOT let carpenters define what is carpentry. I have built two houses as well as being a scientist. Neither do scientists alone, nor professors, nor Nobel prize winners have the exclusive authority to define what is science, nor should they be allowed to do so. That is called priesthood, religion, dogma or doctrine. You are trying to claim everyone else is ignorant and no one is a 'scientist' as if it was a sovereign title given the elect to rule over others. The worship of higher authority is contrary to the scientific method.

Joshua Davis (Yeshua ben David): Never forget that dead brains in museums are nonconscious systems, like rocks. You will likely never find the memories of the human in a dead brain. I see my mind every day. I also hear an output of your mind when you speak to me as well as when I read such outputs. Perhaps, one day you will change your mind about mind when new meanings surprise you. I am sure you will never need to change your brain to change your mind.

Kashyap: OK! But that brain in [the] museum was alive once. Have you seen a mind anywhere? Can you be sure it is not just your imagination, like child's imagination of 100 ft tall monster under the bed?

Grant Gillett: My mind is contributed to by Aristotle, Aquinas, Locke, Kant, Merleau-Ponty, Vygotsky, Wittgenstein and Luria daily but my brain has never been in the same ecosphere as them – interesting!

Kashyap: All the people you have quoted are dead philosophers not scientists whose theories have to be verified by experiments. In particular Aristotle's physics was completely wrong!

Cathy: I should add, Kashyap, that your questions do have answers, just not the sort of answers you may be expecting – which is presumably why Yeshua and Grant are offering you what are in effect, koans. The answer to your question "Where is mind?" is that it is probably not located in physical space-time at all

Nancy du Tertre: Kashyap, are you starting to get it yet? To Cathy's characterization of Joshua and Grant's statements/ drawings as "koans". Do you understand simultaneous logical illogic or illogical logic – take your pick? A mind "is" where in time and space? Nowhere, somewhere, and everywhere.

Kashyap: Cathy, Sorry to be blunt! Yeshua does not have any Physics degree as far as know, although he is trying to do experiments [on Bell entanglement] in the Auckland Physics Dept. Apparently Grant has M.D. but his answers do not look scientific. My question was a serious one. Grant gives some abstract philosophical answer. Yeshua shows a sketch of his smiling face as representing mind!!! This confirms my suspicion that no one understands what is mind and where it is. Most likely some thoughts arising from brain are called mind, which is a word coined by philosophers and not scientists. In fact, I assert that there are extremely few scientists on these forums. That is a big problem!!! ... You will agree that showing a sketch of human face is not much of an answer to the question what is mind and where it is."

Sungchul Ji: Joshua's answer [a smiling face] was a semiotically profound answer. I am afraid Joshua threw pearls to pigs.

Kashyap: To you!!! You have practically zero knowledge of physics!

Cathy: As far as I know, Yeshua is a physicist and Grant is a neurosurgeon. I'd have thought that was scientific enough for anyone.

Grant: You are right in the sense that I have only published a few books on neuroscience and usually in relation to philosophy; it is similar with my several hundred medical publications. But after all us so called 'doctors' sometimes even have PhD's far less D.Phils.

Amit Aurora: Kashyap ji, I could also say, You know little of Biology or Quantum Physics and technologies, or what lies beyond our universe. Why do you just keep on bombing everybody with their limited knowledge of Physics? I don't believe traditional physics will survive any more as science is advancing at a very fast pace. You need to recognize that physics is just one piece of the broader scientific puzzle. While it lays the groundwork for understanding the universe's fundamental laws, the rich tapestry of science encompasses many other branches, each with its own significance and relevance to our exploration and comprehension of the natural world. Embracing the diversity of scientific disciplines allows us to gain a more comprehensive and nuanced understanding of our complex and interconnected universe. Please you need to change yourself and be open to other people thinking. Please try to adopt a Trans-disciplinary mindset, otherwise you will keep on arguing and accusing people if they know physics well or not.

Sungchul: It would be a miracle if our dear Kashyap listen to your loving advice.

Deepak Chopra: Without the unobservable observer there is no science (Chopra & Kafatos 2017). The empirical manifest is a blip of experience in the vast ocean of formless awareness. "Empirical fact" is a name given by humans to a specific snapshot of perceptual activity in consciousness - a v practical magical lie – in the model of naive local realism - basis of all science.

Chris: Darwin didn't need to do $\sigma 5$ quantitative stats because his discoveries were a descriptive analysis of evolution. Einstein didn't need to do $\sigma 5$ 3pp observation to deduce relativity theoretically or to discover quantum reality experimentally in the photoelectric effect, because it depended only on the frequency, not the intensity (Arons & Peppard 1965). Superconductivity is an effect demonstrated by a permanent magnet hovering over the superconducting medium. It is again a definitive result.

If we want to move forward, I suggest two key steps:

- (1) Agreeing to care for one another and take shared responsibility for any outcome and not presume to ignore valid critiques from group members, as Kashyap does.
- (2) Figuring out how the group can actually further, or accomplish, the repair of the world – tikkun olam. This is the urgent key that gives the group meaning and purpose.

Brian Josephson: My PhD was experimental (title: 'nonlinear conduction in superconductors'), but I did do a little theory on the side, including a published paper that went down well.

Chris: Brian was awarded half the 1973 Nobel prize "for his theoretical predictions of the properties of a supercurrent through a tunnel barrier, in particular those phenomena which are generally known as the Josephson effects". Wikipedia notes that he has repeatedly criticized "science by consensus," arguing that the scientific community is too

quick to reject certain kinds of ideas. "Anything goes among the physics community – cosmic wormholes, time travel," he argues, "just so long as it keeps its distance from anything mystical or New Age-ish." Referring to this position as "pathological disbelief".

Daniel: If you rest your case, [Kashyap] please rest it! I am tired of hearing it over a hundred times, and repeating it to this group will not change anyone's mind. As for my "Type 2 publications," to me the connections are seamless not only between science and spirituality but between science and the humanities and social sciences. So I have written articles that are expository for varied audiences, drawing on my scientific research and others', both in scientific journals – like Neural Networks, Cognitive Systems Research, and European Journal of Medicine – and in non-scientific journals – like Journal of Socio-Economics, Utopian Studies, and Interdisciplinary Journal of Partnership Studies.

Siegfried: I will say that it is likely the brain acts as an anchor and receptor to the mind, in the sense that our feelings and concepts serve to delimit our patterns of thought and access to original thoughts and concepts. Such limitations include concepts of locality and identity. Since we know that patterns of movement and memories can be triggered with electrical signals, there is an additional anchoring to the physical processes identified by neuroscience. But I don't think neuroscience will find the mind within the anchors.

Entheogens and meditative practices disrupt the anchors, which leads to revelations of the unanchored aspects of mind (which, of course, can be both good and bad, depending on preparation of the individual and the availability of guidance), or switch the mind to a different set of anchors.

The way mind can be 'outside' or 'prior to' location and still have agency on the physical without appearing to violate any physical laws is if what is describable physically is finely balanced at a critical point. The evidence for the presence of mind is in the intelligence present in the trajectory over time, not in violation of conservation laws in any single event.

A way of linking what I am describing as the mind separate from the anchors to physical anchors is to recognize that there is self-consistency in 3pp science as determined by contextual constraints of the current conceptual foundations of MSP. As I mentioned in an earlier post, the conceptual foundations of MSP rest on perturbative properties of QFT near to and at the extrema of the actions for the current model Lagrangians. There is a kind of confirmation bias that prevents MSP from considering non-perturbative aspects of the model Lagrangians or more accurately other Lagrangians whose perturbative limits we work with that might contain more distant extrema (locatable with Floer homology, for example).

Kashyap: To give a short answer people who investigate unobservable things are not called scientists in the usual sense of the word. So there is no question of any boundary!! If you do not believe me, go to a nearby university and talk to a professor who is spending his/her life in teaching and research in science. Note that there are indirectly observable things like quarks or wave functions. But NO SCIENTIST, yes, NO SCIENTIST will ever say he/she would like to spend his life in trying to investigate strictly unobservable things!!! So there is no type 2 science. Either it is type 1 or something else which should not be called science!

Chris: The only scientific concepts that are definitively unobservable are sub-quantum hidden-variable theories that coincide with quantum field theory at the quantum level. In addition there is only the concept of an invisible omniscient omnipotent God which is, to say the least, scientifically problematic. This is really really important to get right. I "believe" there are hidden variable theories that are (1) consistent with pilot waves in terms of weak quantum measurement, (2) with the transactional interpretation in terms of wave function collapse and (3) with super-determinism in its dynamic detector boundary conditions. I think this is how the universe is and that's why it is alive as Deepak says and we are alive, so the idea that this investigation is not science or not scientific, is itself completely unscientific.

But I don't agree about the existence of an unobservable spirituality either. The whole 1pp vision quest is the complement of the 3pp physically observable world. Both are by definition observable. The journey of the vision quest is both the ferry across the Styx and the voyage of the Beagle in paradise. The mystery is transcendent but the reality is immanently manifest. I am an empiricist and a mainstream scientist on the question of observability. I don't accept any form of unobservable moksha or an unobservable cosmic mind. The whole basis of Brahman as ultimate reality is its transparent experientiability, no longer through a glass darkly, but now face to face, knowing also as we are known.

Bearing in mind the vast differences between these points of view and their cosmological significance I think any premature conclusions are precipitate.

Yeshua: Yes Chris, I concur that unobservable physical quantities are different than unobservable thoughts and spiritual values. I was referring to unobservable thoughts or spiritual values only to 3 pp science and only available to 1st pp and possibly to 2nd pp science in shared experience. I concur with you that experiences and reports of sublime thoughts and values in meditative or entheogenic states are to be considered as 1st pp empirical science.

Deepak Chopra: On target Chris ! 🙏💕💕

Chris: I am not uncertain about the nature of mind or consciousness. You know I have Symbiotic Existential Cosmology fully fledged, of now 763 pages thanks to this review. I am NOT uncertain about this as a theoretical description. I repeat the key principle which is: "**Subjective consciousness has efficacy of volition over the physical universe**" due to our relationship with quantum uncertainty, manifest in environmental uncertainty in a causally open universe.

We all need now to move on and not look back, or those that remain will turn into pillars of salt, or suffer the fate of Eurydice through the uncertainty of Orpheus, to coin a myth that Kashyap may yet come to understand.

Dilemmas of Dealing with the Unshakeable Idealism about Cosmological Consciousness

Deepak Chopra: Matter is a name for human perceptual activity. Useful construct Not fundamentally real. Matter is a collection of qualia in consciousness.

Chris: I think you are dreaming! Or I hope you are! My father was a general surgeon. Who had a dream that he was standing on a very long stairway and on it there was another man and he said to him "This is just a dream and I'm going to put my head on the stair and you can kick me in the face!" So he did just that, and the man kicked him in the face and he awoke in shock in agony with pain, just as real as if he was awake.

Now if you think that when you said "Matter is a collection of qualia in consciousness", which I presume was when you were in a state of alert wakeful consciousness, as you sent this electronic communication to us, how about you put your head on the stair while you are awake and one of us can have a go to give you a gentle jab. If we went too far, you would lose this consciousness, as you know as a medical practitioner. So you are either going to be in abject pain and possibly bleeding, or you will be unconscious and won't have these "qualia" you claim is the physical universe. But for us, the universe is still around us and you are out cold on the stairway.

We all know this and so we just about all know you are fooling yourself. As the old saying goes, you can fool some of the people some of the time, but you can't fool all of the people any of the time, nor any of the people all of the time. You certainly can't fool me, although I don't believe matter makes mind either, but if you intend to continue to try to pull the wool over my eyes, please let's just run the experiment together on zoom for the whole world to see, recorded in its full glory!

Deepak: Your head is also the same illusion. As is your body. As is the pain. As is death. Awareness is independent of its modified expressions. Bye.

Chris: I wear a Tibetan silver skull on my necklace with a 1/4 Anna coin as the clasp, now nearly dissolved by years of sweat, that was thrown to me by a priest in a little roadside temple in Puri where the juggernaut from Jaggernath crushed the faithful under it's wheels. But none of this mind illusion talk has any power to save the Tree of Life throughout the universe!! Neither does running for the door express confidence in your assertion!

Deepak: All names and forms are ephemeral transient identities. Even yesterday is now an ephemeral dream. Why can't we realize all names and forms are human constructs attempting to explain transient experiences in awareness ?



Chris: Transcience is the unbounded mother of living diversity. The sorts of native or naive observations you make, we can make from the age of four, summed up in the same words because consciousness is where we start. But like it or lump it, we are here to transform the living universe, each in our own microcosmic way for better or worse. Stepping off the merry go round is what death actually is. Don't preempt the grim reaper! Don't cast lots on its garments before your time! You are just hastening the inevitable!

