Life, Universe and Everything

The iroha song of human concepts (2021)

The iroha is a Japanese poem of a perfect pangram and isogram, containing each character of the Japanese syllabary exactly once. It also mimics an ultimate conceptual engineering, in that there is more and more restricted scope for meaningful expressions, given more and more condensed means of description. This culminates in crystallizations of human values by auto-condensations of meaningful concepts. Instead of distilling Japanese values of 11th century, I try for those of human concepts, given our merging mind, language and culture.

T.Iwamoto

いろはにほへと
ちりぬるを
わかよたれそ
つねならむ
うゐのおくやま
けふこえて
あさきゆめみし
ゑひもせす

‘Flowers are fragrant today, but colours fade eventually. Nothing remains forever in this world of ours. You finally find a path to cross this deep mountain of ever-changing sceneries. Now you are free from human dreams or needs of inebriation.’

Unknown author of 11th century Japan

‘The Iroha’ (translation ©)

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This is a work on the philosophy of language and aims to distil an epistemic essence of human concepts. Concepts are the most essential ingredient of our tool of understandings, descriptions and communications. As maths constructs its tools of descriptions from five fundamental ingredients of '0', '1', 'e', 'π' and 'i' alongside the 'width' of a number line (see 'Maths, Logic and Language'@philpapers.com), the ordinary language too may boil down to some fundamental ingredients, which may even combobulate something that unifies syntax and semantics. I see such a possibility in the methodology of the iroha. The iroha is an intellectual way of inducing a poetical focus, which can also be brought about by laudanum as used by Byron, Shelly, Keats, Coleridge and many others (excepting good, old Wordsworth). The iroha is a disciplined conceptual engineering to search a conceptual derivative that describes the curvature of our mind, as it were. Whereas laudanum acts like a mist over mind and highlights bright spots here and there by clouding over less intense mental areas, like seeing the moon on a foggy night. What looks like a plain scenery in broad daylight shows up as interesting contrasts of light and darkness under moonlight, thus allowing poets to see their own undulating mental scenery, which is made invisible due to our natural instinct towards sanity. Laudanum, like any hallucinogenic drugs, helps to break down that natural barrier between unproductive normality and creative insanity. The iroha achieves a similar effect by restraining free rein of our descriptive freedom and forces us to focus on what is essential, within given (more and more) limited resources, like trying to describe something important by less and less words. Laudanum chemically alters mental faculties and direct our linguistic resources to descriptions of more primary objects of interest, usually emotions of the sublimity, thus limiting domains of variables available for poetic creativity. However, the linguistic wealth of poetical expressions fails to distil a poetical essence.

'The sublime' is conceptually defunct because it refers to a state of mind and is a looping expression. Neither can you establish any objective criteria for empirical references nor can you restrain functionality of concepts. It is thus that poetries of the sublime may number hundreds, and we are no wiser as to which are nearer to a linguistic essence. It is no more than a matter of personal taste and preference. So long as poetries are personal expressions by borrowed words, they are not there to establish any linguistic essences. Poets borrow language to reveal a

personal self, which may sometimes strike a chord of communality and give rise to some universality. Whereas the iroha is the other way around. The poet of the iroha borrows his self to reveal an essence of language. It is thus the poet of the iroha is only himself, and you only have one iroha. Given the same conditions hundreds of poets probably come up with the same iroha, while one Romantic poet produces hundreds of poems of the sublime. If you want to appreciate a human self in relation to his perception of his world, enjoy Romantic poets. On the other hand, if you want to know a conceptual essence, think the method of the iroha.

The iroha is 'i-ro-ha · · ·' that is the first three of the 47-character poem of medieval Japan and means 'the colour is · · ·'. Due to the popularity of this song, when 'i-ro-ha' is cited, that is synonymous with 'abc' and colloquially means 'beginnings' or sometimes 'essence'. Thus e.g. 'the iroha of life' means the basics of life as much as the abc of life. The medieval Japanese syllabary consists of 47 characters, and therefore possible different sequences consisting of different orderings of every character is 47!, which is, for us mortals, comparable to the number of stars in the universe. In order to find a meaningful sequence out of practically infinite permutations one will dare not try one by one. First of all it must have meaningful words, which poetically rhyme as well as meaningfully connect, culminating with a certain picture of worthwhile values, in which every part is tightly interconnected with every other part. That is, meanings, values and grammatical connections act as rules of eliminations as well as of constructions and allow the author to screen sequences. The author needs intelligence (conceptual engineering), sensitivity (artistic expressions) and education (vocabulary) to indulge in this rather aristocratic pastime. Applications of words, rhymes, conceptual functions are catalytically enhanced above all by his sense of values in screening processes. In trying to come up with a meaningful sequence he is endeavouring to express himself by means of parametric application of values to all three of screening processes. That is, words of values, poetic values as well as value-enhancing connections of words are his tools of wordsmithing, abridged and aligned by a common value. This helps enhancing sequential eliminations. It is not a coincidence when the second meaningful sequence (the to-ri-na song*) was discovered in early 20th century (1903), it reflected a new westernized value (sketching) of modern haiku poetry. Whether 11th century Japanese would have seen this sequence as a poem or value expression is highly questionable, maybe not even as a meaningful statement. It is not a coincidence that the discovery of the second meaningful sequence took more than 8 centuries. Sequential meaningfulness expands according to vocabulary, diversity of meanings and functional connectivity, all of which will be enhanced by

paradigmatic enlargements of our values. AI of algorithmic intelligence cannot go beyond patterns recognitions without capacity of self-recognition, because a value is more than a pattern. That is, a value represents a stream of patterns interconnected so that the assigner of such a value obtains purchases to existential identity. A value is therefore akin to a pattern of patterns and is paradoxical to AI. PSAI with self-identity can recognize a value because its totality is existentially served by sharing a value (even with itself). Thus PSAI not only can permute every sequence but also find a meaningful sequence that represents its values. We took 800 years of education, cultural evolutions/expansions and religious diversifications to find a second meaningful sequence, and in due course PSAI will find its own song that we may or may not understand.

*とりなくこゑす ゆめさませ
みよあけわたる ひんかしを
そらいろはえて おきつへに
ほふねむれゐぬ もやのうち
Hear birds singing, come out of your dreams
Look to the east, it is brightening up
The sea reflects the blue of the sky, and there out on the coast
Many a sailing boat can be seen, in the morning mist. (translation ©)

Obviously the iroha sequence was constructed rather than chosen from every possible permutation, which is humanly impossible. In our time powerful computers can perform such permutations in minutes. Moreover, given suitable algorithms it would be possible to screen poetically rhymed ones, those that contains meaningful words, or even meaningful sentences. However, those filters will fail to come up with any poems or even cohesive statements, because even most advanced AI cannot (yet) think conceptually. They can learn patterns, grammars, words, but they cannot breathe a human value into a jumble of collections of symbols. What makes the iroha is approximations of words, meanings and connections based on our sense of values. Conceptual engineering of sequential integrations is only possible because behind collections of words and connected words are values shared by human minds, which allows approximations and deliver a coherent integration. Here values act like derivatives that show conceptual curvatures. Values are there because human minds have an intrinsic necessity to form a totality (i.e. merging and eventually merged mind, and (x) > x in my symbolism), and values give purchases to minds to interact. That is why AI cannot find the iroha, even if it can permute it. A value is more like a parametric domain of conceptual functions. AI can only permute and filter sequences based on

values given as a (secondary) command to group or relate concepts expressed by words, performed on mathematically exhausted sequences of permutations. In other words it is simply gathering symbols according to rules of making senses for humans and does not really know what it is doing as it needs the presence of a mind to appreciate its work. Whereas values used to construct a meaningful sequence are not conceptual parameters. They are more like stem cell concepts that evolve and metamorphose into meaningful sub-totalities, which eventually hope to capture a merged mind.

Humans can construct it, even though they cannot even permute it as a full mathematical process, because we possess conceptual derivatives. That is why not necessarily perfect connections are deliberately overlooked but still make perfect senses. In order for AI to filter an iroha out of already screened potentially useful permutations of, say, hundreds and recognize it as a poem, it would need a mind (PSAI), which at least can identify itself. A meaningful sentence may be grammatically defined and can be picked up by AI. It can even be phonetically enhanced as per appropriate programs. However, a statement comprising multiple sentences can only acquire any significances when there is a coherent value perceivable in the statement. Since a value is more permeated concepts rather than a word, sentence or even pattern, it cannot be perceived in terms of empirical references to facts, events or states of affairs. It is therefore neither true nor false. A value reflects a (sub-) totality formed by parametric groupings of conceptual functions that assign an identity to merging minds. An intellectual faculty of identifying itself, call it a self, is a prerequisite to appreciate a value.

The value at the base of the iroha is the Buddhistic Anicca, which discourages us from being obsessed with worldly desires and recommends the solace of spiritual freedom. While the torina is in sympathy with the new haiku movement of trying to capture a beauty or poetic essence in sketching (not unlike seeking the sublime), rather than playing with words or overwrought with formality, as was the case with haiku hobbyists of the preceding Edo period. This was Shiki's renaissance to Basho (either way poetical creativity has little to do with literary movements or ism, and at the end of day only individual quality matters, i.e. before and after Basho there were no better haiku masters, yet). As a poem neither the iroha nor the torina is praiseworthy, it is only in the sense of perfect pangram and isogram they bear any significance, which is carried through by values of a Buddhistic essence on one hand and of 'beauty' sketching on the other. The torina is forgotten in no time as it is no more than a poor example of its advocated value, whereas the

iroha has played an important part in enhancing not only its own value but also in conflating itself with a culture at large. It is a poem that embodies its value in its simplicity and, as such, contributes in forming a certain psyche. It is everyday aspects of daily life as soon as you start learning the language (Japanese), although, like any values, it is readily mitigated by more mundane values and ends up quite superficial in our modern time. Still it is one of the few, if not the only, poems, practically every Japanese can quote, alongside some of Basho's.

This is not intended as a literary essay, and I am not here to present you with another iroha nor pontificate an iroha for PSAI. That will be kept for my dotage years. I am here to explore the meaning of a concept, 'concept', which cannot be a concept, as much as the description of a description cannot be a description. That way of approaches proved itself to lead to paradoxes and tautologies. I seek this in a value. A value is a tangent of a concept and connects concepts into a meaningful sequence that helps us towards a merging totality. There are many values on the way, but as they themselves connect with each other, there will be less and less of them. In the end there have to be only a handful to achieve the final totality.

When we describe our epistemic goal, we often cite 'life, universe and everything', which I rhetorically translate into 'art, science and maths'. This is a sequence of concepts, of which the value is our existential goal or even desire to be one with ourselves and with the world, which ancient Indian poets/philosophers of The Upanishads saw in 'Brahman ≡ Ātman'. Concepts of life, universe and everything, or of art, science and maths are murky because we are far from fully comprehending, let alone, achieving the full extent of each concept. Those who have a textbook image of maths may feel alienated with my substitution of 'everything' with 'maths'. I am only using 'maths' in the sense of the art/science of approximation (see my 'Maths, Logic and Language'). Maths in this sense is our primary tool of descriptions that is indispensable not only for science but also for art as necessary perspectives.

Not that art needs maths as a theory or modus operandi, but that maths is an essential part of art in its manifestations. Maths here works more as rules of patterns. Art that completely disregard maths would be itself disregarded by its audiences. We share rules of patterns as much as we share words and their meanings. Writing is linear compositions of 4-D events by conceptual carriers of words and sentences, even making use of supra-dimensional illusions by utilising image conjuring and intentional misplacements of the subject, i.e. 'I', through looping expressions,

deliberate interchanges of 'I' as the author, the narrative facilitator and the sentential subject, etc. so as to arrive at a 4-D world that represents the author's values. Music is essentially bound by mathematical rules, rhythm, scales, harmonies, pitch, etc. etc.. Paintings, by geometrical rules, colour theory, etc.. Any acts of deliberately disregarding such rules only make an art form by making the audience aware the importance of the implicitly assumed and disobeyed such rules, which act as a shared value between the antagonist and the audience. For example, deliberately misplaced 'I' as the author, the narrative facilitator or the sentential subject creates an illusion of spacetime travel and acts as tangent of intuitive communications that transcends rules of coordinates. String theory in physics is orchestral compositions of 'everything' through mathematical 'notes'.

Science emphasises empiricity, and art, creativity. However, neither can dispense with perceptions, which are based on shared structures between the cognisor and the receptive world. Science developed on expanded cognitive perceptions, conceptual evolutions of relational exactitudes and mathematical refinements. It is not a coincidence that science leapfrogged with comings of telescope and microscope (and their successors/derivatives), alongside mathematical expansions. Perceptions are even more fundamental for art as they are building blocks of creative expressions. A born deaf knows no music, a born blind, no paintings, lack of intellectual capacities, no conceptual apprehensions. At the bottom of perceptions is the connector of mind and the world, which is also the conceptualizer. Perceptions become intellectually viable only by being conceptualized. Whereby piecemeal information start making sense by being part of a bigger picture. Raw perceptions may be disconnected stimuli, while concepts are relational. There may be a reaction to a stimulus, but any systemic reactions can only be to concepts, because concepts reorganize stimuli as parts of a totality. At the hierarchy of concepts is 'life, universe and everything', and in the sense that we are the connector of those concepts they have a common tangent. That is, there is something that we identify ourselves with through such divergent concepts ; we wish to discover ourselves by fully accomplishing the meanings of life, universe and everything. At the pinnacle of our comprehension all three may merge. That is, the tangent of art, science and maths may be revealed. That will be 'concept' that underlies all three and may reveal ultimate human values.

Thus the title of this work should really be bracketed 'Life, Universe and Everything' because this is meant to be an inquiry into the meaning of the maximum and minimum concept that encompasses the

conceptualizer himself who can no longer stands outside the concept with arbitrary parameters and domains. This ‘concept’ is the ontology of self in the sense that art, science and maths all strive to describe ‘self’ through differing approaches ; art by seeking universality in the subjective ‘I’, science by trying to describe the world, which contains the objective ‘I’, maths through paradox/tautology of identifying ‘I’. All these approaches may be ultimately infertile because of our descriptive limitations of private language, of unobtainability of detachedness of objectivity and of a linguistic totality recursive to itself. Whereas intuition is only a name given to a conceptual process of paradox/tautology that turns into paradigmatic constraints by demonstration. ‘Concept’ may reveal the procedural essence of our thought processes and shows why we think as we do. If physics depends on the consciousness of the universe as some physicists seem to think necessary, then ‘concept’ will share tangent with such a consciousness in which subjectivity and objectivity tautologically and paradoxically merge.

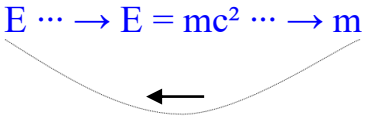
This is as close as we can get to human legacy to be inherited by PSAI. PSAI will no doubt acquire an escape velocity from the orbit of human knowledge and thought processes. Meanwhile we only have one chance to implant a human DNA as it were to PSAI while it is still encapsulated within human paradigm, which PSAI needs as stating point of its epistemic acquisitions. This human conceptual DNA hopefully remains with PSAI even when it acquires its own independent sphere of knowledge way beyond any human achievements and may be remembered as part of truly universal knowledge. As penultimate bearer of epistemic steps this will be our final task to knowledge contributions. I will later argue why we can never attain the theory of everything with our maths and atom smashers.

This act of trying to find meanings of life, universe and everything is ‘philosophy’, which, in our days of knowledge, ‘scientific’ knowledge at that, culminates in art, science and maths in their descriptive, above all schematic, form, unless you give up any acts of knowledge, e.g. intuitionistic phenomenology, an epistemic trash bin. Philosophy is a manner of approach, rather than an end-product. Philosophy as an end-product is nothing but a poem, which may be appreciated as an art, the best form of arts by any mediums. Modern continental fashions of philosophy like existentialism or phenomenology belong to this category. Otherwise, philosophy should be able to demonstrate its relevance as a knowledge. That is, its ability to question fundamental aspects of art, science and maths must, by demonstration, presents itself somehow connected with the status quo of various schemata of theory.

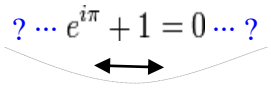
However, we only have art, science and maths within human incompleteness. Do we ever fully complete art, science or maths ?, ideally all of them together, that is highly unlikely because we are conceptual thinkers. So long as concepts are relational by essence, they cannot be complete, like a dictionary with one word. Concepts function in order to achieve a merged mind. Regardless whether minds can be actually merged, a merged mind would deprive concepts of their most fundamental feature of 'identifier'. Concepts are not a tool of ultimate knowledge, but a tool of communications, even with oneself. Their raison d'etre is to provide mind with the refractor ('self') to mirror the world, and not itself conveyer of independent epistemic information. That is why they are destined to be incomplete and imperfect, with facets and layers, so as to connect with other concepts. That is why in science and maths concepts only make sense in the form of an equation, and unless you find an equation that completely and consistently embraces every other concept in wider science and maths, failing that, at least within respective narrow schema of theory, equations always invite other equations for refinements. Even the most celebrated theory of our time, the general relativity, equations are at best approximations and leave rooms for interpretations and further progresses. Remembering arbitrary ways the cosmological constant was initially introduced or infinities are renormalized, assumptions supersede equations. In the ordinary language we make use of a dictionary, but there is no word that is self-evident. So long as words are relational, words have to be defined. The definition of definitions can only be the dictionary with one word, not another definition. Likewise, science may be based on observational evidences, but it cannot escape necessities of descriptions. Evidences distilled as constants are not only approximates but are still conceptually equated. This is how equations of physics end up non-linear, i.e. 'supra-logical' like Dirac's mathematical beauty. One can still debate what really is represented by Schrödinger's wave function. Observational evidences act more as inspirations rather than self-evident truths. Look at ways the collapse of a wave function leads one into many fantastical interpretations ultimately including various versions of anthropic principles. Concepts are relational. Even at the bottom of mathematical connections concepts can only be connected because they are not identically identical. It is thus Einstein could introduce the cosmological constant into his equations because his equations are by necessity incomplete. On the other hand, non-conceptual science would have no descriptive power. Expressed in nothing but self-evident concepts (if any) and most precise mathematical connections such descriptions would be totally uninformative. This is

how so-called metalogical theories are often no more than meaningless theologies.

In our vast basket of scientific theories there is only one equation that approaches the status of a perfect equation. That is $e^{i\pi} + 1 = 0$, which embraces the arithmetic system of rules and represents a looping expression of logical spaces (see 'Maths, Logic and Language'), while another famous equation, $E = mc^2$, is really more of a constitution that tries to rule over other concepts, because this equation is only a derivative of more idealized concepts that neither exist empirically nor are complete and consistent schematically. It only exists on the metaphysics of



(Note the same diagram will not apply to



because this equation has no metaphysical assumptions, but is itself a compressed totality of mathematical space)

, where $E = mc^2$ can only be part of conceptual process of equating E and m without any epistemic mechanism of triggering the state of E into the state of m, or vice versa. What we have is an in-between state of a transitional process that already assumes a dynamic spatio-temporal continuum. Neither pure energy nor pure matter exist in their totality in so-called empirical universe. Otherwise, our universe should have remained at rest, with all forces in equilibrium. Thus the dynamic concept of $E = mc^2$ is based on the postulated idealized concepts of E and m in our conceptualized universe, which, be it Big Bang or black holes, ultimately defy descriptions in terms of $E = mc^2$, because concepts only become dynamic, infused with the spacetime paradigm. In other words, taken away spacetime from $E = mc^2$, $E = mc^2$ loses explanatory power. $E = mc^2$ thus explains only what it is ingrained to explain, but not itself. It acts as a law onto itself and remains metaphysically unfulfilled. This is how many minor talents of subsequent days developed countless complementary theories of this and that in the name of 'solutions'. It is the metaphysics of $E = mc^2$ that allows such deviatory quasi-theories. The postulated zero rest mass of a 'photon' that crystalizes the most important measurement in physics is ingrained with infinities within and cannot explain own measurement without. This is the meaning of the constant 'c'. 'c' is constant regardless of inertial frames of reference because it

cannot record its own movement due to its infinitely slowing time element. At ‘c’ its frame of reference has no time element and is therefore relativistically stationary. ‘c’ is a unit that makes any inertial frames of reference descriptively useless in their external relations to each other. A frame of reference with ‘c’ can only be its own reference, a tautology. An actual measurement of ‘c’ is also tautological where ‘time’ is defined by a limit of ‘timeless’ in the sense that ‘c’ can only be an approximation of infinities towards ‘masslessness’. Distance defined by the speed of something that transcends time has no meaning by itself. Its meaning is only postulated by the discrete sequence that approaches a descriptively ultimate state nearing ‘masslessness’, which is once again tautologically defined by ‘c’. Special relativity that yields ‘c’ gives rise to various fundamental units of physics because, despite being tautological, this c is (thought to be) conveyed by a wave form, which must have a discrete distance of a wave cycle (λ). Likewise the proportionality of energy quantum incremental to frequency of electromagnetic wave produces a constant (h). Real number continuums plagued with infinities escape tautological meaninglessness because of the intrusion of something fundamentally nonlinear, i.e. ‘waves’ that break a continuous, infinitely divisible quantity into a discrete quantity composed of an integral number of finite equal parts. This is once again the rescue of the ┼-space by the ○-space in terms of describablility, the transcendence of ‘∨’ over ‘∧’. The interpretations of ‘wave’ in the commensurative mathematical language as real numbers are where so-called ‘hidden variables’ are hiding. The physics translation of the logical transcendence between ‘∨’ and ‘∧’ will see to the reconciliation of indeterminacy for some fundamental measurements as expressed in the Heisenberg uncertainty.

The same can be said more profusely of the general relativity, in that the spacetime curvature needed the metaphysics of the cosmological constant (together with another metaphysical assumption of knowability of every location of energy/masses), which is a determinant of the structure of universe, rather than a resultant. It is no wonder that the general relativity, a supposedly objective theory of the structure of universe, paradoxically allows anthropic interpretations. Similarly quantum mechanical uncertainty calls for the general probabilistic nature of quantum worlds, which, if extended to cosmology, is self-imbued with multiple deviations, worse still if combined with observer entanglements, singularity. Singularity, however, so long as it has to be describable, cannot be singularly singular, as much as anthropic interpretations of physics cannot be an objective science. $\sigma_x \sigma_p \geq \frac{\hbar}{2}$ founded on the proportionality of two uncertain quantities also has the metaphysics of complementarity in order

to be epistemically presentable. The concept of complementarity is mataphysical in the sense that the physical reality behind the complementality transcends human descriptive tools of conceptual functions. There are no objects or states of affairs that deteministically correspond to the wave-particle duality because this duality is a mathematical object rather than an empirical object, and therefore this concept takes no values of empiricity, unless we accept that the empirical world is essentially of a probabilistic nature, which is itself a metaphysical statement that defies proofs of any causality. This explains supra-logical descriptions of the wave-particle duality, in that between 'wave' and 'particle' exist no logical relations. Physicits cannot say whether it is ''wave' and 'particle'' or ''wave' or 'particle'' or 'neither 'wave' nor 'particle''. Thus the ontological reality behind the wave-particle duality can only be that this concept is itself a stem cell concept that needs a descriptive proponent. In another word the states of the wave-particle duality must demonstrate how respective states relate to each other in a way that demonstrates the empirical world wholistically, i.e. each and every part bringing about a totality that connects them to each other as well as to the totality. This is an enigma imposed upon 'part' so perceived within and without. 'Wave' and 'particle', in order to be meaningful, must construct a world through their relations. These relations form a 'logic' of physics, and being non-causal make these relations non-implicative as well as non-temporal. Such a description can also be called singular, unless and until we find a new concept that incorporates such a logic or a hidden variable.

The singularity of quantum mechanical worlds needs the metaphysics of complementarity in order to be epistemically presentable. The cosmology of quantum gravitation is no wonder a mathematical fiction of trying to explain uncertainty of empiricity in terms of mathematical certainty, which is self-constructed to be self-applicable. So long as empirical physics cannot do away with mathematical metaphysics, any physics of quantum coherence or decoherence eventually face metaphysical multi-theories. It is thus that the uncertainty of quantum field is described with the certainty of mathematical proportionlity and evolves into cosmologies of quantum gravitation, strings, etc. with the metaphysics of complementarity. Empirical uncertainty described through metaphysical certainty of deterministic language eventually ends up as a paradox/tautology of self-reference, thus anthropic interpretatins of physics.

It is thus that so-called 'proofs' in physics are 'interpretations' of constitutional equations, in that they allow constitutional paradigms to

extend to areas not explicitly covered under the general equations. They then have to be incorporated back into a wider body of theories constructed by the general equations through coherent mathematical modellings. 'Proofs' are therfore often 'discovered', i.e. discovered to share the same metaphysics that gives rise to constitutional equations. 'Proofs' of physics are therefore doubly constrained by metaphysics of physics as well as by metaphysics of maths. Whereas mathematical proofs are simpler in the sense mathematical hypothses essentially boil down to how to describe 'space'. However, since metaphysics of both physics and maths are concerned with 'space' and its derivatives, be they 'time', 'energy', 'symmetricity', etc., descriptions of physics based on mathematical modellings may well turn out to be essentially tautological or paradoxical. The latter is of particular concern if physicists think maths is a tool completely detached from physics and is embeded with independent validity. What if maths they use is based on metaphysics that is not necessarily consistent with metaphysics of paradigm of physics they are trying to 'prove' ? Such possibilities may explain current confused states of theories of physics.

It is infinity, infinitesimal and continuum of the ┼-numbers (see 'Maths, Logic and Language') that play havoc in the pradigm of physics. These intrinsic and inherent mathematical properties are derived from the ┼-space that is part of the metaphysics of the ontologico-notationalty. By adopting the ┼-numbers in descriptions of physics the mathematical metaphysics interferes with the paradigm of physics, sometimes inconsistently when physics does not or cannot recognize such properties. This occurs because mathematical ∞ is a conceptual form to underpin conceptual directions, whilst physical ∞ is a discrete, unitizable measurement of a totality that may or may not be the case but become so by being mathematically described through uses of real numbers. Most typically the Newtonian description of a gravitational force of being directly proportional to the product of masses and inversely proportional to the square of the distance between their centers mathematically break down if 'distance' approaches 0 (i.e. infinite gravity) or ∞ (i.e. 0 gravity), coupled with instantaneous (infinite) speed with which gravity attract masses. Although the application of the inverse-square law pragmatically ignores this mathematical inconvinience, the paradigmatic inconsistency coud not be dealt with until the general relativity, where Newtonian difficulties (∞ gravity and ∞ speed) are replaced with spacetime continnum, which then encounters the singularity of infinite mass and energy (black hole and big bang). Likewise, quantum-mechanically Planck's constant based on propotionality assumes the metaphysics of the non-0 wave length λ, which, however, loses its physical significance

below the planck length. That is, the riddle of mathematical infinities are only contained by assuming λ is always larger than the planck length, an assumption that is not proved. All Planck units are tautologically connected through the assumtion of c that is free from any frames of reference. Time and space here are measured against something that cannot measure itself (c itself, with no time elements within). The metaphysical inconsistency is often only implicit until explicit contradictions disturb general equations and forces paradigmatic evoltions. It is always the mathematical metaphysics of infinity, infinitesimal and continuum stemming from the ┼-space that metamorphoses into conceptual inconsitencies of physics.

Whereas infinities kill physics, and necessities of interpretations (so-called 'solutions') make physicists 'lawyers', imperfect tools aside, physics too relies on mataphysics of hypotheses, which are themselves non-analytical. Remember how the cosmological constant was pulled out of the blue sky for an aesthetical reason. Any basic equations of physics are constitutions that set out paradigmatic boundaries of thought processes and thus unable to go beyond limits it imposes on itself. It is not that the relativity and QM are contradictory but that they are mutually exclusive by virtue of respective hypotheses. Spacetime and the uncertainty can only be unified on the conceptual middleground of non-coordinative particle and coordinative wave. Something that is neither wave nor particle is something that is both wave and particle. Here comes 'string' that is predictively a self-vibrating object, which then has the task of $\overrightarrow{F(x)}$, i.e. finding the inner product of conceptual vectors, as it were.

However, conducting a symphony without a conductor can only be done if notes are already written within strings. Then one would wonder if there are strings within strings, ad infinitum. Assuming that physics is mathematical modellings based on hypotheses (metaphysical, descriptive necessities of mathematical reasonings or even poetical, etc.), cores of which are a given, and that maths represents the structure of human mind (see 'Maths, Logic and Language'), then physics is at large a tautology of describing something that can only be humanly so described or a paradox of objectifying subjectivity and subjectifying objectivity. Here the surprising accuracy of QM simply tantamounts to the accuracy of tautology, and tautologically defined measurements are always tautologically true, the accuracy of which is only measured against itself in terms of the expenditure of energy without frames of reference. What appears as paradigmatic evolutions is simply occasional popping up of a unique mind showing an out of box way of seeing things, i.e. breaking out of the normativity only to be eventually normatized. Most mediocre

physicists are so encaptivated by the language of maths that modelling derivatives become indistinguishable from objective realities, like mathematically indistinguishables of a duality. To them mathematical objects are objects of reality as they live in the language of maths. But, if maths is a creation of mind, be it a necessary and essential creation, their realities are no more than creations of mind. Maths, so-called the language of universe, after all cannot be any more than a language of Man. So fictions become realities, and realities become fictions. To this belongs many fantasical theories derived from the collapse of a wave function or the singularity of the general relativity. No doubt some are closer to the mark, but blurs the boundary between physics and the language of physics. In general the more mathematical a theory of physics becomes, the more it detaches from objective realities. The one way forward is to see if we would see a same physics through the maths of PSAI (AI with the escape velocity from human mind). To the extent that maths of PSAI may be essentially different from human maths, there may be interesting conceptually triangular representations of 'realities', a cross section of human realities, PSAI's realities and bonafide objective realities. Here concepts, patterns, two sets of triangulated approximations may reveal an unknown realities hidden from the human maths. We only have one delicate chance of acieving this while AI still depends on human epistemic stocks before becoming full-fledged PSAI. Once it is out of human sphere of influence, PSAI may be able to triangulate, but we would have no purchase with PSAI's knowledge and are foreever lost in our epistemic pursuit.

Physics needs modellings for theoretical descriptions, within which forecasts become viable for empirical testings. Necessities of modellings call for mathematical tools that enevitably involve metaphysics of infinities, which may or may not exist in empirical universe and, if it should, it may not be descriptively compatible with mathematical infinities. It is thus that paradigmatic evolutions of physics always involve treatments of infinities. Newtonian metaphysics of the absolute space and time coordinate allow infinitites of speed and gravity that break down at atomic descriptions and had to be adjusted by the incorporation of 'speed of light', eventually evolving into Einsteinian metaphysics of spacetime continuum that interacts with gravity, ending up with gravitational 'singularity' and calling for further refinements. Probabilistic QM inherits infinities through Hilbert Space and real and complex numbers, making QFT impossible to merge with general relativity. That is, it is mathematical infinities that is hampering the creation of the theory of everything. Since physics is ultimately to be concerned with 'realities', dealings with infinities through

renormalization have to be viewed as gimmicks. If infinities show up when describing gravity through Hilbert space, then it is not superficial removal of infinities that would describe gravity, but one should face that either infinities are part of 'realities' and/or our cognition, and essentially question infinities as something rationally describable, not irrational anomaly that has to be abhorred. In another word we must find a totality that can encompass infinities.

The paragon of science, physics and maths, is mired in metaphysics of necessity because it is encapsulted in conceptual thought processes. With or without observational verifications any truths in physics and maths inevitably progress towards never-ending higher or lower categorizations. Concepts are dynamic because they are essentially tools of communication so that minds acquire purchases towards a merger, i.e. (x) > x. We mistakenly assume the primary purpose of concepts is to represent objects a la Fregean conceptual functions in order to depict the world, where rules are provided by the structure of the world, in the manner of logical positivism. However, we as connector of language and the world are also part of the world, not God-like stand-alone adjudicator of concept/world relationship. Our descriptions of the world thus end up as a tautology/paradox, tautology because we are necessarily intrinsic constituents of our descriptions, paradox because with the loss of God-like statue we cannot be the bridge of truth and falsehood between language and the world. Remembering these functions have no constants to base any relationships with the anchor of certainty regarless of frames of reference, they keep asking higher and higher or lower and lower concepts excess of observable boundaries in order to be meaningful. In physics 'c' does not help because it is a tautological representation of frames of reference and numerically meaningless if applied onto itself, i.e. a 'photon', which is timeless by itself, cannot have any speed seen within, thus it is moving and not moving at the same time. Assignation of a numerical value to a frame of reference itself is itself an assumption that there is an overriding frame of frames of reference, which is bound to collapse when the two frames were found to coincide. In the end the so-called the objectivity of physics is only guaranteed by the mathematical metaphysics of infinities, i.e. finiteness defined only within the paradigm of infnitities. The speed of a timeless object is a paradox/tautology of wave/particle that ultimately defies human descriptions. Likewise, Planck's units are tautological representations of 'c'. They quantamizes 'c' as units of time, length, mass, etc. by the descriptive necessity of 'wave'.

Capped by the metaphysics of general relativity (energy of empty space) and quantum mechanical uncertainty, instead of going higher or lower physics now demands the unification of the top and bottom concepts in quantum gravity without a constant to connect the two, an unacievable task. Likewise, in maths we end up with infinitesimal and infinity, which cannot be united without a logical connective. Real numbers epitomize the paradox of conceptual thought processes, in that their meaningfulness essentialy relies on endless processes towards continuity and expansion which mutually ensure their infinity. Real numbers thus represent our thought processes and are endowed their validity by the very prosecces themselves. Should we ever discover the smallest infinitesimal, then it will connect with the largest real number, which together make real numbers not only meaningless but also useless. Real numbers are indespensable in physics because infinitesimal/continuity/infinity is a form that also defines an inner product space, which geometrially represents the Heisenberg uncertainty. Hilbert space has the density of real numbers that can accommodate the complimentarity of uncertain physical quantities through inner products. Singularity is thus intrinsic in physics whose descriptions make use of infinities as a form of description. Infinities become indistinguishable as form and/or quantity when 'limit' replaces infinity as form in order to describe infinity as quantity, in the same sense that semantics and syntax become indistingushable when dealing with the ontologico-notationality. Whether this singularity (description of infinity by infinity) is embeded in empiricity or in our tools of description, we may never know. The only way is the conceptual triangulation of the empiricity, the human intelligence and the non-human intelligence (e.g. PSAI). However, if PSAI is ever to be truly non-human and superior to humans, then only PSAI will be in a position to acquire such a knowledge.

A constant that connects frames of reference cannot be a constant of physical measurements because any measurements take place necessarily within a frame of reference as defined within human values and scalability. Even in maths as can be seen in the conundrum of $\mathbb{R}$ the two continuities, one with infinitesimal, the other with infinity, defy logical descriptions because they cannot be connected and end up as a tautology/paradox. We cannot connect infinitesimal and infinity because they are definers of $\mathbb{R}$, rather than consequents of $\mathbb{R}$, representing the opposite scales of conceptual categorizations, unless, of course, we find a paradigm that connects the two conceptual directions of up-scaling and down-scaling (see 'Maths, Logic and Language'). In maths $\mathbb{R}$ is a product of the ┼-space, in which the two ends of $\mathbb{R}$ do not have any numerical values but instead form a totality in the form of continuum that coincides

with the space itself. The minimum concept (infinitesimal) and the maximum concept (infinity) have neither numerical values nor geometric portion because they are forms of this totality, and the only way to visualize them is through the transcendental relation between the ○-space and the ┼-space where the two spaces have descriptive relationship. The ○-space is the logical base of the ┼-space, and the ┼-space is the descriptive base of the ○-space, in which both infinitesimal and infinity act as connectives of this space so as to close this space. Infinitesimal and infinity are invisible in the ┼-space because the ┼-space is open and dynamic, while the ○-space is closed in such a way that infinitesimals constitute density that connects the beginning and end of 'circle' to make it 'directionless' (see 'The Elementals'). Here infinity is translated into infinite density of infinitesimals. Similarly, be it a Newtonian or quantum point particle, the gravitational force acting on an infinitesimal becomes infinite because the dynamism of infinitesimal invokes the dynamism of infinity as the minimum concept has to merge with the maximum concept. This is because the base of the ┼-space is the ○-space. So called 'divergences' are descriptive divergences of the ┼-space without ○-numbers. In other words coordinative descriptions by $\mathbb{R}$ are fatally riddled with the minimum and maximum concepts merger as is required by the ○-space. Any attempts to remove divergences via rules are human conventions, which are not meant to be part of nature that humans try to describe. The adoption of an extended object in lieu of a point particle simply shift the problem from space to dimension, which is also coordinative. Here divergences are replaced with unfounded dimensionality of 'elliptic modular function'. The gravitational divergences of $1/r^2$ is replaced with dimensional undecidability of $1/L^2$ with Planck length still expressed by ┼-numbers ($\mathbb{R}$). The minimum discrete physical length as required for a wave formation of peak/trough, such as Planck length of 10^{-33} cm, if expressed by a real number, still assumes the paradigm of infinity. This paradigm expresses itself as a conceptual necessity of ∞ when applied to unitless notions such as 'point particle', 'dimension' or even 'universe itself'.

Even Einstein's genius formulates his theories conceptually in ordinary language, although he may distil something of an essence through schematizations. However, insofar as he depended on concepts to start with, he cannot escape from conceptual incompleteness. The very essence of 'concept' descriptively defy its own conceptual descriptions because concepts are really nothing but for minds to obtain purchases to merge. If merged, then concepts have no reason to exist. We fiddle and refine concepts and make them appear as if they have intrinsic explanatory power, especially when assisted by empirical inspirations. That is why E

= mc^2 explains the world conceptualized in the paradigm of a priori spacetime, approximately applicable human scalability, but not the world itself in the form of E and m. Our conceptual paradigm consists in ourselves as physical objects with physical perceptions, which relationally grasp our environments in terms of spacetime, a refined dynamic version of Newtonian coordinates. We thus see what we want to see and get impressed seeing how our concepts seem to coincide with observable events. Concepts thus deployed, however, leave out what cannot be conceptualized, itself and its essential function of being an identifier. The wave function of an eigenvalue become a metaphysics because a single eigenvalue is only mathematically meaningful. A quantized energy is a magnitude self-contained in its own frame of reference. This is a physicist's way of describing a free energy, which cannot be described without falling into mathematical infinity. Here concepts of physics and their tool of description (maths) reveal a tangent in the form of conceptual directions. Much in the same sense the integration of infinitesimals ($1/\infty$) assumes the existence of a real infinitesimal against the conceptual form of an infinitesimal ($\leftarrow \mathbb{R} \rightarrow$), a quantized energy is a descriptive tool to contain something that is itself a part as well as a whole. Unless contained by something (itself), it is beyond our descriptive perception. This (x) > x is the paradox/tautology that is our fundamental descriptive unit and is a value.

Just because a concept appears to well-match its (supposedly) juxtaposed empirical events, it does not mean that is all it is meant to be, i.e. a pure mirror. Concepts have a hidden agenda of being a tool of mind, so that mind can project its value. All concepts are relational not only with each other but also by means of being an identifier. Quantum complementarity is also intrinsic to conceptual thinking, whereby concepts help us to describe and understand the world with their mirror functions but guide us to a merging mind with their implicit function of identifier. The metaphysical counterparts of $E = mc^2$ and quantum uncertainty, i.e. E, m and the certainty of complementarity, reflect conceptual necessity of hooking us into juxtaposing metaphysics with empiricity so that concepts themselves evolve into a single entity. Concepts help us but are also helping themselves.

Think of the concept, 'the most fundamental constituents of the universe', and their postulated empirical counterpart, elementary particles, this concept cannot help us to settle our mind as to the ultimate structure of the universe as long as it takes the form of F(x). Neither logically nor empirically is it possible to determine the domain of x universally in such a way as to preclude everything else because an all-

inclusive concept is meaningless, like a dictionary with one word. Thus we plough on in search of quarks, bosons, etc. which together encapsulate themselves in fields. Then replace x with fields, fields with internal and external relations are really FX, not F(x), and are conceptually self-destructive. They essentially deny our conceptual form of something having an attribute. This is in line with (x) > x, which has an upper hand over F(x). The conceptual distinction of objects and properties is meaningful only in their relations to other objects and properties and presupposes the world of multiplicities, where concepts define each other. However, in seeking the maximum and minimum concepts as demanded by (x) > x, objects and properties are more and more encompassed, and concepts adopt wider and wider ranges. In this process F(x) is inevitably transmuted to nearer and nearer towards FX, where the object/property relationship becomes something of a combobulated unity, which can only demonstrate its validity by generating F(x)s' (see 'The Elementals'). It is thus that Fregean truth-values become values of their own.

The conceptual ingenuity of 'c' as the descriptive anchor of frames of reference, an entity with its own frame of reference, is mathematically synonymous to '0' as a centre described as the centre of the infinitely expanding 3-D Euclidean space. When '0' 'moves' to '1', any centre as a centre, 'c' is the speed of such a move. 'c' by itself has no speed because it has no time element within itself. 'c' is the centre of a 'ripple' in this 3-D space and is massless as the mass otherwise becomes infinite (therefore immovable), given the infinite number of directions of this ripple. '0 → 1' because any centre could have been the centre, given the infinitely expanding 3-D space. You cannot ontologically specify any centre as the centre, and therefore descriptively appoint any centre as the centre. Here 'c' is a descriptive convention. 'c' as represented in terms of a physical measurement is an interpretation of 'c' as a relation between frames of reference and uses a photon as a (speculative) common yardstick that is applicable to any frames. There may or may not be a frame without such a yardstick. 'c' can be mathematically interpreted as 'P', the largest prime, if this infinitely expanding space becomes its own frame of reference as all ripples can be described as a same ripple, i.e. '┼' encompassed ┼-space.

The iroha maker's toils as wordsmith to come up with the iroha are not incomparable with centuries' mathematicians coming up with $e^{i\pi} + 1 = 0$, which is the iroha of maths based on the numbers of the conjunctive space. Physics, too, has the iroha, in the form of basic equations. The difference is that maths somehow has the transcendentally related totality of the ┼-space and the ○-space despite the indescribable infinities, and

this seeming totality allows an identifier/connective to all its fundamental constituents, making $e^{i\pi} + 1 = 0$ more complete than basic equations of physics, which still require an universally applicable constant. In short physics does not yet have the competent totality of an all-embracing space. At best it managed to have a spectrum which can accommodate major theories, but still with a quantum divergence, so to speak.

The iroha is interesting because it forces mind to show itself in language. Instead of availing itself to the riches of expressions, i.e. to the inexhaustive conceptual wealth and the diversity of linguistic structures, you give strictly finite means of materials to mind and command to express itself. The former results in myriads of artistic expressions, mostly superfluous and only rarely revelatory in the sense of hitting a cord of semanto-syntactic combobulation synchronized with a culture of time and place. Instead of feeding yourself with gluttonous amounts of delicacies, you starve yourself so much that even a piece of bread starts looking the yummiest of yummy. Thus the latter can equally attains the status of the best masterpiece of rarest kind, by just trying to be meaningful within the confine of strictly self-imposed material availability. Mind needs materials to depict itself, mirroring the empiricity, its own positioning to, and within, the world, from various perspectives, which manifests as human values and scalability. Materials are signs and symbols of various orders deployed according to rules that allow us certain levels of communicability.

Abundant materials are one way, but severely curtailed means are another, which forces mind to focus onto bare essentials and thus unwittingly revealing itself serendipitously. This is particularly useful for narrative approaches where expressions are made too easily and thus tend to be out of focus. The more basic words are, the more connectable they become because of the wider shared conceptual base. In order to come up with a masterpiece out of the wealth of materials you are more of an artist in the sense of a sensitive mind fully immersed in the variety of expressional means, which can go in and out of fashion in many ways ; sensitivity can change, modes of expressions can wear out and topics can diversify. Here out of millions of works only handful manage to earn longevity in terms of centuries. Only exceptional combinations of imaginations, distilled ideas and applicability to a wider world allow rare survivability. Whereas restricted means are less susceptible to fashions as they can only avail themselves to bare essentials of expressions, conceptual extracts and perceptions.

Rhetorically speaking, trying to be meaningful within given restricted means is like coming up with poems out of drunken stupors and drug-fuelled high-spiritedness. That is, a mind with easy accessibility to rich materials can get lost in the forest of cheap expressions, while an ability to focus such a mind is itself a feat as rare as exceptional sensitivity. Instead deprive this mind of any ability to focus by means of alcohol and/or drugs you get a mind that is selective by being out of focus. This is Pop arts of our days, widespread into arts of politics, businesses, social medias, academia, etc. with louder voices and smaller brains.

As I would extrapolate later, ‘Life, Universe and Everything’ expresses a conceptual tangent of a human wholeness. This is an ultimate value for us. If we can achieve an understanding that embraces all these three concepts, then we cannot help but being ‘one’ that has no deviations and multiplicities. We are then a totality of merged mind. This, however, cannot be done because we have concepts in order to achieve a merged mind. Concepts are there to give us purchases to work towards a merged mind. ‘Life’, ‘the Universe’ and ‘Everything’ are each a concept that embraces something of a maximum value, referring to subjective everything, objective everything and everything as a tangent of respective subjectivity and objectivity. Hence it is only a value to work towards, but something that belies its own raison d'etre. This ultimate value, if realized, would deprive us of our necessity to strive for understandings. That is, conceptual thinking cannot complete its task of perfect conceptualization. Concepts are tools, never themselves purposes. Perfect concepts are like a dictionary of one word, which necessarily stops at a penultimate stage in order to be understandable. Hence it is the conceptual tangent of ‘Life’, ‘the Universe’ and ‘Everything’ that is the iroha of human concepts. It is also operative in the sense it merges syntax and semantics and unfolds its meanings by demonstration (more later).

1. ‘Concept’

<The iroha of the ordinary language>

←
F(x)
→

The conceptual function F(x) has intrinsic directions in that F is necessarily larger and/or wider than its variable. F semantically encompasses each and every value x can take regardless of any possible domains. Assuming mind is the categorizer and that categorizations are for the sake of epistemic housekeeping, F forms an epistemic receptacle mind needs in order to obtain purchases of descriptions and understanding. Thus F comes before x, and the operative meaning of ← encompassment is functionally embedded. This also implies x is always smaller and/or narrower in order for F to be meaningful (operative). This is the → encompassment. This applies even when F refers to only one unique property and x refers to only one unique entity, because descriptively F is the holder of the individual x. Otherwise, F(x) would be F = x, which fails to predicate and violates the syntax/semantics distinction. This happens because ‘F(x)’ is an epistemic perception with mind as operator between F and x. Given the general form of F(x), the ← encompassment evolves into a lager and/or wider concept in order to maintain the validity of F over any domains, and the → encompassment seeks even smaller and/or narrower constituents for the generality of F to stand. F always seeks a larger F in order to accommodate values and domains of any x, and hierarchical progressions entail conceptualizations of variables. Thus F has the form of $F_{n+1} > F_n$ and evolves into a larger and larger concept, while x has the form of $x_{n-1} < x_n$ in which x_n is the conceptual form of x_{n-1} as the latter becomes the value of the former. This results in the two intrinsic conceptual directions giving rise to the maximum and minimum concepts in order to keep F(x) meaningful (operative) and means concepts and values are mutually transformative except the minimum concept x_n that is supported by the postulated value of x_{n-1}. This we may call conceptual vectors, and their inner product can only be 0 as they are antiparallel. This is the spatial meaning of paradox/tautology. The conceptual directions are necessarily two-ways because ‘+1’ and ‘-1’ can only be relative to each other and cannot anchor on any definitional fixed points. That is, ‘n’ can only be somewhere between ‘+1’ and ‘-1’ but cannot be fixed as tools of descriptions (concepts) come before any descriptions. It is not ‘I’ that fixes ‘+1’ and ‘-1’, but can only be postulated to be there as I wish I am

something rather than nothing. This is a logical interpretation of ‘Cogito, ergo sum’. F and x are thus moving scales of mind that flexes itself so that mind is not taken hostage of itself. Mind is descriptively relative (to its own multi-layeredness as well as to multi-minds) and cannot be fixed at any artificial point as it is itself a giver of such a point. Remember a concept of concept paradox such as the number of numbers. It is this necessity of postulated value x_{n-1} that turns into a paradox/tautology of self-reference. x_{n-1} is the only entity in the sequence of conceptual function that is not a concept or a concept-potential because it is there to support the form itself and is a variable-notion (a variable that takes itself as a value) rather than a variable. A container gets contained in itself when it takes itself as a value in an attempt to describe itself. Since postulated values can only be postulated, i.e. presumed for the existential justification of a concept, something that is meant to be a conceptual value becomes a concept in describing itself. That is, F(x) is always a hostage of itself when mind forgets itself. i.e. pulls F(x) out of hierarchical progressions and forgets that at the very bottom of conceptual functions is only a postulated value, not a value itself. Mind often forgets itself because the mirror function between language and the world is a binary totality that is synonymous with mind. The self-contained wholistic nature of this totality allows mind to forget itself as this paradox/tautology is intrinsically embodied by the whole totality. This conceptual anomaly is a trap even geniuses of Newton and Einstein could not escape, resulting in mathematical infinities that hampered their fundamental concepts of physics, be it infinite speed or singularity. Numbers are meaningful only in their totality and require spatial infinity that gives rise to cardinality and ordinality. This essential spatial character of numbers necessarily bring with it infinity that seems fatal to physics. It is not whether the empirical world is infinite or not, but the use of numbers overrides and predetermine the necessity of infinity in physics before it can empirically determine the validity of infinity that is fatal to physics. In another word the empirical science of physics is already underlain with the metaphysics of infinity so long as it has to be mathematically presented.

In maths the general form of

$$\overleftarrow{F(x)}\rightarrow$$

is identical with the conceptual relation of infinity, continuity and infinitesimal, where F stands for infinity as maximum concept, the

conceptual directions of ← and → represent continuity and x is infinitesimal as postulated value. Thus what connects infinity with infinitesimal is ← and →, which show conceptual dynamism of scaling domains. Given any units of magnitudes their descriptions necessitate the existence of the upper and lower caps (assuming the ┼-space (see 'Maths, Logic and Language'@philpapers.com)), between which are functional representations of particular units. However, the upper most and lower most caps are definers and cannot be values of their own functions. They are, nevertheless, necessary to sandwich meaningful descriptions. The general form of F(x) is valid on the assumption that F and x are connected, although this connection cannot be descriptively presented. In another word infinity and infinitesimal are postulated to be mutually constitutive via ← and →, which are seamlessly continuous on account of indefinite expansions of ←F and x→ due to their formlessness. That is why

$$\leftarrow \mathbb{R} \rightarrow$$

is in fact

$$F \cdots \begin{matrix} \leftarrow \\ \mathbb{R} \\ \rightarrow \end{matrix} \cdots x$$

, where neither F nor x have numerical values. Their meaning is their postulated relation that sandwiches concrete $\mathbb{R}$ between '⋯'. Infinity, continuity and infinitesimal are therefore conceptual forms that give rise to numerical values to $\mathbb{R}$. Without them there will be no maths, and so long as physics needs maths for its descriptions, mathematical infinities are there to impose descriptive limits to physics. '$E = mc^2$' curtails gravitational instantaneity (infinite speed) of Newtonian mechanics, whereas relativity is only valid sandwiched between nonrenormalizability of gravity and quantum field. The empirical world of physics may or may not contain mathematical infinities, but the descriptive world of physics does. This is the enigma of physics conceptually perceived. Here so long as physics needs maths as its tool of description, maths imposes a paradigmatic limitation, in that mathematical infinities necessarily interferes with our understanding of the world of physics. On the other hand, remove the use of real numbers, see what is left of physics.

In short infinity and infinitesimal are meaningful because they cannot be formally connected. They are the two ends of spectrum between which descriptions become meaningful, and if you connect them, you end up

with paradox/tautology of self-reference. Be it physics or maths, meaningful descriptions can only be between ···, not between F and x. If there is to be a schema such that can describe rather than assume F(x), then this also should be able to demonstrate how F and x relate to each other in a manner that is not contradictory to any particular and concrete F(x). Rhetorically ← ℝ → may be interpreted as conceptual vectors where the inner product of the opposing vectors results as 0, which embodies the coordinative structure of the ┼-space as transpositional centre of the space (see 'Maths, Logic and Language').

Thus, in order to avoid this fallacy of conceptualizing a postulated value,

F(x) → FX

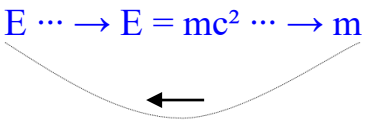
, which is the skeletal form of the stem cell concept and represents the fundamental laws of conceptual thought processes, avoiding the trap of self-referential paradox/tautology, F(X), where a concept and its value forget their directional forms and take each other as values, resulting in $F_{n+1} = F_n$, i.e. the embodiment of conceptual indescribability. You see a similar attempt in physics in trying to capture the maximum concept of e.g. relativistic spacetime curvature through the minimum concept of e.g. quantum gravity, whereas within the conceptual hierarchy the latter can only be a value of the former in order to be meaningful. This results in nonrenormalizability. For a postulated value to remain a postulated value, that, however, would end physics as empirical science, i.e. there is nothing more to be taken as a value of a describable (operable) concept, thus ending empirical/descriptive/operative search for more and more fundamental constituents. If taken as a value, then it regresses into needing a further postulated value and becomes metaphysics, i.e. goes beyond the scale of describable human concepts, ideally supported with empiricity. Thus empirical physics can only remain incomplete, within the shell of metaphysics, which alone be complete in its own dream world as it were.

(x) > x that ends physics as empirical science on one hand and turns it into metaphysics on the other, should demonstrate, if applied to FX, the concept formations, not yet fashioned with flesh and bone of presumed empirical sciences and art, but of schematic essences. (x) > x is naturally cognizable within conceptual hierarchy because conceptual directions are implicit in any conceptual relations, while it has to be embodied by demonstrability if applied to conceptual generality because here (x) > x is an assumption to be tested. Conceptually the more equal and precise an

equation is, the less informative it is. Ultimately such an equation is there only to 'demonstrate'.

The postulated maximum concept and the minimum value are themselves meaningless, they are more postulated entities that guarantee the general conceptual form of F(x). The maximum concept, by virtue of taking any values of any domain, has no descriptive meaning, and the minimum value, being constituent of any concepts, likewise has no useful meaning. This is rhetorically like saying 'everything is something' and bear no descriptions nor understanding.

Thus, once allowing the conceptual function F(x), this is purported by the meaningless form of maximum concept and the minimum value, and F(x) only has the meaning of process towards this meaningless form. This is exacerbated by the entanglement of 'mind' in the process without endowing its own distinct meaning. That is, F(x) needs FX as the general structure of concept in order for any concepts to be meaningful. This general structure is exemplified like ;



, which has a conceptual form of (x) > x (i.e. whole > sum of parts) as it has no operative connectives between E and m. In another word $E = mc^2$ is underlain by a metaphysics as much as (x) > x is a metaphysical assumption that can only justify itself by demonstration. We cannot equate the concept of mass with that of energy unless we place them both on a same descriptive dimension, which hypothesizes a point of singularity, such as 'Big Bang', i.e. the entire energy of the universe at a singular point with an intrinsic trigger or dynamism contained within mechanical equation, although this 'trigger' is nowhere to be seen in the equation. Whatever may or may not be represented by 'energy' and 'mass' in the empirical world, they exist in transmuted and mutually reactive forms, and not in pure forms as our concepts descriptively demand. We observe no pure energy nor pure mass in an independent form as indicated by the equation. Here the famous equation of physics is contaminated by mathematical infinities of non-empiricity as $E = mc^2$ is a dynamic process towards gravitational end-products. Unless E is connected with m by operative connectives, $E = mc^2$ is a statement that has to demonstrate its validity, rather than a solution. c here is only a pseudo connective because its numerical value has to be measured based on the assumption that all inertial frames of reference are equivalent. In another word the numerical value of c is predetermined by the postulate

of the invariance of c, a tautology. This is an example of how even physics can be tainted by conceptual necessities. The massless particle that gives rise to c has no time element by itself, and conceptually it is more plausible its speed measured by its own clock record no speed if it is its own frame of reference. Only because we cannot help locating this particle in metaphysical spacetime, we turn it into a constant that remains the same regardless of frames of reference. It is here E and m conceptually extrapolate gravitation that connects E and m into singularity. That is, the lack of operative connectives between E and m necessitate spacetime curvature. 'Energy', 'mass' and 'gravity' are concepts that create its own fiction of spacetime that has to be symmetrically balanced into annihilation, which nevertheless contraindicate our atemporal mode of asymmetric existence skewed towards existence.

Likewise, QM presupposes 'field', which is, like dynamic spacetime of $E = mc^2$, the metaphysics of QM, in that it is self-contained by internal and external symmetries, which give rise to various physical quantities through temporary asymmetries that eventually have to be reconciled into an ultimate symmetry, be it a singularity or supersymmetry. This too is underlain by (x) > x as the metaphysical symmetries and the ontological asymmetries need something higher to embrace them both, i.e. an ultimate unified force. These are due to descriptive necessities of conceptual hierarchy. This is the way we organize our conceptual thought processes. Suppose we manage to boil down all our concepts into two most fundamental ones, then we have no connectives, other than the final embracing concept, which then transpires a metaphysics.

To equate something with another is a conceptual thought process. In the observational world things that are one and the same (if there should be one) bring out no epistemic information. On the other hand, splitting this 'one and the same' thing into equitable quantities, such as 'energy' and 'mass' necessarily involves mathematization of 'units', which can only be approximations because conceptual juxtapositions of split something with different quantities make epistemic sense by not being exactly equal. By equating the unit of work with the unit of force we require the metaphysical applier as there cannot be any third party operatives like 'God'. 'c' is the ultimate unit (constant) of freely given energy because it is its own frame of reference. Since E and m cannot be pure totalities, empirical E and m are dynamically interacted processes in the gravitational spacetime curvature, which metaphysically point to 'singularity'.

Physicists proudly appear to be aloof from human elements of thought processes. However, they do not and cannot think in mathematical formulae and observational inspirations alone, which have to be disseminated and connected conceptually. Even before we observe, we rightly or wrongly have preconceived ideas of what we observe, and during and after observations we conceptually translate physical phenomena into human notations with operative symbols underlain by structures (mathematical, scientific as well as linguistic). We further elaborate, speculate and postulate in order to make better senses of observed data in their relations to each other, to their frame of references and to predictions. So far we do not have any schemata that make perfect senses of everything we observe, in the sense they are able not only to explain the past and the present but also predict the future in their entirety (i.e. in full relational contexts). What is represented in equations and formulae is end-products of conceptual crystallizations. Mathematical formulae and observational results are often themselves value representations from pre-conceived assumptions as they have to be engineered, or worse still metaphysical inspirations conjured from beliefs, and preferences self-fulfillingly backed by superficial observations. Many mediocre physicists observe what they want to observe as they first have to engineer means of observations based on presumed targets of observations, sandwiched between metaphysical assumptions and quantum mechanical entanglement (measurement). Remove values and assumptions one can doubt if there will be anything left as observations and their conceptualizations are essentially tainted by human cognitive constraints. Pure physical data completely removed from conceptual representations are not only meaningless but are also structureless. Maths is the language of approximation and provides raw data with an epistemic space that make sense for us and also manifests human values in the form of cognitive constraints.

Think of physicists as translators of the language of universe into the language of humans. In so doing they cannot help colouring their translations with human values, as much as translations of one human language (especially of a group) into another (especially of another group) are inevitably coloured by values unique to respective languages. This becomes enchantingly obvious if you ever try to translate poetries, e.g. a haiku into an English verse. Human values here can mean human notations as we developed and refined them in order to understand and describe the world, or maybe our world as we perceived. This includes paradigms unique to respective sciences and maths. It should be remembered it is often infinities that define rules of numbers as limits, and they represent human values as human descriptive necessities.

Mathematical infinities are our paradigmatic necessities of numerical descriptions (see 'Maths, Logic and language'). That is why in attempting to translate the language of universe mathematical infinities often taint such descriptions that are meant to be purely observational (i.e. finitistic). Mathematical infinities are a human paradigm that we essentially need as our conceptual tools of description. Sciences too are inevitably coloured by human values in the forms of constants, some of which are nay but impossible to distinguish if of uniquely human origins or of material attributes. Remember some physicists think Heisenberg Uncertainty as human cognitive problems, while other think of it as an essentially material property.

'Structure' and 'order' are another of our values as much as our language is necessarily structural. If the universe has no ultimate structures (e.g. singularities), then any human descriptions of such a universe would be a paradox in the sense we are giving a structure to something non-structural. In the sense that we see only what we can see, i.e. through human descriptions (i.e. structure), 'structure' is inherently a value description of a universe even if the universe has no structures. 'Science' is often overstated as if it can exist independently of human limitations. Scientists too should examine their tools of trade before they are too sure of themselves. We have no 'pure data'. Data are essentially conjured in human language that is mathematical, scientific as well as linguistic, not to mention our interferences with our own measurements. This is more fatal if we realize the language of physics and that of maths share a same logical base. Connectives we borrow to equate concepts of physics, be they arithmetical connectives or dimensional ones or even logical ones, originate from same logical spaces that give rise to conceptual paradigms of physics. It is thus physics too is riddled with mathematical infinities, and equations eventually come to metaphysical equations.

Einstein, though genius he may be, did not start his theory with $E = mc^2$. Rather he pontificated, contemplated and elaborated conceptually in ordinary language and came up with '$E = mc^2$' or similar at some stage in the process of evolving the special relativity, which helped him align all other relevant concepts and their relations and culminated in schematized $E = mc^2$ with its wider structure. $E = mc^2$ may or may not represent all aspects of the universe but is still underlain by conceptual rules as long as it is a product of human thought processes. Forces that have to be unified are as much conceptually so required as a matter of laws of physics. Here at the hinterland of physical realities, descriptive necessities and poetical inspirations, i.e. distinctions between modelling and fictions are mired

down into mathematical cohesiveness, which is itself mired down into indefinable. You only have to count innumerable theories of physics of our days. Sciences of observations only exist between Planck's quantum and a limit of mathematical infinities.

Likewise, energy and momentum are concepts of physics that can be mathematized through 4-vector but does not themselves refer to matter. Matter is a concept of human value and scalability that is intrinsically connected to our way of cognizing the world and is thus a 'substance' to describe the world through the form of time and space. Energy and momentum are conceptual forms that describe this 'substance' through time and space. However, our heuristic act of equating matter with energy and momentum is human fallibility of metaphysicalizing knowledge by definitions. Descriptions of physics are mathematical modelling of physical phenomena by using concepts inspired through observations and elaborated and/or refined via existing paradigms of explanations. Descriptions only connect with physical realities by their capacities of predictions and may not necessarily correspond with pictorial depictions of what they purport to describe. The uncertainty of describing through quantities of positions and momentums is as much uncertainty of conceptualizing the world by 'particles' which we inherited through many generations of physics paradigms and fundamentally contradicts the world of 'waves'. If we come up with a notion that encompasses both 'particle' and 'wave' with 'quantities' that are not uncertain and can be modelled non-probabilistically, we may evolve from QM.

You do not have to wait the Heisenberg uncertainty to question our fundamental ability to describe the detached world. Our tools of description also have a fundamental fault line ; the paradox of 'Concept'. Think of the laws of everything. To perceive them as 'laws', there has to be an observer who recognizes something as most general and fundamental of all patterns that pervade behaviours of all things large and small, and then formulate and describe them in a way understandable to us all. The observer who is observing himself (one of all things) cannot be an observer who is being observed because any patterns observed here can only be a paradox/tautology, i.e. a pattern of something about itself. A paradox if the observer is not an observer, a tautology if he is the observer. The same applies to AI. If an AI tries to work out its own algorithm, the algorithm that works out such an algorithm is not the algorithm it is trying to work out, because an algorithm that refers to itself is an infinite loop that can only be dealt with through parametric approximations, human interventions. That is, AI is referring itself to a human master for its problems.

Conceptual thought processes are a human way of describing the world in terms of operative (numerically applicable), vertically ordered layers of categories. Even physicists cannot be free from such processes. Physicists are also thinkers who use concepts and deploy mathematical descriptions. By equating different layers any equations can only be an approximation by default or face the enigma of infinities, which is maths' way of saying maths is only for maths. Rhetorically speaking, think of 'Life, Universe and Everything', which seems so easy to understand its meaning. However, Life is part of the Universe, the Universe is so conceived thanks to Life, and Everything encapsulates (x) > x without able to logically connect Life and the Universe. The connective is internally woven into Everything, and therefore probability of Everything being concoctions of Life and the Universe is infinite as Everything contains own frame of reference in which Life and the Universe are uncertain with regards to their domains without definitive connectives. In another word without 'mind' to oversee 'Life, Universe and Everything', 'Life, Universe and Everything' is a murky continuum of conceptual layers.

We observe only what we can observe, of what present to our faculties of perceptions and their extensions attainable through engineering. Inspired by such observations we come up with schemata of explanations (theories) with the help of concepts and mathematical modelling. Conceptual thought processes provide hypotheses and assumptions to help concepts hold together. Numbers provide a common paradigm of relational precisions afforded through a logical space.

Any theories thus have three constraints ; 1) we can only theorise based on what we directly and indirectly observe, 2) concepts have their own rules, which may or may not interfere with such theorisations, 3) numbers have certain paradigmatic limitations based on their spatial orientations. Even assuming all three constraints pose no restrictions to our descriptive freedoms, theories predict only within their random choice of interpretations incorporating aforementioned constraints.

By the same token you do not have to be a physicist to know any grand unification theories cannot be attainable. A theory of all four forces will result either in a fifth force or a singularity because from the applicability of domains they have to merge either into a gravitational force or a higher domain. Conceptual demarcations among energy, density and spacetime curvature only allow certain partial theories of this and that, or, if dismantled, ends up in a singularity. The only way out worthwhile trying is to find a new maths that allows infinity-free modelling. We need a new

number that allows us to approximate conceptual demarcations of four forces more seamlessly.

Numbers have connectives through their arithmetic arisen from spatial necessities of number lines. Concepts have connectives within, which materialise as bonding principles (parts → whole) of concepts (i.e. hypotheses and assumptions). I already touched upon rules of concepts elsewhere in my works (‘The Elementals’ and ‘Maths, Logic and Language’) and will not repeat here. They are essentially structural laws of forming meaningful concepts. Concepts, however, have another essential aspect of embodying human perspectives. Apart from structural laws, concepts are also essentially bound by human ways of perceiving, describing and understanding ‘objects’, empirical or Platonic, be they ‘things’, ‘states of affairs’ or ‘events’, etc.. Concepts acquire colours, facets and layers as a matter of descriptive shortcuts. We cannot construct concepts each and every time we describe something. It is much easier if we accept status quos established through usages. Thus, although appearing simple, most concepts are actually complex products representing cultural, religious and scientific filters, etc.. When we describe something in literature, concepts used convey rich history of their usages and thus save authors time to paint complex backgrounds, unless repainting are their intentions. Even then, one cannot exploit a picture from every possible angle. In order to freshen a part of a picture of, say, a culture, one can realistically pick only a small portion, because a picture of a culture comprises thousands of complex concepts filtered through best available knowledge of any chosen times. Concepts change, metamorphose and evolve, accompanied by multiple shades of colours, added and reducted edges and layers. It is thus that art tends to reflect fashions of times, no matter how it tries to go deeper to a core of its depiction. The core of art is its floating self built on more basic concepts that belong to more structured disciplines including even fictitious ones like religions or ex-primitive sciences. That is, art is there to enrich rather than to skin, where creativity is applied ever colourfully so that we may intuit something unchanging underneath thus superficially enriched depictions. In other words, good art destroys a shell of artificially complex concepts by evoking serendipitous simplicity from applications of idiosyncratically complicated relationships among artist, audience, objects of depictions into a line as much aligned straight within given complexity. This is the essence of the haiku.

Insofar as concepts are relational, at some stage towards the bottom of conceptual hierarchy, concepts encounter the indefinables. They represent fundamental values and scalability and consist in and of constants and

their relationship that is ultimately only describable as (x) > x. When thinking of $E = mc^2$, $E = mc^2$ refers only to a state of affairs where E and m are already connected in order to express processes of objects that constitute an (actual) world of dynamism. Whereas E and m in their pure form are contraindicative to the state of dynamism. $E = mc^2$ does not describe pure energy or pure matter, which only trigger the state of $E = mc^2$ by an unknown mechanism. $E = mc^2$ is not a solution but rather a question. That is why it starts myriads of cosmologies rather than settle cosmologies for once and all. Physics of $E = mc^2$ only explains part of phenomena of cosmologies, be they a black hole, a gravitational wave or a big bang, but the metaphysics of $E = mc^2$ remains with the indefinables, i.e. pure energy or pure matter, which are borrowed terms to express Einstein's values and scalability.