Deepak: Chris is a genius

Deepak: Fundamental reality (existence) is formless. It has no borders. It is infinite. It is the immeasurable potential of all that was, all that is, and all that will be. It is Absolute Irreducible Shapeless Timeless Unchanging Unimaginable Incomprehensible. It appears as every changing form and phenomena. All forms are actually phenomena. The phenomena are in turn constantly changing fluctuations of the formless Absolute. The Absolute is changeless. The relative (fluctuations) is ever-changing. The Absolute is of the nature of consciousness (awareness). The Absolute is Self-aware. Its fluctuations are in the nature of species-specific experience. The species themselves are diverse forms (fluctuations) of awareness. The evolving universe is the changing appearances of Absolute awareness (species-specific). As humans with a narrow band of perceptual activity (now expanding that range with scientific instruments) we experience only a sliver of Reality. Anything perceivable or conceivable is ultimately not real (transient, ephemeral, and momentary). The cause or reason for existence is a Mystery beyond human comprehension. At the Source, we are the mystery we are seeking to explore.

Chris: The diablo is in how Neti-Neti is applied. You are trying to apply it to all forms of experience as illusion, but it means neither subjectivity nor physicality is absolute. In the Beatles' Yellow Submarine there was a personified vacuum cleaner that sucked up everything, just as you do, but you never got to the finish line where the vacuum cleaner turns on itself and sucks itself to oblivion up its fundamental orifice. You are clearly conceptualising everything but the kitchen sink, but then you declare this emptiness Absolute and that's a concept too, so the argument disappears up its fundamental orifice. I think the Absolute lies in the complementarity which is itself a paradox we can consciously experience. To say experience is illusion and consciousness is absolute is contradictory because consciousness is also in its most astute awareness, fully conscious of itself in its experience and in my view is most conscious of itself in the flow of self-aware conscious experience that is manifesting form creatively.

Ram: Brahman is neither mental nor physical (using the neti-neti principle), so it is consistent with Neutral Monism (Vaidya, 2020).

Chris: The Brihadaranyaka Upanishad, that cites both "I AM Brahman" identifying subjective experience with ultimate reality and Neti-Neti "not this not that", states there are two forms of Brahman, the material and the immaterial, the solid and the fluid, the Sat 'being' and tya, 'that' of Satya – which means true, denies the existence of everything other than Brahman. It doesn't say manifest Brahman originates from unmanifest. The diablo is in how Neti-Neti is applied. You are attempting to classify Brahman by a false Neti-Neti. You have neither physical evidence nor experiential evidence. I now simply retort "Neutral monism – Neti-Neti" to refute it, because you are not talking about Brahman, but the philosophical concept. You have no personal knowledge of Brahman and yet you have the cheek to satisfy your predilection to allot Brahman into a category by remote control. It is a contradiction to say Brahman is neither capable of manifesting physically nor mentally. The entire Upanishads revolve on the awareness that atman can experientially merge with Brahman. That's the redemption of the Vedas! In my moksha my brain was functioning physically free of the sensory limitations Deepak points out and my conscious experience was union with Brahman in an NDE. Ultimate reality manifests in ALL aspects and then results in 824 pages of SEC to manifest both irrevocably.

You are simply picking Nirguna rather than Saguna Brahman to suit your neutral monist theory. We already know about abstract Brahman versus personified the Ishvara/Ishvari 'Elohim'. Nirguna and Saguna are philosophical aspects of each with their own conceptual rationalisations. Brahman is BOTH abstract ultimate reality AND a compassionate persona very concerned for the future of cosmic consciousness in the natural universe. This is NOT a false vision because cosmic consciousness depends on the existence of biological life.

Deepak's description is a product of sparse contentless meditation that ends up perceiving consciousness itself as the Absolute, while nothing insightful is forthcoming. Yes, consciousness is behind every experience and is that which is

aware of everything but that doesn't mean it is the Absolute. There is no explanatory power in this description except its claim that everything comes from consciousness itself. But this simply cannot be consciously established because we are inside the bubble of perception. The only way to get out is experienceable moksha, but you can't do that with emptiness meditation. You need a fully experienceable NDE that transforms your world view and provokes you to act to save life throughout the universe. Anything less IS delusion. Psychedelic deep meditation is the complete opposite of this, full to overflowing abundance – and is the incarnate natural route to moksha. Emptiness meditation is a very sparse confining form of samadhi. Seriously at fault is the complete failure to understand how anything happens or why it happens in the way it does. We can't explain the relationship between experiences and the world around us. We can't explain biology, why we are alive, or any other aspect of reality except to say it is all illusion.

Deepak: Do you have any idea why there is existence? Or why there is aware[ness] of existence? Do you believe that systems of human thought including science or philosophy have access to reality? Do you know the source of thought? Have you ever questioned the limitations of human knowing? Why do you assume that a species on a speck of dust in the junkyard of infinity among 2 trillion galaxies has access to Truth?

Chris: Existence exists to experience with no limitations. It's not about thought, or rational discourse, which are superstructural logical forms of conscious experience but unconditioned experience, able to adopt any form. The diversity of existence is the jewel of life incarnate, not a junkyard. The certainty of knowing transcends the illusion of "Truth".

Ram: The question is how Sagun Brahman manifested from Nirgun Brahman. Is it through evolution and natural selection? Yes, it might be true because life arose 10 Bya after the Big Bang. For 10 Bya, Nirgun Brahman manifested into non-living entities such as galaxies, stars, planets, etc. When humans came, Nirgun Brahman manifested into Sagun Brahman, such as Ishvara/God and deities, which were needed to organize us, live peacefully, reduce suffering, and solace when our loved one died. It makes sense to me to bring science and spirituality closer. What do you say?

Chris: I don't think Sagun is just a manifestation of Nirgun. They are both perspectives on an unconstrainable reality. The Vedas were conceived through samadhi from the idealistic perspective that emerged from animism and spans both East and West. Their rationale is thus conceived idealistically as thought, or consciousness. It's inherently subjective, not neutral.

When you say manifesting into "non-living entities such as galaxies, stars, planets, etc" this is assuming two things:

- (1) **That these are non-living.** While I see biological life as cosmologically climactic, because it is the most complete manifestation of the four forces of the core standard model, the answer to all this is that cosmological Gaia is plausible on all levels once we have primal subjectivity, so the primal paradigm is fertile.
- (2) **Whether there is an abstract symmetry-broken force of nature at the source or whether it needed an aphysical "agent".** All the events since the inflationary big bang are consequences of this early phase following the known symmetry broken laws of nature. The jury is still out for lunch on the early pre-inflationary phase and whether it needs primal subjectivity or "God" or us anthropically to define it, or is a one of many multiverse. In every other respect outside quantum uncertainty, the subjectivity is complaint to physical boundary conditions avoiding causal conflict, although the inflationary origin was likely a quantum uncertain fluctuation. So I suspect Brahman manifests initially as primal subjectivity and ramifies late in cosmic history, with organismic consciousness, so the cosmos can become self aware, pulling itself up from its bootstraps so to speak using the forces of nature to become incarnately embodied in the biota.

Ram: Where does primal subjectivity come from?

Chris: From the necessity for the subjective to exist at the origin because material complexity does not explain subjectivity. It doesn't mean subjective and objective can't interact, as Ryle claimed, as we actually experience this all the time, but one cannot be used to explain or invoke the other, so subjectivity has to be coeval with the cosmic origin. This is exceedingly plausible, because the universe itself arose from a quantum fluctuation in the inflationary scenario and it provides primal complementarity to the primal universe. Then they can both bootstrap interactively together as Shiva-Shakti. And it trounces the hard problem by saying that if physical matter can't generate subjectivity through physical complexity then matter must already have a subjective aspect. It's just like dual aspect monism, but its interactively alive, so subjective conscious can, in turn, affect the material universe. That's the other way it is asserted

– the primal axiom that **subjective conscious volition has efficacy over the physical universe** as an empirical experience, in which both come together existentially in the now. So we are full circle.

Ram: The article by Swami Mehananda is fascinating. It seems the neutral (neither mental nor physical, neither conscious nor non-conscious, neither formless nor with forms, neither attributeless nor with attribute) Nirguṇa Brahman (NB) is the fundamental/ultimate reality.

Chris: You seem to be misquoting Aurobindo and the content of Mehananda's (2022) paper about Sankara as well, so your Nirguna Brahman thesis unravels.

Firstly Aurobindo says:

For in the Inconscient itself and behind the perversions of the Ignorance Divine Consciousness lies concealed and works and must more and more appear, throwing off in the end its disguises. —Sri Aurobindo, Letters on Yoga I.

This clearly says Aurobindo does not accept a neutral monistic idea of aspect-less ultimate reality. It says he sees consciousness as the divine fundamental and neutral Inconscience as simply a substrate for consciousness to manifest and transcend.

Secondly the key reference to Nirguna in Mehananda's (2022) paper says:

According to Sankara's "illusionist" Advaita philosophy, the sole reality is the impersonal and attributeless (nirguna) Pure Consciousness, which only appears to manifest as this world due to our ignorance.

By contrast, according to Aurobindo's "realistic" Advaita, the Divine Saccidananda is both personal (saguna) and impersonal (nirguna): the Sat aspect of Saccidananda corresponds to the impersonal Absolute accepted by Sankara, while the Cit aspect of Saccidananda is "Consciousness-Force," a personal and dynamic "Cit-Sakti" which has the inherent capacity to manifest in and as the world. Hence, Aurobindo, unlike Sankara, holds that everything in the world is an emphatically real manifestation of Divine Consciousness. ... According to Aurobindo, evolution has both an outer and an inner dimension. Darwin's theory of physical evolution through natural selection provides a more or less accurate account of how various species have evolved in the course of the earth's history. However, what Darwin overlooked is the inner spiritual evolution of consciousness through the mechanism not of natural selection but of divine "involution." Divine Consciousness, Aurobindo claims, is "involved" in everything in the universe and progressively manifests itself at each stage of the evolutionary process from matter to life to mind, and ultimately, to Supermind.

Mehananda is saying neither Sankara's "illusionist" philosophy nor Aurobindo's "realistic" approach are neutral monism with no manifest aspects – Sankara because nirguna is not attribute-less but is a form of "consciousness" and Aurobindo because "Consciousness-Force," has the inherent capacity to manifest in and as the world. Deepak also clearly identifies consciousness as fundamental not attribute-less unknowable, neutral, nothingness.

Aurobindo comes closer than Deepak to a comprehensive notion of existence:

These [i.e. Mind, Life, and Matter] are in themselves powers of the superior principles [i.e., Sat, Cit-Sakti, Ananda, and Vijnana]; but wherever they manifest in a separation from their spiritual sources, they undergo as a result a phenomenal lapse into a divided in place of the true undivided existence: this lapse, this separation creates a state of limited knowledge exclusively concentrated on its own limited world-order and oblivious of all that is behind it and of the underlying unity, a state therefore of cosmic and individual Ignorance.

I am certain Deepak is wrong about all experience being illusion, which also justifies Mehananda's term "illusionist" applied to Sankara, but he is right in identifying "consciousness" as primal.

But Aurobindo makes the mistake of seeing matter as aggregates of consciousness:

According to Sri Aurobindo, in conformity with the oldest Indian scriptures, matter was created by the ultimate or supreme consciousness seeking manifestation. In order to manifest, supreme or absolute consciousness, starting from the full fluidity of the spirit, created graded planes of being, till it reached the state of manifesting the solid density of matter. Sri Aurobindo calls this the process of Involution. The involution of consciousness is the process in which the Supreme or Absolute conceals itself more and more by creating planes of consciousness of increased density, in order to create the density needed for physical manifestation. In each of the planes that were created during the involution, (called typical planes or graded worlds) the absolute or divine consciousness veiled itself increasingly till it was able to produce and manifest the various forms of solid matter.

At least this is aiming for an existential cosmology. Symbiotic Existential Cosmology avoids this problem because it conceives of cosmic conscious as a state we approach asymptotically through opening the doors of perception while primal subjectivity is vestigial at the cosmic origin, thus not having to try to explain the physical universe as derived from involutions of consciousness, which we know to be a primarily organismic climax phenomenon in biological evolution.

Ram: Yes, there might be many possibilities; but how can we rule out what I mentioned previously? “When humans came, Nirgun Brahman manifested into Sagun Brahman, such as Ishvara/God and deities ...”

Chris: Before I reply to Ram I want to explain briefly how the relationship between consciousness and experience arises physically in the brain and how this clarifies the nature of existence and the relationship between NB and SB in Symbiotic Existential Cosmology. I am going to discuss the mammalian brain but we need to understand from the outset that all metazoan brains share deep common principles that arose in single celled amoeba-flagellates, despite apparent anatomical differences, exemplified by the apparent REM sleep phases of resting baby spiders.