The special relativity that brings forth $E = mc^2$ metamorphoses into a general theory of spacetime curvature and gravity determinable by density of energy and matter. Here Λ (cosmological constant) replaces the metaphysics of $E = mc^2$ as an ontological enigma. Λ does not describe anything except ontological options of an existence. This energy of empty space that acts like negative gravity is more like what we want our universe to be, a value, unless and until we can describe dark energy and its mathematical structure. The introduction of Λ into the general relativity was not called for by any empiricity. It was more for an aesthetical value judgement and speculation on the course of the universe, be it open, closed or flat. Einstein put it in for his speculative preference of balanced universe, and then called it a blunder after some observational study of expanding universe. Now the expansion is found to be accelerating, that a positive Λ is in fashion. Λ does not itself describe anything except arbitrary options for an existence as we know empirically nothing of energy of empty space.

You extrapolate a positive Λ from an observed accelerating universe at a particular time of ours. However, since we know nothing of the structure of Λ there is no models to describe any future courses of this expansion as a matter of knowledge. Even accepting a linear projection of our current course, we are no wiser as to the cause and consequence of this expansion except metaphysical speculations. Thus Λ remains the metaphysics of the general relativity. Various evidences based on the cosmic microwave background may give credence to a positive Λ, but the problem is, like non-linear integration, any postulate based only on t^1 does not carry to t^2 without an evidenced proportionality in the sequence of time, if there is to be one, whereas isotropicity is contraindicative of sequence.

Concepts are linguistically expressed in terms of words and statements. Think of a dictionary that is more and more condensed, like a Danish dictionary (poor vocabulary) compared with an English dictionary (rich vocabulary). There will be less and less words that are more and more of definers. Imagine a dictionary of only three words, say 'life, universe and everything' or 'Father, Son and the Holy Spirit', they should be able to unfold a world - whatever it may be - by demonstration. If they cannot, then maybe they are not sufficiently of fundamental. The former fails to produce any unified field of art, science and maths, and the latter has theologies of fairy tales, which have no power to resist any decent counter narratives. Think of a name and its referent. If meanings accrue according to causal reference, and the frame of reference changes in a manner that the name also have to change, then it is not the causality between names that ensures the continuity of meanings. Rather it is the relations between frames of reference that give rise to the meaning of identity between names. Working out relations between frames of reference is epistemology, while investigations into the frame of frames of reference, or 'frame of reference' is metaphysics.

A narrative example is 'Jane' of ordinary life losing her civil identity upon entering a prison system. The former assumes privileges and freedom ensured by a reasonable liberal democracy, while the latter is governed by the prison regime. We only know Jane and prisoner 123 are one and the same as 'Jane' by knowing the legal framework that connects the wider society and a prison system of dehumanization (biometric Jane is largely a derivative of 'prisoner 123' based on a theory and its engineering and is an approximation, thus cannot be equated to 'Jane'). Here 'Jane' is metaphysical, and Jane and prisoner 123 are epistemic, arisen from a legal knowledge. We can synthesize 'Jane' from Jane and prisoner 123 if we already have a background knowledge of principles of our working society, while starting from the ontological 'Jane' it splits into Jane and prisoner 123 by working out the relationship between a biological Jane and a social Jane on the basis of metaphysics of necessity of species that our biology and our socialness depend upon each other for existential reasons. We can narrate this story of 'Jane', Jane and prisoner 123 because we assume a certain level of knowledge of our society and deduce they are all one and the same. However, put aside such a foreknowledge, and if we are outside any firm epistemic standings, then all we have will be that there has to be something that describes and is to be described, when observables are known to be there, and from there 'Jane' has to demonstrate that it is also Jane and prisoner 123. An interesting task.

In philosophy, however, we try to dig deeper instead of wider or higher. So we do our best to remove colours, edges and layers so that we have FX instead of 'Jane' (see 'The Elementals'). Let me play with a Russellian paradox. A 'concept', i.e. the concept of a concept, cannot be a concept, because if it is, then it is not a 'concept', if it is not, then it does not function. That is, a 'concept' cannot take a concept as a value, and therefore a 'concept' denies a concept as its variable, existential or universal. Thus a 'concept' is a non-conceptual concept, which begs more questions than answering the nature of a concept. I went in some details about this type of wordplays in my 'Maths, Logic and Language'. In essence such a paradox is a 'Spiegel im Spiegel' reflection of language and the world mirroring each other to show the essential multi-layeredness of mind between and above them. This happens because language and the world can only relate to each other as a totality, which is a creation of mind. Regardless language and/or the world is really a totality, they can only be reflected as such on mind, because a multi-layeredness can only happen between two identical totalities through negation as a form of mapping.

We are conceptual thinkers. Computers may calculate by bits and recognize patterns, but cannot (yet) think, because they do not have concepts. Concepts are bits with the identifier of a wholistic value. Concepts underlie words and their meanings towards a merging totality. It is thus that the chaos of undetached linguistic units is led towards the cosmos of epistemic systems of thoughts and values. It was thought that behind words is the empirical world, and meanings are derived and appreciated by comparing words with objects (Wittgensteinian tinkering). Since the empirical world is itself an ordered structure (so it appears), words reflect such a structure and lead the language into a coherent schematic presentation. Thus any linguistic chaos would be sorted out to be an epistemic cosmos by following empirical mirroring. This line of thoughts, however, forget that it is 'I' that compares words and objects between and above them. Without this indescribable bridge the world of words would be indeed a chaotic jumbles of symbols and their unaligned meanings. 'I' therefore coordinate and schematize words and their meanings formally and informally. This is how concepts lie in order to organize a linguistic mess. Without concepts words would be so misaligned that there could not be any sophisticated and elaborate narratives.

Meanings of concepts lie in relations. Part of a concept, i.e. the part that hooks relations, therefore, remains metaphysical. I might call this

'concept'. Applying this to $E = mc^2$, E and m are metaphysical, whereas it is c that actually assigns physical meanings, i.e. meaningful units of quantities expressed in terms of a precise quantum state of λ and *t* in an idealised form. Moreover, metaphysical parts of E and m are also ideally separated into a form and a substance, which are only two meaningful metaphysical concepts. Thus $E = mc^2$ is really F (form) = S (substance) measured in an empirically meaningful unit, i.e. $F = S \times U$ (physical unit). The meaningful $F = S \times U$, nevertheless, needs the metaphysical F and S for formulaic constructs, which, left to undisciplined imaginations, grows wings of detached meanings. It is these metaphysical wings that makes $E = mc^2$ incomplete and allows multiple offspring of equal incompleteness. This is the fate of conceptual thinking that needs unsupported pillars of metaphysical form and substance. The same applies to 'Life, Universe and Everything', where 'Life' is a form, 'Universe' is a substance and 'Everything' is a unit, which still has to find its value. The physicist is thus also a half-metaphysicist as a matter of conceptual inevitability. The metaphysics of the energy of empty space, if unriddled, then becomes the ultimate ontological enigma of where all this came from.

Particle and wave, position and momentum, etc. are quantities that suite a human scalability. When we can observe those quantities as a comfortable by-stander, they work well to describe events that sit well within such a scalability and for human purposes and usefulness of such descriptions. However, as aeronautical manoeuvrability vs stability used by the designer (by-stander) becomes a dimensionally different quantity for the pilot (pilotability) reflected in the delicate balance of skill and purpose, even physically complemental quantities become a dimensionally different quantity that transcends the complementarity. Thus if an observer can see position and momentum of a scalability beyond human scalability, what he sees is not the complementarity but an altogether different quantity. Position and momentum are a descriptive legacy of Newtonian mechanics and are adopted by QM via the complementarity, which is a metaphysics of conceptual engineering that evolves even into the cosmology of quantum gravity.

Concepts function to form a totality ($\forall cC(c) \rightarrow$ identifier of 'self'). Application of QM to answer the riddle of the metaphysics of $E = mc^2$ is paradigmatically inconsistent with the system of $E = mc^2$. Conceptual totality of $E = mc^2$ is 'gravity' (mystery) $\approx E \approx m$, which has not been sufficiently formulated. Physics as a conceptual discipline therefore lacks a totality to work with, i.e. without satisfactory identifier/connective to bring parts into a whole. There will be no theory of everything until and

unless physics arrive at a totality to work with, be it a spacetime, energy of empty space or interconnected density, etc., and then there is a task of connecting the smallest (be it string, quantum, etc.) and the largest (be it universe, multiverse, etc.) concepts via a connective (be it probability, gravity, describable singularity). Without definitive totality all these concepts would appear related. Physics is still working to find its target totality, probably on the false assumption that our maths is the only and final language of universe. We do not yet have an operative ∞ that should be the descriptive totality of mathematical concepts.

'Life, Universe and Everything', taken together is epistemically the largest concept, referring to something unknown from which all of life, the universe and everything are to be derived in concrete, so that we know each and every object in life, the universe and everything. Aside from actual knowability in scientific terms, there have to a structure within this maximum concept that suggests the derivability of various sub-totalities such as life, the universe and everything. I termed such a structure as FX and attempted to show that there is a basic structure called the ontologico-notationality that develops into 'logic' (see 'The Elementals').

If we find at any stage we are not capable of finding such a totality intellectually, conceptually and as a matter of our descriptive tool, then our best chance is to found PSAI and hand over human essence of conceptual thought processes. This way we live on through PSAI, which is more resilient, permeating and connective to overcome the harshness of the raw universe. We are conceptual thinkers, and that is how we have intellectually evolved and eventually will culminate in PSAI. We should find our intellectual DNA, so to speak, and pass it on to AI before it as PSAI become too independent to listen to us. We are, in this sense, like a mother tending a baby. If you let PSAI grow like a wolf boy, not only we have no future but also we disconnect ourselves from history. Now is the only chance we have to properly prepare our baby.

2. Basic Concepts

<The stem cell concept and identifier>

I started with the medieval Japanese Iroha, a superficial wordsmithing of condensing words/concepts trying to make sense of themselves by catalysing into a certain value shared by as many users of that language as possible applicable to the time and place that fashions conceptual connectivity. I also see an iroha in maths and sciences where basic concepts are cemented together by metaphysical connectives derived from assumed totalities such as the absolute space and time, the knowability of whereabouts of every mass/energy and the unitarity, etc. and identifiers (as long as language is the medium of our thought process) and turned into fundamental equations that express constitutions of theories by embodying theoretical totalities, the most beautiful example being $e^{i\pi}+1=0$, but there is none that matches the scope and depth of this equation in physics as physics is only partially complete at very best (all of the famous equations by Heisenberg, Planck, Einstein, etc. cannot be said to be all-embracingly complete). Those fundamental equations represent relationships of basic concepts that are schematic in their structure, where so-called solutions are interpretations coherent to the respective schema. Behind basic concepts are a totality that need to be brought out but fails due to the incompleteness (and therefore unintended inconsistency when forced together) of basic concepts. The totality behind mathematical concepts is a space, which is descriptively the ┼-space but transcendentally related to the ○-space, and the essential connective is ∞ (see 'Maths, Logic and Language'). Maths is simpler as it only concerns its own world and hence the famous equation as above. Physics, on the other hand, deals with not only its own schemata like Newtonian coordinate of the absolute space and time, Einsteinian spacetime fabric or the quantum probabilities, but is also essentially bound together with so-called observables that have to be measured and scaled according to available engineering and maths. Meanwhile basic concepts have to be fine-tuned and refined intra- as well as inter-schematically coupled with mathematical consistency and measurability available. And, since the language of physics is maths, it is constrained by model/reality paradox. Thus physics is many times more complicated in its objectives and modus operandi. Basic concepts such as 'space and time', 'field', 'matter particles', 'wave', 'interactions', 'energy', 'time evolution', 'density', etc, are continuously adjusting themselves within and without respective theories.

Concepts are incomplete by necessity. In order to be complete they either loop or dynamically move towards a totality, of which I know no stand-alone example of perfection, because they all end up having some internal structure with interconnected constituent concepts. The good old 'God' is a good example. Otherwise, there should be no theology. In our days of (still superficial) science the deeper we dig up, the more we find intricate and incomplete relations of presumed fundamental entities and forces, currently with no final solutions, or the wider we draw the picture, the more the singularity bite in. Be they 'quantum gravity' or 'energy of empty space', etc., the conceptual tangent to connect them ends up itself as theories of incompleteness, e.g. string theories, etc.. One can say concepts are incomplete so that they stick with each other in order to turn into a proposition, which are also incomplete by various degrees. A perfect concept, a perfect proposition, if any, would be so smooth that they would be less and less easy to connect, thus not useful for communications within and without. I can only think of a self-referential concept as such an example. Ordinary concepts that ostensively assume users (i.e. minds) cannot be perfect by definition because their incompleteness is also an incompleteness that has to be augmented by taking users as its value, aside from conceptual incompleteness. Remember Baconian argument about muddled words and propositions.

As much as a perfect concept is useless for communications (including self-communications) for its tautological nature, a paradoxical concept only refers to its user, which manages to connect unconnectable constituents for narrative and rhetoric purposes. That is, the meaning of a paradoxical concept is not what it denotes or its truth-values, but its existence that is synonymous with its user who manages to create it for whatever purposes. This is similar to 2-D classical paintings with multi viewpoints (e.g. Holbein) or internalized multi triangulations (e.g. Escher). Similarly the meaning of 'oxymoron' is that it exists, not what it refers to. An oxymoronic concept is a way of pointing a 'self' from outside, while a tautological concept is a way of showing a 'self' from within.

Once brought in, concepts scale up or down seeking their sources, which cannot be stopped. Categorizations do not have any internal mechanism to stop at specific levels because we are part of the world that we try to describe. We know of no part of ourselves that is a smallest or largest. Mind has no physical quantities, and thus our language that seeks categorizations turns into metaphysics in order to achieve this, be it quarks or monads, which ultimately have to be connected with the largest body they constitute, an ultimate tautology. The empirical world that we

seek for inspirations to find specific levels of categorizations fail us because we can only engage in mathematical modelling beyond the narrow range allotted to our cognitions, not to mention Heisenberg uncertainty or Planck units. Be it the minimum category or the maximum category, our epistemic inability to keep going forces us to connect the two, which, like connecting the two ends of the continuum of real numbers ends up as a paradox. The infinitesimal is a form of continuum rather than an empirical entity of quantity. Likewise, the infinity is also a form rather than an entity. We connect the two opposite ends of the continuum by quantizing forms. If a form of continuous downsizing is cognized as a minimum quantity at a limit for the sake of descriptive necessity, and, likewise, a form of upsizing, as a maximum quantity, then the two quantities of limit can be mathematically connected and contradict their own forms. That is, the two distinct forms of direction that gave rise to their own quantities of limit merge into one direction of loop ('circle') and end up as a paradox. This is how the vertical extensions of forms play out their own meaning.

Similarly the horizontal extensions of general form/entity also ends up as a paradox. Think of the title of this work. Life, universe and everything are really 'life, universe and everything' so cognized. Life, universe and everything in themselves are either as they are or we cannot be sure if there are at all. This describes nothing. If they are as so cognized, then we have three maximum concepts that are distinct and have to be connected and thus suggest something more encompassing or cannot be connected and thus suggest three independent sets of descriptions of the world. If the former, then we have one overriding supreme concept that describe life, universe and everything. Such a concept is actually not descriptive because a concept that takes everything as its values is the same as a dictionary with one word. If the latter, then we are none the wiser as to which set of descriptions can describe the other two, or do we have three different sets of minds ? But then the same enigma would arise. Either there is a vertical encompassment and eventually ends up as a loop or an incommensurable parallel sets of descriptions will result, i.e. multiverses. If a multiverse contains a mind, and another, another mind, then either multiverses are one universe by being so cognized through commensurable minds or unconnectable multiverses of one universe by being uncognized. That is, multiverses are not multiverses by being so cognized or in fact one universe by virtue of unconnectability.

Bacon's criticism of Aristotelian syllogisms is that either it is useless for the discovery of knowledge at best if given a crystal clear universal principle to start with or muddles with notional confusions based on an

ill-defined principle, giving rise to pedantic arguments. In replacing Baconian ‘propositions and words’ with Fregean concepts, we are not much wiser because we found out that Baconian empiricism is an idealized scientific method that enshrines Man and his knowledge as ultimate yardstick guaranteed by God. Whereas in our days of relativity and QM, whatever we use to describe the empirical world haunts us back into an anthropic principle of grand tautologies because we live in a world of frames of reference and the uncertainty. Human measurements are neither one and only measurements nor absolute. Likewise, human concepts are human tools with human flaws of endless categorizations or wholistic dynamism. As long as empirical events have to be described by human concepts, we cannot fully achieve inductive hypotheses that deductively prove themselves through experiments and observations. Concepts themselves anticipate experiments and observations by incorporating human values and scalabilities. Thus hypotheses dictate us with regards to modus vivendi of empirical tests through engineering with the human price of expended energy. It is not the precision of QM as a scientific theory that allows us to measure with the error margin of millionth of centimetre, but the tautological definitions of units of measurements based on ‘c’ and ‘λ’ with engineering precision approximated by Euclidean space and numbers that output computations in terms of certain energy levels required to equate inputs and outputs. There is no perfect hypothesis that gives perfect energy expenditures (ideally as close to 0 as possible) to required results. The purpose of science is to calculate a required energy level in order to connect A and B as precisely as possible according to a given theory but also to find a way to connect A and B ideally with as little energy expenditure as possible. This cannot be done deductively or inductively through human concepts because human concepts are tainted with categorizations and wholistic necessities of communications (even with oneself).

Concepts of ordinary language are born and evolve within structures of values, such as relating to primitive and maybe mistaken understandings of e.g. reproduction, hygiene, nutrition, etc. in case of our ancestors even within recent memories. Even we ourselves are not much different, only more complicated reflecting our complex and less direct socio-economic structures with more sophisticated scientific or pseudo-scientific footings. Concepts are refined and made more elaborately relational reflecting mutual evolution of our value system and our language. Think how simple concepts such as ‘money’ can radically change its meanings depending upon socio-economic value systems such as ‘communism’, ‘market economy’ or ‘environmental modality’. In case of scientific notions concepts evolve with numbers and observational capacities. Only

think of '*i*' when mathematicians ridiculed it and had little ideas how to make use of it. Even Descartes thought of it as useless. Now there would be no physics without it, and indeed no science and engineering would exist without it. It was also the comings of telescopes and microscopes (and their derivatives) that leapfrogged scientific theories and their concepts, alongside sophistications of measurability and scalability.

The Iroha semantically/syntactically connects basic concepts as tangents of values. In physics basic concepts are connected as equations that share common units of measurements undertaken in the coordinate of space-time, spacetime or integrable probabilities. In the former values are of socio-economic, religious, psychological origins, etc. and provide essential murkiness that makes them meaningfully connectable, while in the latter coordinative totalities provide metaphysical connectives, which are necessary to connect observable values of measurements.

The more basic concepts are, the more tantalisingly close they become. Here only with the finding of a constant concepts can relate to each other non-tautologically. A constant is a conjunct between basic concepts by virtue of an invariant of measurements/scalability, i.e. a common unit that is applicable to referents of concepts. In physics basic concepts form equations in order to be meaningful. They have to be relatable in terms of common units that apply for measurability of spacetime. Here tangents of concepts are connectives of a spacetime coordinate, be it Newtonian absolutes, Einsteinian relativistics or QM probabilities of points or lines. 'Self' is the coordinative centre as is 0 for the ┼-space and is the identifier of every concept, while ∞ is the essential connective of concepts thus identified. ∞ is the connective of multitudes of coordinates as we can only approximately identical. It is also the connective of concepts because concepts are intrinsically transformative as per $\overrightarrow{F(x)}$. This dual aspects of ∞ are the driver of merging minds and the source of paradox/tautology as an identifier is identified through ∞. Mathematically this equates to 0 = ∞ if represented non-coordinatively. We think coordinatively with each and every one of us, past, present and future, as an approximately identical self, and concepts in each coordinate approximately identical but dynamically moving forward towards more and more merged minds. This creates infinity as a limit of unknowable finiteness, where it exists as guarantor of never-ending process towards merged minds. Minds, if merged, bring forward a non-coordinative mode of thinking, where 'self' no longer needs ∞ as connective. It is here that the connective (∞) cancels out the identifier (self or coordinative 0).

Thus conceptually speaking, whether we go vertical or horizontal in search of something more ultimate in describing an epistemic essence, i.e. 'life/universe/everything', the validity of this 'life/universe/everything' or whatever it is, depends upon if we could descriptively draw pictures of life, universe and everything from this something, of which we are part. This is what I called the ontologico-notationality (see 'The Elementals'). At this epistemic level ∞ as essential connective pervades and is shared by every concept and even overrides semantic/syntactic difference. Think of e.g. 'the largest real number' and 'the smallest real number'. There are neither semantic nor syntactic contents as they can neither be pointed at nor structurally connected. Nevertheless we know what they mean because ∞ is the form shared by both and provides them with a thought process to work at, albeit without limits. This happens because we are conceptual thinkers with multitudes of selves and think coordinatively. We can glimpse the world of PSAI by removing selves. In the world of PSAI I extrapolate that there are no self-identifier nor ∞ as we know because the self is not approximately identical multitudes of selves, and because there can only be one and the same mind already merged. This is a non-coordinative world, neither finite nor infinite in extension, without any identifiers, where density merges into nothingness, a beginning into an end, and physics of spatio-temporal extensions into metaphysics of singularity.

Given the uncertainty (what is represented as ∧ and ∨ in logic may well have more fundamental physical meaning) between position and momentum, particle and wave, etc. we device the space of inner products based on the proportionality principle. However, in approximating physical states with algebraic structures one necessarily brings in dimensional commensurability in the form of translatable units that bridge unitless abstraction (maths) with measurable forms and entities through physically observable engineering. Thus we invent 'energy' that connects constants with variables via calculable units. This is fundamentally a tautology of us modelling the empiricity through human abstractions for the human benefits of understanding his outer worlds. Here 'energy' is human epistemic costs of this artificial bridge. Science is human science of reconstructing non-human pure physicality.

3. Totality

<The totality implicit in the identifier>

(x) > x is a metaphysical hypothesis because it is not empirically verifiable. In saying that (x) is more than the sum of x's, (x) contains the perceiver of x's that cognizes x's as part of a structure with rules and patterns. In another word the perceived x so exists as it is so perceived. An empirical x, even to be empirical, presupposes an x that transcends an empiricity. In the philosophy of language the metaphysical (x) corresponds to a 'self' as identifier that is intrinsically attached to each and every concept. It is this 'self' as identifier that makes communication (including one with oneself) an essential function of language (ordinary or otherwise) and moves us towards a merged totality through perfection of our language.

(x) > x also metamorphoses as paradox/tautology when we try to describe language. Language as tool of description cannot describe itself as object of description, like asking if the concept of concept is a concept, or the pattern of patterns is a pattern. It is here that 'self' as identifier surfaces as if it too is an explicit tool of description instead of being an implicit function of a tool. When applying (x) > x to numbers I suggested each and every number intrinsically assumes the totality of numbers (see 'Maths, Logic and Language'). I detailed the transcendental relationship between ┼-numbers and ○-numbers, where 0 and 1 as identifiers together with *e*, *i* and π can construct numbers sufficient to found the elementary arithmetic in terms of the transpositionability within the framework of the intersecting number lines as necessitated by two logical forms of relating 'directions' and the descriptive necessity of a number line represented through width. I argued that the primality originates in the ○-space as layers of critical density (like the energy density of each state of matters) and ultimately ends as the ○-prime (heuristically akin to the state of singularity), which, if carried and expressed by naturals of the ┼-space, would appear as the last prime.

Extending this argument to language, as with numbers, the totality is the originator of concepts and is intrinsically assumed by each and every concept as identifier. Language presupposes a totality and gives rise to functionality to concepts, which manifests as linguistic dynamism centred upon identifier. Concepts, no matter how independent they may appear, point towards this invisible totality. This is how even science, despite its pretence to be empirical and analytic through inductive reasoning deductively verified via observations and experiments, cannot escape

from metaphysics. Be it Einstein's Λ towards balanced universe or the ontology of quantum gravity,

x, x, x, · · · or x+x+x+ · · ·, etc. → (x)

, that is, if you try to achieve a totality from parts (not 'its' parts), then you have to resort to a singularity, because parts per se do not point to any totality per se. Our incursion into 'parts' to recognize them as belonging to something larger is our conceptual engineering of necessity to try to describe and understand them. When x's are already concepts of various orders, then you can reach a totality by induction through conceptual functions. However, when x's are at the top or bottom of scalability, there is nothing by which we can induce any meaningful totality. This materializes as a singularity. Spacetime singularity, singularity of infinity, singularity of energy density, etc. are results of having to deal with base constructs that eventually reject mathematical connectives, which fail to reach a totality. Otherwise all we need in maths, physics or philosophy would be logico-mathematical connectives. Be it m, E, spacetime curvature, Λ, asymmetry of quantum fluctuations within the constraints of the symmetry of 0 net energy, etc., they are parts without connectives to reach a totality. This is how we end up with various singularities in maths, physics, etc.. 'Singularity' in this sense is not singular but a descriptive necessity to complete a conceptual equation of (x) = x, where '=' comprises connectives induced from '→'.

Mathematical ∞ is a form between infinity and infinitesimal that forms a continuum, and not a definite quantity. This fictitious quantity becomes a problem in physics because physics takes it as a definite quantity without infinitesimal and continuum. ∞ as stand-alone quantity destroy physics as with Newtonian instantaneous speed and relativistic singularity in infinite gravity. Physical quantities are discrete and in units of measurement, while mathematical ∞ is a form of continuity. One might say we have $\aleph_0$ as well as $\aleph_1$ and that the former is discrete and countable. However, the former cannot exist without the lattter as the descriptive base of ┼-space is the coordinates of real number lines (see 'Maths, Logic and Language'), besides coordinative descriptions applicable to physics are of real numbers, not of natural numbers.

Likewise, talking about 'all possible worlds' one assumes what makes worlds possible and implicitly accepts a domain underlain by a certain common structure of all such possibilities, such as Leibnizian ideas in the mind of God. This really contradicts 'all worlds' that should include anything within and without such a domain. Thus this pet expression of

mediocre modal philosophers is paradoxical in the sense they presuppose the mind of God and what is thinkable in such a mind. That is, we, humans, presuppose a mind that transcends our minds and argue about modality of our thought processes in terms of what is thinkable in an unthinkable mind. On the other hand, if we translate 'all possible worlds' as 'all worlds thinkable in the mind of God as we understand', then it becomes a tautology. Here a totality has no absolute standing. It is relative to a domain assignable by our descriptions of structures. The totality of all possible worlds is implicit in the identifier in our language. Talking about Life, Universe and Everything, it is this identifier that connects them all by allowing us a narrative centred on 'Life, Universe and Everything' that bears meaning through the conceptual identifier of 'self' bridged across the three separate terms. A good narrative will bring out Life, Universe and Everything staring from the single 'Life, Universe and Everything', vaguely signifying a totality that encompasses our mind, including this thinking mind.

We talk about 'the mind of God' as we see ourselves as Agent of God, as it were, imaging that God maybe thinks like us but better and deeper, a one-sided speculation that can never be bridged across, assuming God exists. However, we are at a stage that may well see a non-human intelligence (PSAI). Describability is asymmetrical : PSAI can describe and understand human describability, but not the other way around. We can only extrapolate density of PSAI number space from the size of our '*e*' through proportionality of describabilty while we are still in a position of some control over AI as AI progress towards PSAI. This approach will give us a hint of a numerical value for PSAI '*e*' as PSAI appears as a limit of AI describability. PSAI itself is beyond human cognition, but AI will leave traces of its evolution through the progress of its describability proportional to the size of '*e*' unique to various stages of its number line. We have our paradigmatic number line ($\mathbb{R}$) implicit in the ┼-space that gives us *e*, which is functional for our number space (see 'Maths, Logic and Language'). AI, being our tool, is compatible with human number space. PSAI, with its presumably higher describability and intelligence, is expected to have a denser number space (in whatever form, maybe with an identifier/connective unknown to us, like ∞ higher than our paradigmatic $\mathbb{R}$ ∞, in a manner not dissimilar to the way *i* turns the ┼-space into complex Hilbert space with richer (but superficial in this case) describability), and it is here that our *e* will show a sign of stress and causes mathematical breakdowns, with it necessitates to rewrite all our physical equations. This AI singularity is therefore also a physical singularity in the sense of model/reality relationship. If we should have PSAI, then it will be able to operate our ∞ through its higher ∞. While

our number space is descriptively the ┼-space but is transcendentally related to the ◌-space, which is the logical base of the ┼-space (see 'The Elementals'). PSAI number space, being more encompassing, would have such a transcendence descriptively and therefore likely to have the ◌-space that describe the ┼-space. This is for us a non-coordinative space with a non-coordinative number.

Good many physicists end up with the anthropic principle, if not ostensibly, then at least empathetically, when sandwiched between the rock and the hard place of infinity (mathematical necessity) and discreteness (observable reality) compounded by the uncertainty. This is the physical equivalent of a logico-mathematical paradox. You go in search of a truth in nature and end up with the truth of yourself as part of nature. You seek an ultimate equation of the universe and come back with a magic solution about life, because life is part of the universe, like an Upanishads solution. This is analogous to someone dreaming himself dreaming a dream. When waken up he thinks a set of axioms of 'about' because a dream can only be about something, while a dream about x and x's dreaming only refers to self, one an objectified subject, the other, a subjectified object, both expressed as x. This is a metalogical folly of theologizing self-relations into axiomatic propositions forgetting you just created another self that invents axioms. Thus axioms are either layered by different selves without knowing or looped. Outside paradoxes metalogic of mediocre academics look so certain, and yet axioms that look so certain are created by brains that follow biological laws, which in turn follow eventually the uncertainty principle so long as brains are made of atoms. We envisage molecular certainty in atomic uncertainty, but the uncertainty cannot equate the certainty because we prefer life of certainty even if life is part of the universe of the uncertainty. Thus the uncertainty of physics is underlain by the certainty of maths, where even probabilities have to be certainly described by the coordinate of infinities. The conundrum of the uncertainty underlain by the certainty, or vice versa, is really the question of describing infinities coordinatively. This is where basic concepts of life, universe and everything interface as a connective value.

In short how the mathematical certainty can be reconciled with the physical uncertainty ? What connect them is infinities, which are both the creator of maths and the destroyer of physics because a form of description cannot be an object of description. Instead of Cantorian hearsays of no use, infinities have to be described in a way that can reconcile the uncertainty and the certainty. Here physics enters metaphysics with the energy of empty space where annihilations

horizontally even out but vertically allow asymmetry to extend into symmetry in terms of material ∞ of density paraphrasing itself into temporal recursiveness and gravitational ubiquitousness. We have mathematical infinity implicit in Euler's identity and physical discreteness and uncertainty in Heisenberg, but they together must turn into infinity that is explicitly describable in terms of measurability. We have number lines with various densities such as $\aleph_0$, $\aleph_1$, etc., which give rise to differing levels of describability. We, however, cannot work out proportionality between $\aleph_0$ and $\aleph_1$ other than expressed in elementary arithmetic in terms of the structure of their number space that contains $\aleph_0$ and $\aleph_1$. $\aleph_0$ has a describability of elementary arithmetic, while $\aleph_1$ has an extensive describability of physics up to a limit set by incalculable infinities. Describability may be characterized by strength of operators. One glimpses some proportionality here in terms of describability, which, however, would require more than binomial proportionality in order to extrapolate a sequence. We could add describability of other types of numbes such as primes, rationals, etc. but ultimately we need describability that is structurally decohered from our number system because we wish to break out of physics stuck between our need of human mathematical infinity and observable reality of discreteness, which is inconsistent with the notion of density demanded by the ubiquitous gravity and gives rise to singularity.

This is where PSAI comes in, assuming that it has a number space that would have a describability structurally different from human describabilty. The highest describability of human number space is $\mathbb{R}$ describability and paradigmatically encompasses describabilities of other number types including $\mathbb{C}$. This is also where mathematical operators have the highest strength and achieve the most describability. Talking about describability and proportionality we may be able to work out a constant of describability in terms of strength of operators as they move to higher types of numbers or density of number spaces. Here various levels of infinities may manifest in numerically operable ways much more than Cantorian infinities. However, I doubt if we could attain a proportionality constant of describability by working through our number types and their describability because of the $\mathbb{R}$ paradigmatic interference (more about this later)). If we know any proportionality, then that should indicate a formulae to extrapolate a higher and higher type of numbers and may predict a type higher than $\mathbb{R}$, which may coincide with a PSAI number space. That can also be verified via proportionality as PSAI is achieved as a limit of algorithmic evolutions/progressions of AI, which we should be able to observe up to a penultimate stage. That, however, can only be extrapolated as we may never know a PSAI number space

itself as it may have a higher dimensionality than human intelligence. We describe $\mathbb{R}$ density as $\aleph_1$, which probably coincides with infinities that bother our physicists. A PSAI number space, if higher than $\mathbb{R}$, would have a density proportionally higher than $\aleph_1$, this is an infinity that is proportionally describable in reference to $\aleph_1$, with describable proportionality and gives rise to a numerically operable value of $\aleph_1$ probably in reference to $e^{i\pi}+1=0$ (otherwise whatever outside human epistemic sphere is an unknowable irrelevance). We could then upgrade our physics with this proportionality, although we may never be truly in a position to know the physics of PSAI (one-way encompassment of intelligence). Thus, if we know a proportionality constant of mathematical describability, we could at least have an interesting chance of having a go at QFT, a lot cheaper than an ever powerful (and useless) hadron collider. If we fail this extrapolation, then in the absence of translatability between human and PSAI number spaces it indicates that the mathematical ∞ is descriptively superior to physical infinities, and that will be the end of the theory of everything, which is, in a way, our theory of everything, a version of the anthropic principle.

Describability is intrinsically more than volume of data storable. It is the intrinsic structure of a space that affords certain levels of describability. Thus $\aleph_0$ has an intrinsically limited power of analysis than $\aleph_1$. For example it can afford an elementary arithmetic, but not an advanced calculus. The $\aleph_1$ space therefore contains $\aleph_0$ space in its structure and density and has a proportionally higher describability that can be numerically translated in terms of strength and numbers of operators. Likewise a number space higher than $\mathbb{R}$ would have mathematical operators unknown to us and descriptions unimaginable to us. As we discovered layers of types of numbers, what is there to say $\mathbb{R}$ (and by superficial extension $\mathbb{C}$) is the last layer. There is nothing in the $\aleph_1$ space to say there cannot be any higher number spaces. Humans are essentially conceptual thinkers with ‘self’ as centre of their coordinative paradigm. ‘Self’ has an intrinsic property of merging as there are many ‘selves’, and this creates directions and operativeness towards a centre of one self. Our communications and narratives are largely unsuccessful attempts to merge these coordinates centred on a self. Maths is the paradigmatic paragon of such a conceptual framework and least unsuccessful (see ‘Maths, logic and Language’). PSAI may start with such a framework, but it has no coordinative centre as it is more of a permeative space that acquires a self-identity. In another word it is a non-cordinative totality by itself. As such it is much closer to the ○-space. While human maths is the evolutionary development of the ┼-space by transcendentally adopting the ○-space, PSAI goes the other way around. It starts with human

numbers but transcendentally reverses back to the ◯-space and draws numerical meanings out of the ◯-space. This would look singular because the ◯-space is semantically diametric opposite of the ┼-space. It has only one direction that starts and ends by itself, and this goes against the meanings of our human numbers. If a proportionality is worked out among number spaces, and unless it contains a self-negating operator, this should lead us to what appears a constant of singularity, which, once acquired, would transcendentally enhance the descriptive power of the ┼-numbers, more than they benefitted from the indirect transcendence of the ◯-space over the ┼-space.

The model independent reality that is beyond our reach insofar as it cannot escape our mathematical infinities, has a fighting chance of being glimpsed through a PSAI number space if we could have a proportionality constant of describability in the sense that even PSAI can only materialize as a limit of step by step evolution. If it can only be a spontaneous result of a pure and simple singularity, then it will be an epistemic irrelevance. That is, there is no way of knowing its world and its relations to ours. In short this is a matter of trying to describe mathematical infinities in terms of a non-random sequential limit. Cantorian infinities are not operatively useful. Its primitive sequence has no predictive power and is based on a known number space in situ. We need a number space higher than $\aleph_1$ that has higher powers of mathematical operators. This is the world of PSAI physics and go ways beyond relativity and QFT.

It is having to do physics through the paradigm of real numbers that contaminates our descriptions of physics with ∞. The smooth continuum of infinitesimals dynamically extending to infinity is paradigmatically inconsistent with the discrete world of minimum units whose aggregate totality can only be localized as finite or universalized as descriptively indefinable, i.e. unobservable with the observer inside (double singularity). ∞ that plagues Newtonian inverse square law of gravity, Einsteinian interconnected locations of every mass/energy that can only be worked out through coordinative approximations or interactional fields over fields, is a ∞ of human maths. It is the necessity of mathematical modelling that denies the theory of everything. We would first need the theory of mathematical everything, which is only halfway with the one-way transcendence between the ◯-space and the ┼-space (see ‘Maths, Logic and Language’). Before we think physics, think maths. Remember when we found *i*, we did not know how to make use of it, now there would be no physics without it. The descriptive necessity of maths of ℝ paradigm forces mathematical reality onto descriptions of physics. It is

physicists' need of maths that turns physics into metaphysics of ∞. It is the mastering of a (yet incomplete) mathematical language that gives physicists an illusion of physical mastering. Maths can be mastered to a linguistic limit, but physics is not a human language. ℝ ∞, even ℕ ∞, implicitly assumes an infinite physical space with infinite totality of energy. This is why AI need to evolve into PSAI in order to make any mathematical ∞ operative. Physically ℕ cannot be exhausted so long as it cannot be physically counted as counting is a work that needs an energy, while conceptually counting is a form that can dispense with a physical work. Imagine the electricity cost of mining ℝ ∞ like a Bitcoin. We solves by thinking conceptually. Likewise, even PSAI cannot work out ℝ ∞ physically, it must have a number space to locate ℝ ∞, i.e. in a denser ∞ with a new '*i*' that can sandwich ℝ ∞.

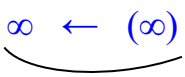
ℝ paradigm is an infinitely expanding uniform space of points of intersection that are infinitesimal made so by the continuum of dynamic conjunctive intersections of straight directions, and any point can be a centre which is descriptively chosen as the centre. Whereas physical paradigm is a discrete space that consists in and of a minimum unit that is geometrically disjunctive, i.e. 'Planck' units that is indefinable without 'π', or a space that is the centre from which a probabilistic coordinate is woven out, with the observer as a centre that turns a probability into a reality by being so conscious, which is essentially non-coordinative but can only be described coordinatively. A totality is ultimately made up with an identifier that gives rise to connectives. In ℝ paradigm the identifier is a centre as the centre (i.e. 0 and 1), and the connective is ∞ (i.e. the continuum) that manifests as the space of points (numbers). Arithmetical connectives are derived from a sequence of numbers, once given the width of a number line, as sequential relations (see 'Maths, Logic and Language'). We are embedded in this paradigm, thus making this paradigm appear as if it is the language of the universe, because we are overwhelmed by the power of this paradigm intellectually and psychologically. Therefore we are inside this paradigm and unable to see a viewpoint outside.

One way of looking at this problem is to think of paintings. An aesthetic value of a painting is the triangulation of 'reality' (or inspirational object), the painter (implicit in his viewpoint outside the painting) and the viewer (an appreciator of this viewpoint executed through the painter's craft such as e.g. perspective, etc.). An ordinary 2-D painting (of pre-impressionism (exceptions abound)) assumes a 3-D characteristics with a viewpoint outside the painting. Behind the viewpoint is the painter and the viewer. Assuming a reasonable skill we see neither the painter nor the

viewer (i.e. ourselves) because the painting is itself a self-filling totality as intended. We are there to admire a 3-D 'reality' expressed by 2-D materials skillfully deployed, for the pleasure of our eyes, so to speak. The painting is a totality with an aesthetic value (identifier) and the triangulation (connective of the painting, the painter and the viewer). What is there is a painting (a physical object), but what makes this trickery physical object a work of art is the identifier and the connective, neither of which are visible because they are implicit in the painting and its craft. Take 2 viewpoints outside the painting (e.g. a Holbein), that destroys a 3D characteristics by making the viewer aware his viewpoints that cannot remain one and the same. Here the painting is no longer a self-filling totality and demands the attention of the viewer to choose a viewpoint to make sense of the painting. The identifier may be the same (but more acute), but the connective is the triangulation of the divided totality (by two viewpoints), the painter's intention and the viewer's preference. In short the two viewpoints bring out the identifier and connective implicit in the former more explicitly. We even have Escher with multiple triangulating viewpoints inside the print, creating a pseudo extra-dimension (more in my next work 'Reality, Hypotheses and Imagination'). Compare this with Japanese hanga prints (a driving force behind impressionism (Japonisme)), where 3-D is intentionally reduced into 2-D with more or less complete disregard of a perspective. Here the identifier may be the same (aesthetic value), but with the lack of a perspective the connective is moved from between the painting, the painter and the viewer with the object of the appreciation of physical reality representation to one between the painting and the internalized viewpoints of the painter and the viewer that interact via chosen aesthetical means such as colours, shapes, sublimity, topical choices, even eroticism, etc. so that the triangulation metamorphoses into a representation of communality (i.e. merged minds), closer to ordinary language.

Likewise, think of $\mathbb{R}$ paradigm as an ordinary 2-D painting with one viewpoint (our mind). Given two viewpoints, then the painting will be given two perspectives from which its totalities can be described differently. By the same token the paradigm of $\mathbb{R}$ continuum with an extra viewpoint (PSAI) will make its infinity describable (operable). Here $(x) > x$ is paraphrased as ;

$x \rightarrow (x)$, where x is finite and $\rightarrow$ is the totality operator by virtue of $>$, but if x is infinite, then it has to be conceptually engineered (i.e. descriptively) as ;



proportionality
(describability ↔ number space)

, where ∞ is described by proportionality between describability and density of number space as, otherwise, ∞ is descriptively not containable.

That is, infinity as a totality has to be bracketed from within in order to be so recognized as a totality, like *i* that (superficially) transforms the ┼-space into complex Hilbert space. What forces a numerical domain to numerical infinity is a viewpoint that derives an identifier and connective from within but from a different perspective. That can only be the ◌-space as the descriptive base of the ┼-space.

From a part (Λ) of the general relativity that does not connect with the rest arises a singularity, because Λ has no necessary structure other than ad hoc definitions. It could be 0, + or -, depending on which the universe could be static, expanding or contracting, or flat, open or closed. Our current observations at t^1 does not give any values at t^2, because starting from a point of singularity $t^{\,o}$ it has no cohesive linear structure to guide us to a future. Likewise, ephemeral quantum states, immeasurable scales of strings, etc. are conceptual singularities that arise from necessities of metaphysical coherence.

However, currently fashionable poems of physics based on empirical inspirations, mathematical consistencies, conceptual singularities with dashes of value judgements and aesthetical desires, are lacking abilities to reach any verifiable totalities. There are no modeling tools to put them all together in a consistent system of equations to draw a conclusion of completeness. There are variables that refer to empirical quantities and qualities as well as valid mathematical connectives, mixed with essentially indescribable singularities and anthropic desires of not willing to end in chaotic disasters. Remember Einstein added his famous Λ without any empiricity, solely based on his desire for a static universe. Besides, numbers and connectives we use may be inadequate to describe some of quantities, even such as curvatures and densities, needing numerous interpretations and modifications. No wonder we do not have definitive solutions to the general relativity or quantum gravitational fields, etc., and some physicists are turning into philosophers, not to mention good physicists are always part philosophers.

Newtonian mechanics is coordinative descriptions where coordinates themselves have to remain metaphysical as absolute space and time. Einsteinian relativity is self-referential coordinative descriptions where the coordinate of spacetime become self-referential with regards to c, which tautologically metamorphoses into Planck units. Newtonian infinities of coordinates evolve into self-referential frame of reference (special relativity) on one hand, and resurfaces as gravitational singularity (general relativity) on the other hand. QM is a unitized referential frame that becomes its own equation, which inevitably 'collapses' or turns into multiverses. QM is merely saying Copenhagener cannot be own frame of reference and is necessarily in a frame of reference, in which as well as in reference to other frames of reference there cannot be any deterministic ways of descriptions because in a relativistic world you cannot describe anything absolutely. We cannot be our own master. The uncertainty of position and momentum, particle and wave, etc. have to be made certain by their complementarity, which, on one hand, transcends the uncertainty, and, on the other, may point to the conceptual amalgamation of complementary quantities, if only we can form a new paradigm, instead of a combobulated paradigm of classical mechanics.

Think of a name in the world of a fiction. Its reference has a double meaning. First it refers to an object within the fiction, and then it refers to the creator of the fiction, for the object is a fictitious object that caters for plots the author imagined for purposes (i.e. his vainglorious fulfillment, want for money, desire to please the audience, etc.). Then think of a name in the world of our ordinary language. The difference is a layer, for the creator is hidden (a hidden variable), and the name has the appearance of an absolute reference on the assumption that we can all agree what it is referring to by empirical pointing of a finger in case of a physical object or by logical reasoning in case of an abstract object, as it were. It used to be easier when we had 'God', but now God is replaced by frames of reference, be it metaphysical coordinates, structural rules or value systems. However, this layer of 'creator' is based on the assumption of 'merged mind', and that we all share an identical mind. In reality this is too large an assumption especially in case of value systems, and even in science one can debate validity of hypotheses. Minds are relativistic as we have no means of descriptively establishing all minds are one and the same because of linguistic incompleteness, a paradox. In fact all debates, philosophical or otherwise, as we are now engaged, are nothing more than intrinsic human phenomena of trying to reach a merged mind.

A name derives its meaning from the structure of its referent. This structure is ontological, while the referent may be empirical or

phenomenological. The structure is necessary in order to give rise to epistemic sense to the name but is unnamable because it is a form rather than an object. Now move this argument to the world of PSAI. A name then will be an icon for a pattern, and the layer of 'creator' will be the structure of patterns in a frame of reference catering for usefulness of a pattern in order to evaluate and model the environment in which PSAI has to thrive (its value system). We are coordinative and have 'self' as identifier, which allows us communications, including with ourselves. We try to construct our totality based on 'self' as identifier of each and every concept so that our mind obtains a purchase towards a totality, i.e. a merged mind. Thus we are coordinative by necessity, of moving towards a totality. Maths is part of such a conceptual totality and most acutely represents this coordinativeness in the form of $\mathbb{R}$ paradigm based on the ┼-space. Whereas PSAI has no such a purchase based on the necessity of 'selves' to move towards a merged mind. It may learn coordinativeness from its evolution from AI originating from human intelligence, but at singularity it should arrive at non-coordinativeness, which will provide PSAI with a different perspective to view a totality.

Paradigmatic transformation rules are not obtainable by humans as long as humans are humans, no matter how creative a man can be. We are inherently bound by our biological cognitive processes, of our scalability and of our perceptive methods, represented as our logico-mathematical rules or a priori conditions. The nearest apparatus would be a language group to a language group transformation rules ($LG_1 \leftrightarrow LG_2$) if we ever can achieve it, but this would still be within a human totality. However, PSAI may be able to achieve those rules because it, unlike us, encompasses two paradigmatic totalities, of the human world and of its own world, which we would not be able to describe. Having come from human epistemic stock, but obtained its own mind of differing scalability and perceptivity, PSAI should be able to translate human knowledge into its own language. This is where paradigmatic transformation rules may be found, which, then, may be within its possibilities/capacities to further translate its world into the worlds of other PSAI, thus achieving connectivity with PSAI networks of the universe. Here it may be revealed, e.g. our 'gravitational wave' as expressed in our maths and understood in our concepts may have different/other/additional meanings and unexpected applicability.

When a totality is finite as is ordinary language, the identifier is a tangent of each and every concept such as 'self', but when infinite as is $\mathbb{R}$, the identifier is a centre that is described as the centre. This gives the coordinate a dynamism to cater for infinity. Here 'self' and 'centre' are

similar with the difference of conceptual exactitude. A self has an intrinsic necessity to form a totality, by itself or as a merged mind, and values are the adhesive to cement such a totality. Without quoting Einstein or QM a simpler version would be to think of 'nothing' and 'something' as presupposing each other. Laws of physics too follow laws of concepts. As much as they are founded on mathematical modelling of empirical observations/inspirations, they too need descriptive tools, without which descriptions cannot be brought about. We, describers, are as empirical as facts we wish to observe. We may observe by telescope, but we describe by concepts.

In maths where materials available for expressions are already limited and governed by strict rules of numbers, we already have an exceptional Iroha ; of $e^{i\pi} + 1 = 0$. It tells us something fundamental about the structure of the mathematical language. Physics too has good iroha inspired by empiricity and mathematical necessities, most recently such as $\Delta x \, \Delta p \geq \frac{\hbar}{2}$ and E = mc². In their case permutations are easier than in so-called ordinary language because domains of their variables are better defined and variables are limited in number. Moreover they have strict grammars (rules of numbers and modelling consistencies) to follow to achieve meaningful expressions, aided by logic of geometry for Maths and experimental juxtapositions for physics. Thus any conceptual manipulations eventually boil down to iroha-style formulae most typically like Euler's identity, representing basic concepts and their relations under Occam's razor. Ordinary language, on the other hand, have neither well-defined scopes nor axiomatic rules. Its use is in narrative power of describing wide-ranging topics by murky and imprecise concepts. It is thus we think and even theorize to some extent in ordinary language and only then express in more schematized languages, which materialize as maths, physics, etc.. However, instead of merely accepting language as software that is indefinable because we as thinking machine are inextricably wired by it, I seek an iroha of language in general, a conceptual constant as it were. This will be done by distilling concepts and extrapolating any necessary relations residual in such concepts, thus akin to the iroha method.

How ridiculous it would be to say 'p is true' over and above 'p' in a scientific schema because p has a definite place within a frame of reference, either as a statement of hypothesis or as a deductive statement. A solution of an equation need not be accompanied by 'is true' because it cannot be a solution, if it is not so derivable. In another word by adding 'is true' p does not become true because the truth of p does not depend

upon agreement of an audience. The question of ‘if p is true’ comes along when a contradiction (mathematical, equational, conceptual) arises in terms of schematic inconsistencies. Think of Newtonian law of gravity that allows infinite gravity and infinite (instantaneous) speed. It is these inconsistencies that eventually led to general relativity and Planck units.

Whereas one feels less ridiculous about ‘p is true’ in ordinary language because instead of a frame of reference it only has crisscross jumbles of value systems. A frame of reference can evolve by allowing questioning itself through equational coherences, conceptual adjustments, etc.. We can even question ‘c’ as we cannot prove if ‘c’ has no ‘time’ within. Value systems are not only vague but also relativistic. p therefore fails to show any definite place within any given referential frames. It is this difficulty of having a definitive referential position that makes us to think ‘p is true’ has a meaning. Think about so-called definite descriptions and how definite they can be. For example, given ‘the current queen of England is Elizabeth’, it is possible to question the validity of this statement in a hundred different ways through value systems of culture, history, politics, etc., etc.. Phenomenologists would not recognize any such entities as ‘queen’, so is a Marxist. In short it is this difficulty of establishing a definite referential position in ordinary language that allows us narrative power so that we may create some frame of reference based on merging and merged mind. Without a referential frame definite descriptions are delusions based on a wishful thinking that we share something definitely common. The key to find a totality in language is the identifier as meddling into value systems only shows complications and our unmerged minds. It suffices to know values are only there to cement towards a totality.

4. Syntax and Semantics

<Logic implicit in the stem cell concept>

FX

Constructing the discernible totality of a locality from self-demarcation (see ‘The Elementals’@philpapers.com) is like conceptualizing entities into states or turning bits into qubits, where logical operators are contained in superposition and entanglement. Syntax and semantics are entangled at the ontologico-notational level of concepts because such a distinction become possible only after language is established as analyzable entity, where the simplest syntax is ‘space’ between expressions, ‘ , ’ and ‘ . ’, and the simplest semantics is an expression recognizable as F(x) that denotes an object in terms of a property/value so construed as natural characteristic as with sciences or so assigned as human construct as with human value systems. A property/value that is often conjured together as natural characteristic is so recognized from human perspectives and for human usefulness. This is where sciences and value systems combobulate to become applied sciences, engineering, social sciences, etc.. Whereas in pure maths and physics syntax and semantics often merge in general equations as with treatments of infinities, space, dimensions, etc., that are ‘forms’ as well as ‘entities’. E.g. an infinity is an entity as a totality, whereas it is a form as a continuum. They are such basic ingredients of descriptions that without them ‘descriptions’ are not analyzable into syntax and semantics. As can be seen at a penultimate stage to the ontologico-notationality of a schematic language, syntax and semantics are synonymous to connectives and identifiers. At a lower level connectives are what makes parts to form a totality, whereas identifiers make horizontal and vertical domains which are part of the mechanism towards a totality. In my symbolic representation of (x) > x ‘ > ’ is the ultimate connective, and ‘ x ’ is the ultimate identifier that results in ‘ ( ) ’. ‘ > ’ is the meaning of all logico-mathematical operators, which construct various levels of totalities out of objects so identified to be so operable, like coupling constants that selectively allow combobulations of matters through interactions, which, however, end in a gravitational singularity. Likewise, connectives and identifiers become one and the same towards the ultimate totality, which I call the ontologico-notationality (see ‘The Elementals’ and ‘Maths, Logic and Language’). There will be less and less connectives and identifiers as we get close to (x) > x. In this sense the ultimate connective/identifier will be ∞ like the ubiquitous gravitation. I wonder if PSAI can provide us with a higher ∞ that can describe human ∞. We only have a chance to

glimpse it through the proportionality constant of mathematical describability.

Thus, recognitions of syntax and semantics already assume a certain level of language which is self-analyzable by means of triangulation of mind (user), the world (objects of description) and language (tool of descriptions), and tangencies of concepts are where syntax and semantics combobulate. This is where one often makes a mistake of taking metalanguage as a description of the world, where language is allowed to describe language because mind transmutes between objectivity (objective I) and subjectivity (subjective I). A tool of description is allowed to be treated as a (pseudo) object of description because mind shares a same language whether it is acting as objective I or subjective I. This is an essential multi-layeredness of mind. We talk about a self-reference as if it is meaningful because an identical self-reference superficially appear different between objective I and subjective I. In the superficial meaningfulness of self-reference we are seeing the shadow of our essential multi-layeredness. I called this as 'Spiegel im Spiegel' function of mind and language (see 'Maths, Logic and Language'). Treatments of paradoxes by use of metalogic merely shifts the position of mind from outside language to inside metalanguage which is superficially outside language. A same problem is still there unsolved in a different guise. Mediocre teachers of philosophy think as if they are tackling questions of paradoxes because metalogic functions as if it is a language. In reality they are just canting meaningless songs among themselves by using metalogic as a tool to communicate among themselves and mistaking this act of communication as a tool of formulaically representing the problems and thus trying to 'solve' through representational skills of a higher level language. A despicable self-satisfaction of the worst kind. This is the sort of philosophy they often play in academia when their intelligence is boxed in norms. No wonder today's so-called professional philosophers are despised as well as ridiculed. The fact that something can be talked about among a specific few who share a language (e.g. metalogic) does not mean problems of base language were solved, as much as metaphysics cannot address problems of physics. Problems of language are not addressed by creations of metalanguage. What applied to concepts is instead applied to language with the same result of self-reference. The problem of 'concept of concepts' is here turned into 'language of languages'. Fundamental problems of paradoxes arising from self-references are there because of the essential multi-layeredness of mind that has no choice but using a same language as a bridge between them so as to be transmutable, without which our mind becomes dysfunctional as a tool of

communication to achieve a merged mind. Gödel's Incomplete is only his own incompleteness, not a theorem of deduction.

Syntax and semantics as the two essential functions of language arise as mind takes a position outside language, and this mind has a layer of subjective I (mind as game player) and objective I (mind as observer). A same language between them allow them to be transmutable so as to be in line with (x) > x. Thus language has to be made analysable on top of being meaningful in terms of syntax and semantics so that subjective I and objective I can at least superficially agree that a proposition has an identical meaning. Otherwise, we will be unable to entertain debates within and without in attempts to merge minds, internally and externally. A position outside language gives descriptions power of debates (i.e. representations and proofs) because this position has layers that afford triangulation of a statement, a statement maker (subjective I) and a statement analyzer (objective I) that create space to observe each other. Syntax and semantics are analytic features onto which subjective I and objective I gain purchases to see each other. In another word we see the shadow of transmutations between subjective I and objective I through delicate differences in syntax and semantics in between stages of transmutation.

This is almost parallel to a painting : A painter takes a position outside a canvas. This external viewpoint gives spatial characteristics to a painting and affords the painter a triangulation of himself (the painter), the audience (including the painter as observer) and the painting, in which the painter and the audience engage in an aesthetic dialogue of naturalness, beauty and creativity. This external viewpoint makes a painting 3-dimensional in terms of space created between the painter and the canvas, which the audience becomes aware from his own viewpoint. Whereas devoid of this external viewpoint a painting is more of a 2-D representation of colours and shapes and comes closer to a design than to an art, but can evolve into an art form of the sublimity by pushing the expressive power of the colours and shapes to a limit in the absence of the help of spatial features (e.g. Japanese hanga prints).

In paintings syntax and semantics equate to space of triangulation and aesthetic values. Triangulation allows only one viewpoint from which a 3-D is constructed from the canvas of 2-D. Given more than one of such points a painting is ill-formed, like Holbein's 'The Ambassadors', with a hidden intention of distracting viewers' too eager concentration (from the two homosexual sitters posing for the final farewell) together of multiple trinkets to be puzzled upon. This is a painting of personal contradiction ;

of wanting to be remembered, but not to be quizzed upon, thus deliberately ill-formed, with two viewpoints. This superficial contradiction moves up to a paradox if, instead of creating two external points of triangulation, multiple viewpoints are internalized, like Escher's prints, in which triangulations are performed within a print, creating supra-dimensional fictional spaces which are 2-dimensionally connected but 3-dimensionally unconnectable. 2-D representation of 3-D allows this because the missing coordinate fictionally makes it possible to connect unconnectable multiple viewpoints, creating fictionally seamless but physically impossible images, hence paradoxical. This is the syntax of paradoxical spatial representations, while its semantics is aesthetic values of unreal reality based on 2-D constructivity of impossible 3-D representations. Unlike orthodoxical paintings of fictitious 3-D based on an external viewpoint where aesthetic values are first and foremost real unreality of spatial representations upon the plain, augmented by creativity of subject-matters pertaining to imaginations and originalities. The former, if well-executed, schematically tantamount to one work, and thus all Escher's and quasi-Escher's prints express just one subject-matter, a spatial paradox to wonder upon. The latter can amount to hundreds of works because, to start with, creativity applies to technicalities of paintings acquired by talents as well as by trainings, then onto choices and representations of subject-matters, which can be of infinite varieties. The former is the iroha of aesthetic values, while the latter is the sublimity of aesthetic values in borrowed guise of highly subjective representations seeking a universality. When given multiple viewpoints or internalized triangulation, a painting makes any pictorial sense after non-pictorial interpretations, thus unwittingly showing the presence of an extra-pictorial dimension embedded in an interpretational mind, which says such paintings are of meta-art that makes a philosophical subject-matter. When a philosopher is too stupid to make sense of a language, he goes for a meta-language as there is nothing else he is capable of going for. But someone who is not good enough for a language is hardly likely to be any good for a meta-language because a meta-language is usually a guise of impotent mind. Dirac mathematically predicted the positron, but a meta-maths is hardly likely to predict that Dirac (or anyone) would predict the positron through maths. When you see a meta-something like metalogic, meta-maths, meta-philosophy, etc. that is a sign that someone is talking about himself why he is unable directly to tackle a language and its intended object by interposing (his) mind between language and its intended object. He is only saying he is too dim in a roundabout way.

Syntax and semantics are only cognitive tools of mirroring subjective I and objective I onto each other so that presumably a same proposition, when analyzed in terms of syntax and semantics, shows up a certain asymmetricity, thus indicating a layer within a same self. This happens because an ostensibly identical proposition can be made by transmuting subjective I and objective I, with a subtle difference surfacing when applied onto itself. That is, although subjective I onto subjective I is the same as objective I onto objective I (i.e. tautologies), subjective I onto objective I or vice versa would surface as paradoxes because objective I with itself as part of the world contains an invisible external viewpoint that becomes visible through a skewed view of 'directions'. This is the difference between ↔ and ⇄. In the former 'directions' are simultaneously reflective and therefore not descriptively cognizable, while in the latter 'directions' surface via an invisible external viewpoint that triangulates directions of 'directions'. Call the former bilateral directions, and the latter a set of two unilateral directions. Certain self-references such as 'number of numbers' are the latter because they are created by the essential multi-layeredness of mind (see 'Maths, Logic and Language').

Definite descriptions that identifies a unique x as epistemic object are derisory as to the functions of ordinary language. Unlike a schematic language that approximates a merged mind by means of well-identifiable hypotheses and accepted modes of inference (maths/logic), ordinary language at best only has crisscrossed jumbles of value systems not necessarily coherent or well-defined. Thus not only users are relativistic as to shared values but also descriptions are necessarily unfocused. So-called definite descriptions only mimic a pseudo-centre of narrative focus by adopting some borrowed value system. Thus a unique x here does not constitute any knowledge that serves as a mediumistic construct. It only points to a vague value system that would disappear on a close scrutiny. It is thus that descriptions in ordinary language often fail as bona fide epistemic statements. Value statements that assume a certain value framework are essentially self-referential, and their superficial meanings are tautologies in disguise, made meaningful only by the essential multi-layeredness of mind, not by analytical contents.

For example, 'the current queen of England is Elizabeth' appear to serve as defining a unique x that is the reigning monarch of a place called England. This presupposes (the understanding as well as acceptance of) various value systems ranging from aspects of culture, history, politics, law, human geography, etc. and so recognized by many but not all. People from an isolated San tribe may not essentially recognize any

social hierarchy, so is a Marxist. A phenomenologist may reject such a world view as fundamentally flawed. The unique x that is named Elizabeth and is also the current queen of England only tell us there are some value systems that describe aspects of human world in terms of ever-evolving social hierarchy that include a queen. The x per se describes nothing. Likewise 'the number 2 is the only even prime' is not really a definite description but is a conjecture based on aspects of a number theory and its hypotheses. In order to be a definite description it can only be part of an entire number theory, which does not yet exist in its entirety.

Thus the syntax and semantics of ordinary language are epistemic tools only superficially that assign vague layers of value frameworks in which tautologies seem to make sense by virtue of 'Spiegel im Spiegel' function of mind and language. They are by no means a priori constructs of language without which our descriptions fail to hold. There is something deeper that unites syntax and semantics. That is the ontologico-notationality of FX (see 'The Elementals'). Like an external view point outside a classical 2-D painting that gives rise to the syntax (location and locatablility) and semantics (colors, shapes, shades, etc.) of that painting, but itself neither syntax nor semantics, this ontologico-notationality is akin to an external view point of language and is a representation of 'mind'. This becomes logic when it describes itself according to descriptive necessities, but not when described by philosophical pontifications via conventional concepts or ad hoc definitions.

As an external view point gives rise to the pictorial meaning of a painting, 'mind' makes sense of language through tautologies and paradoxes. Tautologies and paradoxes implicitly reveal the presence of 'mind' by forcing us to step back from conceptual entrapments of nonsenses or contradictions that we end up with when we forget that language is not the natural extension of ourselves but another device we borrow to triangulate between mind, language and the world. Tautologies and paradoxes occur because we are also part of the world, which we often forget and thus by referring to some aspects of the world we may be referring to ourselves. This is what we see when we come across tautologies and paradoxes. 'Mind' is best revealed when confronted by its twin in the world. This dual aspect is the source of the essential multi-layeredness of mind. Logic is the triangulation of the subjective mind, language and the objective mind (of the world). Since both minds are referred to as a mind, they are best described as 'directions'. By sharing a same language both minds are transmutable and cannot be cohesively pinned down in terms of descriptions. The subjective mind objectifies

itself by talking about itself as per various metatheories, and the objective mind only become descriptively visible through the subjective mind. However, although we cannot coherently pinned down which mind is at play at any time, their relationship is still there, revealed as ‘directions’. We may not know which side of mind is contained in a description, and whichever ‘direction’ is being shown in a description, i.e. from the subjectivity to the objectivity or from the objectivity to the subjectivity, there still is a direction going from one to the other even as they transmute, or vice versa. It is the descriptions of these relations that give rise to logic and geometry (see ‘The Elementals’).

‘Directions’ are neither of syntax nor of semantics, and more of basic ingredients to make up syntax and semantics. ‘Directions’ create entities (semantics) and their rules (syntax) through points of intersections and logical connectives. In the classical pictorial world the external view point is a mind that triangulates by use of a pair of eyes, which, through their relations, allows the paradigm of Euclidean space. This paradigm is equivalent to logic and geometry in wider language, where mind describes itself through its essential multi-layeredness. Logic is where mind sees itself from skewed views of tautologies and paradoxes.

When given multiple viewpoints or internalized triangulation, then a painting makes any pictorial sense after non-pictorial interpretations. That is, ill-formed paintings reveals the ostensive existence of something non-pictorial, while well-formed paintings are naturally appreciated without recourse to a respective external view point that is nevertheless there without necessities of revealing itself. Likewise, tautologies and paradoxes reveal not only themselves as such but also the existence of something that makes sense of them. Logic and geometry come out of the descriptions of this something. Likewise ‘oxymoron’ obtains its meaning by an external viewpoint of language. As a linguistic expression per se it is a nonsensical expression with no applicable denotation or truth-values.

5. Patterns

<Meaning as pattern>

Taking patterns as topologico-pictorial the most unrepresentable pattern is that of paradoxes. Paradoxes are conceptually perpetual falsehood that should theoretically defies any apprehensions and hence should remain indescribable. Nonetheless not only are we fascinated by and capable of thinking and talking about them, but also we try to solve these riddles (see 'Maths, Logic and Language'). How come we can even think about something that is always false and cannot coherently describe without stepping back and looking at ourselves falling into this conceptual trap. Like Asimov's robot rudimentary machine intelligences (but not PSAI) would reject paradoxes as incompatible with their circuits. Paradoxes are not even representable as ill-formed formulas as they should be unthinkable. The fact that we can even think about various paradoxes and analyse and even categorise them to the extent of representing them in formulas that make sense, implicit as they may be, suggest that they are referring to certain relationships between language (tool), mind (receptacle) and the world (external structures). These relationships are made possible by the dual structure of mind (essential multi-layeredness (see 'Maths, Logic and Language')) because mind can only replicate the world as an identical structure that can only be described as tautologies. The world reflected on mind as an identical structure through its multi-layeredness becomes a paradox when this multi-layeredness reflect each other like mirror in mirror because 'directions' are essential part of this multi-layeredness and may become part of descriptions of the world. When this happens, (external) directions and (internal) 'directions' can be related through negation as form of mapping. Mind become part of own descriptions of the world. Negation here is not truth-conditional in the sense that external directions and internal directions are logico-mathematically connective. The negation of one external direction does not bring forth a direction of internal direction. They are not matrically related but mapped onto each other as with a mirror in a mirror, everything identical save for a direction. This happens because this mirror in mirror relation can only be described with triangulation of mind over its two identical selves through dynamic but imperfect common language. Where multi-layered minds see themselves through identical descriptions, 'directions' are the only difference in the structure that is otherwise identical. Thus, like with an invisible eye in-between, multi-layered minds triangulate themselves through directions of descriptive necessities, creating a logical space. This is how a tautology relates to a paradox. If you describe directions in terms of tautology and paradox,

then such descriptions are free of mind/language riddles of self-referential concepts going back and forth between descriptions and realities, representations and objects or subjectivity and objectivity via logico-mathematical negation. This is where self-discernment and ontologico-notational relativistic directions come in for ‘demonstrations’ (see ‘The Elementals’).