The mammalian brain is not just a neural network of synaptic connections but utilises phase modulated feedback with tissue field potentials and is in fact a vast symbiotic population of neurons and neuroglia cooperating in an intimately coupled society similar to aggregating social amoebae. It consists of two interacting systems, one arising from the ascending cholinergic reticular activating system evoking the energetic resonances between the thalamic nuclei and the cerebral cortex we associate with active consciousness, in turn, modulated by the adrenergic ascending pathways of serotonin, dopamine and other monoamines modulating brain dynamics for organismic survival.

Complementing this is the envelope of the cerebral cortex, which, with the exception of prefrontal areas involved in attention, is organised as an experiential filter on ascendent activity, in six cortical layers, distributed across the cortex in micro-columns, which despite the extreme variations of visual, auditory and somato-sensory processing, all have a common architecture and physiology. This cortical experiential filter under normal operation eliminates the subterranean level of processing to form a perceptual/experiential internal model of reality spanning all dimensions of subjective experience external and internal. This means that we don't see the physical world of wave particles directly as it is, but an inner representation of it, e.g. through three colour vision based on the versions of rhodopsin in the cones of the retina, augmented by higher level visual processing areas into veridical 3D vision, symphonic spectral audition, alluring olfaction of hundreds of receptor dimensions and subtle tactile through to emotional and internal organismic sensations. Because some areas of the cortex include information about self and other, these also include recursive experiences of autonomous agency over the world around us, distinct from consciousness itself. As well, partly through culture and language, we have developed higher processes of cognition, analytical thought and reason, extending from natural intuition of the environment around us and our relationships with other agents. This internal model of reality, although located biologically in the brain becomes the holy grail of existence, as a kind of controlled hallucination, we call subjective conscious experience.

When we enter deep states of meditation leading to samadhi, the cortical filters become diminished, leading to consciousness becoming liberated from physical perceptual constraints. In addition samadhi leads to a full or partial dissolution of the distinction between self and other when areas of the default mode and related networks key to organismic survival, to do with rehearsing existential survival threats become quietened. This leads to an oceanic view of consciousness connected to both one-pointed concentration, and abandonment of one-self to the greater whole, which may be associated with bliss and with the idea of the formless emptiness of consciousness, but is also associated with the merging of organismic atman with Brahman as ultimate reality beyond form.

There are two additional factors we need to take into account. The first is that human cultural emergence arose from gatherer-hunter society in which other living agents rather than machines constituted the key existential crises in other people, climate predators, storm, fire and flood, so human consciousness has invested in animism, the a priori assumption that the “other” is another conscious agent. As animism became pantheism and then doctrinal religion, these animistic perspectives grew into anthropomorphic deities possessing jealousy, anger, compassion, and other human emotions. These emotional dimensions are also manifest in the default mode representations, so it is possible for the subject in samadhi to either experience ultimate reality in the abstract in the dissolution of experience of form into pure consciousness, or to envisage the merging with Brahman in a fully manifest personality of meeting God. One can see these features physiologically in cingulate cortical areas such as the precuneus, having representations of the emotional personality of both self and other which can become merged in samadhi.

This means NB and SB are different theistic and abstract conscious states accessible to individuals in samadhi which is how Vedanta and Buddhism became traditions. To claim NB is completely inaccessible to consciousness is a contradiction to Brahman being cosmic consciousness and nullifies the basis through which the very concept of Brahman arose in deep samadhi. This also means NB and SB are coexistent depending on how they are experienced at the time, not SB arising cosmologically from NB

The second factor we need to take into account, which is much less familiar to many of you is the advent of visionary sacraments and particularly the classic entheogens. These provide an additional avenue to a very experientially overflowing version of samadhi, in which the very processes producing subjective experience become emergent in consciousness. This provides a full to overflowing visionary condition which is also strongly predisposed to quietening the default mode network, particularly when combined with deep meditation, to make a more experienced form of samadhi, which nevertheless also involves consciousness beyond form and can induce a moksha experience of escaping the mortal coil, the bubble of perception, or bundle of life, in which our incarnate condition is bound, resulting in release from the confines of birth and death into union with cosmic consciousness. Although this is highly sensual, it strongly manifests consciousness not only beyond form, but the generator of all form, both illusion and reality, so it is in a Copernican sense, a privileged view of ultimate reality that can be of immense healing power, although it can also be profoundly distracting without deep meditation.

This leads to an altogether different view of ultimate reality in Symbiotic Existential Cosmology in which Brahman is in the process of becoming manifest in the samadhi states of meditators and in which subjectivity and the universe are complementary and coeval manifestations of reality, from which full consciousness emerged late in the universe in the eucaryote endosymbiosis.

Consequently Brahman is a climax conscious phenomenon in an asymptotic liberation of the confines of organismic consciousness in samadhi-moksha, which is in the process of becoming in us and will continue to do so more fully through the use of entheogenic samadhi-moksha states in a human culture symbiotic with the diversity of life throughout our future generations, rather than committing a destructive Fermi extinction upon ourselves as we are currently doing.

Ram: Individual consciousness is conscious subjective experiences (CSEs) of (a) self-as-subject and self-as-object, (b) exogenous and endogenous stimuli, and (c) conscious components of cognitions such as conscious thoughts, decision-making, and judgment, &c. Each of these CSEs (consciousness) including all types of samadhi-related closed eyes meditation/mystically induced endogenously generated or open eyes meditation and external objects induced CSEs must have its own neural-physical activity/basis (NPA/NPB).

Chris: Your definition is deconstructing consciousness into three inaccurate forms of conscious subjective experience, which is not just self, stimuli and cognition. It is confusing the subjective observer with their observations. This robs identity of its agency. It is necessary to distinguish consciousness from experience to have any understanding of subjective existence. Consciousness is the active process of subjective awareness observing the contents and varied forms of experience. This is why Deepak for all his super-idealistic bias is correct that consciousness is formlessness beyond all the forms of experience. You depersonalise this by objectifying both into NPA (~ consciousness) and NPB (~ experience). But your classification eliminates the ghost of consciousness in the machine of IDAM. You can then extrapolate incorrectly to use NB as a cipher to fill the gap with an inverse null hypothesis that ultimate reality can neither be experienced by consciousness nor comprehended in any way physically nor experientially. When Buddhists say enlightenment is "emptiness" what they are misdescribing is that consciousness is formless awareness beyond all forms of experience, not that it is null. Consciousness has to be like this so as to be able to experience virtually anything and everything possible.

Your definition obliterates active conscious agency by asserting that consciousness is subjective experiences of self and subject and self as object. You have already in your definition turned not only our experiences, but our very selves into mere objects, or features of our observation on the false basis of both being fixed duals of active brain states. This is obliterating the active agency of what conscious existence is.

When I say subjective consciousness has efficacy of volition over the physical universe, it is saying there is an active intentional wilful attentive interaction between subjectivity and the physical universe. Without this, we are no longer

transformative agents over physical reality, as we must be to survive in the wild. The key mystery is in consciousness itself complemented by its private experiences in perception of the physical world, as well as dreams memories samadhi states and deep visionary states of entheogens.

You add to the problem by falsely classifying CSEs with NPA/NPB in a dualistic breakdown that incorrectly attempts to identify physical and subjective states as duals from the micro to the macro. This model is incorrect because the physical universe is fermionically composite particulate, while experience is holistic and it causes you to depersonalise the agency of consciousness into ball and stick categories you can then assemble into a classical "objective" philosophical framework.

You now propose that unmanifest Brahman is the core non-subjective non-physical transcendent reality and that manifest Brahman is derivative and dual aspect. The trouble is also that Nirgun being primary over Sagun is still part of degenerative false cosmology. Idealistic cosmologies start with a super-conscious omnipotent entity, generally of transcendent subjective experience invoking the universe in which we consciously exist. The trouble is spiritual entropy. The superconscious state disintegrates and separates into a plethora of Shiva-Shaktis lost in their organismic survival (ego). Then it ends up in genocide the Kali Yuga, Samvartakalpa, Frashokereti or Eschaton. So everything is running down hill into iniquity. This makes no sense at all. This is a false cosmology because here we are at the climax of biospheric life incarnate having come out of nowhere. So we need to invoke the creative principle that runs uphill to overflowing. It also lead directly to Christ as the sacrificed mediator in the Logos creation cosmology of Philo invoking Golgotha and the Eucharist.

Both Eastern and Western cosmologies show that reliance on an ultimate good abstract or unmanifest creative entity leads to the Fall into degeneracy because the ultimate eternal goodness of the "Godhead" ends up becoming an unbearable contrast to tooth and claw in the mortal coil, in a tragedy of the commons. This dichotomy pervades both Greek and Vedic cosmologies, in which matter and nature become cursed with mortality, betrayal and pain which is attributed to evil and leads to the Kali Yuga. Idealistic inspiration also pursued false moral doctrines, which became infectious social memes, because religion began to seek control over social lives and reproductive choices.

But Brahman as ultimate reality is also the creative principle from which all conscious life springs forth, so Brahman is unbounded by organismic mortality, which is just an evolutionary aspect of biospheric sociobiology. Brahman is indestructibly creative but takes 10 bya to evolve fully conscious manifestation, so Brahman in my moksha is rightly expressing compassion for the fate of a timeless cosmic consciousness caught in the Faustian pact of a humanity hell-bent on destroying itself, from sheer ignorance of the cosmic condition. That's why Symbiotic Existential Cosmology reverses and inverts the entire sequence. Deepak is right that we are in Shakti's graveyard, the junk pile at the end of the universe unless we wake up, but that's all that is required!

The second problem is that Nirguna Brahman is a completely unmanifest entity which is neither empirical by experience nor by experiment, so it reduces to an a priori belief and remains unestablished unless and until there is some indirect manifesting evidence for its existence. This is the same problem in cosmology as asking what preceded the Big Bang. We can imagine brane worlds and cyclic universes or that God created Eden, but we can't afford to opt for a model of cosmology that ends in apocalyptic disaster to appease our own desires. I am asserting that since full cosmic conscious Logos cosmology – creation by cosmic conscious pronouncement – is fundamentally degenerative of existence, it is a false invention of the human psyche, reasoning essentially from idealism of the perfect mind, in abject horror at the tragedy of the ephemeral world of the mortal coil, which we must needs accept and redeem.

SEC poses primal subjectivity. This is the minimal axiom added to ensure subjectivity is present at the cosmic origin. Primal subjectivity covers all notions of subjective reality outside full eucaryote consciousness and conscious experience, so it retains empirical integrity. All the evidence we have says that subjective volition can be efficacious only in causally uncertain situations, or causal conflict would arise. Thus primal subjectivity has to be fully compliant with physically-defined boundary conditions. The answer to the manifestaton question question is evolution itself and the quantum uncertainty of mutational change, given the molecular boundary conditions and selection forces.

Your notion that there is an inscrutable formless null-aspect Brahman hovering over the early universe, like the Father God of Philo, is in contradiction to achievable manifestation. Prior to the eucaryote endosymbiosis the only physical avenues for primal pre-conscious subjectivity to manifest were broadly speaking in quantum uncertain and butterfly effect Gaia systems in nature. Quanta have individual "free will" only within uncertainty and uncertain events, storms

and Gaia effects likewise. Therefore to claim an all powerful fully formed but aspect-less Brahman orchestrating consciousness has no vehicle, no evidence.

The tradition says that formless Brahman is ultimate reality and manifest is personified as 'Elohim Ishvara/Ishvari'. The former is mystical visionary and the latter religious, leading to two traditions. Advaita (Nondualist) school of Vedānta sees Saguna merely as a preparatory aid to meditation but theistic schools of Vedānta (Viśiṣṭādvaita), argue that God (Brahman) is possessed of all perfections and that the scriptural passages denying qualities deny only imperfect ones. I experienced both, ultimate reality and Brahman as persona, so I see formless Brahman as unrestrained consciousness, when full consciousness as we know it has no sensory boundary conditions. Griffiths et al. (2019) compared "God-encounter experiences" under classic psychedelics and naturally. While "the Non-Drug Group was most likely to choose "God" as the best descriptor of that which was encountered while the psychedelic groups were most likely to choose "Ultimate Reality." Karen Armstrong notes that Brahman emerged from Vedic *Rta*, the principle of natural, moral and sacrificial order in the cosmos. *Rta* and the Avestan equivalent *aša* both derive from Proto-Indo-Iranian **H₂rtās* "truth". Karen Armstrong points out that Brahman was the outstanding insight of Vedic understanding, allowing a direct experiential appreciation of "ultimate reality", transcending personalised divinity.