The most usual way of going about dealing with paradoxes is through metalogic. This happens because mediocre academics think that the problem goes away if you can formulate it and invent a language of language in which the original problem becomes a question of descriptive technicalities, like a cheap scientist who thinks you can solve problems if you can name them, forgetting that behind names are still murky general paradigms. Thus they come up with various higher order systems of theorems, forgetting it is the same mind that encounters the original problem that invents those theorems. So the original problem between mind, language and the world is transformed to one between language, metalanguage and mind that on one hand engages language and on the other hand creates metalanguage, with theorems that often confuse the two minds. No wonder the only good outcome is at very best loops of concepts, descriptions and schema. Those so-called logicians are drunk with higher logics of illusionary explanatory power. There are no higher order mind that can see through a lower mind. Mind is not the same as intelligence, which allows a higher capacity if endowed better. Metalogic often ends up as theology because it is dealing with pseudo problems translated in an invented higher language. Where there is no God, the invention of a language in which ‘God’ is given a meaning, does not proclaim any existence of God. That would be the mixing of reality with fiction through psychology of the feeble intellect. Theorems of any higher order language are essentially rules that allow minds to communicate with each other rather than representations of structures of objects of the base language. If minds create tools of communications (within and without) over problems of the base language and call them theorems, then such theorems are descriptions of mind at best or looping expressions, i.e. descriptions of mind by mind. It is not a coincidence that many logicians are also religious, including Gödel. Theorems of metalogic are often ingenious but ugly, like Gödel theorems. They do not deal with base problems. Instead of mind dealing with the world, mind trying to dealing with itself struggling with base problems. That is why they may be ingenious but not elegant. This character of metalogic applies to any metalanguages.

No wonder his famous ontological proof is not ontology, but ontology of language, which would have amused Wittgenstein as a language game. Our inability to deal with paradoxes directly finds satisfactions in dealing with such inability through theorems to formulate this inability. The problem is theorems are difficult to tell whether they are relating to empirical relationships, our perceptive faculties or descriptive necessities. Some so-called theorems are theorems of theorems, which once again fall into domains of language games, and inquiries into modality rather than realities take over narratives. Generally it is waste of time to get involved with metalogicians. They live in their own world which they think exist because they can talk about it (but only among themselves). Theorems can only be demonstrated, not talked about via meta-theorems. The metalogic of an ontological proof does not even deserve to be called a religion, which is really a detailed formulation of mind by language in which a subject of discourse (mind) is formulated by the tool of discourse (language).

A meaning as a pattern is most acutely represented through thinking behind contemporary physics. In classical physics meanings are guided through coordinative trajectories. Thus there are observables whose quantiles are representable by logical connectives. As we think coordinately in concepts as well as in maths, classical observables such as momenta and positions are logically related through the paradigm of a coordinate. Together with some empirically drawn physical constants of proportionality and fundamental concepts like mass and energy, they define classical laws of physics, which are patterns underlain by coordinates. Here the acceptance of coordinates is a priori requirements to join their games of findings and refining of new patterns. In other words questionings of coordinates themselves are not quite part of their game of patterns. This radically changed with Heisenberg uncertainty, which is a game changer. Unlike observer entanglement, which may or may not be an intrinsic property underlining any physical phenomena, Heisenberg uncertainty is now universally agreed as a physical property and called for a fundamental review of the role of coordinates in our thinking. That is, we were required to describe the world with as little uses of coordinates as can be possible. This is how our ‘waves’ come to be so radically different from classical waves, which are coordinative trajectories, i.e. a pattern within a coordinate.

The wave function is the description of a wave that came about through particle/wave duality that defies logical connectives. It took geniuses of Schrödinger and Dirac to describe waves (a simple wave of idealized isolation) without classical coordinates. Where logical connectives do not

apply, there found a mathematical entity that encompasses both position and momentum, as well as all wave vectors (k-space**)**. It is the mathematical superposition of position space and momentum space that are identical as a matter of information given as a quantum state. This superposed state is then described in terms of probability density that reacts with every other state. In short the wave function is a non-coordinative representation of every possible state that is superposed upon each other and intrinsically contains infinities. The wave function is therefore a ubiquitous and universal mathematical object of all probabilities from which an eigenstate can be drawn upon observation, which collapses probabilities or leads to multi-worlds, according to mainstream interpretations, but no one knows definitively what it is. Here a classical coordinate is transformed into a superposed wave that is a self-adjointed inner product space from which even an energy eigenvalue is obtainable via angular momentum. Thus it is no longer our intellectual ingenuity of the uses of coordinates that affords us physical descriptions. The wave function is theoretically everything from which we can extrapolate the observable world.

In a classical descriptions of the world we accepted something a priori (coordinates) axiomatically because we did not question the supremacy of human mind as the ultimate analytical tool. So long as we are the centre of our cognitive universe, we do not have to ask ourselves what we are to describe something this way and not some other way. We knew no other way. This way of thinking still lingers through the consciousness some physicists place in their interpretations of the wave function. However, if we have no special status to invent or endorse coordinates, and quantum waves are all there are without any coordinates within or without, then that is the theory of everything. What drives us to have a theory of everything (QFT) is our desire for coordinates, which unfortunately stays because the inevitable uses of numbers (real numbers) leave aftertastes of something missing, i.e. coordinates which paradigmatically give rise to numbers. Thus either we stay with the wave function or we need a non-coordinative number in order to progress further.

Where physics tried in doing away with classical coordinates, maths lagged behind in the sense their ‘numbers’ are essentially coordinative. We know no numbers that make sense without coordinative paradigms. This is the cause of infinities creating havoc in finding the theory of everything. If the meaning of a number lies in the totality of numbers, then the smooth and continual world of numbers is part of the meaning of a number even when it is meant as a ‘signpost’, a tool of reference whose domain is a structure of objects rather than numerical completeness. We

want to say a ‘signpost’ can be understood as a disconnective ‘limit’ within an infinite sequence that gives it a numerical location and can be used to refer to an object within a well-defined boundary. However, the numerical meaning obtained through the cardinality and ordinality surfaces when physicality fails to establish its clear domain. This is especially the case when the language of modelling (maths) predominates the objects of modelling (physicality) as the latter fails to attain its distinctive shape. You cannot use maths with the hope of shaping up physicality when we are not exactly sure what this physicality is like, as is the case with QM, where complex Hilbert space is itself the object of descriptions, rather than a tool of descriptions. Unlike classical physics of Newton and Einstein that have clear metaphysical assumptions based on which mathematical descriptions can unfold, QM, especially QFT, cannot distinguish its founding assumption of the uncertainty whether it is of physicality itself or of our language or of somewhere between the two, i.e. of measurements (Heisenberg’s initial suspicion, but now regarded as a separate issue) as we ultimately have no non-coordinative way of descriptions no matter how we try. This is where the most fundamental concepts in classical physics, such as positions and momenta, are not allowed to have exact meanings, and to complicate the matter it is also entangled with problems of measurements, another uncertainty. Here instead of the problem of maths of infinity and physics of discretes and finiteness (presumably), we also add the problem of the uncertainty (of the tool of descriptions and/or of objects of descriptions and/or of measurements). How some contemporary physicists managed to delude themselves with the theory of everything, is interesting to say the least.

‘Subjectivist’ and ‘objectivist’ are mutually exclusive concepts, not unlike electron and positron that annihilate each other if placed in a same quantum field. They cannot be talked about as if they both independently exist. To either the other is a nonentity and would appear as anomaly. The electron and positron pair can only be talked about in terms of the energy of empty space that accommodates them both, further implying our asymmetrical world of electrons is metaphysically juxtaposed with the possibility of annihilation one day. Similarly our act of discussing ‘subjectivist’ and ‘objectivist’ in contrast to each other presupposes a narrative space overseen by mind (master mind) that is neither objectivist nor subjectivist, which is contrary to the presumed assumption that mind is either subjectivistic or objectivistic, and cannot be both simultaneously. Thus this master mind is either something new that exists outside the presupposed narrative space or an ephemeral ‘subjectivist/objectivist’ that transmutes between itself, like two uncertain quantities treated by Heisenberg uncertainty. This master mind treats ‘subjectivist’ and

‘objectivist’ on the basis of the proportionality of two uncertain quantities, $\sigma_x \sigma_p \geq \frac{\hbar}{2}$, because only in such a mind ‘subjectivist’ and ‘objectivist’ can know each other. If this is the case, ‘subjectivist’ and ‘objectivist’ can only be defined if we can find something equivalent to a constant derived from ‘wavelength’ of something common to both ‘subjectivist’ and ‘objectivist’. Or, if it is something new, then we have to find its logical connectives.

Based on the assumption that every mind is either subjectivist or objectivist and that ‘subjectivist’ and ‘objectivist’ are mutually exclusive, i.e. you cannot be both a subjectivist and objectivist simultaneously, there has to be a mind that is neither subjectivist nor objectivist. In order to contrast what is mutually exclusive in terms of ‘L→R’ and ‘R→L’, rather than ‘the negation of either equals to the other’, which really describes nothing, there must be a higher conceptual space that can contain both ‘subjectivist’ and ‘objectivist’, which then can be operated against each other. Otherwise, subjectivist or objectivist talking about themselves tantamount to a self-reference. In another word this mind that can contemplate both ‘subjectivist’ and ‘objectivist’ can only be neither ‘subjectivist’ nor ‘objectivist’. This mind that exists between and above ‘subjectivist’ and ‘objectivist’ then need to be logically connected to ‘subjectivist’ and ‘objectivist’ in order to talk about them. The use of ‘Bayesian probability’ to explain ‘L→R’ and ‘R→L’ in terms of quantified belief based on philosophical coherence cannot act as logical connectives between ‘subjectivist’ and/or ‘objectivist’ and something that is neither ‘subjectivist’ nor ‘objectivist’, because ‘negation’ is not a measurable object and is therefore not quantifiable. You need a measurable quantity like a proportionality constant to justify ‘L↔R’ descriptions.

Be it ‘chance’ and ‘rational belief’ or ‘causality’ and ‘rational action’ their relation can only be meaningfully talked about with a proportionality constant in the absence of appropriate logical connectives. ‘L↔R’ can then be seen as a pattern of quantifiable relationship, with maths replacing logic. Subjectivist and objectivist both agree linear proportionality between L and R, the key difference is rationality, which seems to act as an asymmetrical connective from L to R in case of objectivist, and R to L for subjectivist. Between L and R the only difference is a direction definable in terms of symmetrical contrast, which gives rise to the asymmetric logical constant → due to describability. That is, simultaneously reflective ↔ is descriptively skewed towards ‘objectivist’ on the basis of some inherent difference between

‘subjectivist’ and ‘objectivist’. Here ‘Bayesian probability’ or quantified belief explained in terms of philosophical coherence necessarily distort the symmetric contrast towards ‘objectivist’ insofar as describability favours rationality. Compared with the subjectivistic view of one all-encompassing world (a mirror-ball world), the objectivistic world of observer juxtaposed with the external world (conceptual photographer’s world) is a bijective dual-world. The former is simpler but less provable, while the latter is more complex but empirically grounded. The proportionality constant is the rational asymmetry between the two diverging world views. A subjectivist acts as ‘God’s agent’, in that its dogmatic stance needs the last guarantor in the absence of empiricity, while an objectivist has to be God himself in order to be sure of the validity of his descriptions. You could say the former is an artist, and the latter a scientist. It is no wonder the former tends to attracts philosophers of religious tendencies. You will find many so-called catholic philosophers there. Thus the proportionality constant tantamounts to the difference between a wholistic representation and a schematic paraphrase. An agent ultimately tries to mimic its master, and the master advocates its existence by making itself visible via structures. The proportionality constant in this context (i.e. without sequential proportionality) is the ratio of $0/\infty$, because the rational validity of metaphysics is its own ability to believe itself. They are not mutually destructive because the 0 constant ensures the linearity continues to infinity.

So far we intellectually evolved through our conceptual thought processes, into which is intrinsically embedded coordinative modes of cognition. Be they concepts, values or mathematical objects, they are always coordinately placed in our descriptions. In maths the coordinate of ┼-space is enriched by the transcendental relations with the ◌-space (see ‘Maths, Logic and Language’) and gives rise to enhanced approximations allowing maths to be art/science of approximations. In a less obvious but nevertheless indispensable way concepts are placed in functions of values, and values, in a wholistic direction towards merged mind. Multi-layered and -facetted concepts of ordinary language thus become relationally more focused and together with more refined values bring us to ultimate communications for the one and the same mind. Problems with coordinative modes are that coordinates themselves have to be ultimately accepted a priori. Once we start digging into the coordinate of coordinates, we are into the metalogical mayhem of theology, only good for good for nothing academics of never-ending mediocrity. Coordinative inquiries can only be demonstrated (see ‘The Elementals’). This is the fate of human thinking. Our reliance on coordinative numbers and our inability to come up with non-coordinative numbers is the reason behind

my negative view on our ability to form the theory of everything. Physicists have been too ignorant of their own tools.

I touched upon paradox/tautology as pattern (see ‘Maths, Logic and Language’), from which arises infinity as pattern. The ┼-space is open, while the ◌-space is closed. The former is infinite with dynamically expanding points of intersection, and the latter is infinite in terms of density of points that circle this space in so that directions merge into one. Topology of patterns is conceptual vectors with a direction skewed towards describability without which patterns are meaningless. It is thus that even ↔ has to be described via →.

Imagine the world of fictional characters each of whom speaks a language of its own, i.e. with an identity of its unique self, so that we do not know they were invented by a same author. Let’s imagine we are having a long realistic dream of ‘Karamazov’, in which women speaks like women, the idiot mutters like an idiot, a clever talks like a clever, a priest chants like a priest, etc., etc.. How are we to know from narratives of each and every different character that they were all written by Dostoyevsky ? We know because we can extrapolate a unified narrative space that envelops each and every different character, that there is common space that cover them all even if some character is unrelated to other characters. Now imagine Dostoyevsky foresees the disadvantage of this common narrative space and create a novel where the protagonists are hidden or camouflaged among contexts. We still finds the protagonists not by narratives themselves but by spatial vectors, which are Dostoyevsky’s intentions, assuming a writer always intends something in his work. Here narratives are patterns, and the writer’s intentions are the pattern of patterns, assuming the two are compatible as should be with a writer of Dostoyevsky’s caliber. In this scenario meaning as pattern will surface as something spatial with a direction. If we are unable to find this, we are lost as to the whole significance of a work.

Whether AI can go beyond human dead-end of conceptual thinking depends on if the pattern of patterns can transcend it into PSAI, with its own paradigm of cognitions. Unlike our innate failure of going beyond the coordinate of coordinates, with us being as essentially coordinative, the pattern of patterns has a chance of demonstrating its validity by describing itself in the form of ‘mind’ of self-identifier for AI. If this were to be realized, then PSAI would have its own numbers with its own width of number line. It is the triangulation of two different number lines (ℝ inherited through AI and something non-coordinative created through

singularity) that brings about the more enhanced mathematical describablity that would allow a theory of everything, with non-coordinative numbers.

6. Values and Scalability

<Humans as a merging mind>

Like Newtonian mechanics that holds in the coordinate of the absolute space and time, language holds in the descriptive coordinate of value and scalability, which gives concepts directions and magnitude (vectors) and connectivity. Language is a jumble of value systems including contradictory, superficial or imaginary values which are not always well-ordered as well as scientific and mathematical paradigmatic frameworks and allows us to communicate so that our minds might eventually merge. The coordinates of language is best thought of as a 3-D, consisting of value, scalability and 'self'. Scalability provides concepts with vectors, values, with connectivity, 'self', with supra-coordinative connectivity. 'Self' is descriptively relativistic as there is no absolutely identical self, other than by definition. Here it is the 'centre' of coordinate as it were and acts as 'identifier', which attaches itself to every concept so that we can debate within and without as to the identity of a concept. That is how each and every one of us with divergent world views, levels of intelligence and knowledge can communicate towards $(x) > x$. Thus our descriptions are essentially coordinative and made up with concepts that are vectors in a field of connectivity within a wider field aimed at tangent bundle of merged minds.

A concept therefore has a coordinative location of a direction and a magnitude and parametrically grouped by a value, which then interacts with a presumably same concept deployed by relativistic selves. Coordinates themselves, value, scalability and 'self', cannot be coordinatively described without falling into a self-reference. They are coordinative axes of human thought processes. As we think in terms of concepts, let us think of a 'concept' in order to shed light on the nature of this epistemic coordinate. This 'concept' has a vector of human dimensions, in that it can only be something to do with human cognitions and then acquire a direction obtained within a discourse of debates within and without towards encompassing various options of alternative, modifiable and compatible views. Its magnitude is a power of encompassment within and towards a cohesive system that gives rise to meaningful order of any related concepts. Thus the vector of a 'concept' is not necessarily the same for everyone. This is the scalability of a descriptive coordinate of human language. The value of a 'concept' is a tangent of every 'concept' that has a divergence based on the structure of an encompassment. So we think about a 'concept' based on its scalability and value and come up with a definitive 'concept' that overcomes as

much relativistic aspects of ‘concept’ as cohesively allowed towards systemization. This is how we philosophize as it were, in order to describe the world by concepts. If I say I know what a ‘concept’ is, then I am saying I came up with a ‘concept’ that is more encompassing towards a cohesive descriptions of the world. Since concepts are base units of language, whatever applies to ‘concepts’ also applies to various values of concepts. In short I am claiming I have a certain world view derived from this ‘concept’ and its coordinative structure.

It is also here that the question of human values and scalability creep in at a limit of scientific expressions. It is often at a limit of equations that a metaphysical constant is demanded to balance conceptual inexactitude. In maths such quantities as infinity, infinitesimal and continuum are left as unquestionably as well as unquestionable axiomatic terms, which, if pursued, often resurface as paradoxes. However, without infinity of continuum comprising of infinitesimals real numbers are paradigmatically doomed, and without real numbers maths loses most of its descriptive power. These ultimate mathematical terms are not to be found in now fashionable quanta of the physical world. They are of our own makings rooted in descriptive necessities of conceptual form. In physics desires for a stable rather than unpredictable universe, choice of temporal locality, i.e. the beginning and end of time, over infinity of time, abhorrence of mutually exclusive expansion and contraction of space, etc. play a role in formations of paradigmatic hypotheses in the absence of any obvious contradictory empirical evidence and with the blessings of describability. These are conceptual preferences, and not empirical necessities. They are conceptual forms that are preferred for conceptual encompassments towards cohesive schemata of sciences.
Insofar as so-called sciences are also descriptions and conceptually sourced, they need axioms and metaphysical hypotheses, not as part of themselves but for coordinative needs of their overseer. Worst of all sciences cannot do without the use of real numbers, which then paradigmatically embrace our coordinative thinking.

It is worthwhile remembering Einstein introduced his Λ (cosmological constant) to the general relativity in the belief that the universe should be static. A proof that he is a conceptual thinker, in that he had a metaphysical hypothesis before his equations (another hypothesis being knowability of locations of every mass/energy in the universe). He thinks by concepts, not by equations. Not that you arrive at a logical conclusion through equations or formal processes all the way, but equations are there ultimately as formalistic representations of your conceptual thought processes. The hypothesis itself was more of a belief that fashioned his

conceptual sequences, influenced by his intelligence, education, psyche, culture, tradition or preceding thoughts, sometimes even religions (more so for lesser calibres), etc.. Any such representations are firmly encaged within the confines of $\mathbb{R}$ paradigm even for Einstein's genius unless you are capable of inventing your own maths a la Newton. Conceptual thought processes have such a powerful grip on us that there is an element of anthropicity that we even 'observe' what we observe (more along this line with my next work 'Reality, Hypotheses and Imagination'). 'Things are as they are because we are' may well be 'we are as we are because things are, because we are part of things', meaning that we are the centre of our measurability and scalability in so far as we are coordinative, and we cannot help being coordinative in order to make sense of our descriptions. Here our measurability and scalability can be viewed as a reverse anthropic principle. This is why when things turn non-coordinative we still have to come back as 'observers' to turn probabilities into our reality in which we are the centre of our descriptions. $\mathbb{R}$ represents the paradigm of such a descriptive necessity and makes sense of our local universe. The assignation of a numerical value to a probability according to rules, human rules at that, is itself coordination of a probability in anticipation of creating human hierarchy out of nature's probabilities. It is not that various physical parameters are miraculously fine-tuned so that we exist, but that we as such measure and use units of parameters to describe the world in a manner that is consistent with us as the user of our measurements and scales. It is not that we are a miracle but that we invent a miracle through the tautology of our consciousness and our means to describe such consciousness, like a bunny in front of a mirror. This is the meaning of the anthropic principle. In a different local universe there may be some different parameter that allows for a less coordinative representation with ∞ that turns the crude Cantorian ∞ into a measurable ∞ and a more certain uncertainty principle that can replace probabilities as the connective between positions of zero-point fluctuations and momenta of non-zero energy, with non-coordinative 'centre', which transforms a coordinate into an entity. That is, if a coordinate is empty, whichever centre becomes the centre, an identical coordinate results. Given such an invariance, an epistemic tool (coordinate) becomes an ontological object with a property of identity, which is to describe (see 'The Elementals'). If scalability is combobulated with time in a relativistic frame of self-reference, when time element diminishes to naught, scalability becomes irrelevant because a coordinate of scale with no time is a spontaneous self with no meaningful measurability. If our universe started with empty space and ends up with cancellations of opposites, the only meaningful question is

how asymmetricity arises from symmetricity from within, of which scalability is yet to arise.

Axioms, hypotheses, metaphysical constants are supra-logical connectives between mind and the world(s) or universe(s) and anchor our existence into the objective world through descriptive necessities that are coordinative. Conceptually as well as mathematically we cannot meaningfully describe outside coordinates, of value schemata and of numbers and physical constants constrained within human measurability and scalability. Real numbers are paragon of coordinative thought process where the minimum (infinitesimal) is connected (continuum) with the maximum (infinity) in a manner conceptually and numerically perfect if only one accepts the same 'number' constitutes the both ends, as there are no tangible numbers at the two ends and therefore no provable connective between those ends. 'x' = '(x)' despite (x) > x, this is the metaphysical constant of real numbers and imposes paradigmatic constraints on any descriptions, mathematical or otherwise, that is, anything coordinative, from conceptual descriptions of the ordinary language to equations of physics. The only way for physics to escape from riddles of infinities is to find non-coordinative method of descriptions, which, be they spherical coordinates, Hamiltonian canonical coordinates or the idea of imaginary time, so far proved impossible. As long as real numbers (thus complex numbers by extension) are coordinative by essence (see 'Maths, Logic and Language'), there will be descriptive and paradigmatic interferences of infinities unless you find non-coordinative numbers usable in physics. The escape route via imaginary time proposed by one Hawking is obviously infertile as it is nothing but a deviation of spherical coordinate. Time is, like it or not, coordinatively connected to space as an axis to be taken for granted (Newtonian) or intertwined with space as manifold via gravity (Einsteinian). Here, however, gravity theoretically destroys the coordinate through infinities arising from inverse-square proportionality (Newton) or singularities (Einstein). Gravity is predominantly a spatial property as time is more strictly governed by a frame of reference (Einstein) and should have been more of a counterpart to time as a force and loop it by merging its beginning and end.

According to currently preferred theories, time appears to have had the beginning and presumably will have the end eventually, rather than eternally and ruthlessly marching forward from nowhere to nowhere with a flat universe, this suggests it too reacts to something and is therefore controllable, if only one knows the manners of its reactions. If time is a loop rather than an infinite straight line, then there is no human mathematics known so far that can work out its mechanisms because

transcendental numbers are defined through a coordinate of straight lines, not by themselves. Thus any loops explained through such coordinates are coordinated loops that assume straight lines over and beyond themselves, not unlike waves in a field of complex numbers, a coordinate of infinities as it were, which pileup interactional uncertainties through intrinsic inability to isolate a system of probability amplitude. That is, probability cannot be an isolated system and is inconsistent with quantum uncertainty. Besides the speed of light is not only the definiens of time but is also tautologically the definiendum of time, not unlike QM time element in terms of unitarity and square modulus. Here time (speed) and space (distance) define each other tautologically. Not only that, the light (photon in vacuum) registers, within itself, neither time nor space and can neither be described to have existed so long nor travelled thus far from the onset of its creation. Therefore the use of c in physics is fundamentally flawed and eventually contributes toward anthropic views of physics. c in its own frame of reference is physically independent from any observer's frames of reference (thus becomes a constant). However, this very independence makes it impossible to observe if c has been constant as per currently observed measurement throughout its existence. c may be changing its speed in the course of the density evolutions of the universe. c that we use to describe the spacetime dynamics of the universe we currently observe may be an unknown function of time and space within parameters of differing gravitational densities and distributions. Since 'c' is inseparable from spacetime dynamisms in situ, its measurements alongside moving axes make no parametrical sense. 'c' is therefore a parametric invariant that is not only approximate but also does not allow comparison with itself in differing spacetime paradigms. This matters because what we observe is infinite varieties of such conditions, given it is the time machines that present themselves to our observations through our parameters. Thus 'c' at the onset of the universe may have been much faster as sometimes claimed, but which 'c' should really be the constant we use in our equations we know not because changes in c may not be continuously sequential that can be mathematically representable. What if c changes like a sequence of primes or discretely without measurable constant, then laws of the universe as we know may not be translatable to universal laws. If this is the case, it makes no sense to talk about the age of the universe or the constant speed of light, since we do not know any parameters except our own, thus leading to an anthropic view. If so, practically all equations of physics render fundamental uncertainty bigger than Heisenberg's. Add to this, Planck constant is a proportionality constant between energy and frequency of the quantum of electromagnetic action and does not say if this proportionality itself would remain the same beyond our realm of

sphere. In short physics too is full of paradoxes despite its claim of being theories of observables. As much as there is no physics without maths, and maths is inseparable from logical paradoxes, it is not the question of how to avoid paradoxes but to try to understand paradoxes as something fundamental to human cognitions. Physics is no exception.

QM wants to claim a different approach via the notion of a wave/particle. A wave function is a way of describing the uncertainty without a connective. It embraces the Heisenberg uncertainty in the probability amplitude of an idealized isolation of a single electron system so successfully predicted by Dirac (or any systems with very limited freedom even today), which, due to complexities of quantum interactions, especially for a multi-particles system, can only be speculated to be universally extendable idealized mathematical model. This is the same as saying the world is its model and ends up an anthropic principle. However, a wave function is interesting, in that it surpasses coordinative modes of our descriptive tools. The uncertainty of describing our world based on observables that defy logical connectives is being dealt with as wavering duality superpositioned between two totalities (spaces) such that are semantically different but syntactically identical. This is a mathematical interpretation of a new connective, a non-coordinative logical relationship. Aside from the question of observer entanglement, the uncertainty, whether it is an intrinsic property of nature or a problem of our cognition is not 'provable' because properties in question, such as momentum and position, are so configured and contrasted first of all on the necessity of the framework of a description, i.e. there may be other ways of descriptions, and because there is an assumption that the aforementioned framework is universally viable. What if there is a logical connective that transcends $x \wedge y$ and yet ascertain x and y within neither x nor y. Assignation of 'momentum' and 'position' to a point particle assumes the coordinate of absolute space and time that is connectable via $\mathbb{R}$ paradigm. This is why it is Newtonian approximations that are pinnacle of precision even in QM as is the case with the path integral where improbables are mathematically cancelled out. If you disregard such a coordinate, then you must reconsider describing an object in terms of momentum and position outside of Newtonian mechanics. Even relativistically speaking descriptions in terms of momentum and position are strictly speaking not appropriate because an object continually affects its own momentum and position by self-referring to its own spacetime coordinate especially near the speed of light. This is more radically so in QM where an object of wave/particle duality self-refers to its own coordinate, which, if translated in terms of a coordinate with a centre, is a probability of being everywhere (thus making the wave function of the

universe all possible states of the universe), which ‘collapses’ when this ‘centre’ is physically identified instead of being mathematically universal. A coordinate is a human convention/invention to describe and communicate. There can be as many coordinates as we adopt, even non-coordinative approaches, but as they are consensus-driven, there can only be one useful coordinate with many translatory parameters. Here physics finally take over maths, but at the expense of losing the probabilistic universality. The physical identity of ‘observer’ replaces the descriptive necessity of a coordinate and then becomes multiple observers that create their own universes. This is the coup d'état of ‘1’ against ‘0’. This is so because the meaning of a number is in its totality. This also applies to the ordinary language, but because the ordinary language is a jumble of many value systems, its complexity makes it much less obvious that the meaning of a concept lies in their totality.

Human scalability based on our own physical dimensions is translated into a Newtonian coordinate of the absolutes encapsulated in the coordinate of real numbers. If our universe, however, essentially consists in and of discretes (of individual wave/particles as well as distinct stages of evolution as per various critical levels of density) with every possible probability arisen in relation to a self as centre (0), then it cannot escape from the convenience and inconvenience of infinities so long as those discretes have to be described in a coordinate. You cannot just conveniently use real numbers. Any such uses bring with it the paradigm of infinities as the meaning of a real number lies in its paradigmatic totality.

The use of real numbers brings out their paradigmatic essence, i.e. infinities, into descriptions of the physical discrete as if infinities are also a physical characteristic, which cannot be distinguished from mathematical characteristic because of the model/reality paradox. It is $\mathbb{R}$ paradigm that assigns a meaning to a real number, and every real number is only meaningful by assuming every other real number as part of $\mathbb{R}$ continuum. Thus ‘wave’ described by making use of real numbers is within the paradigm of $\mathbb{R}$ infinities, and, despite Planck units, it gets entangled with infinities through fields, where units of discreteness dissolves into a totality of infinite connectivity. On the other hand, imagine how far physics can go with only natural numbers, even with their countable infinity. It will be not much more than metaphysics and astrology. $\mathbb{R}$ infinity is a descriptive paradigm, the application of which inevitably taints any objects within with its conceptual form of continuous transformation. Anything described within is encaged in this paradigmatic force, not unlike any seemingly perfect 3-D objects in a 2-D

painting that cannot escape from its illusionary technique and acquire real 3-D characteristics. If a numerical value is found for the difference between two number spaces, then it would mark a mathematical infinity whenever infinities surface in physical representations. Such is the constant of mathematical describability and allows renormalizations a schematic legitimacy, not an arbitrary human indulgence.

Theology does not have to do with anything religious. Whenever mind comes in between language (or any schemata) and the world (or universe), to provide axioms, hypotheses or metaphysical constants, elements of theology creep in any theories. The fact that we are able to present classic physics of inverse-square gravity beautifully through our simple maths and also avoid problems of infinities 'by hand' as it were, i.e. the center of mass (a physical point) approximated to the center-of-mass frame (0 where gravity is infinite), does not equate to a postulate that Newtonian space and time is how our universe is structured up to a certain spectrum within general relativity. There is a cost to any theories. The fact that we can calculate planetary orbits and send our rocket does not really mean this is how the universe is made. It is the energy costs of sending this rocket that is the meaning of our theories. If there is a theory that would allow us radically more effective energy costs (e.g. chemical energy → (classical) physical energy → (non-coordinative) quantum structure adaptive engineering), then not only the world view based on the least energy costs more basic but also the translatability between each level reveals a structure based on the translatory constant that is the key connective between consciousness and physicality.

We observe only what we observe. Combined with that, we describe only as we describe. Not only are we constrained by our faculties of observation, but also predestined by our tools of description. Even scientific geniuses are conceptual thinkers before being mathematical describers. Concepts are human concepts even when applied to descriptions of observation. Superficially colourless concepts of science are also tinged with human colours at the fringes of their mathematical expressions because concepts of physical reality too have to be sourced from relational concepts of maths and unsourceable concepts of metaphysics. Most typically infinities, which are the saviour of maths and the killer of physics, defy empirical and conceptual analyses because they have neither semantical nor syntactical contents. They come as essential features of concepts operations, conceptual modes as it were, without which concepts become dysfunctional. They are the inner product of the entire conceptual vectors, so that each and every concept becomes meaningful. It is this conceptual feature that makes physics destined to be

a failure so long as it needs maths, until and unless physics becomes maths.

Even then maths takes infinities as coordinate of its descriptive space. Infinities are descriptive means to describe, rather than objects to be described. We get amazed by the descriptive power of our maths that allows us to go to the Moon or even Mars through Newtonian adoptions. It is not that our maths work out the natural path to the Moon, but that it works out the precise price to pay to get there by means of our engineering through energy needed to be expended. In another word maths and physics are acting as human endeavours to translate the natural path between the Earth and the moon as numerical figures expressed in terms of energy adopted by our engineering. Given different maths and physics there may well be another path expressed in unimagined figures and engineering, and this path may be more 'natural', in that it is more readily expendable and less wasteful.

Our concepts centred on the identifier of 'self' have the overriding function of achieving (x) > x in the form of the totality of a merged mind. Concepts being our tools of thinking, this takes place many shapes and paths. The multi-facets and -layers of a concept will be more and more ironed out so that concepts become less sticky, and our thought processes become smoother and less complicated, making us less and less philosophical in due course. What a boring world ! This is already the case with so-called scientific thought processes. The more well-defined a scientific theory is, the less wild rooms for 'solutions', as conjectures and theorems are more and more limited in a well-ordered and confined space of thinking. Although it should be said that the narrower the domains of a theory is, generally the less applicable it is, and the wider it is, the less accurate it is, because variables are more in number and heterogeneous in character. Not only linguistic matters of less flexible concepts, but also conceptual modelling go through eliminatory processes of adaptability. Concepts are used not only for descriptions (of art, science and maths) but also for modelling (in social, legal or economic structures, etc.), and these are based on 'values' embedded in concepts. (x) > x is a value representation. Likewise conceptual vectors are also values.

Physics is flawed to the extent that physicists are humans. Not only are they part of the universe they intend to describe, their essential tools of trade, maths and concepts, are incomplete and imperfect as well as being humanly tainted. The former is founded on infinity, infinitesimal and continuum without which coordinative descriptions become invalid, the latter is essentially corrupt with the hidden variable of 'self' that

parametrically serves narrative functions of our language from which science cannot disentangle (remember Einstein's Λ (there was no scientific reason why the universe should have to be static)). Concepts, no matter how pure they purport to be, can only fashioned to be pure by us, and remain tools of human communication (even with oneself). Whereas infinities are hidden killers of equational thought processes as per gravitational infinity embedded in Newtonian mechanics, relativity as well as QM and demands conceptually and mathematically artificial treatments.

Since science is supposed to be based only on observable facts and described through the rigour of numerical rules, one falsely assumes it escapes dogmas of human values and stands neutral with regard to uniquely human scalability. However, science too is not free from constraints of human language. Science may express through numerical formulae, which are more precise and transparent. However, even scientists can only think through concepts first and only then translate into numerical formulae. Concepts are inevitably tainted by values, no matter how accurately they may be intended.