There is no evidence a neutral non-manifest substrate can manifest as either subjective or objective because it then has to violate categorial inconsistency. There is absolutely no way to justify this or make any kind of reality check. Furthermore consciousness itself IS the hypothetical formless substrate and it can be and is experienced.

Deepak: Repeating myself. All theories of consciousness are inferential explorations of consciousness in consciousness. Only consciousness can be conscious. Direct experience of consciousness is Self Awareness without theories. It does not need scientific or philosophical explanations. Science and philosophy are human mental activities in consciousness! Consciousness is acausal and everything else is its activity. Existence is awareness of existence. No theory needed.

Chris: Deepak is broadly correct that Brahman is consciousness itself. This is where the dialogue begins and the Upanishadic tradition continues and it arises from deep samadhi where subjective conscious experience is all there is. To say this has null aspect is the fundamental error of Atmanspacher (2012), which becomes a ghost, not only in the machine, but also of consciousness itself.

To break the cycle, we HAVE to undo this madness by accepting that we are, although mortal, part of the immortal web of life as the conscious universal climax, invested with the creative divine principle and the interaction of subjective consciousness and the physical universe is real and the personal responsibility that we inherit as manifestations requires us to undertake to save life throughout the universe from precipitate annihilation. That's what Symbiotic Existential Cosmology is here to do. Nirguna Brahman is not intended to be the ultimate reality over Saguna Brahman – they are alternative views of one entity and they are free choices of the conscious beholder. We need to take personal responsibility for being at the centre of the cyclone and playing that good part in cosmic redemption, not relying on comforting delusions which turn out bad for us all, the world and life as a whole.

Subjective Physical Interactivity as the Source and Cause of Conscious Biological Life

(1) Categorical Interaction of subjective consciousness (s) and physical reality (p)

Interactivity between subjective consciousness and physical reality is a natural process. In terms of an *s-p* category error that Gilbert Ryle expressed in terms of verbal formulations, the categorical inconsistency of *s* and *p* is an illusion. In the conscious interactive context:

(a) There is **only one overall subjective s state** involved, namely the entire stream of conscious intentionality corresponding to the conscious subject's unfolding subjective experience.

(b) There is **only one physical state** in this interaction, which is the integrated climax state of the ongoing causally uncertain brain dynamic.

These are **dynamically coupled as whole s and p states without any category error**, because the climax *p* state is as wholistic as the *s* state through its coherence as a conscious brain state.

The *s* and *p* states can thus readily interact. There is no causal conflict, because subjective consciousness perturbs only the physically uncertain aspects of the whole brain state, but neither *s* nor *p* categories are complete, nor causally

closed because, as complements, the totality requires both, so their interaction is critical to the existence of subjectively conscious existence. Veridically this is experienced as **subjective conscious intentionality affecting the unfolding states of the world** around us in our volitional behaviour, and through our intuitive “Aha” moments, imbuing the meaning of temporal existence as we move through the world and transform it. Corresponding to this active interaction of our subjective consciousness upon the world around us, which we describe as conscious “agency” and the sense of autonomous will over our circumstances, are **neurodynamics in self-organised criticality at the edge-of-chaos, which are not fully determined as a causal deterministic process.**

As a “prediction machine” the brain is seeking to anticipate both acute existential threats to survival which are environmentally uncertain events and bear the characteristics of quantum uncertainty, and opportunities for food, reproduction and social advantages which are likewise culturally complex at the limit of predictive determinacy. Thus the interaction between s and p consists of a brain in a complexity crisis of computationally intractable problems of prediction compounded by environmental and hence quantum uncertain processes due to multiple interacting butterfly effect perturbations, in turn interactively modulated by conscious intentionality. **The veridical experience of being a subjectively conscious intentional agent changing the physical universe through our behaviour is correct.**

Ram Vimal: SEC (ICAM Interactive complementary aspect monism) has no source; so what is its ontology?

Chris: Its ontology is the actual existential condition of “efficacy of subjective conscious intentional volition over the physical universe”, not an assumption of a formless God that made the cosmos, like your Nirguna Brahman idea. This ontology is a late comer in physical cosmology, arising through interactive climax of the fundamental forces, in biogenesis, evolution and conscious sentience.

I will now critique your claims that IDAM (inseparable dual aspect monism) or ICDAM (the complementary version), or Nirguna Brahman explain the hard problem extended to subjective conscious intentional autonomy over the world.

(2) Brahman as ultimate reality v Brahman as ‘Elohim

Due to lack of personal experience, you are describing Brahman “objectively” from the outside, in a way which misrepresents how the transcendental process works. All manifestations of Brahman, both Nirguna and Saguna occur during samadhi and moksha experiences of a visionary, meditating or religiously contemplating subject. Whether Nirguna or Saguna depends on the religious proclivity of the subject. Religious people will say they saw YHWH in a burning bush, or Lord Ram, or Ahura Mazda or the Virgin Mary or Kali because their religious expectation colours the visionary state to imbue it with theistic transcendence. Those who don’t perceive in religious terms see Brahman as ultimate reality in the abstract, as the infinite truth, once the doors of perception are flung open as living cosmology transcendent, rather like the Net of Indra.

Critical to this is the notion of moksha, which is escaping the round of birth and death in the visionary state. This is more than bliss. It is bursting the incarnate bubble of perception of organismic reality so we can see transcendence face to face in the abstract condition outside our incarnation. This needs to be transformative and change one’s world view as the acid test. Not just more bliss in samadhi but enlightenment – everything, everywhere all at once now and forever. We stand outside our incarnation and see mortality for what it is in the “Net of Indra” in the abstract condition. This is organismic consciousness asymptotically approaching the cosmic state by relaxing the cosmic boundary conditions imposed by the physical universe. Aurobindo would call this the supermind and posit that beyond is the ultimate reality that makes both the universe and our experience of it, but this is hypothetical.

The thing you need to understand is that these samadhi and moksha states are all and all have been in all Vedic discoveries subjective experiences of the rishis. No one experiences unmanifest reality, so the notion never arises. What is actually happening is that in the visionary state, the organismic brain becomes an experiential palette spanning all forms of sensory perception integrated into kaleidoscopic and dream-like visions. Because these also include the centres that process the experience of self and other including the world at large and these become mere the experiencer witnesses a variety of states from religious transcendence to natural immanence. So both the Nirguna and the Saguna experience are glosses of the full encompassing potentiality of subjective conscious experience running free of external physical constraints.

(3) Your notions of Nirguna Brahman as the interactive connection between subjective consciousness and the physical universe and epiphenomenalism

You claim incorrectly that no *s-p* interaction can occur and instead assume that the magic is performed by a null cosmic Brahman state that connects the *s* and *p* realms through unmanifest ultimate reality. This has zero explanatory power and is an imaginary use of ultimate reality to orchestrate every interaction we make with the world to ensure our own survival.

While prohibiting *s* and *p* interacting naturally in the survival of the organism, you are saying the cosmic mind has to solve the entire problem of what the organism should do to survive and do it for every sentient organism simultaneously in the universe. The critical thing about uniting science and experiential reality is Occam's razor. We need to find a compact explanation for the phenomenon with actual explanatory and potentially predictive power. Your notion raises the most intractable spectre of Nirguna lacking any manifestation having to determine every event in the universe in a predetermined manner. Why then do some people get cancer and others live long psychopathic lives. You have thus inbred all the tragic paradoxes of theism and injustice into every organismic action and reaction.

You make three incorrect claims:

- (1) That complementary inseparability "means changes in the *p* (*ns*) domain (physical brain processes) can automatically (because of inseparability) influence the *s* domain (conscious experiences), and vice versa. This influence, however, operates through a unified underlying ground (NNB), not through direct interaction".
- (2) That the inherent dynamism within the neutral ground generates both *s* and *p* (*ns*) aspects, with the *s* aspect embodying the qualitative richness of consciousness. This inherent connection explains why physical processes affect subjective experiences while maintaining the distinctness of the two domains.
- (3) Epiphenomenalism often reduces subjective experience to a mere byproduct of physical processes. IDAM and ICDAM, however, reject this reductionism. They acknowledge the irreducible nature of the *s* aspect and its unique character that cannot be fully explained by the *p* (*ns*) aspect alone.

Both (1) and (2) invoke turtles all the way down, confessing in the same breath that "This inherent connection explains why physical processes affect subjective experiences" but you don't state subjective experiences affect physical processes", showing that your frameworks are functional epiphenomenalism. This is clear from (3) where the only role for the *s* state is to affirm the *p* state cannot "explain" the *s* state which however remains epiphenomenalistic. But you do not reveal how an attributeless entity can functionally mediate categorically disjunctive *s* and *p* aspects when you reject outright any form of interaction between *s* and *p* or vice versa, when this IS assuming this through a super-natural intermediary.

The physicalist notion of epiphenomenalism that our brains made us do it and intentionality is a delusion of evolution to convince us to survive as automata is incorrect.

In Symbiotic Existential Cosmology, the physical processes remain causally incomplete without the interventions of subjectivity, which is what makes us all consciously alive and behaviourally efficacious over the physical universe. That is why Symbiotic Existential Cosmology couples the survival of the diversity of life to the future of consciousness in the universe as a subjective notion.

The interaction of subjective consciousness upon the physical world comes in multiple forms, intentional volition veridically confirmed by subjective experience, intuition, hunch, the "aha" moment, insight, acts of compassion and kindness, visionary states, and psychedelic experiences.

There is one *s* -> *p* interaction – **intentional volition**. There is one *p* -> *s* interaction **conscious perception**. There is also *s* -> *s* interaction e.g. in the visionary state. There are countless *p* -> *p* interactions, forming the fabric of causally open uncertain dynamics, but these are insufficient to determine the course of live agency, which is creative and physically transformative over homeostatic autopoiesis.

Although the physical universe can be conceived of as fermionically particulate and sub-dividable, the only *s* <-> *p* **interaction** which occurs in our context, is the subjective stream of consciousness interacting with the whole brain state reflecting it, in such a way as to prolong the survival of the organism through the advantage accrued by subjective consciousness perturbing the uncertainty of the entire complex physical system.

This cannot be meaningfully decomposed physically or subjectively. BOTH are interacting or resonating **s** and **p** as one whole coupled system.

If we are looking at individual eucaryote cells such as amoebae, or human white blood cells, the same interaction occurs at the cellular level, which is where it began.

Ram: Q1. Where do **s** and **p** come from?

Chris: Existential reality requires explaining ontologically how things actually are – why are we are subjectively experiencing conscious autonomous agents in a universe which is causally open due to the presence of objective stochasticity complemented by subjective intentionality / agency. Where they come from is to be inferred from how it became like this. SEC asserts that both primal subjectivity and the the cosmic origin are complementary aspects of the nascent existential cosmos.

The universe comes to fruition in biological consciousness because the symmetry-breaking of the fundamental forces leads to fractal molecularity, biogenesis, evolution and organismic sentience as ascending states of critical phase transition complexity. The key step from primal subjectivity to attentive/intentive consciousness arose from the topological transformation to the eucaryote cell to sequester respiration from membrane sentience. It is not a continuous emergence but a topological transformation.

Ram: Q2. Does each have its own ontology or source?

Chris: No because they are complementary. The universe can't manifest without subjective consciousness and consciousness can't exist without material climax complexity. At the inflationary cosmic origin there was a quantum fluctuation which possessed both vestigial sentience in the wave function extending throughout space-time and maybe outside it and intentionality in collapse of the wave function as complementary processes. These are physical aspects but they reflect intrinsic subjectivity, realised in Gaia effects, biogenesis etc.

Ram: Q3. Can **s** and **p** exist independent of each other?

Chris: No (see Q2).

Ram: Q4. If **s** is a latecomer then does it come from **p**?

Chris: No Subjectivity is primal (see Q1).

Ram: Q5. If **s** and **p** interact then they must be separable. Is this true?

Chris: No the interaction is dynamically inseparable. Conscious agency \leftrightarrow physical indeterminacy.

There are lots of physical realisations of inseparable interaction. The chaotic dynamics of a double pendulum is inseparable. The complexity of chaotic bifurcations arises from resonance between two simple harmonic processes.

It appears to experiencers that everything is subjective experience, but the physical universe is necessary for conscious life to exist.

Ram: Q6. What is **s** and **p** for a stone?

Chris: In a rock defined as a mineral solid with fixed molecular structure that is non-reactive, **s** is latent subjectivity that has no coherent means to express its presence dynamically in a quantum sensitive way. There are no butterfly effects or quantum sensitive phenomena, but this can be deceptive. A silicon crystal imprinted with quantum dots could be a quantum computer and manifest subjectivity if the principles are right. Liquid helium 3 has all kinds of quasi-particles and superfluid states that could display subjectivity as could phase transitions of molecular systems and some types of superconductor.