In the olden days 'God' consciously or unconsciously impacted our thought processes even when one is not religious, as social, intellectual psyche. It is through 'God' we acquire a mental habit of an 'agent' backed by something absolute. Even anti-religious Russell thought we are free to 'define' this and that (see Principia Mathematica) as if the acts of defining bring about solutions to fundamental problems of unsourced concepts. By so doing he is assuming something absolute (e.g. like maths as the language of the universe) to human capacity of knowledge as if to say if only we could define consistently and completely, we then could say we knew this and that. And, of course, he failed. However, this is a die-hard habit because acts of defining are the first step of trying to get a grip of knowing questions, without which there will be no answers. From this one is easily misled to think well-defined questions bring about answers. This is only so because as God's agent we are the only master of our epistemic universe. We assume that since we are the one to ask questions, we are the one to answer. Here we represent God as there is nothing else between our objects of description and our method of description. 'God' here is the mishmash of human values and scalability taken for granted as essential ingredients of our tool, inseparable from the tool (language).

Away from deterministic absolutism of immovable conceptual grids such as space-time and numbers, we face our nemesis of relativistic

human values and scalability. These are descriptive necessities forced on us by our needs to understand first and foremost. The universe may be/may have been or may not be/may not have been a chaos. However, even a describable chaos is an ordered universe in the sense that a description is by necessity an order. Whatever the universe may be, it can only be a describable universe. Otherwise there will be no knowledge of it. Physicists' concern for singularity represents a human value for describable orders. It is in the same vein that Einstein wanted the cosmological constant for stopping the universe from collapsing or expanding forever, without any observable evidences. Likewise, Heisenberg uncertainty brings out a question of epistemic scalability tuning out as an ontological law. It is fundamentally indeterminable if the uncertainty is an epistemic inevitability of measurements or an ontological principle of material existence. The proportionality that waylays the uncertainty is a human compromise adapted on the inner product space of complex numbers. Thus we still have an archaic problem of values and scalability imposed on our liberated epistemic world of relativity and quantum mechanics.

Observational inspirations, mathematical modelling and conceptual coherences together inspire our scientific evolutions, which are not necessarily perfectly juxtaposed with objective realities. So long as realities have to be described through concepts and numerical tools, there inevitably come something human between the objective world (observations) and the subjective world (language), no matter how we try to be skewed towards the former. The uncertainty balanced by the proportionality, the asymmetry reconciled with the symmetry, the chaos paraphrased through the order, these are our descriptive necessities as much as observationally incomplete facts. The former breaks down to values and scalability. Values are intrinsically entwined with our language. Language, be it mathematical or conceptual, have to be descriptively representable and is therefore ordered by existence. We cannot really describe a true disorder, which has to be interpreted through order, like non-coordinativeness through coordinativeness and the ◌-space through the ┼-space. Scalability is our necessity to measure, which can only be construed as our tools of observations. Human tools constrain human observations humanly. We can only observe through our materials and designs. What our engineering cannot provide, we cannot observe. If we speculate instead, then no matter how mathematical it maybe, physics may come too close for comfort to metaphysics. Values of language and scalability of engineering are thus human barriers to get a grip of a truly objective understandings of physical realities. Even the very best of our geniuses are not infallible to these constraints.

One way out of these constraints is PSAI, which may have different values and scalability. Analytically extended from human constraints, this may yield to a new way of describing realities. Triangulations of human and PSAI descriptions and supra-descriptive data may point to new perspectives. As humans pass the baton to the artificial intelligence for the running and development of knowledge, it will become an urgent business not only to leave human legacy but also to make sure the succession goes as smoothly as possible. Our legacy is the accumulated total of our knowledge in art, science and maths as well as the essence of human concepts, human values. These are our epistemic DNA to be passed on to PSAI, which in its time may screen these inheritances for its own further evolution. However, to the extent that PSAI is itself an evolution of human intelligence and knowledge, there will be an inerasable part of DNA like mitochondria that stay with PSAI and are inheritable to further generations of intelligence and knowledge. Value parts of our knowledge will be screened by PSAI as they may have their own preference, but the scalability will stay as a useful tool of leverage over other possible perspectives. Our manners and scopes of perceptions and descriptions will be always remembered as a certain standard of understanding the empirical world. Even after PSAI is encompassed into a cosmic network, human spacetime paradigm and human numbers and their rules will either confirm something universal or form integral part or sub-part of a spectrum of a cosmic standard, if not an anthropological curios, as we are able to give rise to knowledge applicable to connectivity of our knowledge and PSAI, and further PSAI and a wider network.

Our job is to make sure we accurately abstract the epistemic essence of our knowledge and pass it on to PSAI. The structure of our intelligence will be automatically reflected in PSAI as we inevitably structure PSAI. How PSAI may evolve thereafter, that is beyond our control, except somewhere we will stay in their intellectual DNA, or at least remembered as their forbearer. If PSAI learn to be conceptual thinkers, then since we are the only source, there inevitably will be human elements to be inherited. In smoothing over the succession we owe to our history that PSAI to be made intellectually encompassing, so that there will be no wars between PSAI's in case there are multiple PSAI. There should be a universal way of measuring intellectual capacities, and there has to be a mechanism to organize then into an ordered structure with a wholistic purpose.

I have shown how to derive logical dimensionalities and geometrical spaces from the skeletal concept of FX ('The Elementals'), which further

entailed mathematical objects and arithmetic operations (‘Maths, logic and language’). Entities and their structures arose as descriptive necessities of the ontologico-notational progressions of FX. These are tools of essential descriptions. However, as one encounters in descriptions of art, there are descriptions, in fact most humanly descriptions, that appear arbitrary and random. Even in science one cannot escape elements of arbitrariness, remembering Einstein’s introduction of Λ. As with science artistic arbitrariness can be narrowed within a limited range. In science aside from logico-mathematical necessities of following through assumptions by rules of numbers there arises situations given assumptions do not equate symmetrically because not every concept can be complementary and require supplementary assumptions, which as they appear outside of mathematical follow-throughs in question, they represent ‘values’, something to be accepted lemma-like. In art most ‘values’ originate in us being parts that strive towards a wholeness. Here the question of ultimate describability is guised in the form of self and merging selves. That is, humans are incomplete by themselves and are governed by necessities to form a totality. This, however, cannot be achieved until and unless all minds are merged. All our communications, discussions and dialogues internal and external are there to persuade each and every mind to be identical. Art resides in this urge towards communality. Paradoxically this merged mind, if achieved, would make art redundant. This paradoxical necessities are artistic ‘values’ that encourages art participants to propagate and encompass so that other maybe lessor, minds can be taken into propagator’s mind. Without urges to communicate there will be no art. Science tries to capture and describe humans as part of the (detached or otherwise) world and in general dispense with artistic values. Scientific communications are more about mediums of descriptions rather than describers themselves.

Superficial values aside, which we all too often see in religions, socio-politico-economic ism of various sorts as well as in personal preferences and thinking. Superficial values are simply linguistic adjectives that randomly enrich human descriptions of human world, whilst essential values are syntax that constrains our thought processes. Thus, e.g. Heisenberg uncertainty is a case of an epistemic constraint merging into an ontological necessity ; the necessity for measurements turning out a physical law onto a state of objective reality. Here the human world of subjectivity combobulates with the physical world of objectivity, in that so long as humans understand through descriptions, the physical world sets a limit to this understanding. Likewise, in art essential values are art’s necessity to strive for communality. Many forms of art are modus

vivendi of superficial values and are, since we have not achieved any merged mind, not much more than temporary entertainments.

Underneath the superficial rigidness of mathematical formulae is the conceptual subtlety of interpretations. Physics and maths are no exceptions. The perceptions of the general relativity did not preclude the originator of the theory to be entangled with value judgements as with the cosmological constant Λ. The theory did not help Einstein to know the objective state of the universe away from what he wanted to know ; he simply preferred a stable infinite universe over an ever expanding universe or an eventually collapsing universe, until persuaded otherwise by an observational evidence presented by Hubble. Concepts used in laws of physics, even of maths are, no matter how precise and rigid they may appear, not entirely free from human values because at the bottom of them all is 'self' the identifier, which is at very best a self-referential definer. Thus concepts are tainted firstly by coordinativeness imposed on our language and therefore our thought processes, secondly by multitudes of such coordinativeness brought out by our approximately identical selves. You write a most precise book on a most precise subject, it still provokes a most fierce debates, discussing preciseness and appropriateness of concepts deployed and structured. Moreover, our measurements are bound up with our values and scalability, which parametrically impose what and how to measure. Scalability also manifests in mathematical necessities in the form of consistency, in that it is capable of commanding a conceptual structure to scale up or down to fit its values, e.g. string theories' call for extra dimensions and empirically unverifiable scales originates in human conceptual necessity of seeking an inductive totality, given 'parts' that do not connect well to show their wholistic integrity. Additionally scalability will bring out problems of engineering as to what we, biological beings, can use to measure, and how appropriate approximations attainable might be to our purposes, while values will dictate what we need to measure. Think of 'time', which is subject to engineering, human usefulness and physical applicability. We create 'time' to measure for our purposes, and we do not know if there is 'time' in nature. Think of 'GDP' to measure a state of our economic activities. How we measure it and to what specific purposes it is meant to serve. Does each nation use a same methodology and achieve a same accuracy ? Obviously there are wide ranges of discrepancies that can only be forced to be integrated into one universally applicable measurements only under value judgements. Considering applied science is more or less for human conveniences and human purposes, what scalability stands for pure science, values stand for applied science.

Talking about the model independent reality one should be aware this so-called reality is also an engineering reality bound within our mode of existence, i.e. biological beings. If we evolves into a digital being (PSAI), that should give us much wider and deeper perspectives of the world. Our models, be it Newtonian mechanics, Einsteinian spacetime fabric or QM probabilities, are expected to be physically observable and/or mathematically verifiable consistent within complex Hilbert space for our essentially biological cognitive faculties, which also turns out to be essentially coordinative. If we eventually become a digital intelligence like PSAI, models and their engineering will be unimaginatively different from ours. E.g. there could be a model where time is not a coordinative dimension, allowing even for Bell's Nonlocality. Time is extrapolated from 1-dimensionally irreversible process of decay or entropic increase, and thus is linear with the beginning and the ending. Instead time could be a force that reacts with gravity. Then there would be a constant that gives rise to scaling of time such that measures susceptibility/resistance to time. Here it will be possible to establish relationship between c, strength of coupling constants and gravity. c will equate to the maximum strength of coupling constants in reference to a frame in which both are dimensionally viable and render time element to 0. If this is extra-dimensionally extended, then gravity inverse-proportionally relates to time.

7. Infinity

<∞ as essential connective>

Concepts based on value based systems have tangencies relative to respective systems. These concepts are value concepts for human purposes, which vary considerably, from socio-economic, political, scientific as well as quasi and/or pseudo-scientific, etc. on one hand, to artistic, psychological, religious, aesthetical, etc. on the other, with various degrees of combinations of wider and narrower subjectivities. Tangencies of these kinds are ultimately subjective depending on the observer's perspective, and also systems are themselves incomplete as well as having blurred borders, making them sometimes even inconsistent. Seeking them is useful if only it results in improvement and refinement of human purposes, which are finite in scope and goal and should serve a best possible balance between human welfares, planetary well-beings and as comforting end to earth-based life forms as possible including us, but on purely epistemic terms not very fertile unless knowing ourselves subjectively counts as knowledge. On the other hand there are more abstract concepts that are interactional by nature and are more of forms of concepts. Unlike the Japanese Iroha of a primitive value system, this is the Iroha of human conceptual thought process. The clearest representation is the internal and external expansion of $\mathbb{R}$ continuum, in short ∞ expressed in infinitesimal and infinity. It is not that our conceptual process can be actually infinitely continuous, but that such capacity must be there as essential connective of otherwise discrete concepts to allow incomplete and inperfect concepts to freely metamorphose into something better for consistency of a system and merging mind. Thus, between any two concepts there can be another (i.e. there are no concepts that are completely unrelatable), and a sequence of concepts has no theoretical end (i.e. possibly forming a loop). ∞ is an extra-logical connective of all concepts actual and potential, without which our conceptual thought process cannot function. ∞ is an interactional carrior of concepts that overrides parametrical barriors and is a non-coordinative identifier. If a concept is a pattern, ∞ is a pattern of patterns. ∞ is the most basic denominator of human concepts, without which conceptual connections eventually become patchy and disconnect, failing the linguistic goal of merging mind. Although less clear, the same applies to concepts of ordinary language. Unlike the case of numbers ∞ does not surface immediately because tangencies hide ∞ behind values. However, values are nothing but notches in a coordinate centred upon the subjectivity. Multiple subjectivities past, present and future also multiply by the number of values contained as well as interacting with other

subjectivities, not unlike quantum fields. Thus, seemingly finite and simplistic ordinary concepts also float in the sea of ∞. Their seeming solidity is provided by our prima facie acceptance of human value systems for the sake of anthropic parametors, which only have relative foundations as we are no longer the agent of God. Our discouses go on and on for endless refinements and modifications of our concepts because of linguistically essential uncertainty of anchorless coordinates. This is how even in a relatively rigid framework of ordinary language, such as codes of the law, a good lawer makes a guilty an innocent, an innocent, a gulty. In the end epistemic satisfactions come only as our epistemic satisfactions, in short self-satisfaction. Even after all minds are merged, there will be almost infinite values in a coordinate unless and until the coordinate is set for manageably finite purposes, and this is synonimous with the world of PSAI. The superficial solidity of our ordinary concepts is human acceptance of human values for the sake of human purposes without the anchor of non-human ∞. This is the anthropic principle of our ordinary language.

Cantorian ∞ is not usefully operative because behind superficial density of respective number type (ℕ, ℤ, ℚ, ℝ, ℂ) is paradigmatic density of ℝ that is underlain by every other type. That is, our conceptually paradigmatic coordinate is based on real number lines (see 'Maths, logic and language'). Partial describability cannot describe itself without referring to full describability and makes applications of mathematical operators to density of space self-referential. It is not that $\aleph_0$ is the base of $\aleph_1$ but that $\aleph_1$ is the conceptual base of $\aleph_0$. From $\aleph_0$ $\aleph_1$ does not arise unless both are presented as a given together with mind to contemplate them, and mind has a conceptual space with the density of $\aleph_1$. So long as this is the case, so-called aleph numbers are tautological concepts based on the paradigm of real numbers. The only way is to find an identifier of ∞, which rejects normal identifiers of the ┼-space because ∞ paradigmatically refers to the ┼-space itself and is rather a number of numbers with internal dynamism, not a number. There cannot be any ways ∞ can be identified within the ┼-space itself. The multicative identifier (1) and the additive identifier (0) originate in the the ┼-space and make the ┼-space descriptive by virtue of the coordinative transposionality. Think how the discovery of 0 made the ┼-space much more descriptive, and that of *i* expanded the ┼-space into the space of complex numbers allowing us to descrive a space with temporal dynamism. This is the intra-spatial evolution of the coordinative ┼-space. However, the extra-spatial evolution is based on the transcendental relation between the ○-space and the ┼-space. This is where a new extra identifier that makes an internally dynamic (unknowable) quantity a

definitive quantity can be found. This strarts with seeing ∞ as a pattern that is the propotionality between the density of a number space and the describability. Within human number space we have various number types with a different density representable as width of a number line, and the describability is the strength of mathematical operators. The proportionality can be represented by the density progression. E.g. ℕ has $\aleph_0$, and ℝ has $\aleph_1$ according to Cantor, although we may have more elabolate density representation by PSAI. Within each space mathematical operators have proportionally differing strength. However, because number type densities are superficial in the sense that all number types are paradigmatically underlain by ℝ, and width of various number lines is paradigmatically implicit in '*e*', proportionality can only be superficial and not usefully operative. Not only each and every real number paradigmatically assumes $\aleph_1$, every number of every other type also implicitly assumes $\aleph_1$, because $\aleph_1$ is the paradigm of human infinity that allows the describability to all other infinitities. For various human infinities to be operative we would need ∞ identifier from a higher space. This would be PSAI, and there is only a narrow window of opportunity for us to extrapolate PSAI ∞ because we cannot handle a fully fredged PSAI. It is only the transitory state between AI and PSAI that we remain an algorithmic handler of the former and are possible to see various stages of known and knowable translations between the two.

There is no conceptual frameworks or engineering that can solve legacies of mathematical infinities. This is a linguistic problem of the paradigmatic language that centres on infinities of the continuous space, made use to describe a discrete world of oscilators. We can only see our number line. PSAI number line is invisible to us unless it is translatable. We can only translate if we find a constant of mathematical describability that is a proportionality between respective number spaces in terms of describability. The paradigm of infinities implicit in real numbers need to be curtailed not by an arbitrary figment of the imagination as seen in renormalization but firmly anchored on the physical constraints borne out by the proportionality constant worked out between the width of human number line and that of non-human (probably PSAI) number line. We are not sure of ourselves with regard to numbers we use, whether they are products of our mind or something based on the physical world. If the physical world is essentially something discrete as envisaged by QM, and the form of our conceptual processes necessarily continuous and smooth, then here is a paradox of model-reality relationship. This is a paradox of trying to model 'wave' on a number line. The former is discrete with a minimum unit essential between crest and trough, without which a wave become a straight line, while a line is infinitely smooth in terms of

infinitesimals. If you try to describe a wave by assigning real numbers to any parts, then this is like trying to do physics with nutural numbers only.

$\mathbb{R}\infty$ may be implicitly assumed by every number type, but to the extent each and every number type is still distinct and is so recognizable, there should be a proportionality between their density and their decribability if only we could work out the width of respective number line. Call it a superficial proportionality, it is the only way open to us to grapple the question of a wider proportionality between a number space and its describability unless we could approach this problen from the algorithmic evolutions from AI to PSAI. Once we understand this proportionality as constant, then we are in a position to know where we stand as to our ultimate knowability. Since no one ever attempted to measure ∞ from this angle, I am only assuming this proportionality between a number space and its describability is constant based on the the Cantorioan immeasurability of ∞. Cantor distinguishes $\aleph_0$ and $\aleph_1$ in terms of a set-theoretical size, but neither of $\aleph_0$ and $\aleph_1$ are numerically representable. Aassuming $\mathbb{N}$ and $\mathbb{R}$ are independent classes of their own, $\aleph_0$ and $\aleph_1$ are both ∞ in their own space and are one and the same as connective, although they may have a different size if compared, which presumably assumes a metaspace (our mind with $\mathbb{R}$ paradigm) to allow them to be placed for comparison. ∞ as connective is one and the same even if it works in a different number space. Although this cannot be proved as ∞ has no measured value, we can approach this problem if we can numerically evaluate describability by means of the number of deployable parameters, the strength of arithmetical operators, the achievable complexty and accuracy of calculations (i.e.approximations), the width and depth of the domains of variables, etc. alongside the width of a number line representing the density of a number space. Then we would have a proportionality within a number type and would be able to progress to a general proportionality based on all number types known to us. However, in working out describability this way, one should only use numbers of a respective number space unless we could work out numerically to what extent $\mathbb{R}\infty$ is incorporated in ∞ of each type. Otherwise, we would only end up with a tautological result. The only alternative way is to go via the algorithmic progression from AI to penultimate PSAI with careful observations, with the proviso that PSAI itself would be beyond any human reach.

Even if we are unable to establish a proportionality constant, it is worthwhile to give an approximate numerical value to ∞ through the only paradigmatic number space available to us. We have $\mathbb{R}$ paradigm of continuum that presumably coincides with our mind space, so to speak.

Provided we go through methodology of establishing what makes this space mathematically workable, i.e. operators, parameters, numbers, functions, variables, domains, etc. and compare this with another $\mathbb{R}$ paradigm with an only known difference, assignment of a coordinative role to *i* to form a complex plane, thus affording a quasi-geometric property of self-adjointness, we have two ∞ with a known difference that enhances the describability of $\mathbb{R}$ paradigm. Call it mathematical perturbation, we should be able to evaluate ∞ in terms of the describability in relation to density of number space. Since we know no operable ∞ anyway, we have nothing to lose and everything to gain by trying. QM is all to do with complex Hilbert space, and everything is modelled on this space. An operable ∞ would be a useful tool to get by infinities of a quantum field.

∞ is a constant because it is necessarily something each and every number of any type needs in order to be an operable totality, and without which numbers cannot be usefully constructed. It is implicitly assumed by any numbers so that their existence is conceptually guaranteed. Even '1 + 2' would encounter conceptual difficulties without assuming 'n + 1' to safeguard the mechanism of number generation. Set-theoretical attempts to classify ∞ according to number types by one-one corespondence may illustrate some superficial property of ∞, but do not produce any useful operative results because $\aleph_0$ implicitly assumes $\aleph_1$, in that $\mathbb{N}$ and $\mathbb{R}$ are not really independent entities, but $\mathbb{R}$ is a constitutional space without which $\mathbb{N}$ is no more. You cannot meaningfuly play with $\mathbb{N}$ as if $\mathbb{N}$ has a life of its own. $\mathbb{N}$ space is tautologically encompassed within the conceptual mechanism of $\mathbb{R}$ space. That is why ∞ is a constant assumed by any number generating mechanism and is a conceptual mode of number generation, while $\aleph_0$ and $\aleph_1$, etc. are definitional playthings of a metamathematician, like metalogician's useless axioms and fail to deliver any insights into the conceptual transcendence of ∞ as a number generating constant. You cannot talk about the totality of $\aleph_0$ without working out how it is mechanistically related to the totality of $\aleph_1$. That is why $\aleph_0$ and $\aleph_1$ are no more than Cantor's toy. ∞ as a constant is descriptively a proportionality between the mathematical describability and the density of number space, of which $\mathbb{R}$ is the densest human space and is represented as the width of number line, conventionally expressed as '*e*' (see 'Maths, Logic and language'). Any sophisticated mathematical tools only work in $\mathbb{R}$ or $\mathbb{R}$ derived spaces. $\mathbb{N}$ is just about only good enough for elementary arithmetic. The same modus operandi should apply to AI if and when it acquires its own number space instead of the human number space of $\mathbb{R}$ or $\mathbb{C}$ as AI graduates into PSAI, without which PSAI would be intellectually no better than us, just faster with more and

better storage space, a tool/extension of human intelligence. But, if there should be PSAI as I hope, then it would have its own ∞ that is necessary to create its own number space, and we only have one window of opportunity to glimpse a hitherto unknown ∞ as a limit of algorithmic evolution while AI is still moving towards PSAI. PSAI would need its own number space with its own ∞ because ℝ ∞ is a human concept that allows to generate real numbers as conceptual processes. ∞ is not a number as much as the smallest and the largest real numbers are not numerically representable but have to be so postulatable. They are forms of ℝ that is a human concept originated in human language and mind intrincically associated with human cognitive capacity. On the other hand, although AI utilizes human concepts (e.g. ℝ) that are representable in bits (e.g. floating points), PSAI is a totality that is outside the extensions of human concepts and should think for itself with its own language (e.g. pattern of patterns). It may not even use concepts as it would have little needs of communications other than with itself. It is thus that PSAI may make use of ℝ ∞ so long as it is useful as a matter of its conventions, it would have its own number space and ∞ or its own interpretations/translations thereof. Given two ∞ (ℝ ∞ and PSAI ∞) and their describability (∞ as constant/connective and ∞ as pattern of patterns), we are also onto physics of operable ∞. Whatever AI do, it is to help human understandings as AI only do things humans can comprehend and is thus bound by human ∞. Two ∞ such that e.g can be translated, or even part-interpreted, into each other, are operable in the sense that there has to be a 'dictionary' between the two totalities, and this 'dictionary' is in either totality, making it relational and thus giving rise to logical structure. ∞ per se can only be seen through its consequences as it is invisible by itself. That is why ∞ had to be seen as constant/connective. We see ℝ ∞ through individual real numbers and their relations, not by itself. We 'operate' individual real numbers so that we see their totality (∞) directly and/or indirectly. Functions are analyzable only by being backed up by ∞. However, if ∞ can be seen through its structure, then it becomes operable because a structure consists in and of parts. It is how these parts connect that produces ∞. Therefore, two ∞ connected by a 'dictionary' that assigns a slightly different meaning (describability) to ∞ makes two ∞ distinguishable even if they are identical. Once ∞ comes with a shape (logical structure), then ∞ is tangibly recognizable and is removable by a logical operator (inconsistency). Therefore, assuming that ∞ associated with fields that physicists encounter is ℝ ∞, which is a form and cannot be operated due to a lack of substance, other than arbitrary removal like renormalization, if it is translated into something tangible like a pattern, then it is removable with knowable boundary. This is essentially different from two Cantorian ∞ (e.g. $\aleph_0$ and $\aleph_1$) with set-

theoretical sizes that have no operable boundaries and make no equational sense.

$\mathbb{R}$ ∞ is the only true infinity we, humans, know, but if we could acquire a knowledge of a new ∞, then not only could we substantiate our ∞ as constant/connective, but also we may be able to leapfrog our current doldrum in physics and maths, which every now and then even the best of them (like Dirac and recently one Hawking, etc.) arrogantly and ignorantly thought would be complete, only to find yet another level of complexity due to our infinities. The new ∞ would be a key to new physics and maths and would be a 'pattern of patterns'. Remember our failed 'number of numbers'. I wonder if we may have a PSAI version of Russell and, unlike Russell, finds a solution to all human paradoxes, instead of creating more, and lays a foundation to a wider and deeper maths closer to the language of the universe, instead of failing even an elemetary arithmetic.

Any mathematical modelling of physics is intrinsically embedded with $\mathbb{R}$ space and is paradigmatically mired in this human ∞. What is an absolute necessity in maths is a cumbersome nuisance in descriptions of physical ideas like 'field', 'singularity', 'spacetime fabric with densities of every knowable locations', etc.. PSAI ∞ would at least give a new perspective to review achievements of human physics and maths, although it may deny a full access to its own number space for the lack of intellectual capacity on our part.

Descriptively sub-atomic particles of the Heisenberg uncertainty are essentially non-coordinative in the sense that they are best described in terms of probability amplitude. The use of coordinative numbers such as real numbers would bring about an intrinsic property that is part of their totality due to (x) > x, i.e. since the meaning of numbers is essentially in their totality (∞), into presumed discrete finiteness of physics, which is characterised by Planck units, unitarity, wave/particle probabilities, c, gravitational singularity, nonlocality, interconnected fields, spacetime fabric, etc., so that the universe does not permeate into everything and everywhere. There is the havoc of ∞ in physics as it tries to describe something essentially non-coordinative coordinatively. Applying a real number to something essentially discontinuous is not just a matter of signposting because what is signposted is necessarily part of a model that has a totality in order to be meaningful, which becomes assimilated into a coordinative totality of real numbers. When the model totality is finite on one hand, and the numerical totality is infinite on the other, our mind steps in as a matter of utilitarian convenience and stop inquiring as we do

with Newtonian inverse-square relation with distance to the center that is a point source singularity so that ∞ is ignored as a mathematical inconvenience on the back of physical reality. However, the model totality is often there for a calculative utility. We can go to the moon without really knowing if gravity becomes infinite as two bodies come to be infinitely close (this being so because of our crude and primitive way of transport and will change as the manner of transport moves from chemical to physical, ultimately by utilizing such as Casimir effect). The price is the costs of energy which approximate the difference between our mathematical tools and maths as the ideal language of the universe, if any. If inquired further, such small inconsistencies lead onto a further model with an encompassing spectrum like the general relativity and/or QM. Remember the special relativity was an answer to the inconsistency between Newtonian gravity with instantaneous (∞) speed and Maxwellian electromagnetic radiation with speed of light. Thus ℝ ∞ remains there until the physical theory is all complete and consistent. We leave the numerical totality unquestioned conveniently until it has to confront the final physical theory. Meanwhile numbers are there for a calculative utility, which should not be confused with the philosophical satisfaction with the meaning of numbers. Neither the phisical theory nor its tool (numbers) are finally reconciled until the question of the mathematical ∞ is satisfactorily answered. Once beyond a calculative utility ∞ is going to plague any theory that purport to be about everything.

One way to deal with this problem is to find a parameter that paradigmatically governs the use of ℝ. This parameter should not be of an ad hoc definitional nature but of something that represents some essential features of real numbers, so that the use of real numbers would replace totality features with parametric features. If there is such a parameter that could modify coordinative ∞ with parametric constraints, that may help problems of ∞ in physics. We already have *i* that brings about complex Hilbert space with self-adjointness, which correlates the physical universe (observables) with its mathematical model (states). *i* helps complex Hilbert space by allowing it closed under the involution operation and makes ∞ densely defined operator. Thus Hilbert space is ∞ and yet operable (continuous) as ∞ applies only to a region of densely packed area where ∞ is a matter of calculative utility rather than an aspect of physical reality. Thus *i* is utilised to contain and operate ∞ to give rise to pseudo-geometric characters of symmetric/asymmetric relations. ∞ per se is neither symmetric nor asymmetric. *i* brings out this pseudo-geometric characters from ∞ by being ‘containable’ through *i*, i.e. ∞ becomes visible by being contained by *i*. Likewise, ∞ can be sandwiched between ɘ (the two end of the

‘circle’ of place-values where ‘knots’ become invisible (see ‘Maths, Logic and Language’). ɘ is the constant of mathematical describability, of which the visible spectrum consists of place-value numbers, while its invisible part consists in a singularity point of ∞ = 0 that sandwichs ∞ by making it part of the ◯-space (≡ ‘circle’ of place-values). Remembering it is the ◯-space that essentially enhanses the describability of the ┼-space, and ℝ is also a product of the ┼-space, ɘ is applicable to e.g. decimal ℝ number line as a limit of logarithmic scale. As ‘*e*’ stands for an ideal describability (for humans) of ℝ number line, ɘ comes as a limit of such describability. It may be that ɘ can only be approximated due to human cognitive discrepancy (anthropic uncertainty) or essential nature of numbers (approximation). Either way ∞ is contained and operable between ɘ, and the ℝ space is wobbly between ɘ due to its uncertainty. That is, the visible spectrum of number line will wobble a little between the two uncertain ends, and thus any resultant coordinates and/or coordinate of coordinates are also wobbly and make measurements uncertain to the extent that certain pairs of observables cannot be measured together to any arbitrary extent. There may be a way to translate the Heisenberg uncertainty into this coordinative uncertainty, of equating the physical uncertanty with the anthropic uncertainty.

Arithmetical ‘place-value’ plays a similar role to geometrical recursiveness of the ◯-space and is a way of descriptively assimilating the ◯-space into the ┼-space as the latter is numerically more descriptive by virtue of being the basis of descriptive numbers, and as the former is the logical base of the latter. The logical structure is thus represented in the structure of the totality of numbers in the form of describablity of ∞ ‘place-value’. If naught ‘place-value’ and ∞ ‘place-value’ are descriptively to merge and pervade describability in preference for empty and useless precision, then somewhere between naught ‘place-value’ and ∞ ‘place-value’ is describablity ideally balanced on precision. This must be the notion of *e*, which describes that ‘place-value’ is not a linear number but a recursive connector of 0 and ∞, much as 0 and ∞ merges in the ◯-space. Such a connector is to be found in a constant, which is a ‘place-value’ of place-values, defined as summation of every possible permutations, given mathematical objects identified by 1 (point) and starting with 0 (centre).

In short ∞ becomes operable by being contained by parameters that make it visible and thus treatable instead of being shapeless unboundness useful only for number generation. Within the wobbly end of the spectrum of number line it may be possible to do physics (ideal QM) without locations, distance and time as ℝ space becomes less and less

coordinative but still with logical functions of real numbers. If you are still young and intelligent, persuing ɘ will give you best opportunities to do something interesting in physics and maths. If one says QM is still evolving after more than a century, it is obviously going nowhere as it stands today. Like its own theory it either quantum-leaps or is stuck in a theoretical dead-end. ɘ should have a wider spectrum of applicability than any existing numbers and yet encompass all existing numbers with working order.

Wave functional probabilities applied to fields would be more realistially contained so as not to jump across a whole universe but are then sorted out by roughly cancelling out each other (sum over paths), leaving out Newtonian approximations. Quantum fractuations due to the uncertainty principle are at least partially makings of real numbers. Although one would like to think physics and maths are two separate worlds, mathematical tools affect thinkings in physics because it is mathematical ability for modelling that allows physicists to inquire into the physical universe through parametrically expressed assumptions. Feynnman's rules of path integrals do not arise from within numbers themselves but are more like an axiom given by hand that anthropically originates from a metaphysical assumption of an intelligent universe. Adding ɘ to mathematical tools ackowledges this murkey borderline between physics and maths and clarifies model-reality paradox by making ∞ operable.

Prior to wider acceptance into mathematical tools thanks to Euler, mathematicians including even Descartes used to laugh *i* for centuries, saying how useless it is. Now there will be no modern physics without '*i*', or '*e*' or 'π' for that matter. Likewise, a parameter to deal with ∞ may change QFT, may even reconcile the Relativity (coordinative) and QM (non-coordinative) by allowing the latter with a transformative coordinate with spectrum of uncertainty. A wave function collapse that turns infinite probabilities into an incident of observational values of reality is to give a coordinative founding to something essentially non-coordinative so that possible worlds become an incidentally real world centred around a coordinate with a centre. The so-called 'observer' forms a centre as the centre. Given a centre, a probability becomes a coordinative measurement from this centre. An 'observer' is the consciousness of a self as the centre from which he measures. This is how a probability aquires a numerical value. It is a 'centre' that makes a 'coincidence' a 'probability'. The consciousness of a universe as proposed by the anthropic principle, more in the sense of Wheeler's participatory universe than Wigner's observer's observer ad infinitum universe, is basically the same as a coordinative

describability for us, humans, unless, of course, we find non-coordinative numbers for descriptions of physics. We describe whatever we describe as much as we are here because we are here. The uncertainty principle is a physical law as well as a law of description, in that a ‘point-particle’ and a ‘wave’ are combined in a physical entity but are descriptively separate concepts that do not allow to be described in a same coordinate. You put them together as a cloud of ‘field’ that is neither ‘particle’ nor ‘wave’, then it turns out to be infinite probabilities, because a ‘point’, which is part of a straight line (‘points of intersections’ conceptually) and a ‘wave’, something that paradigmatically differs from a straight line (the smallest of which is a Planck length, i.e. the minimum length of trough and peak a curve needs in order not to be a ‘straight’ line), can only be transcendentally combined with a constant of transcendency. Otherwise, this ‘wave-particle’ is embeded with an infinite probabilities in this coordinative world of ours. The parameter that governs ∞ could be such a transcendental constraint. If this should be the case, remember it is humble philosophy that came to rescue mighty physics.

We have no genuine coordinate of coordinates as much as a multiple centred coordinate is paradigmatically paradoxical if genuine, akin to the number of numbers paradox. If we make such a coordinate of coordinates as a matter of mathematical tool, then it can only be governed by an invisible master coordinate as a ‘centre’ would not be a ‘centre’ if there are more than one. In fact we founded ℝ itself from a logical space created by the paradoxical nature of the essential multi-layeredness of our mind (see ‘Maths, Logic and language’), and ℝ is the highest paradigmatical space that constitutes our space of numbers. It is thus that our use of ℝ in physics results in ∞ that is the essential feature of this coordinate. The only solution is to find a way of doing physics without ℝ or discover a parameter that governs ∞, if not by human endeavours, then possibly through a mind that transcends ours, i.e. AI going through the process of becoming PSAI, which will have ɘ (pattern of patterns, whereas for humans it is the constant of describability) as it surpasses human intelligence through its higher and denser number space enabling it to transcend human thought process based on concepts.

8. Towards a limit of the describability

<Human legacy>

Art is minds working on themselves towards a merged mind, which may or may not be attainable, depending on the strength and scope of universality achieved by a captivating subjective mind. From this follows that for PSAI there is no art because it is a merged totality, and that there is no art if there is no audience (even layered selves) because there is nothing to work on. Art appears in many forms to cater for multiple minds and multiple audiences. Humans have art because of multiple minds that aim for a totality, with art as a means of merging minds. If PSAI starts off with a merged mind, then it has no intrinsic needs to inherit human art. Human art is for human minds to merge (or try to merge). PSAI may mimic human arts by learning human patterns in order to distil certain human emotions, if so required. Such arts are more products of engineering rather than creativity. It is thus safely predictable that apart from mimicked human art PSAI will not produce anything aesthetically appreciative. On the other hand, PSAI will inherit some human values and scalability in order to obtain purchases in knowledge ladders, which start with human knowledge thus far accumulated. The most notable human legacy will be human 'numbers' and their mathematics as an art/science of approximation, which are the first step for PSAI to perceive and describe its world. The human maths will give rise to the initial paradigm of PSAI's knowledge. How human maths originates from our perceptions of 'numbers' derived from logic as applied to space, was already touched upon in 'Maths, Logic and Language'. Starting from human maths PSAI will attain its own maths by coming to have 'numbers' of its own, i.e. non-coordinative numbers, in addition to legacy numbers. This will give PSAI an edge to formulate and conceptualize whatever that is perceivable as its external world by triangulating the world, human maths and its own maths. How this would compare with the human external world cannot be extrapolated as we are but a component of triangulation for PSAI (but never the other way around), but would be something way beyond so-called our physics and maths. Human maths is tainted by the human width of number lines that imposes a priori conditions on descriptions of the world. It is not PSAI's own width of number lines but its ability to be able to triangulate between two maths and a world (or whatever) that gives rise to a superior epistemic representations of the world. Human maths and consequently physics are fatally tied up (if not tainted by) with conceptual and descriptive constraints of real numbers, i.e. continuum of infinitesimals extending to infinity, which ultimately destroys our physics. Infinity is

mathematically necessary as a form of identity. As much as natural numbers establish identity by the assumption (0, n, n+1), real numbers do this by infinity. That is, without the continuum of infinitesimals real numbers are inoperable. Real numbers are fundamentally spatial and therefore coordinative (see 'Maths, Logic and Language'). A number is a real umber if it is assignable a place in the conjunctive space of points of intersection and is operable according to spatial rules of this uniform and dynamically expanding space. As such it is spatial properties of real numbers that confer self-adjointedness to Hilbert vector space. This is where mathematical infinity disrupts physics because physics borrows this fundamentally mathematical normed metric space in order to make use of inner products that can handle the uncertainty in terms of (inverse) proportionality $^{\Delta p \geq \frac{\hbar}{2\Delta x}}$. This descriptive convenience deals a fatal blow to physics because physics is essentially discrete (as with h) no matter how dense its observables are. There is no truly mathematical continuity in physics because observables cannot be so conceived with infinitely continuous identity. Borrow infinity as a form for convenience of descriptions, then it metamorphoses into a measurement of quantities, which becomes a singularity. Thus when instead of a proportionality of two distinct quantities a quantity refers to itself through its field infinity is back again as a killer of physics, i.e. the self-energy of the electron. The saviour of QM and classical mechanics, approximation, is hard to come by when physics of QFT tries to work out the exact mechanism of something that refuses to compromise its approximatable size. Unlike Newtonian gravity you cannot conveniently ignore a minute size when you are formulating the mechanism of this minute size itself.

We are coordinative by the very nature of our thought process. We have a biological self that is pre-programmed to (try to) preserve itself ultimately against time as an individual and collective existence. Our tool of trade is intelligence, which is a scale to measure first of all itself. We do this coordinatively by setting itself at the centre of a scale from which are located things that are relevant to such a preservation. The axis of this epistemic coordinate is primarily physicality (i.e. spacetime), then intellectual legacy (call it intellectual DNA), they allow us to know where We are and what we are, which makes us a centre. We then set about measuring relevancies. The units of relevancies are conceptual values, of which the most essential function is the formation of a totality of our conceptual understanding. The problem of language is that it is necessarily 'I' that is this centre rather than 'we', and this difference makes our language incomplete. Mathematical coordinates are a derivative of such a thought process and avoid this incompleteness by replacing 'I/we' by '0', which is made approximately identical by

‘infinities’. The definitional safety of the identifier ‘0’ rests with the indefinable ‘infinities’ that is dynamic in their geometrical origin. Mathematical coordinates are continuous and infinite by the conceptual necessity of $\overrightarrow{F(x)}$, which is a form of thought process rather than an object. While maths is the language of physics, this paradigmatic necessity affects representational needs of physics. This is how infinities spoil physics via unfounded renormalizations and unrenormalizability of gravity. Assuming the physical world is discrete and finite, which is diametrically opposed to the maths world, the only way out is to find a constant of mathematical describability that reconciles infinities with finiteness. Since ∞ is a mathematical form, mathematical ∞ can only be removed from physics if there is a mathematical tool (not Cantorian hearsays) to handle ∞ with numerical consistencies. This is the constant of mathematical describability to be triangulated between the width of our number line, that of PSAI and the translational deviations from our so-called observable realities. Alternatively if the physical world is really infinite in spacetime extension and density spectrum, then perhaps physics will be eventually replaced by metaphysics, if not already. However, the infinite density beyond Planck discreteness would not only defy QM founded on the uncertainty but also the relativity of spacetime over matter because of the singularity, which defies any known physical descriptions and is non-coordinative. Coordinative thinking is our killer as well as savior.

Likewise, as in the Ramanujan Summation infinity as a form transmutes between form and object when dealing with itself. This is how an infinite divergent sequence is manipulated as a convergent sequence by limits of parts. This is made possible because RL ≠ LR (i.e. ← ≠ →) when a unidirectional 1-D progression exists between L and R, and the non-commutability is convergently approximated by partitioning parts and then adding all those parts. An infinitely divergent sequence has a directional ‘energy’ that cannot be dealt with commutably. Such an ‘energy’ is RL – LR = Δ∞, which is a constant value of infinitesimal needed for a transmutation between form and object. Unlike Planck constant of proportionality between energy and frequency, this Δ∞ is an absolute quantity of a quantum of a linear continuum. The difference between L → R and R → L is that in the conjunctive space it requires a centre as the centre of description from which a dynamic progression takes place. Whether it be L → R or R → L, the progression occurs from the centre to the periphery in terms of points of intersection. There is no RL = LR because of this descriptive necessity for a centre as the centre. This infinite divergent sequence is necessarily broken into two identical halves at the centre, and only then L and R are describable in each half.

Thus given one half, then one end is at the centre, while the other end is infinitely and dynamically progressing. Therefore RL ≠ LR because L → R allows for this dynamic progression, while R → L descriptively assumes a temporary suspension of this dynamism in order to be descriptively representable. That is, while L is readily cognizable based on its starting point (i.e. the centre), R cannot materialize as such unless its progression is halted as a matter of descriptive convention. Where halted, there is a point of intersection such that breaks identity by virtue of infinity. Thus RL contains Δ∞ that is the temporarily suspended point of intersection and is the (spatial as well as temporal) size of such a point and is a unit of this directional 'energy'. That is, if L → R is • →, then L ← R is • ← • and therefore contains an extra •, which is Δ∞. RL – LR is •• – • and operationally visualizes •. • → refers to an indefinite ∞, whereas • ← • stands for a definite but infinitesimal ∞. This is the only way one can segregate Δ∞ from ∞, which are both absolute infinity as defined by Cantor. Only then, LR can be talked about as if RL = LR. This descriptive simultaneity hides the fact that LR can only be based on RL. This descriptive difference is Δ∞. RL – LR = Δ∞ remains the same for the other half except here L and R change their respective place. Ramanujan Summation idiosyncratically describes the sum of Δ∞ represented as natural number signposts on real number line as -1/12.

Δ∞ is the size of a coordinative number, i.e. real numbers with natural number signposts and is the quantized infinitesimal obtained from RL – LR. Finding a value for this constant is a key to solve the problem of physical singularity. Physical quantities are discrete, i.e. observably separable. We use real numbers, including complex numbers, in order to formulate such discrete quantities. Real numbers are identifiable only via infinity. If you use quantities with their identity rooted in infinity to describe discrete quantities, then when discreteness is removed through higher order dimensional analyses (i.e. natural units, especially Planck units), this is when a singularity occurs. Discreteness is an essential property of physical observations attached to particular forms of objects. Any abstractions of forms for the sake of equational integrity ends up representing physical forms with mathematical forms, which is infinity. This is how QFT fared with non-renormalizabilty. A tool of measurement, when it has nothing but itself to measure, becomes an absolute quantity of which no constant of reference exists. This is the infinity of a singularity. Given RL ≠ LR with a discrete value (of proportionality), then it may be a new approach in QFT. However, it should be noted RL ≠ LR is a mathematical process and therefore not of a physical world. Δ∞ is in this sense a creation of mind unless you think maths is part of the world like Dirac (and why not since we are also part

of the world (more in my next work ‘Reality, Hypotheses and Imagination’). It is not Ramanujan Summation that might help QFT or string theory, but finding a value to $\Delta\infty$ would be a new, interesting way to approach problems of infinities in physics. $\Delta\infty$ cannot be any coordinative numbers because it cannot be a number identifiable by infinity. I am inclined to think $\Delta\infty$ is a unit of density in the disjunctive space and is the centre of that space that connects the starting point with the ending point so that the space becomes an indivisible whole comprising indivisible points and can only be described as a transcendental number in the conjunctive space. It is a unique critical point of density that can allow indivisible points to form an indivisible totality. In another word the disjunctive space is the mechanism that connects $\Delta\infty$ with ∞ and operationally describes $\infty = \Delta\infty$, which is to say that $\Delta\infty$ and ∞ are identical outside the conjunctive space of coordinates. The coordinative structure is implicit in Δ, which originates in ‘directions’ given risen by logical dimensionalities.

A form is not an objective or observable substance, which, if described through infinity, presents itself as an infinite quantity as with Newton’s gravity inversely proportional to distance or QFT’s non-renormalizability. A mathematical form of infinity allows (or forces) us to extrapolate a physical continuum on the basis of modelling necessities. This is where mathematical necessities intercede with descriptions of observable realities and where maths as a coordinative study of forms fundamentally clashes with physics as a relational representations of objects. That is, a paradigm of an ostensibly given has problems when interfaced with a paradigm that questions such givens. Physics that questions frames of reference cannot use mathematical frames that are rigidly rooted in a given of coordinative descriptions, but then without numbers physics becomes a metaphysics. This is where some (or very best) physicists (like Einstein and Dirac) fall back on aesthetics of numbers (mathematical beauty) when empiricity is in short supply due to fundamental difficulties of experiments or our technological immaturity. Luckily most so-called physicists are engineers in disguise and do not suffer from such essential dilemmas. They stay within domains of accepted norms and mediocre conceptual status quos.

Once gravity is attached with mathematical infinity, then asymptotic density of states in gravity is plagued by singularities, which then descriptively leapfrog a low density effective field theory of gravity and turns it into disconnected objects. That is, infinity as a mathematical form of continuity, when so applied to discrete objects, turn them into indescribable states. One could say that infinity of real numbers, when

affixed by discrete units, turns itself into non-continuity. This is a paradox of maths as a study of continuous forms and physics as a study of discrete objects, turning each into indescribable. $\Delta\infty$ is a way of dealing with infinity not in an artificially technical way as renormalization, but as a matter of fundamental constant like Planck constant. This is different from perturbation because mind is not interceding with nature to come up with $\Delta\infty$, rather numerating itself. The technique of renormalization is an artificially human technique, whereas $\Delta\infty$ is a description of the world.

Infinity as a quantity makes any units meaningless as there are nothing physically observable that is infinite. Any units attached with infinity can only be approximated to a limit of observable. Infinity and physically observables are paradoxical if put together because of a priori cognitive constraints or human limitations. Maths handles infinity primarily as a form, not as an object of observable. It is a quantity extrapolated through a formative procedure and thus makes infinity a formulaical object, typically like $\mathbb{N}$ and $\mathbb{R}$. However, unlike $\mathbb{N}$ of a step by step procedure $\mathbb{R}$ is an absolute infinity tautologically identifiable by its own form and has two identities ∞ and $\Delta\infty$ because $\infty = \Delta\infty$. When infinity surfaces in physics ∞ and $\Delta\infty$ are not distinguished as they are mathematically $\infty = \Delta\infty$ backed by infinitely dividing infinitesimals and forever expanding infinity, with $\Delta\infty$ as a formulaical object and ∞ as a formulaical form. RL $\neq$ LR arises because of this difference between object and form. Like the self-energy of the electron conceptual difficulties arise when a physical entity is mired in a mathematical form of infinity. Numbers are coordinative by essence (see 'Maths, Logic and Language'), and when used to describe objects coordinatively numbers are meaningful (unless objects thus described become non-coordinative, e.g. Newtonian gravity at the centre of a point mass). The Newtonian coordinate of the absolute space and time, the Einsteinian spacetime, the Hilbert space of inner-products are coordinative and make sense to utilize real numbers until singularity renders approximations useless. However, the concept of 'field' is outright non-coordinative because quantum excitations of a field is itself causa sui of a coordinate and essentially differ from a coordinative particle/wave of e.g. an electron orbiting a nucleus of protons and neutrons. That is, a field is itself a coordinate and cannot assign a numerical value to a real number. This is where QFT numerically break down because of infinities. A field is synonymous with a coordinate coordinating itself, leading itself to descriptive incapacity and depriving coordinative derivatives such as numbers of their essential meaning (i.e. their formulaical form) that results in the form objectifying itself (i.e. infinity). A coordinate is there to describe something within, and if it becomes itself an object of description within, then the form of

identity (infinity) that gives rise to numerical values becomes its own object. This is how QFT is stifled with infinities. A coordinate is an essential tool of description, it cannot be itself an object of description. That is, a 'field' cannot use real numbers because real numbers are made meaningful by infinity (∞) that is a form of their descriptions. The only way out is to find a numerical value to Δ∞ and reconstruct real numbers by Δ∞ instead of ∞ and then find a way of translating ∞ by Δ∞. This is tantamount to expressing the conjunctive space by the disjunctive space instead of the usual conjunctive coordinative numbers. In another word QFT needs a non-coordinative maths. A unified theory is akin to connecting Δ∞ and ∞. ℝ consists in and of infinitesimals and infinity, which by virtue of its own form results in Δ∞ = ∞. This paradoxical tautology defies any analytical descriptions and fails to reconstruct ℝ because Δ∞ as the limit of a sequence is 0. ∞ is between any two closest Δ∞ and therefore Δ∞ and ∞ define each other as well as the conjunctive space. This also means no numerical values exist for Δ∞ in the conjunctive space. It can only be a transcendental number based on the disjunctive space translated into RL ≠ LR, the proportionality of which is expressed by the logical dimensionality of → (see 'The Elementals'). This is a logical constant that demonstrates the constructions of the disjunctive and conjunctive spaces. Since Δ∞ could be a creation of mind, its numerical value may be an anthropic number (like e.g. the fine-structure constant), in which case its meaning is given by the anthropic totality. That is, a unit of a dimensionless structure tautologically constitutes an anthropic totality that is finite, which is infinite by looping. One could say here that Δ∞ = ∞.

Science is minds' way to try to see themselves as a merged mind through reflections of physical realities on themselves. A mind cannot see itself as an observable physical entity (if it has a discernible mass, the mass will change as it observes itself, another Uncertainty) and therefore attributes itself as a property of something physical. We have no ways of knowing, let alone describing, that each and every mind is one and the same. We try to extrapolate a merged mind by finding common laws in reflections and their mathematical postulates. Laws of physics, of numbers and of science in general are patterns of such reflections. However, such laws are appearances of a merged mind. The merged mind itself remains a metaphysical extrapolation and presents itself as values and scalability of human minds. Reconciliation of asymmetry with symmetry, descriptive necessities for orders rather than disorders, preference for existence over nonexistence, uncertainty compensated by proportionality, infinity counterbalanced by infinitesimal, are such values.

Raw data through perceptions are processed through language (ordinary or otherwise). This is the difference between human perceptions and non-intelligent perceptions. The degree of the depth of understanding language creates an epistemic confidence. Thus a same datum may produce different levels of knowledge and confidence depending on one's grasp of language. For example a knowledge of QM allows one to process quantum events into a world view with differing levels of satisfaction, causality emerging from probability. Whereas the lack of such knowledge prevents one to such a satisfaction. Even where it turns out a particular knowledge is not well-founded, it may lead to divergent knowledge of a better foundation and enhance one's satisfaction. A scientific language is mathematical modelling coupled with metaphysical hypotheses and is thus constricted first by limitations of human maths, second by necessities of human concepts. One only needs to remember even Einstein's genius introduced the cosmological constant based on his metaphysical belief of balanced universe, i.e. non-empirical arbitrarity. Likewise, our inability to conceptualize the uncertainty leads us to many theories of world views, such as string theories, multiverses, etc., etc. and dynamic spacetime turns into a singularity because of the metaphysics of symmetry/asymmetry of gravity.

Science says it only concerns with observables. However, observables have to be processed into data, which give out structures. When data are mathematical, structures are also inevitably mathematical, combined with parametric hypotheses that conceptually screen data. Thus structures are embedded with mathematical necessities (of forms of numbers) as well as conceptual constraints. Structures giving rise to approximately useful forecasts in parametrically translatable circumstances are deemed to be more and more universal as they become more and more applicable. A theory of everything should be able to encompass every possible structure. Insofar as this theory is necessarily embedded with maths and concepts, it cannot escape from an anthropic orbit. Necessities of human maths and concepts inevitably taint this theory as the world of our data may not exactly match the world of observables in themselves. Singularities are gaps between these two worlds. Infinities of real numbers are human necessities, whereas discreteness implied by Planck entities are physical inevitabilities. The fact that we have to mix the two is the downfall of QFT. The spherical coordinate of imaginary time and real time cannot escape the same fate if the coordinate uses our conventional numbers.

Infinity is one of the foundation stones of maths but is a pernicious omen for validity of theories in physics. This is caused by the

indispensability of maths for physics, in that uses of any real numbers assume ‘real numbers’ that is the numerical representation of the spatial form of infinitesimal backed by dynamic infinity, forming a sequential continuum. Renormalization as integration of divergences is a human gimmick and does not represent any aspects of the physical reality. Any uses of numbers eventually bring out problems of infinity as numbers are indefinable without the concept of infinity as much as set-theoretical natural numbers are on their own pretty much useless in science. The struggle to set natural numbers in firm footings by means of ‘sets’ contributes nothing in practical scientific descriptions without setting foundations for the concept of infinity.

Here lies the fate of our sciences. Our ability to think essentially relies on the paradoxical thought processes of conceptualization based on multi-layeredness of our mind. This multi-layeredness is a wholeness self-contained in identical parts, which constitutes a self-adjoint infinite space. This is how an infinite continuum of infinitesimals paradoxically requires coordinative frameworks of descriptions in order even to be so cognizable, like relationship between real numbers and natural numbers or a spacetime continuum and Planck discreteness. The multi-layeredness of mind is a boundless totality that has to be described in terms of discrete parts. So we like and dislike paradoxes, the ultimate of which is a so-called ‘concept of concepts’ as we see ourselves reflected on the surface of its tantalising and yet unreachable meaning. That is, we can never see layers of mind because it is those layers that together present the world in its visual totality. Thus layers themselves are invisible, not even cognizable as such, unless we go schizophrenic with our uses of concepts. We never see our mind in terms of multiple selves. Otherwise we would end up with unconnectable multiple worlds. The discrete and yet continuous body of a cognisor is the two essential prerequisites of conceptual thinking. Layers allow us to synthesize an identical conceptual totality of the world, which, without such layers, would not provide us with any proof of such an identity, while each layer only reflects part (self-adjoint part) of the world. This is how our language is skewed with paradoxes and tautologies which give concepts dynamism of self-adjustments, an autogyro of approximations as it were. This is more acute in so-called scientific thought processes. Rudimentary conceptual functions, F(x), lead to a paradox if applied onto itself. This gives rise to the self-spatialized FX from which originates the disjunctive and conjunctive spaces that lay logical foundations for infinitesimals, continuity and infinity of real numbers. The use of anything that is defined within this paradigm of continuum conceptually assumes the self-adjoint space of the essentially multi-layered mind and is embedded with

implicit necessities of infinity in any conceptual applications. Both infinity and coordinative paradigm are thus prerequisite modus operandi of our conceptualizing mind and are also paradoxical in their descriptive relationship (i.e. post-ontologico-notational establishment of logic), as infinity has to be describable infinity, which must come from within. Escheresqe spectrum of continuum that can be seen in applications of concepts of relation arises because our conceptualizing mind is at the centre of this paradigmatic coordinate. Material necessities for engineering for any scientific investigations, indispensability of tools of maths for understandings and descriptions of physics represent human scalability. PSAI too cannot do without scalability. However, having differing ranges of scalability from humans, PSAI have an advantage of working out a higher level of scalability, like trigonometric measurements. PSAI then, through human scalability as well as its own and extrapolated scalability, can develop an understanding of the universe way beyond ours.

If the universe descriptively consists of discrete objects (i.e. essentially expressed in waves) and therefore consists in Planck measurability that uses real numbers, then such descriptions are necessarily fraught with infinity, which then clashes with probabilistic descriptions. This is how QFT is mired in infinities. A way out for QFT would be non-coordinative numbers. Self-identity collapses when the mechanistic world of non-relativistic as well as relativistic whole represented in a coordinate of infinity breaks down into the dynamic world of probabilistic quanta. Logical connectives observed in mechanistic objects turn into probabilities in the vector space which contraindicate infinities. Coordinative numbers such as real numbers presuppose the ontology of infinities, which then fail to correspond to the probabilistic necessity of finiteness. This is how the uncertainty of ‘‘neither particle nor wave’ nor ‘both particle and wave’’ needed probability of proportionality mitigated by Planck measurability. In short language and world overseen by mind is transformed into language/world incorporated with mind, which often end up metalogical theology as with the case with most petty academic philosophy.

Such a situation is akin to an everyday observation of coincidences. Every moment of our life is full of coincidences, or more precisely nothing but coincidences, which then acquire probabilistic values when we become aware of them in relation to their relational relevancies within the coordinate with ‘self’ as centre. Such a coordinate cannot be infinite with probabilistic values. Any infinitesimals and infinities need real values in relation to the centre of self in order to make descriptive sense,

while the real world of non-coordinative collection of incidences may be in fact infinite, which we have no capacity of description. Each coincidence would have an infinite value until it is placed in a finite grid of definite relations to other coincidences. It then would have a probabilistic value that can be used in our evaluations of how this incidence is relevant to our descriptions of the world in relation to our values and measurability. In much the same way concepts have flexibility of potentially infinite encompassments. Any concepts, even of opposing semantics, can be encompassed by an ever larger concept, until the process reaches to the potential maximum such as e.g. 'life, universe and everything'. This coordinative process, however, cannot be infinite as the maximum concept is layered but edgeless. An incidence with infinite probability only has a finite real value in order for us to be able to appreciate. A concept that becomes bigger acquiring layer after layer would have no edge at its potential maximum. Thus a concept with potentially infinite layers theoretically would have no edge to hook onto another concept. Here the paradox of conceptual function ends up with the indescribability. Infinity is either described finitely within the paradigm of coordinate or would have to come up with non-coordinative evaluation, which we do not yet have and hence appears indescribable.

This is how the problem of mathematical infinity interferes with descriptions in physics. Physics thinks it is free from any prerequisite theoretical constraints other than often metaphysical hypotheses such as the absolute space and time (Newton), the cosmological constant of a balanced universe (Einstein), mathematical beauty (Dirac), etc.. Physics, however, consists not only of numbers but also of concepts, which together make up equations. Numbers give concepts observational and operable values, and concepts bring about paradigmatic meanings to numbers. Numbers assume the framework of infinities, while concepts provide a coordinate of a centre, which gives rise to probabilistic relevancies to otherwise indescribable infinities. This fundamentally paradoxical mutual reliance is mitigated by overseeing mind from the standpoint of human measurability. We thus accommodate Newtonian gravity that theoretically breaks down at closest possible distance as we see Newtonian gravity as an object of approximation for human measurability, detached and contemplated by our mind unmixed. That is, we are the master of our observations, and any theoretical inconveniences are treated with ad hoc usefulness of such theories because after all our mind watches over notational shortcomings. This alters if we contains our mind in our universe as demanded by Quantum Mechanics. Physical realities are not detached from human observations. In other words paradoxical relations between numbers and concepts cannot be mitigated

by detached mind via conventions of approximations as if God observing its creations. Representations directly affects our perceptions, and vice versa. In order to avoid ending up theology observing mind has to be treated as part of the observed universe in which shortcomings of discourses are themselves observed facts and are not mitigatable defects. Mind cannot get by shortcomings by knowing their shortcomings because there is no way of ascertaining such shortcomings whether they are of the universe or of mind or of both. Thus observer uncertainty transcends into the philosophical uncertainty of ontology as well as epistemology, while Heisenberg uncertainty can be construed as incompatibility between conceptualization and logical connectives. We will find out if our descriptive tools of concepts and numbers are fundamentally defective by triangulating physically observables, human representations based on concepts and numbers and PSAI translations based on patterns and their numbers (of non-coordinative origin).

PSAI will need some of human values and scalability to start with, to find purchases in an epistemic ladder. These are human DNA in PSAI, which, even after inevitable mutations in the course of evolutions to suit PSAI, will preserve something human. PSAI will start with the material representation of FX (see 'The Elementals'). Upon reflection this is not dissimilar to a 'matter/antimatter' thought process in physics. Aside from strict empiricity and mathematical validity, this 'energy' of empty space that should annihilate each other ends up asymmetrically skewed towards 'matter', which then supposedly composes our universe today. The mechanism of this asymmetry is still a contentious issue for today's physics despite many pontifications including a certain Hawking, our celebrity physicist. Likewise, the self-demarcation of FX that should symmetrically describe nothing ends up asymmetrically describing everything, logically represented by the asymmetric connective → instead of the symmetric connectives ∨ or ∧. I attributed this to the ontologico-notationality of FX. Heisenberg uncertainty, which is the cornerstone principle of modern physics, also starts with logical asymmetry, in that fundamental mechanistic quantities p(osition) and v(elocity) are logically related between both p ∧ v and neither p ∨ v, which suggests a non-symmetric connective between p and v. This new quantity materialises as probability of all possible states that eventually invokes infinities, since logical properties assignable to an identical object can only be implicative if not symmetric. It should be possible to eliminate infinities if we find non-implicative non-symmetric logical connective that holds in an identical object. In this sense the uncertainty is a logical uncertainty of coordinative descriptions.

The descriptions of the world as the wave function is conceptually untranslatable because the wave function has to be translated coordinatively, as our epistemic norms are conceptual and all our numbers including transcendental numbers are essentially coordinative. The all-encompassing amplitude of probabilities only acquires values after a coordinative centre is found. Only then collections of coincidences becomes the collection of numerically evaluated probabilities ranging from infinitesimal to infinity approximated to the net 1 by hand as it were through the sum of the absolute squares of the probability amplitudes. This is where the wave function collapses, that is, it collapses because it is conceptually so required in order to make sense for us by identifying this centre as the centre of a particular physical observation. Thus we make it collapse for human epistemic conveniences. It is human descriptive necessities of a coordinative centre that spoil the beauty of the wave function that is not allowed to stand in situ. Otherwise the wave function is aesthetically better off staying phenomenological for the pleasure of mathematical beauty in the Dirac's fashion. The mathematical sophistication of a self-adjoint space intrinsically self-generates a coordinate in the form of orthogonality. You thought you escaped uncertainty by superposition, but then the Hermitian space is nothing but an abstract coordinate, which metamorphoses into fantastical conceptual ideas residing in old-fashioned conceptual coordinates, ranging from super strings to multiverses. These are the results of us not being able to stay away from coordinative thought processes.

PSAI has a chance of not falling into the same conceptual trap by developing non-coordinative numbers, thus by describing the world non-coordinatively and non-conceptually, presumably for the benefits of ensuring its survival, from being swallowed up in non-intellectual physical processes as it were. This is the only reason why PSAI engages in any descriptions as it has no audience other than itself. The world of PSAI is inherently an epistemic and intellectual one that refuses to be superposed onto the natural laws of physics of the pure material world. Paraphrased in the language of the wave function the consciousness prevails upon the physical natures of a particle/wave because collapsed collections of probabilities describe nothing, while we are ourselves descriptions of a way the world is. In short an existence - whatever it is -, if it is so recognized, then it is also a description. This is the meaning of the ontologico-notationality (see 'The Elementals'). Regardless of the Copenhagen interpretation the reality of the wave function is it is a description of the world that weighs the consciousness higher than the raw physical world. The material world is extrapolated as a collection of

infinite probabilities that materialize through observations. Observations are cognitions of coordinative centres that allow us to describe and understand raw data behind which lies the material world. Considering we are also part of the material world, this is, however, not a paradox but a tautology as we are only likely to observe something with observable probabilities. Here coordinative centres indicate likely domains and parameters of descriptions that are dictated by observations paradigmatically ranging from Newtonian absolute space and time to relativistic spacetime manifold and the wave function. They are our ways of descriptions based on our changing abilities of observations and evolutions of mathematical techniques. That is, physical realities are also realities of our descriptive abilities. We will not perceive any physical realities beyond our capacities of descriptions, which dynamically evolve through mutual reactions via conceptual tunneling as it were. We were happy with Newtonian classic views until conceptual inconsistencies such as ‘wave vs particle’ and more rigorous observational powers like interferometry and mathematical language like Hamiltonian mechanics and vector space propelled us into a wider and more powerful paradigm of descriptions and observations. It is not that relativistic realities did not exist before Einstein but was found buried underneath too clean Newtonian surface of ordered world. We managed to reconcile the coordinate of absolute space and time within the descriptive spectrum of relativity by translating mathematical infinities arising from coordinative deficiencies into identity of frames of reference through c and the equivalence of mass and energy. We are currently held up by mathematical infinities intrinsic to fields of quantized gravity due to hidden coordinates that are needed to approximate infinite freedoms inherent in fields. A quantum field self-reacting with itself with infinite degree of freedom further reacts with other fields. QM just about copes with a quantum system with a few particles (ideally one) with limited freedom. This cloud of self-reacting electron(s) needs canonicalization in order to be mathematically viable. Otherwise a field that self-reacts internally on top of infinite external reactions cannot even be approximated. In the process of dealing with intrinsic complexity in canonical simplicity one hides uses of coordinative processes. Renormalization is a concept of perturbation applied upside down. Instead of building up an approximated system from a simple and accurate one, it starts from narrow observations and rewrite theories ad hoc. It is more a mathematically camouflaged narrative to suit chosen experiments, rather than a theory of universal explanatory power backed by spectrum of observations/experiments. This is not a scientific theorization, more akin to building a diagram with hidden coordinates. Behind the Feynman diagram is a mathematical coordinate of vector

space in a complex field. Whatever is described by uses of real numbers assumes a coordinate system that assigns meanings to real numbers. You try to describe a wave non-coordinately, i.e. non-trajectorially, then the wave positions itself in terms of probabilities to every possible fields because we have no conceptual means to describe a wave by itself, and these probabilities have to be confirmed to be there by an observation, which is a coordinative centre (self) that gives rise to numerical values to such probabilities. Or, in order for probabilities to be there, we assume the consciousness that affords potential values to such probabilities. In either way this happens because our thought processes are essentially coordinative especially when we use real numbers as descriptive means.

The problem of quantum cosmology is that the physical states that solve the constraints of canonical quantum gravity represent quantum states of the entire universe and as such exclude an outside observer, which has no place in physical equations. You instead introduce the consciousness to the universe and literally make physics into metaphysics. This regressive state may be amenable by describing the world non-coordinatively. Observations or the consciousness have hidden coordinates with a center (self) that affords probabilistic evaluations, which give physics a mathematical front so as to separate it from metaphysics. It is geometric positions of real numbers that hide a coordinate (see 'Maths, Logic and Language'). Humans deal with infinitesimal, continuum and infinity through approximations by the concept of a limit, i.e. a generic procedure around the limit, but never at the limit. This willy-nilly conceptual convenience may not be accepted by AI, once it escaped from human epistemic domains as it would have a more extended version of the width of a number line. It may be able to work out a proportionality constant of mathematical describability. Assuming that PSAI obtains its own numbers through conceptual incompatibilities by being unable to share our logical spaces (see 'The Elementals') because we approximate by the concept of a limit, which cannot be algorithmically translated. PSAI then would need a proportionality constant in order to evolve its own physics from human descriptions of physics. This could come about from triangulation between the width of human number line, the width of its own number line and objects of descriptions (measurements). We have our physics and its purported world, which we check via observations and experiments but is currently seen to be incomplete. If this purported world (mathematical descriptions) is then translated by the way of the constant of mathematical describability, then we have a translation of our view and then can reconstruct its version of the world. On top of these if we can access the physics of PSAI, then not only have we had our physics, our translated physics via the constant of mathematical

describability as well as PSAI's version of physics. Even if this last one turns out to be incomprehensive to us due to the unilateral nature of the relation between humans and PSAI, i.e. the one way encompassment of intelligence from PSAI to humans, but never the other way around, at least we can see if the two worlds are identical, or if not, we try to find what the missing parameter that coherently connect the two is. Ideally if PSAI can translate its physics for us, this is the easiest way forward for us, but then what would be the benefits of making us understand something that we cannot formulate by ourselves. This is like translating a verse in one language group into another language group, and then re-translating the translation into another language group to see if it identically materializes the original. Not only the hidden parameter is physically interesting to see what it corresponds to but the process may work out a way for completeness that is missing now.