I don't expect any classical digital computation to do this, even a large language model, which is just fitting plausible word strings from human generated text, but bacteria are at the threshold of conscious awareness except that their cell membranes are devoted to energy production via electron transport so they can't use them informationally as well. Some rocks generate complex chemical reactions generative of the origin of life so there's another avenue. For example look up "Lost Sea Vents" and you will see the universe is set up so that cosmologically abundant olivine forming planetary crusts reacts with acidic seawater water to make chemical gardens which could generate life. The oceans and atmosphere have geochemical cycles creating Gaia effects like hurricanes and tornados.

Ram: Q7. Please elaborate further on "the interaction is dynamically inseparable.

Chris: You already demonstrated how the *s-p* interaction occurs in your question! When you wrote your reply, you had the subjective experience of my previous replies and you came to the conclusion that because the two pendulums were physical I needed to show you an example of *s-p* interaction, so you then formulated a subjective response and watched yourself typing out the message below physically, reading its meaning subjectively as you typed it, confirming to your subjective satisfaction that the underlying meaning of your statement was becoming what you consciously intended, and then pressed send, making the result fully physical to me as well. Watching yourself doing this is achieved by veridical perception of the relationship between your conscious intentions and the result in your emerging reply. Veridical perception applies as much to internal subjective experiences of intent and its affects in behaviour as it does to our three dimensional perception of the physical world. We have a very good experiential view of whether or not our subjective conscious intentions look like they are going to achieve the intended results and even their personal style and conviction.

This is clearly not the subjectively consciousless brain doing it on its own, or we would experience being passengers on autopilot. All epiphenomenalistic and physicalist theories attempt to rationalise this by claiming notions like evolution needs to con us into the idea that we are autonomous intentional agents so that we will have the confidence to survive. Neutral monist rationalisations are that the subjective view is just the inner reality of the physical process, but because the physical process is strongly causal, punctuated only by quantum indeterminacy, the physical view defaults to a form of stochastic causality eliminating any real capacity of the subjective conscious state to influence our physical circumstances.

I arrived at this conclusion by the most indirect route possible. I had an experience of cosmic consciousness on psychedelics, in which I came afterwards to realise that the critical question existence revolves around is in plain sight – **that subjective consciousness has efficacy of volition over the physical universe.**

This is the founding principle which unfolds the entire existential dilemma. From it follows the full complementarity of subjective and objective existence and the meaning of life and the role conscious intentionality has in healing the world and reflowering the living universe.

If we forsake this, we are either lost in Bertrand Russel's physicalist nightmare, of collocations of atoms heading to their final demise, or an idealist heaven and hell amid moral karmic retribution, or finally a 50 shades of grey notion of neutral monism which explains nothing by claiming *s* and *p* are different views of a single reality that defaults to physical stochastic causality. Any speculations about Nirguna Brahman being the origin of reality come long afterwards, just as inflationary physics comes long afterwards, with the explosion of science.

Panpsychic cosmologies are neither Neutral Monist (Stubenberg 2016), nor dualistic (Goff 2017). SEC as a complex form of panpsychism that cites only primal subjectivity as universal, but regards full consciousness as a discrete evolutionary result of the eucaryote endosymbiosis thus does not fit any pre-ordained philosophical framework. Unless and until you come up with theory of how an unmanifest featureless propertyless neutral entity can manifest either physicality or subjective consciousness SEC is not compatible with IDAM because it is Darwinian panpsychism and hence not neutral monism and neither is it dualism.

Ram: Cosmology is defined as (i) the scientific study of the origin and structure of the universe and (ii) the philosophical study of the nature of the universe. If SEC is cosmology then what is the scientific and philosophical origin/source and structure of our psycho-physical universe?

Chris: Symbiotic Existential Cosmology is designed to augment scientific cosmology into a psycho-physical cosmos by the inclusion of subjectivity, so it at this point accepts the inflationary origin but doesn't attempt to speculate about before origin models, like brane worlds, for the simple reason that these are not empirically verified and remain speculative and given the vast area it has to cover, only empirical evidence is included. We still don't know the full origin story, or the final state of the universe, in a heat death, cyclic process big crunch, or big rip, so these remain just speculatively discussed, as are hypothetical TOEs like superstrings.

To include psycho-physicality, primal subjectivity is included as a complement to the primal nature of early inflation in the unified force period, as a minimal "axiom" that solves the hard problem extended to efficacious volition and is assumed to be vestigial in the same way the nascent universe is. Introducing any further details or psychic complexities at the origin leads to problems of panpsychism and turtles all the way down of what made Brahman so so on – explanations by a cosmic consciousness more absolute than our experiences of samadhi and moksha that themselves retreat from an explanation because the hypothesis is more complex and demanding than the problem. There may be many versions of moksha but the acid test is experiencing existence outside one's incarnation and one's world view, being thereby transformed in a quantum change event.

Ram: ICDAM argues for (i) pre-BB (Big Bang) through a neutral entity (neither mental nor physical) scientifically as the origin (quantum vacuum with quantum fluctuations) and post-BB as a psychophysical universe, and (ii) philosophically, using Brhadāranyaka Upaniṣad cosmology. Thus, my goal is accomplished in bringing science and spirituality closer, i.e., their languages are different but the conclusion is the same. I feel fully content in this conclusion. Perhaps the same type of feeling you get after your psychedelic moksha; there are about 16 types of moksha. Thus, we both will return to the same source after our death, which is our moksha.

Chris: I actually like this point of view generally, except the claim that death is moksha. We don't possess our conscious existence and we know all living organisms and definitely all humans, manifest subjective consciousness. We know it is a complement coupled to our biological brains through their coherent climax transition state criticality. This invokes a sensory environmental boundary condition on our experience which SEC calls encapsulation and Deepak might call illusion, but allows intentionality to creatively facilitate our physical survival. This means that in a sense, consciousness is eternal and manifests in all conscious living organisms and is relinquished on our demise, apart from fringe near death experiences.

The living moksha state releases the encapsulations, but the super-mind is still a product of organismic consciousness with the doors of perception thrown open. This makes it possible to see reality outside our incarnations and realise the relationship between mortality and eternity and the sacredness of life's preservation in the mortal coil, which heals mortal angst and shows the true meaning of life. So this has attributes of both abstract experiential and sensory space and cosmic personae because the moksha state is integrating self and world/universe/others, so it has the attributes of personality in Saguna, as well as Nirguna Brahman. I'm not sure it is possible for cosmic consciousness to manifest except within a sentient being experiencing samadhi or moksha and suspect that the entire purpose of the physical universe is to bring about the organismic moksha state in the biota as the only way the conscious universe can come to know and understand itself in paradise on the cosmic equator in space-time. So the Big Bang is actually to make sexually naked lunch on the lawn of time while perennial paradise lasts.

Varieties of Panpsychist Philosophy

Panpsychism is the view that mentality is fundamental and ubiquitous in the natural world:

"The view has a long and venerable history in philosophical traditions of both East and West, and has recently enjoyed a revival in analytic philosophy. For its proponents panpsychism offers an attractive middle way between physicalism on the one hand and dualism on the other. The worry with dualism—the view that mind and matter are fundamentally different kinds of thing—is that it leaves us with a radically disunified picture of nature, and the deep difficulty of understanding how mind and brain interact. And whilst physicalism offers a simple and unified vision of the world, this is arguably at the cost of being unable to give a satisfactory account of the emergence of human and animal consciousness. Panpsychism, strange as it may sound on first hearing, promises a satisfying account of the human mind within a unified conception of nature" (Goff 2001).

Galen Strawson (2016), who advocates a form of physicalist panpsychism, claims it serves to reinforce the primacy of conscious experience against reductionistic materialism:

Every day, it seems, some verifiably intelligent person tells us that we don't know what consciousness is. The nature of consciousness, they say, is an awesome mystery. It's the ultimate hard problem. The current Wikipedia entry is typical: Consciousness "is the most mysterious aspect of our lives"; philosophers "have struggled to comprehend the nature of consciousness."

I find this odd because we know exactly what consciousness is — where by "consciousness" I mean what most people mean in this debate: experience of any kind whatever. It's the most familiar thing there is, whether it's experience of emotion, pain, understanding what someone is saying, seeing, hearing, touching, tasting or feeling. It is in fact the only thing in the universe whose ultimate intrinsic nature we can claim to know. It is utterly unmysterious.

The nature of physical stuff, by contrast, is deeply mysterious, and physics grows stranger by the hour. (Richard Feynman's remark about quantum theory — "I think I can safely say that nobody understands quantum mechanics" — seems as true as ever.) Or rather, more carefully: The nature of physical stuff is mysterious except insofar as consciousness is itself a form of physical stuff. This point, which is at first extremely startling, was well put by Bertrand Russell in the 1950s in his essay "Mind and Matter": "We know nothing about the intrinsic quality of physical events," he wrote, "except when these are mental events that we directly experience." In having conscious experience, he claims, we learn something about the intrinsic nature of physical stuff, for conscious experience is itself a form of physical stuff.

Strawson (2006) who sees panpsychism as the only way to deal with the hard problem, has an insightful and provocative philosophical defence of his philosophy of consciousness which he states forcefully. I will not depend on his physicalist panpsychist perspective, as symbiotic cosmology is a complementary description of the existential condition:

"What does physicalism involve? What is it, really, to be a physicalist? What is it to be a realistic physicalist, or, more simply, a real physicalist? Well, one thing is absolutely clear. You're certainly not a realistic physicalist, you're not a real physicalist, if you deny the existence of the phenomenon whose existence is more certain than the existence of anything else: experience, 'consciousness', conscious experience, 'phenomenology', experiential 'what-it's-likeness', feeling, sensation, explicit conscious thought as we have it and know it at almost every waking moment."

Strawson's view of realistic monism, as a form of panpsychism, is subtly different from eliminative materialism in a way which Strawson insists is huge, but remains unclear as to the exact nature of, especially when he says human consciousness is 'really just neurons firing':

Realistic physicalists, then, grant that experiential phenomena are real concrete phenomena — for nothing in life is more certain — and that experiential phenomena are therefore physical phenomena. It can sound odd at first to use 'physical' to characterize mental phenomena like experiential phenomena, and many philosophers who call themselves materialists or physicalists continue to use the terms of ordinary everyday language, that treat the mental and the physical as opposed categories. It is, however, precisely physicalists (real physicalists) who cannot talk in this way, for it is, on their own view, exactly like talking about cows and animals as if they were opposed categories. Why? Because every concrete phenomenon is physical, according to them. So all mental (experiential) phenomena are physical phenomena, according to them; just as all cows are animals. So when physicalists — real ones — talk as if the mental (experiential) and the physical were entirely different all they can really mean to be doing is to distinguish, within the realm of the physical, which is the only realm there is, according to them, between mental (experiential) features of the physical, and non-mental (non-experiential) features of the physical.

As a real physicalist, then, I hold that the mental/experiential is physical, and I am happy to say, along with many other physicalists, that experience is 'really just neurons firing', at least in the case of biological organisms like ourselves. But when I say these words I mean something completely different from what many physicalists have apparently meant by them. I certainly don't mean that all characteristics of what is going on, in the case of experience, can be described by physics and neurophysiology or any non-revolutionary extensions of them. That idea is crazy. It amounts to radical 'eliminativism' with respect to experience, and it is not a form of real physicalism at all. My claim is different. It is that experiential phenomena 'just are' physical, so that there is a lot more to neurons than physics and neurophysiology record (or can record). No one who disagrees with this is a real physicalist, in my terms.

The difficulty here is that Strawson is claiming subjective experience is realer and more immediate than the physical universe but then claims it IS physical when he claims we don't know what physical is. This looks a little like a finesse of promissory materialism turned inside out!

We can distinguish various forms of panpsychism in terms of which aspect of mentality is taken to be fundamental and ubiquitous. Two important characteristics of human minds are thought and consciousness. In terms of these characteristics we can distinguish the following two possible forms of panpsychism:

Panexperientialism—the view that conscious experience is fundamental and ubiquitous

Pancognitivism—the view that thought is fundamental and ubiquitous.

Thought is obviously a much more structured and structurally complex notion than experience, and there may be entities from a single quantum at one extreme, to a eucaryote cell at the other, which may readily possess a subjective aspect identifiable with experience, but not be capable of structured thought.

A second division is that between **panpsychism** and **panprotopsychism**, which asserts that some form of proto-consciousness rather than consciousness per-se is fundamental and ubiquitous. Just as the properties that characterise conscious experience are commonly referred to as “phenomenal” proto-conscious properties are “protophenomenal” – properties that in certain combinations transparently account for the existence of consciousness, in the sense that one could in principle move a priori from knowing the relevant facts about protophenomenal properties to knowing the relevant facts about phenomenal properties (Chalmers 2015; Goff 2015, 2017).

The combinations problem gives rise to further ones like the structural mismatch problem (Chalmers 2016):

An especially pressing aspect of the structure combination problem is the structural mismatch problem. Macrophysical structure (in the brain, say) seems entirely different from the macrophenomenal structure we experience. Microexperiences presumably have structure closely corresponding to microphysical structure (this is especially clear on a Russellian view), and we might expect a combination of them to yield something akin to macrophysical structure. How do these combine to yield macrophenomenal structure instead?

A third division as originally defined by Chalmers (2015) is:

Constitutive panpsychism—Forms of panpsychism according to which facts about human and animal consciousness are not fundamental, but are constituted of facts about more fundamental kinds of consciousness, e.g., facts about micro-level consciousness.

Non-Constitutive panpsychism—Forms of panpsychism according to which facts about human and animal consciousness are among the fundamental facts.

Symbiotic cosmology is **non-constitutive** as it considers the relation between biological and quantum forms of panpsychism to be differing subjective manifestations complementary to differing degrees of coherence in the physical aspects these subjective aspects correspond to, for example eucaryote excitability is a coherent quantum-sensitive form of edge of chaos excitation giving rise to new forms of “quasi-particle” excitations, so its subjective aspect is qualitatively distinct from quantum panpsychism and is not conceived from semi-objective structural interactions of its quantum parts.

The work of Schaffer (2010) has advanced an alternative picture of reality, from the view that micro e.g. quantum events determine events at large. According to “priority monism”, facts about little things are grounded in facts about big things – all things ultimately exist and are the way they are because of certain facts about the universe as a whole. If we combine priority monism with constitutive panpsychism we get:

Constitutive cosmopsychism — The view that all facts are constituted of consciousness-involving facts at the cosmic-level. Just as the micropsychist holds that electrons have experience but not thought, so the cosmopsychist holds that the universe has some kind of experience, but may refrain from attributing thought or agency to the universe.

Bertrand Russell (1927) proposed a novel approach to the mind-body problem. Arthur Eddington (1928), in his Gifford lectures of the same year, independently expressed very similar thoughts. Russellian monists are motivated by the need to characterise the intrinsic nature of matter:

A **Negative**: The information we get from the physical sciences is in some significant sense limited. There are subtle variations on how exactly this is put, but the idea is that the physical sciences only tell us about the extrinsic, relational, mathematical, or dispositional nature of matter, and leave us in the dark about its intrinsic, concrete and categorical nature. Physics tells us how an electron behaves, but it doesn’t tell us how it is in and of itself.

B **Positive**: The intrinsic/concrete/categorical features of matter which physical science remains silent on account for the existence of consciousness. The problem of consciousness, the difficulty seeing how consciousness fits into the physical world, is the result of our not taking into account these “hidden” features of the physical world.

Constitutive cosmopsychism is thus a form of Russellian monism according to which (i) all facts are grounded in facts about the universe as a whole, (ii) the universe instantiates consciousness-involving categorical properties.

David Chalmers (1995, 1996) first delineated the **hard problem of consciousness** – why it is that a person has subjective experience. Philip Goff (2001) writing in *The Stanford Encyclopaedia of Philosophy* (Zalta 2012) notes: *“Some think the alleged problem involves a confusion, although anyone who thinks this is obliged to diagnose the exact root of the confusion. Others think that there is a problem, but one that further scientific investigation will solve. Perhaps we just need to wait for the arrival of the “Darwin of consciousness” to make progress”*. However, there is no reason to suppose that “further scientific investigation” has to be pursued under the methodological assumption that consciousness is to be accounted for in terms of processes which don’t involve consciousness, e.g., in terms of facts about non-conscious neurons. The panpsychist proposes an alternative approach: explain human and animal consciousness in terms of more basic forms of consciousness. These more basic forms of consciousness are then postulated as properties of the fundamental constituents of the material world, quanta.

Ironically in debate on panpsychism, Darwin’s name has come up three times. Seth (2021), in critiquing panpsychism, advances the case that the success of materialistic science is based on explanation, prediction, and control (EPC), the criteria by which many scientific enterprises are assessed, thus reducing biological 'vitalism' in a demystifying dissolution into molecular biology. Goff (2019) has countered that some scientific advances such as Darwin's theory of evolution “emerged from a dramatic insight, rather than incremental dissolution”. But the objection to EPC is fundamental, because, at the very climax of biology, neuroscience has currently no idea of how to solve the hard problem or how the easy problems might be combined to evoke consciousness either, as noted in the Darwin comment above.

Seth returns to Goff’s view of Darwin *“Finally, many successful scientific explanations operate with qualitative rather than, or as well as, quantitative concepts. Darwin’s theory – highlighted by Goff as a paragon of materialist science – provides one striking example of such an explanation.”*

Goff is also critiqued for disregarding empirical evidence: *“Goff’s defense of panpsychism therefore needs to involve an argument to the effect that his view is preferable to the structural realist and empiricist alternatives.”* (Laasik 2020).

I have entitled the form of panpsychism advanced in Symbiotic Existential Cosmology Darwinian panpsychism for four specific reasons:

- (a) It advances a careful objectively empirical interpretation of which physical systems possess forms of panpsychism or sentient consciousness based on seven essentially evolutionary criteria, namely: (a) individual quanta, (b) critically unstable multi-quantum dynamical systems including (c) living cells, (d) in sentient form in eucaryotes (e) in organismic form in multi-celled organisms (f) in the evolving biosphere and (g) collectively in the universe.
- (b) It applies objective physical criteria to which coherently unstable systems in the natural universe possess psyche or consciousness based on their physical and biological properties, avoiding an attempt at decomposing the subjective aspect leading to the combinations and related problems.
- (c) It broadly coincides with Darwin’s own speculations on consciousness extending down to founding biota, extending it only into dynamically unstable physical and quantum phenomena which also possess attributes consistent with the evolutionary view.
- (d) Like Goff's comment, it was devised as a result of a startling insight on psychedelic mushrooms, not EPC and it depends on qualitative, not quantitative criteria.

*“To see a puppy playing [one] cannot doubt that they have free-will”
and if “all animals, then an oyster has and a polype.” (Darwin ex Smith 1978)*

Ironically symbiotic cosmology solves this paradox by using an evolutionary view of panpsychist cosmology in which the transition from quantum subjectivity to organismic consciousness is matched to evolutionary quantum leaps – in particular the formation of cellular life and the eucaryote endosymbiosis. So on all three counts – the Darwinian “insight” of the evolutionary mushroom-evoked cosmology, the qualitative nature of the evolutionary investigation and the actual bringing of the hard problem to a solution, it is a “Darwinian” model of conscious evolution.

The intrinsic difficulty with Seth’s so-called “real” problem of consciousness – how to distinguish different types of qualia e.g. red and blue sneakers, is that it completely fails to address the root question of subjectivity, which is by

nature entirely different from the localisable, analysable, distinguishable and separable properties of objective reality and arises in both quantum observation in physics and the hard problem in neuroscience in complementary ways.

Thomas Nagel (1979) influentially argued that adopting a view like panpsychism is the only way to avoid **radical emergence** (Strawson 2006) – properties of a complex system that cannot be intelligibly derived from the properties of its parts, in contrast to “emergentist panpsychists” where they may not be intelligibly so derived. For Nagel, “emergent” properties of a complex system are ones that cannot be intelligibly derived from the properties of its parts. In contrast, for the “emergentist panpsychists” discussed above, “emergent” properties of a complex system are simply fundamental macro-level properties, which may or may not be intelligibly derived from the properties of its parts. Following Galen Strawson (2006a) we can use the word “radical emergence” to express Nagel’s notion of emergence.

Nagel’s argument involves four premises:

Material Composition – Living organisms are complex material systems with no immaterial parts. The matter composing us is not special; the matter composing any material entity, if broken down far enough and rearranged, could in principle be incorporated into a living organism.

Realism – Mental states are genuine properties of living organisms.

No Radical Emergence – All properties of a complex organism are intelligibly derived from the properties of its parts.

Non-Reductionism – The mental states of an organism are not intelligibly derived from its physical properties alone.

Strawson (2006) has defended a similar argument from the untenability of radical emergence. Whereas Nagel’s aim is merely to establish the disjunction of panpsychism and panprotopsychism, Strawson’s argument concerns the truth of panpsychism. Strawson begins by arguing that radical emergence is upon reflection unintelligible:

Emergence can’t be brute. It is built into the heart of the notion of emergence that emergence cannot be brute in the sense of there being absolutely no reason in the nature of things why the emerging thing is as it is (so that it is unintelligible even to God). For any feature Y of anything that is correctly considered to be emergent from X, there must be something about X and X alone in virtue of which Y emerges, and which is sufficient for Y (Strawson 2006 18).

Thus, the crucial feature of intelligible emergence, is that the relationship between the product of emergence and its producer can be adequately characterised using a single set of conceptually homogeneous concepts. But it’s very hard to see how any set of such concepts could capture both the experiential (i.e., consciousness-involving) and the non-experiential (non-conscious-involving), and hence how the thesis that consciousness emerges from non-consciousness could be rendered intelligible. It is only by supposing that human and animal consciousness emerges from more basic forms of consciousness, e.g. in the eucaryote endosymbiosis discretely transforming primitive subjectivity, that we have hope of avoiding the emergence of animal consciousness being a brute and inexplicable miracle.

There is a second prominent argument for panpsychism, which has nothing to do with the need to explain human consciousness, but begins from a gap in the picture of the world in the physical sciences. This argument has its roots in Leibniz, Schopenhauer⁹⁸, Russell (1927) and Whitehead (1933 [1967]), and is defended by many panpsychists, including Sprigge (1999), Strawson (2003) and Goff (2017).

In the public mind, physics is on its way to giving us a complete account of the fundamental nature of the material world. It seems almost tautological that “physics” is the true theory of “the physical”, and hence that it is to physics we should turn for an understanding of the complete nature of space, time and matter. However, this commonplace opinion comes under pressure when we reflect on the austere, mathematical vocabulary in terms of which physical theories are framed. It is not clear that such an austere vocabulary can even in principle capture the complete nature of concrete reality. A mathematical description of a situation abstracts from concrete reality and statements having the general force of natural law can only express information about how physical entities are disposed to behave. This is fine if we want to do is predict, say, how electrons will behave (except that we can’t individually). But intuitively there

⁹⁸ According to Arthur Schopenhauer, it is the laws of nature that arise from a transpersonal will, not the will from the laws of nature. Felt volitional states are the irreducible foundation of both mind and world. For Schopenhauer the inner essence of everything is conscious volition – that is, will. Nature is dynamic because its underlying volitional states provide the impetus required for events to unfold. Even in the absence of all self-perception mediated by the sense organs, we would still experience our own endogenous, felt volition. Will is indeed free because it is all there ultimately is.

must also be an intrinsic nature to an electron; there must be an answer to the question “How is the electron in and of itself?” And this question doesn’t seem to be answered by describing how electrons are disposed to behave.

Some philosophers, known as “dispositional essentialists”, hold that all fundamental properties are pure dispositions. On this view, once we have fully described how for example an electron is disposed to behave and have thereby said everything there is to be said about the nature of the electron. However, there are powerful arguments against the intelligibility of this position. Most discussed is the charge that it leads to vicious regress. For any given disposition X, we understand the nature of X only when we know the nature of its manifestation, that is, the property it gives rise to when manifested. If this argument is sound, then physical theory will never provide us with a complete and adequate account of the nature of the material world.

The panpsychist has a proposal: the intrinsic nature of matter is, at least in part, consciousness. What is to be said in favour of this proposal? The first thing is that it is not obvious that we have an alternative proposal, at least at present.

Another argument turns on the assumption that evolution is a continuous process that moulds pre-existing properties into more complex forms, but that cannot produce “entirely novel” properties:

“we cannot suppose that so enormous a jump from one creature to another should have occurred at any point in the process of evolution as the introduction of a fact entirely different and absolutely separate from the physical fact. It is impossible for anybody to point out the particular place in the line of descent where that event can be supposed to have taken place. The only thing that we can come to, if we accept the doctrine of evolution at all, is that even in the very lowest organism, even in the Amoeba which swims about in our own blood, there is something or other, inconceivably simple to us, which is of the same nature with our own consciousness” (Clifford 1886:266)

“we ought ... to try every possible mode of conceiving of consciousness so that it may not appear equivalent to the irruption into the universe of a new nature non-existent to them” (James [1890] 1950: 148).

More recently, Goff (2013) has argued that consciousness is not vague – if consciousness does not admit of borderline cases, then we will have to suppose that some utterly precise micro-level change – down to an exact arrangement of particles – marked the first appearance of consciousness (or the change from non-conscious to conscious embryo/foetus), and it is going to seem arbitrary that it was that utterly precise change that was responsible for this significant change in nature.

A final motivation for panpsychism comes from the need to account for mental causation in a way that is consistent with alleged causal closure of the physical: the thesis that every physical event has a sufficient physical cause (Chalmers 2015; Goff 2017: ch. 6). If, as the dualist believes, consciousness exists outside the physical world, it is hard to see how it could impact on a causally closed physical system. But if, as the panpsychist believes, consciousness infuses the intrinsic nature of the material world, then consciousness and its effects are part of the system.

It is generally agreed, both by its proponents and by its opponents, that the hardest problem facing panpsychism is what has become known as the “combination problem”. The inspiration for the problem is the following passage:

“Take a hundred of them [feelings], shuffle them and pack them as close together as you can (whatever that may mean); still each remains the same feeling it always was, shut in its own skin, windowless, ignorant of what the other feelings are and mean. There would be a hundred-and-first-feeling there, if, when a group or series of such feelings were set up, a consciousness belonging to the group as such should emerge. And this 101st feeling would be a totally new fact; the 100 feelings might, by a curious physical law, be a signal for its creation, when they came together; but they would have no substantial identity with it, not it with them, and one could never deduce the one from the others, nor (in any intelligible sense) say that they evolved it.” (James [1890] 1981: 160)

The general consensus among panpsychists is that there is currently no wholly adequate solution to the combination problem, however symbiotic cosmology derives the subjective aspect from each complementary physical aspect as a manifestation of it, so does not attempt a quasi-reductionistic view of the subjective as in classical panpsychism.

In David Chalmers’ (2016) taxonomy of the combination problem, there are three dimensions of difficulty:

Difficulties relating to subject combination: the core difficulty being the **subject-summing** problem

Difficulties relating to quality combination: the core difficulty being the **palette** problem

Difficulties relating to combination of structure: the core difficulties being the **structural mismatch problem** and the **grain problem**.

Symbiotic cosmology largely avoids the combination problem because it is not seeking a panpsychic analysis of the subjective aspect, but rather looks at physicalist, biological and neurophysiological descriptions to delineate differences between qualia such as vision and sound both in terms of the differing quantum modes they access and the types of CMS processing involved because these are features that can be interrogated objectively as boundary conditions on the kind of subjective experience involved. This is because the focus is not on a reductionistic description of the subjective aspect of brain processes but establishing the cosmological complementarity as a whole that is necessary to solve the hard problem and the problem of volitional will in a coherent cosmological account.

Many panpsychists believe that the conscious mind is identical with, or bears a very intimate relationship with, the brain. Most Russellian monists, for example, believe that the conscious mind is the intrinsic nature of the brain. And all constitutive micropsychists think that human experience is grounded in the properties of micro-level entities. Thus, these forms of panpsychism face the challenge of explaining how the rich structure of consciousness results from, or at least co-exists with, the seemingly very different structure of the brain. Perhaps the most discussed form of the structural mismatch problem is the grain problem the worry that experiences seem to be smooth and continuous in a way that is at odds with the discrete, particularised structure of brain properties.

Again there are numerous proposals for addressing the worry. Lockwood (1993) for example suggests that the worry only arises when we are implicitly thinking of the brain in terms of classical physics, and that it evaporates when we explicitly adopt more recent scientific paradigms. Symbiotic cosmology likewise sees the brain properties arising from edge of chaos sensitivity to quantum processes at unstable tipping points in the conscious brain dynamics, so invokes both wave properties of brain states and wave-particle complementarity so that there is no actual discordance of mental continuity and the quantum nature of reality, which is manifested in a complementarity between objective universe and subjective mind at large.

For a diverse current account of the interplay between proponents and opponents of panpsychism, [Philip Goff's](#) webpage [Conscience and Consciousness](#) contains links to scientists, philosophers, and theologians with a variety of views debating Goff (2019). In this series of articles, The author [Annaka Harris](#) points out that the combinations problem ceases to exist if consciousness in her words akin to a pervasive field analogous to space-time in my words to the universe as a whole:

"Rather than an obstacle to theories that place consciousness in a fundamental role, the combination problem may be a reason to favor the proposition that consciousness is a fundamental feature of the universe in the form of a continuous, pervasive field, analogous to spacetime. Just as spacetime and gravity have an interactive relationship, consciousness might be thought of as a fundamental "field" that interacts with, and is integral to, matter. We typically don't think of spacetime as bits and pieces that build on one another (it's simply everywhere), and I don't think we should be tempted to think of consciousness, if it is indeed a pervasive field, as divisible into building blocks either."

This is confluent with the defence of symbiotic cosmology using panpsychism in a way which utilises a physicalist position to characterise the subjective in its complementary objective evolutionary terms from cell to eucaryote to organism, including edge-of-chaos systems with quantum phenomena due to the butterfly effect, so characterising, in each case, consciousness as a whole. Really the combinations problem proto-psychism etc. is an attempt to think reductively about the subjective, the very thing we are trying not to think reductively about.

[Lee Smolin et al.](#) also highlight exactly symbiotic cosmology's point of intervention in the causal closure:

"There will be a mixed functionalist and reductive explanation for why humans and other animals experience qualia (or just experience). It is then very natural to suppose that if the existence of consciousness is to be explicable for a physicalist, it must perform some function that increases the fitness of the creature that is endowed with it. But this requires that consciousness can intervene in the network of causes in the physical universe."

*"Most of the approaches to quantum foundations do split the laws into two parts, the first being described by unitary Schrödinger evolution in a fixed Hilbert space, which we identify with **Mode I**. In most formulations, quantum mechanics is more than this. Collapse of the wave-function, whether spontaneous or based on a law of some kind, is strictly **Mode II**."*

This parallels symbiotic cosmology accepting mode I as causal and allowing the subjective aspect to intervene in mode II, thus completing the incomplete causal closure of the quantum universe without disrupting causality.

Chris Koch's position which I had to get out of another article ([Koch 1](#)) classes himself as a panpsychist but really he is an information network panpsychist as expressed in [Tononi and Koch's](#) (2015) integrated information theory. But nevertheless sees consciousness potentially on multiple scales:

"The only dominant theory we have of consciousness says that it is associated with complexity — with a system's ability to act upon its own state and determine its own fate. Theory states that it could go down to very simple systems. In principle, some purely physical systems that are not biological or organic may also be conscious" ([Koch 2](#)).

In this article, Koch is worried about humanity self-destructing and cites the Fermi Paradox as evidence intelligent societies self-destruct, which is why I'm introducing cosmological symbiosis as a climax remedy for avoiding a human induced mass extinction of the diversity of life which could do just that.

Galileo's error as expressed by Smolin et al., talking about Goff is this:

"The core of Galileo's new science was the idea that all motion could be represented mathematically while all change could be rendered as motion. To make this credible not only was part of the world discarded but memory of it erased. Sensations, colors and thoughts were not part of the mathematical universe and that came to be thought of as the only universe there was. Galileo's error in removing qualities, sensations and awareness from the world, leaving only a universe of quantities and of quantifiable relationships, led to an equally profound error about the nature of time. The success of the science of motion led to the hypothesis that the motions and forces of the world - from atoms up to stars - were a system that was causally closed, as all explanations of motion pointed to more motion. "

Where have I heard this before? Evolutionary psychology and sociobiology. This is the old gatherer-hunter divide between categorisation in woman gatherers identifying plant species and male hunters stalking their prey silently. Men are or claim to be "ace" at mental rotation and describe a route as hunters in terms of a set of vectors to the destination and women say "go past the gas station to the child care centre".

So materialism or physicalism is another hideous manifestation of patriarchal dominion over nature and woman alike. In Goff's view Galileo has taken the feminine qualia out of the description and Newton has sealed the deal and we are still stuck in the classical description of the causally closed Laplacian universe, despite staring quantum reality in the face. This is another manifestation of complementarity that shows up materialism for just what it is.

Miller (2021) notes that cosmopsychists have their own combination problem but turned on its head — the decombination problem: how can a subject and its experience decompose into other subjects and their experiences?

Goff (2019b) poses the question "Did the universe design itself?" by invoking a form of constitutive cosmopsychism. In his words this might not provide an intelligent form of psyche:

"The claim that the universe is conscious does not imply that it has any of the sophisticated mental features enjoyed by human beings, such as thought, intelligence and agency. In our case, these mental phenomena are the result of millions of years of evolution; one might doubt that they could also be properties of things, such as the universe, which have not evolved through natural selection. Indeed, in previous work ([Goff 2017](#)), I suggested that the cosmopsychist conceive of the consciousness of the universe as being a 'mess' entirely lacking in elements of thought and rationality".

Goff then amends this "primitive" cosmopsychism to address the fine tuning problem, the fact that the current description of the physical universe, comprising the standard model plus gravity has about [25 free parameters](#) which the theories themselves don't explain. The fine tuning problem was first drawn attention to by Dicke (1961) and has been elaborated by Barrow and Tipler (1988) using the anthropic cosmological principle and Martin Rees (Lemley 2000). The [fine tuned universe](#) has reached quasi-religious dimensions in the minds of its proponents.

A key cited example is that ϵ , a measure of the nuclear efficiency of fusion from hydrogen to helium, is 0.007: when four nucleons fuse into helium, 0.007 (0.7%) of their mass is converted to energy. The value of ϵ is in part determined by the strength of the strong nuclear force. If ϵ were 0.006, only hydrogen could exist, and complex chemistry would be impossible. According to Rees, if it were above 0.008, no hydrogen would exist, as all the hydrogen would have been fused shortly after the Big Bang. Other physicists disagree, calculating that substantial hydrogen remains as long as the strong force coupling constant increases by less than about 50%, but these parameters are critical to the cosmic distribution of the elements, especially the elements of life, as outlined in [fig 17](#).

Dicke cited $\frac{Gm_p^2}{\hbar c} \sim 5 \times 10^{-39}$, as a near-vanishing constant involving the mass of the proton, the gravitational coupling constant, Planck's constant and the speed of light, but these parameters may be defined by a deeper theory of everything (TOE) determining the symmetry-breaking parameters in the cosmic origin. Dicke noted that most physicists seem to believe that such a dimensionless constant, such as (1), is provided by Nature, cannot be calculated, and is not in any way related to other numbers, although Dirac has suggested a deeper law connecting these on powers of 10^{40} , for example $\frac{Tm_p c}{\hbar} \sim 10^{42}$, where T is the Hubble age of the universe.

But some of these problems arise from the way quantum field theories and relativity have been constructed. For example, the fine structure constant determining the convergence of the Feynman diagrams of quantum electrodynamics fig 1: $\alpha = \frac{1}{4\pi\epsilon_0} \frac{e^2}{\hbar c} \sim \frac{1}{137}$. Quantum electrodynamics is the most accurate theory ever devised calculating the magnetic moment of the electron correctly to six decimal places. It forms an archetype of all the quantum field theories in the standard model. This means that all in all the way these theories have been built upon empirical variables these types of theory don't determine the empirical parameters out of which they are constructed. However a deep TOE might do precisely this because the overall structure of these theories is elegant involving symmetries that are then broken by symmetry breaking potentials like the Mexican hat precipitating the weak-electromagnetic symmetry-breaking. So deeper TOEs which unify all the four forces might do so.

Goff instead invokes features of a primitive cosmopsychism that might do this from the subjective aspect instead, by invoking two modifications to the messy primitive universal consciousness (1) agency and (2) a form of future awareness:

"The first modification I will be proposing is that the universe, although physical, acts, and only acts, through a basic capacity to recognise and respond to reasons."

This has all sorts of problems because "reasons" and "facts" are optimally sophisticated concepts and Goff admits they could sweepingly overrule and define physical laws:

"How do the laws of physics fit into this picture? If the universe acts through a basic capacity to recognise and respond to reasons, and all facts are grounded in facts about the universe, the laws of physics seem to be irrelevant to the causal evolution of the universe."

He then addresses the central question of fine tuning having to anticipate its own cosmological outcomes:

"If, during the Plank epoch, the early universe fine-tuned the laws to bring about life billions of years in the future, then it must have in some sense known, or been aware, of the future consequences of its actions. In other words, to make sense of the idea that the early universe fine-tuned the laws and initial conditions in order to bring about life, we need to make sense of the idea that the universe has mental states that represent the future."

"I propose that the agentive cosmopsychist should suppose that the universe has a basic disposition to form spontaneous mental representations of the complete future consequences of all of the choices available to it."

This is something that is already implicit in special relativity in the usual physical interpretation, where both retarded (causal) influences and advanced (retrocausal) come out as positive and negative square root solutions of the defining Lorenz transformations giving us results defining the velocity of light as a maximum and $E = mc^2$.

My real concern here is that agentive cosmopsychism, by virtue of possessing willing agency inherits the idiosyncrasy of will without which it would be impotent, so this leaves us with a regress why such an agent should decide to act in a way to bring life about. So in my view, although proposing Darwinian panpsychism, as a cosmological solution to the hard problem is that we need to wait a little longer to see if an underlying TOE will emerge that explains fine tuning in terms of symmetry-breaking, before relying on either a multiverse, anthropic, or a cosmopsychic solution to the fine-tuning problem.

Cathy Reason: How does SEC solve the problem of how panpsychism is divided

Chris K: Because I'm not decomposing the subjective. Qualia in SEC are features of the way the brain acts as a filter on primary subjectivity not "parts" of panpsychism. I agree with your critique of classical panpsychism, especially pan-proto tying itself in knots and qualia being treated as things that have to be put together to make experience, the combinations problem etc.

Materialism leads to an irreducible explanatory gap about subjective experience, so the logic has to work backwards – matter must have mind at the foundation as a cosmological complement. I.e. primitive quantum-psychism with no subdivisions. The subdivisions all occur in physical reality driven by fermionic divisibility of matter. The brain dynamics doesn't fully cause conscious states but acts as a contextual boundary filter on the mind at large as Huxley put it. Subjective consciousness then makes integrated choices exercising free will through quantum uncertainty because that's the only avenue it has, without inducing causal conflict with classically certain brain function and because it is enough to split the wave function defining history.

Cathy R: How do you start with a single cosmic subjective experience and end up with a preferred set of complex individual experiences?

Chris K: We don't know we start with a single cosmic subjective experience. SEC just asserts primal subjectivity not cosmic consciousness. Primary subjectivity has to be fully compliant with all determinately causal aspects of the physical dynamics or subjective-objective conflict would arise. So it has to exploit quantum uncertainty which is what its evolutionary advantage actually is, although it's counter-intuitive. We think we are making reasoned decisions but that is largely derived from brain function, so we think uncertainty is random, but that's our cubic centimetre of chance to avoid the tiger pounce and survive when all the computational odds become intractable because the tiger is exploiting them too.

Cathy R: But this just replicates what I called the preferred partition problem -- why and how is subjectivity partitioned according to the dynamics of brains, rather than, say, the dynamics of individual molecules?

Chris K: Because biological matter is fractal, the brain dynamics ARE the molecular dynamics so the explanation arises from molecular quantum fractality, which is much more complicated than simple scale invariance, as illustrated in [figure 54](#), fractal biocosmology.

To give a very general outline, conscious subjectivity is partitioned by how a system exploits and responds to uncertainty. Each neuron is a conscious eucaryote cell. We experience the coupled state of billions of these in organismic consciousness, but as individuals they are putatively also conscious as in cell migration in early brain development and neural plasticity in the adult.

Cathy R: You cannot justify that choice empirically because no prediction you make about this preferred partition could ever be testable. Panpsychism cannot, by definition, be proven empirically. Because it is impossible to know if inanimate matter has subjective states. The only subjective states which panpsychism predicts are the ones we already know about, and the ones we can never detect.

Chris K: Empirical science verified by experimental investigation is the foundation hallmark of the scientific method and it applies both to objective observation and subjective experience. While subjective consciousness can only be experienced, behavioural volition is physically evidential up and down the scale. Testability is a challenge with all subjective experiences, even the ones we know we do have, although it can be done through subjective reports.

Cathy R: Do you mean that both the brain and all its cells map on to the *same* conscious state?

Chris K: Yes when they are dynamically linked but NOT as mappings. Mappings are functional definitions on points or parts. That's simply not how it works, because its a pure abstract objective description. Watch the video of [Dictyostelium - a Cellular Slime Mold](#) and you have an example of volitional behaviour both at the individual cellular and organismic collective levels. Dictyostelium has two active modes, individual in single foraging cells and then coupled in the worm and later fruiting stages. The individual mode is very similar to individual human neutrophil phagocytes [1](#), [2](#). Each mode gives rise to different – independently distributed or coherently unified versions of “consciousness” in the same cells, because the organism has evolved to make this possible, and our brains have conserved the unified mode. The switch occurs as soon as the individual amoebae come into membrane contact.

Cathy R: Or do you mean that every possible subset of cells maps onto some separate non-intersecting conscious individual? In that case it would have to be possible for the same cell to map on to several separate conscious individuals.

Chris K: No unless you are talking Psi which I accept on an incidental but not provable basis.

Cathy R: Or are you trying to claim that conscious individuals actually comprise other conscious individuals? Because that would contradict the meaning of individuality.

Chris K: Not unless they're telepathic, which I also accept on an incidental but not provable basis.

Cathy R: I prefer to express the problem in terms of set theory or category theory, because they are both very powerful abstract formalisms. But the preferred partition (decombination) problem (Miller 2021) is not dependent on the formalism. Feel free to use any formalism you want, but so far the only way you have been able to deal with the problem is by axiomatizing it away.

Chris K: Subjective consciousness is the prima facie, sine qua non reality, through which we know the universe exists. It IS axiomatic Cathy. It's the correct "mathematical" approach! Demanding to prove something that is axiomatic is futile, as Godel demonstrated.

Cathy R: But what is not axiomatic is your claim that all matter has a subjective aspect, and your choice of a preferred partition whereby certain elements of the physical world, such as brains, map on to conscious individuals, but other elements, such as molecules, do not.

Chris K: The claim that all matter has subjectivity IS axiomatic! If neurons do then their molecules do when they are participating in a process which is resonant and is responsive to uncertainty, as in edge-of-chaos membrane excitation. The coherently integrated form is functionally a quantum fractal. I already cited the fractal biocosmology [figure 54](#), which runs from fundamental particles through molecules to super-molecular assemblies to subcellular organelles to cells to organs to organisms. It's a quantum fractal from foundation to sentience.

In a subjective conscious experience, the brain, it's neurons and its molecules are all coupled together in a coherent edge-of-chaos dynamic which means they are forming a fractal complement of the subjective conscious state. They are all acting and contributing together in a fractally-coupled dynamic. We don't know it's a mapping or a functor because these are objective abstract models of functional relationships. Indeed, we don't know the relationship is functional as such. To be precise, boundary conditions are not functional relationships. A function is causally forward – i.e. for all x in X there exists a unique $y = f(x)$ in Y . Rather we have a physical system in an indeterminate state and there is a volitional "mapping" from the subjective to the objective, limited by the physical boundary conditions which give the conscious experience its world view via the brain. But this limitation is not causally determinate, which is what gives free-will room to move.

Cathy R: But any form of panpsychism – including yours — requires a preferred partition because there are all sorts of ways of partitioning the physical world into discrete individuals and you have chosen just one of them.

Chris K: Yes the universal one Cathy. You could try to say the same thing about the standard model of physics.

Cathy R: If you claim it is universal, then you have to *show* that it is universal. You haven't done so.

Chris K: No, it's an axiom! The only evidence either of us have to bring to bear on this issue is (a) through direct subjective experience or (b) through objective analysis. Neither of us have any direct access to forms of conscious experience outside our own personal human organismic experience, because that is axiomatic to what subjectivity is – experience private to the subject. The SEC analysis of the physical aspect – i.e. quanta, uncertainty-sensitive unstable molecular systems, biogenesis, prokaryote excitability, eucaryote attentive sentience, organismic consciousness, biospheric evolution and cosmology itself is manifestly and indisputably universal to the maturation of the symmetry-breaking consequences of the standard model. The physicist's lament at the failure of string theories and other TOEs to fully define the standard model of physics confirms that your critique demanding proof of universionality is as true for the standard model, as for Symbiotic Existential Cosmology.

Cathy R: You need to explain why you think all matter has a subjective aspect (because I can't see any reason why it should, and it is not parsimonious to assume things for which one has no evidence).

Chris K: The conclusion is more parsimonious than any other because it is arrived at by rejecting the physically materialist notion of causal closure of the universe as inconsistent with our empirical experience of subjective conscious volition over the world around us, aka the physical universe. But it's more than parsimonious, it's necessary because rejecting conscious volition makes a full cosmological representation of subjective and objective reality impossible because one contradicts the other. Conscious subjectivity is invoked by how an uncertain physical system responds to and exploits uncertainty to survive. Broadly this involves quanta, unstable systems at the edge of chaos with a butterfly effect, biogenesis, prokaryotic life, eucaryote sentient consciousness and organismic consciousness with an option on biospheric evolution through volitional survival and finally the universe as a whole. There is no more parsimonious conclusion. It is not a "preferred partition". It is a universal manifestation. One criterion, which is essentially physical and not confined to biological systems only.

Cathy R: And you also need to explain how these subjective qualities evolve to produce conscious individuals, and do so in a manner which isn't intrinsically circular or self-contradictory.

Chris K: Evolution selects conscious organisms which benefit from volitional adaption to existential threats beyond computability and memorisation, and strategic advantages e.g. in food.

Cathy R: What is your evidence that all matter has some sort of subjective state?

Chris K: We have three possibilities:

1. **Matter has no subjective aspect.** This fails the explanatory gap causing the hard problem of consciousness, and evidence of volition, and is thus cosmologically untenable. No attempts to skirt round it assuming that the easy problems will eventually solve the hard problem show signs of even eventual success and are category errors.
2. **Some matter has "consciousness".** This leads to various forms of complexity theory such as Tononi and Koch's IIT Integrated information theory. These are also untenable because there is no real idea of where and when complexity becomes subjectively conscious. But even these are actually pure materialistic theories coopting some qualitative features of how human consciousness works e.g. Graziano's AST attention schema theory.
3. **All matter has "consciousness".** Subjectivity is intrinsic to cosmology, complementing the physical universe, so matter must have mind in some root form. An extreme form is Vedanta where matter is emergent from pure consciousness and is central to all mystical traditions underlying religion. SBoC is strongly aligned with this approach. Symbiotic Existential Cosmology takes a middle view summed up as "Consciousness is primary but the universe is necessary", reflecting empirically how our experience actually manifests primarily through subjective consciousness and only then through our consensual view of the physical universe.

Both (1) and (2) fail on grounds of both outright untenability and lack of parsimony. (3) does not. It is manifestly tenable since we know we are subjectively conscious and are so primarily over assumptions about the external world. It is also the most parsimonious because (1) and (2) have no way to explain consciousness without crippling complexity arguments which fail the recomposition test – how does an unconscious system below the threshold become suddenly conscious above it?

I would point out also that, at the root phenomenal level of a single quantum, subjective "consciousness" is represented physically in its wave function extending and potentially entangled throughout space-time, and the volition, or free will, is represented in wave function collapse, which in each single case is indeterminate physically so corresponds "informationally" to free will. The very independence of each collapse guarantees conformity to the wave probability interpretation unless two particles are entangled and hence correlated. This thus solves both the conscious awareness question and the volitional or free will question succinctly, tenably and parsimoniously.

Cathy R: How does your theory solve the decombination problem?

There is no decombination problem for biological organismic consciousness in SEC since it is not a form of cosmopsychism because primal subjectivity is effectively quantum subjectivity, not cosmic consciousness. So organismic consciousness is not decomposed cosmic consciousness. The physical form of organismic consciousness is a unified quantum fractal process in which all the parts are acting coherently in the overall physical aspect, so it doesn't decompose either. Cosmic consciousness is something which is approached asymptotically in moksha states, such as

samadhi, so it is an emergent form of organismic consciousness converging to a cosmic form. There is thus no state of decombination occurring. This also applies to butterfly effect physical systems, where the overall dynamic is coherent.

But I don't class Symbiotic Existential Cosmology as part of panpsychism at all, because it is a cosmologically empirical discovery, not a philosophical argument.

In Darwinian panpsychism, we don't start with a fully developed cosmic mind, we start with primary compliant subjectivity, responsive to quanta, uncertainty-sensitive systems and biogenesis. Then the evolution of life generates excitable prokaryote cells and attentively sentient eucaryote cells through endo-symbiosis, freeing the cell membrane for attentive consciousness, shaping primary subjectivity, then brains and then organismic consciousness and only then can organismic consciousness asymptotically approach fully fledged cosmic consciousness, through idling in neutral in moksha samadhi into an abstract form of subjectivity reflecting the cosmological condition, as a culmination.

This turns the God/cosmic mind logic backwards. Transcendence emerges from the biota. We don't start with divinity, we end with it if we protect diversity. Shiva and Shakti are pulling themselves up by their bootstraps through virility, fecundity and fertility.

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