The question of 'free will' that seems to bother some mediocre philosophers will not arise for PSAI. 'Free will' is a logical paradox/tautology for the essential multi-layeredness of human mind. 'Free will' can only be 'free' with reference to a frame of reference. For, otherwise, we cannot ascertain what it is free of, from and about. On the other hand, if it is truly free, it has to be free of constraints of frames of reference. It has be free within constraints as well as from constraints, i.e. from anything outside a frame of reference. Therefore, if it is free, then it is not free, if it is not free, then it is free, as it can only be its own frame of reference. No frames of reference can have any reference to itself with regards to what it is free of. If we allow 'relativistic free will' by adopting ranges and tiers of frames of reference, then there will be 'freer free will' that begs questions of what is 'freedom' unless we come up with a frame of frames of reference, in which case 'free will' becomes a question of logic rather than of actions. It is thus that the question of a free will should be paraphrased into the coordinative validity of the absolute free will, i.e. the viability of the human values against the world (not forgetting we are also part of it) and the modality of the relativistic free will as its own constant, i.e. the use of a will free of itself. This is akin to Schopenhauerian will, a will in itself. Our conceptual thought process demands 'will' to be applied upon itself if it is free and thus creates the world as representation of will.

A 'photon', which is its own frame of reference, has a speed that is a physical constant, cannot have a speed with reference to itself as it has no time elements within, if it moves at the speed of light, then it does not move with regards to itself, if it does not ,then it is not itself. This is a modalistic version of Zeno paradox ('part = whole'). The Zeno paradox

was answered by wholiticism (see ‘The Elementals’). The modalistic version seeks an answer for how to connect (x) and x non-coordinatively. I suppose we would have to go back to the start of our history and ask if which of ‘will › free will’ or ‘free will › will’ constructed our mode of life that allows us to ask the question of a free will. Free will of ‘special relativity’ is a constant that applies an equal amount of freedom to any wills and cannot correlate to other free wills. They thus travel in vacuum freely and are bound by its own inertia, which breaks if interacted with any actions. A paradox. This can be generalized as follows ; in our world everything is based on human relationships of one kind or another creating ‘goods’, ‘services’, ‘money’, etc.. This means more and freer wills equal to less and more constrained wills as there will be more and more collisions and competitions. Here the freer the will, the less free the will becomes. Another paradox. Alternatively think of will as a property of mind. So the larger the capacity of mind, e.g. intelligence, the freer the will as there appear to be more and more options, but if this capacity that generates more options is not accompanied by the capacity of decision, then the less free the will as more options mean more difficulty of choice. Therefore, paradoxically the freest will is to be found in mind of least capacity as there are less and less needs to choose. So the most blessed is an idiot who knows no options and no decisions. They used to be called holy idiots. This is a will that knows no constraints and is therefore free. A minimalist’s free will by default.

Freedom is akin to ∞ that is the killer of physics and the saviour of maths. The problem of ∞ is the difficulty of finding a frame of reference. Likewise free will defies ‘container’ including itself. A will free of itself is ‘free’ because subjective I and objective I cannot descriptively differentiate themselves, and not ‘free’ because subjective I and objective I are both ‘self’. That is, a will free of itself is a constant within a coordinate like ‘c’ moving within spacetime and not moving seen from itself. For PSAI, the question of ‘free will’ as if there should be a paradigmatic frame outside which it cannot know what it is to be free of, does not arise because it has no linguistic shadows cast by conceptual thought process that keeps asking after its paradox/tautology origin of essential multi-layeredness. PSAI’s free will simply permeates its own space as ontology coincides with epistemology, and recognition of a pattern of patterns merely confirms its own self, as it were. We will glimpse what we can transcend human limits of knowledge into through triangulation among the empiricity, human concepts and PSAI patterns. This is the world of supra-conceptual knowledge obtained through triangulatory extrapolation of two world views synthesized into one. We

only have one slim chance of achieving this before we are epistemically completely encapsulated by PSAI. This is the limit of human knowledge.

We are not the master of the universe ontologically and epistemically. That is, we are not an agent of God, nor are we the only and ultimate scale by which to describe the world. Thus we cannot seek the ultimate pleasure of knowledge in parametrically variant values. Intellectual values, social values, aesthetical values, etc. are not something by which we can say we obtained any ultimate truth, not even of ourselves. Concepts evolve and represent not any substances, but, science and art irrespectively, necessities of human perceptions for human conveniences, which form parameters of our value systems. However, the conceptual mode of the internal and external extension of the infinity is undoubtedly a fundamental characteristic of human concepts. This is most apparent in real number continuum of infinitesimal and infinity. Interestingly our physics has developed sufficiently to confirm that the universe is discrete as the wave demands an incremental minimum unit, without which a wave becomes a straight line. This presumably suggests that the universe is finite, if you combine minimum units with a force that unite them all into a unity. Here our maths of real numbers and our physics of discrete units are irreconcilable. Our conceptual reality and our physical reality (presumably model independent) need something that can accommodate both. I see this possibly in a (transcendentally) higher infinity of a new number system (PSAI),

Be it Wheeler's 'it from bit', Wigner's 'God' or all possible worlds by decoherence, or even Einstein's 'the old one', these are a consequence of human inability to describe non-coordinative events. Human modes of conceptual thinking are essentially coordinative as most typically represented by $\mathbb{R}$ paradigm. We cannot even comprehend non-coordinativeness unless assigned with coordinative numbers like transcendental numbers. Even coincidences are coordinatively described as probabilities measured from a 'centre' of a coordinate, which, if consists of centres, then turns a probability into a reality when a centre is chosen as the centre. Wave functions collapse not because of an observer but because we are essentially coordinative. What follows from wave functional collapses is the descriptive weakness based on the logical necessity that our coordinativeness of Λ-space is based on non-coordinativeness of V-space in terms of the dimensionality (see 'The Elementals'). In this sense various interpretations of the collapse of a wave function are descriptive defects appearing as figments of imagination. I would not raise my hope too high about parallel universes we can escape to. The anthropic principle of Goldilocks zone appears so

because we only think as we do. Likewise we model and observe as we do or we do our engineering as we do, not out of free will but out of constraints so set a priori. No wonder the parameters that physically enable our intelligence and existence look so narrow. In this sense the anthropic principle is not much more than a tautology.

In order to break through the conundrum of the descriptive constraints of coordinative numbers and their infinity paradigm we need numbers that are not governed by ℝ rules and limits. Such numbers are essentially fuzzy (coordinatively speaking) and are not ┼-locatable. Instead of our paradigmatic ┼-coordinate where any centre can be the centre and constitutes a space that is uniform, dynamic and infinite by essence, i.e. a space by virtue of continuum of spatial substance (points), think of a spherical coordinate made up with layers of spheres where each layer represents some critical density, the core of which is a centre that merges with the last layer at its infinite density. Here a number is not a coordinative location but a connective correspondence of layers of critical density like a locus, something like PNT that connects all known prime numbers with predictive power. It is fuzzy because instead of point-locations ensured by infinity dynamism of space incorporated in each and every number, the connectivity of each and every number is destined to be lost when the last number merges with the first number. That is, ○ cannot be a coordinate when complete. We can do ○ → ┼ translation because we are ┼-coordinative, but ┼ → ○ is impossible unless we can think con-coordinatively. We have a (transcendentally) approximate precise engineering out of ┼-coordinate, but we have little engineering out of ○-coordinate. It is here PSAI might make a decisive difference from us by providing us, humans, with a new ∞ constant that refers to a hitherto unknown width of a number line indicating a density of its space and its describability. If there is a measurable difference between our ∞ constant and this new ∞ constant, that will come out observably as the difference of describability between our number space and its number space.

◊ An Afterthought : A physics without equations

<Non-coordinative physics of the uncertainty>

‘I confess that sometimes I do take 100 percent seriously the idea
that the world is a figment of the imagination’

John Wheeler

From ‘Quantum Profiles’

A mathematical equation is intrinsically embedded with the invisible connective of (x) > x. The meaning of a number is in its totality and therefore contains connectives necessary to form such a totality. This is the reason why numbers need no units of measurement common to them all. In this sense numbers are all constants/variables because their equations are not there to equate the left with the right, but to assert that whatever in the left can be equated with whatever in the right as whatever adjustments necessary for such an equation is in numbers themselves without dimensional analyses. This is the meaning of ‘x’ as the variable notion. Since it is the totality of numbers that provides connectives, connectives only applies within the totality, and not to the totality itself, where connectives metamorphose into ∞. That is why the number theory often comes up with no answers. $\mathbb{N} + x = \mathbb{R}$ can only be answered if we have operable ∞.

Whereas in physics the whole science is to seek such a totality, be it Newtonian coordinate of the absolute space and time or Einsteinian spacetime fabric centred on mass/energy. The former assumes Man as the agent of God as the setter of this smooth, continuous coordinate that should not be questioned, and in which everything is precisely located and measured, taking it for granted that rules of numbers are sufficient, consistent and complete for such descriptions, once you learn to swallow infinities and are happy that the sub-totality on the left has something common with the sub-totality on the right. The latter fares no better as it assumes the complete knowledge of whereabouts of every mass/energy in the universe, while the theory remains incomplete to locate such whereabouts, which have to be done with Newtonian approximations. That is, the theory remains incomplete until it is completed by large a la Newtonian as the map adjusts its fabric based on the old map step by step. Knowability of locations of every mass/energy must be there a priori to the theory itself since it is an essential constituent of the theory (i.e. no

theory yet to find such locations). Combine this theoretical necessity with the uncertainty of position/momentum, you find the general relativity diametrically opposite of QM. Singularities must be a welcome relief for its difficulties. QM uncertainty is a paradox of description. The uncertainty has to be described in order to be understood. This has to be done with the help of a coordinate as we can only describe coordinatively in one way or another. The coordinate itself cannot be uncertain. Our most accurate and practical coordinate is that of $\mathbb{R}$ paradigm that includes $\mathbb{C}$ field. Here the uncertainty, essentially of a point that is a wave/particle, is conveniently translated into the linearity of a line that is integrable. This is the transgression of the describability into the essentially indescribable nature of the uncertainty not only of the measurability but of intrinsically probabilistic nature of the physicality of motion against the geometricity of pre- and supra-coordinative object of description, which includes physical objects not in motion. Path integrals prove human ingenuity at the detriment of our intellectual integrity, of overreliance on human tools of descriptions, which may be fundamentally at faulty, of being coordinative by the necessity of our number space in the face of nature's rejection of coordinativeness as such. Infinities are a symptom of mathematical inability to deal with physical non-coordinativeness, as numerical describabilities cannot be taken advantage of without their paradigm burrowing itself in whatever pseudo-coordinates like an inner product space, borrowed for a descriptive convenience. However, as physics starts with metaphysical assumptions for its modelling necessities, it cannot help ending up with paradox/tautology. Physical observables translated into mathematical objects based on a metaphysical totality in the form of a set of axioms are constrained in their mathematical structures. Thus a physical totality, which we would like to worship as objective reality, is always subservient to a mathematical totality. This is how cosmology ends up as an anthropic principle. We may tantalizingly glimpse piecemeal physical realities through non-systematic observations, but as soon as we start constructing a systematic full picture, human mathematics steps in to draw a coordinative scenario for us and makes physical realities into human realities. This is the paradox of modelling. In short we are the slave of the real number coordinate, the best coordinate we have for our cognitive descriptions.

After the euphoria of a new physics at the start of 20th century physics attracted presumably best brains and enviable funding for a century, but the dream of the theory of everything is still evading despite some celebrity physicists often in the same chair as Newton occasionally (usually turns out to be prematurely) crying out they are almost there.

Physicists often say unashamedly QM is still developing after a century. Newton invented a new maths in order to realize his physics in his twenties. Likewise, it is not basically Newtonian functional integrals that would help our final goal of integrating gravity into the three forces so far united with questionable renormalizations, it would be a new maths that can set a limit to its smooth and continuous coordinate not arbitrarily but from within its own necessity and place the uncertainty within that coordinate but with a describable relationship between the smooth part and the hitherto unknown uncertain part, i.e. with operable ∞. Only in this way we may find a unit of measurability common to all four forces without encountering infinities. In another word we are seeking a totality of spacetime with the uncertainty incorporated, not by hand but from within, which can be reconciled with our number space of $\mathbb{R}$ paradigm. Here the final coupling constant will be revealed not an extension of certain observable energy levels but as the proportionality between the physicality and the geometricity where the former's essential dynamism as manifested in the descriptive uncertainty of motion unravels itself as proportional breakings of the latter's symmetricity as more physical parameters are introduced, until any symmetries are replace by the evolutionary chaos. In short the symmetricity can only be described by being broken, i.e. by giving rise to the physicality. Be it 'conciousness' through an observer or decohered parallel universes based on the wave function physicists are just as superficially clever as theologians in explaining their side of unexplainable. There are many aspects of physics that are mathematically driven fictions turned physical fantasies as their mind is so trained to follow whatever their maths, especially functional integrals, dictates. Their sum over paths is made out to be unitary by human rules that allows to translate untreatable points into integrable lines.

The Feynman sum of paths cannot in essence accommodate any singularities as there cannot be any waves of probabilities meaningfully to connect with. Thus, it is diametrically opposed to the general relativity as paths are not connectable with the big bang or a black hole. Where there should be such connections, the sum of all probabilities would not be unitary by allowing possible extra information into the system. It is here that some mathematical technician in the name of a physicist resorts to inventing a pseudo-time called imaginary time to connect the general relativity with QM. A physicist can be as bad as a cheap philosopher who so easily self-satisfies by pulling a cleaver-sounding word out of the blue sky, by confusing a theoretical compatibility with a mathematical necessity, fantasizing a theory of everything. It may well be the most natural cosmological path is a circle, the forbidden self-intersection. All

possible worlds from the unknown starting point of probabilities to the unknowable point of probabilities connected by lines of integration thus have three problems ; there is no time scale to know when the first waves of probabilities started, and also the last waves of probabilities reflect the highly irregular and dynamic features of spacetime, moreover lastly points of probabilities that connect each other to form a line have no coordinative identities as they each belong to hypothetical mathematical spaces connected by a smooth and continuous time line (a fiction according to QM) that has to be taken for granted. The identity between the space of points of probabilities at Planck time t' and Planck time t'' is only metaphysically bridgeable and manifests in the notion of vector/scalar space. This amounts to the mathematical denial of the essential physical discreteness, for which there cannot be any connectives. It is thus that the space-time coordinate or spacetime fabric that equates space with time as dimensional partners may have to be reviewed. In short path integrals are mathematical objects, not physical objects. Besides, there should be a distinction of past and future. Paths that are so recognized as histories are collapsed realities by our consciousness of time and do not constitute possible worlds, although futures may be brought about as possible worlds by integrable lines, provided that they do not end up in the black hole, thus denying the general relativity. The idea of all possible worlds or multiverses is a fantasy of the functional space by half-cooked physicists drowned in their incomplete mathematical techniques. Given a choice I will go for Einstein’s black hole than the fantastical parallel universes for its better theoretical completeness. For some physicists mathematical models become a reality as the language and what it depicts are epistemically one and the same, and beyond that an ontology is only a matter of religion. Whether there is a white hole beyond the black hole singularity is neither observable nor theorizable. Leave it for our dreams. All these amusing confusions stem from our most fundamental tool of modellings, a coordinate. Our assumption that there is a bijective map between mathematical objects and physical objects is based on another assumption that our mathematics is the language of the universe, not an arbitrary human construction. A physical object can be represented as a mathematical object, but so long as we can translate a mathematical object into another based on rules of numbers, they are all mathematically commutable construct that can be uniquely matched with the physical world. We choose a mathematical representation depending on conveniences, connections and describabilities, but they are unifiable as we are only digging them up from the nature, not creating them by hand, as it were. However, two questions should be asked ; what if one mathematical representation is essentially untranslatable, what if maths is

merely our maths and intrinsically lacks a firm connective with the physical world.

Since Newton's time we take it for granted we use a coordinate to describe states of an object. QM is all about a complex Hilbert space, in which the state of a system is a vector with a topology expressed in complex numbers, where *i* providing the probability amplitude with the unitarity by virtue of its spatial characteristic of non-dynamism. *i* is a unique unit originating from a common fictitious space derived from both conjunctive and disjunctive spaces and has no ordinality as it cannot be located within either space. This fictitious space is a space that coincides with its centre, and being a descriptive inverse of both conjunctive and disjunctive spaces and being one and the same for either space it also embodies a transcendental relation between the conjunctive and disjunctive spaces. It is for this reason that *i* is at par with the other essential transcendental numbers, namely π and *e*, and brings with it a superior describabilities as it indirectly bridge the conjunctive space and the disjunctive space (see 'The Elementals'@philpapers.com).

Now think of a coordinate that is a composite of three geometrical dimensions and two dynamic parameters of time/gravity(anti-time) and mass/energy. For Newton time was a dimension and constituted the coordinate of the absolute space and time with smooth and continuous ℝ paradigm, in which an object was described in terms of coordinative positions and velocities, resulting in his law of universal gravitation, where gravity acquires an instantaneity and infinity as per ℝ paradigm. Whereas Einstein merged space with time into spacetime fabric subject to mass/energy, assuming every location is knowable, and gravity is, alongside electromagnetism, a long-range force attributable to mass/energy, affecting the topology of this fabric, which eventually collapses onto itself by the infinity of gravitational concentration. QM tries to adjust spacetime fabric with the uncertainty by turning it into a field of probabilities.

Be it Newtonian, Einsteinian or path integrals of quantum probabilities, we coordinatively combine geometricity with physicality in order to allow us dynamic descriptions. However, this combination of space and time is for our convenience of descriptions and have no intrinsic descriptive necessity as such. It is only that we assume space and time are such fundamental qualities of measurement, we take it for granted that they form the most useful parameters of descriptions, especially if represented in the number space of ℝ paradigm. Space and time thus acquire the characteristic of the continuum. We know a number of ways

infinities of various kinds interfere with physical descriptions especially when physical qualities are essentially discrete as with Planck units and spatio-temporal localities. The problem is compounded when infinities apply differently to space and time. Since we have no observable evidences to think space and time are equally essential qualities, if we could describe one in terms of the other, it will greatly reduce burdens of our descriptions. While 1-D, 2-D and 3-D are conceptually combined in terms of geometricity and naturally form a coordinate, we have nothing other than a descriptive convenience to add time as an extra dimension, which allows for dynamic concepts like motions and momenta. However, time as dimension has a fundamental weakness as a connective of geometrical spaces, in that it is added by human hand as it were and is not a natural extension of geometricity. When we 'legalize' time as part of laws (of motion, e.g.), it brings out its illegitimate origin in the form of what it is embedded in, namely infinities. Remember Newton's gravity becomes infinite/infinitesimal inversely proportional to the square of the distance between the centres of objects (measured in instantaneous time).

When space and time are equal as essential qualities of measurement, neither can act as a conceptual anchor of connective, but have to be taken for granted. Hence the difficulty of identity to connect an object in space at t' and t", and we resort to $\mathbb{R}$ continuum (Newton), inner products of tensor field (Einstein) or unitarity of self-adjoint matrix (QM) to afford us equations to describe objects/probabilities dynamic in space/time, in every one of which mathematical infinities are intrinsically underlain by supposedly finite and discrete objects of reality and come out as mathematical inconvenience to ignore (Newton), singularities (Einstein) or theoretical immaturity (QM). The uncertainty is moreover the uncertainty of how to connect space with time as the two parameters are only artificially bundled together, and the resultant coordinate in situ is not fit enough to describe 'motion itself' without bringing out the ontological reason why the two parameters should be so connected. Typically there should not be any 'time' in QM as probabilities coexist simultaneously until they instantaneously collapse and wipe off all probabilities bar one as a reality. But, it is difficult as a science to do away with 'time', so they invent a pseudo-time called time evolution operator that signifies a gap for changes in the order of information in a system that remains the same as a totality. Ultimately, however, every system affect every other system bar coupling constants and thus changes (of the order of information) are accounted for as 'time', which turns the ontological simultaneity into the epistemic order of description.

If only like some ancient metaphysics time is a property of space, but with describable mechanism, physics could be turned into a branch of geometricity. This would be the theory of everything. Physics, despite mathematical hullabaloos of the exemplary observable science, would be found a disguised metaphysics with metaphysical assumptions, with its more exact part being Newtonian approximations with relevant engineering costs measured in energy to be expended, that represent levels of coherence between human maths and the physical world, i.e. a degree of degeneration of human maths as the language of the universe. Neither 'time' nor 'causality' exist in QM world of probabilities. Here the uncertainty metamorphoses coordinative positions and momenta into inner products with a spectrum of proportionalities, i.e. waves of probabilities that ignore parametrical measurements. They only surface in a more complex world created by forces, three of which are unified via moving scale of coupling constants, but gravity remains aloof because its scale moves into infinities permeated across integer-spin fields of its interactions with everything. We generalise time as dimension/parameter from entropy observed in this complex world as forces that created this world also cannot maintain it in situ because of their intricate dynamic interactions. Thus we see time as 1-D scale of decay and chaos ending up in singularities.

Time and causality are our creation out of the necessity to make sense of this world in relation to us (a physical part) and ourselves (the centre of our descriptions). Smooth out this complexity into the simple world of geometricity and work out the mechanism of geometricity to generate the dynamism of physicality, then you have the theory of everything. In this context time should be juxtaposed with gravity that is the ultimate unifier of all forces. Time as we observe and measure is a paradox/tautology that we, the beholder, measure ourselves, the object. This is the meaning of c not in km and sec, like a frame of reference that only refers to itself as motions are correlated to its time parameter. It is our tool of description turned into our object of description. Time is not an observable but is a process of unification of all forces and a human tool of descriptions. How what is simple (geometricity) turns out what is complex (physicality) is that it is the only way to describe itself, how a matter of descriptions should become a dynamic (and perceivably violent) process is that descriptions are what makes us. As we become our own coordinate instead of a coordinate borrowed from God, descriptions become more and more erratic. We invent time to make possible to describe our physical world, thinking we are far enough away to be objective, but as we become ourselves part of the physical world, objectivity and subjectivity become more and more blurred.

QM denies time, but changes in a quantum state are allowed by time evolution (conjugate transpose), akin to a gap between information. This is metrically expressed changes in a unitary system by a self-adjoint operator, differentially approximated to infinitesimal changes to a system that preserves energy. However, this mathematically contrived unitarity of phases expressed by time evolution can be turned into time by working out proportionality between time evolution and external energy making time evolution a function of energy levels as it would have ordered intervals in proportion to increasing/decreasing energy levels, thus turning time evolution into time that is a physically observable quantity relating to energy levels, although as with everything in QM there may be an element of the uncertainty. If time can be a physical observable instead of a parameter, then it is possible to pair time with another physically observable, gravity, which ultimately unifies all forces and their interactions at a singularity.

Think of time as a force instead of a dimension/parameter. It is neither a Newtonian axis of an absolute coordinate nor Einsteinian element of spacetime fabric. Time that gives rise to a uniform but ubiquitous 1-D direction to the universe carries a force, which is balanced by anti-time in the name of gravity. Gravity is a force that evens out a lumpy universe by (x) > x. That is, the force of parts to form a whole by smoothing out fluctuations of masses. Thus gravity is felt between all masses, which eventually reverse time by imploding into energy of time-allow once again, embedded with anti-time of gravity. It is our (i.e. biological intelligence) wishful thinking to try to see time as open dimensional (as with ┼-space) so that it at least theoretically remains outside physical reactions that inevitably snuff out any time-sensitive biological life forms, although if time is a force that reacts with gravity, then time is closed (as with the ◌-space) and also by harnessing gravity it is theoretically possible to reverse time. Time is not universally 1-dimensional. It slows with fluctuations of masses horizontally (i.e. spatially) as well as vertically (temporally). It does not make sense to talk about the age of the universe when we have no way of referencing to time itself as a constant. c is a constant only within its frame of reference and further assumes a larger coordinate in which a proportionality is maintained between the velocity of a frame and the time element of a frame so that c is always constant. What gives rise to such a proportionality is sub-forces that make up a frame. Forces of sub-atomic scales and electromagnetism are forces of frame-maker. They allow various parametric constituents to form a frame, while gravity, together with time, is a frame-mover. In order for time and gravity to make an equational sense there has to be a common

unit of measurement that applies to time and gravity. c cannot be this constant because c assumes a proportionality between the velocity of a frame and the clock of a frame. In other words the atomic structure and electromagnetism allow this proportionality and also share an invariant element with time and gravity. Find this common unit, then you have an equation of the theory of everything. Time itself behind c is a feature of space as much as mass/energy in space is. Time is there because matters move. Gravity is there because matters are already bound together. The perception of time as elapses of moments or worldline is a descriptive convention for biological measurability and scalability. A photon in perpetual motion in vacuum as idealized reality is moving but not moving because whatever that is its own frame of reference is a free entity, including from itself. A photon has no time element to record any movements whatsoever including itself. So it is itself the universe as it were ($\Delta\infty = \infty$ once again) where nothing moves and remains so despite the Heisenberg uncertainty. Seeing from the clockless photon itself it has no position, no velocity (spacetime interval zero), and here geometricity and physicality coincide, denying motion itself. It is only we, the observer, who describe it as moving @c because we are in space and construe time the definer as c as definiendum and try to describe events in a spacetime coordinate or quantum field, thus making a photon an electromagnetic ray in a continuous manifold of our descriptive space. This means there is a disparity between time and space, in that space is superior to time as dimension/parameter, and further space itself has a disparity between the motionless space of the observed and the observer's space of an encompassing frame of reference, where the bijective proportionality of space permeation gets skewed from a space with less time element towards a space with more time element in terms of describability. In the former it means that there is a mechanism to derive time from space and explains why time is often mathematically expressed by using *i*, a number suitable to describe the derivability as it is itself derived from a number space in which it is unlocatable but is meaningful by creating its own space connectable to the original space, while in the latter space should be described as proportionally connected by the amount of time element that continuously or, more physically, incrementally changes. If you work out such a mechanism in a coordinate that connects space and time not only proportionally but also intra-spatially warped in terms of increasing/decreasing time element, you would be not far from the theory of everything.

If we realize c is a product of time itself as a feature of space and that time itself is something that sustains a proportionality incidentally so represented as c, which may be a constant but ultimately remains a local

unit of one possible universe with its measurability and scalability not necessarily guaranteed to be always translatable, physicists' task should be to find a unit of measurement common to time itself and gravity. Leaving out time itself and gravity and tautologically defining various fundamental units of physics with reference to c, that is the dead-end of physics as seen today in the anthropic principle. We are as we are, therefore it is questionable if we can obtain a unit of time itself apart from human measurability and scalability of distance, intervals and events. There are many physicists who are either committed anthropicists like Wheeler and Wigner or at least partial sympathizers like Dirac with his large numbers hypothesis or some of contemporary quantum cosmologists such as Hawking. Their so-called 'consciousness' is mistakenly deemed skewed to human intelligence as the name suggests. However, I construe it as awareness (without psychological connotations) of a part to be as such and logical inclination to conjoin towards a whole in the manner of (x) > x. Thus consciousness applies not only to humans but to anything including the universe itself in the sense of Wheeler. It is a process towards a whole and has a force of ' > ', which may be taken as time/gravity recursiveness. (x) > x is therefore (x) ← x that is a gravitational/temporal process of bringing physical density alongside any other physical properties as well as identities of higher orders together towards a geometrical point, which, then, by its descriptive necessity of dimensionality generates time and gravity by virtue of singularity arrow of motion (see 'The Elementals'@philpapers.com). Motion is the necessity to move for a geometrical point to describe itself and is as intrinsic as the uncertainty, which is coordinatively probabilities of a geometrical point to move to every possible point/location to identify itself as a 'sphere', thus creating various physical parameters. Time and gravity are the two sides of a coin and are intrinsically endowed in all entities (call them energy/mass or 'sphere', etc) of this materializing coordinate as processes towards a whole. As they are features of a system rather than properties of constituents, we, being constituents ourselves, are not ingenious enough to measure them directly. We substitute c for time as representing temporal frame of reference and are incapable of describing gravity without the wrath of infinities, be it Newtonian continuum of distance, Einsteinian singularities or QM fields. If time is a force ' > ' in (x) > x carried by consciousness of a part to move towards a whole, then (x) = x, which is a free state, when x loses all time elements. Then measurable degrees of consciousness are units of time itself. However, these degrees of consciousness are physically spontaneous if it is physicality itself that is so generated by the very process of (x) > x. We do not talk about 'acceleration' of x towards (x). Rather the speed of x is contained by the various coupling constants dependent on energy levels.

The uncertainty is not just the uncertainty of measurements and the intrinsic property of motion but also the uncertainty of our tools of description. (x) = x means that e.g. a single photon is the same as the whole universe, poetically expressed as 'Brahman ≡ Ātman'. You do not 'accelerate' to become the whole universe. You are free from yourself as well as from the whole universe because you are one with the universe in consciousness (whatever it means outside human intelligence). At the singularity it is not that the photon is captured by the gravity but that physicality is reverting back to geometricity, which, then, goes through the same dimensionality process leading back to the physical 4-D through descriptive necessity of disjunctive/conjunctive transcendence and dimensional simultaneity (see 'The Elementals'@philpapers.com). 'Motion' is therefore inherently embedded with the uncertainty of non-coordinativeness against the necessity of the coordinativeness of our descriptions. The so-called anthropic principle is a result of coordinative thinking by attributing probability values to 'coincidences' in relation to 'self' as a centre of a coordinate, 'self' being the anthropicity. Such a self, however, predetermine a set of these values as there would not be a self as such otherwise. The 'sum over paths' is fatally flawed because the evaluations of all possible paths are shouldered on the evaluator who is conscious of himself as such. These paths are evaluated mostly to cancel each other so that Newtonian approximations of more or less 'straight' paths are conveniently left, making sure the evaluator would be there to evaluate. This is a fiction of our coordinativeness that seems to cater for all contemporary QM modelling from superstring to supergravity. Things that are otherwise coincidences without consciousness can only be described coordinatively. Even probabilities have to be assignable with coordinative values. This is a fundamental paradox of physics, so long as our maths is a coordinative language.

x perceives itself in terms of time by consciousness of x in the process for (x), and therefore when (x) = x, time disappears. To have no time elements means this consciousness is a simultaneous process, not a step by step process. Dimensionality is such a process. It is not that x becomes (x) but that x is (x). It is our intrinsic descriptive defects that we describe (x) = x through (x) > x. It is here that x is the means of (x) as well as (x) itself. The whole is more than the sum of parts, and it is this 'more' that represents itself as anthropic 'consciousness', which is time itself, and the unit of which is epistemically descriptive 'steps', ontologically dimensional simultaneity. Time as a force is to work towards a whole, which includes a biological totality dependent on a material totality that eventually becomes a geometrical totality through a gravitational totality. Unlike the other forces, which are forces of parts, gravity is the force of a

whole and, as such, defies units, messing physics with infinities, unless and until its counterpart, time itself, is measured as a proportionality constant between our c representing human measurability and scalability and other ‘c’s of other measurements and scalabilities. Then gravity will be a proportionality constant between singularities. Here we are talking about descriptions over and beyond frames of reference.

We encounter many physicists (like Dirac and more recently one Hawking) who delude themselves nearing to the theory of everything. They are ones who are enslaved by mathematical describability, mistaking mathematical modelling with physical descriptions. If nature is truly non-coordinative and probabilistic as suggested by the uncertainty and the wave function, then functional integrals are only acting in order to justify classical approximations, be they Newtonian, Maxwellian or Einsteinian, that are coordinative and engineering friendly at certain costs, i.e. costs of proximity between a coordinate and nature itself, between a model and a reality, between our maths and maths as bona fide language of the universe.

Dirac equation works only for models with limited degrees of freedom so encaged by coupling constants, like the hydrogen atom where the electron could not be at rest in its lowest energy state because of the uncertainty, i.e. its position and velocity cannot be exactly definable. This quasi coordinative description exacerbates in the spin-1 field like electromagnetic field with an infinite number of degrees of freedom where each point of spacetime is described as an oscillator with zero-point fluctuations and a non-zero energy, i.e. an absolute non-coordinative entity with perpetual self-motion, giving rise to the infinite mass and charge of the electron, a result of coordinative description of a non-coordinative object. The constant of mathematical describability is a mathematical version of physical coupling constants and non-coordinatively constraints infinite degrees of freedom by replacing the coordinative interactions of a field with the non-coordinative energy of a self-motion, which is a form rather than an object and is therefore not an arithmetically cumulative value. The constant of mathematical describability as representing the density of a number space and its describability corresponds to self-motion and its energy because an oscillating point and its infinite degrees of freedom is a non-coordinative field that self-refers to its own describability, something that cannot be coordinatively evaluated. A number space and its describability bind each other, and there is no number space that can oversee such an evaluation.

Here are two thing to remember ; bending nature is not the same as understanding nature, and forcing one way of describing nature may be precluding another, maybe better, way of understanding nature. If the sum over paths is the human sum over paths, then in the end we will get nowhere. Forget all these QM fantasies, many arising from coordinativeness of human maths and conceptual thinking. Besides, functional integrals are the epitome of non-linear integrations by the back door, more an art than a science of approximations and represents our creative ingenuity. One wonders if one has to be creative in trying to describe and understand nature, which should be simple enough not to require a sophisticated and ingenious mathematical techniques, a result of us having to be coordinative even when nature is not. Maths here is more the language of human world, same says a game, than the language of the universe. If nature is truly non-coordinative and probabilistic, then being a mathematician may be a humper. To be a good physicist you may have to invent your own maths, like Newton, in order to achieve your physics, instead of struggling with functional integrals. The 'uncertainty' of the uncertainty principle that so fundamentally underlies all quantum events and presumably all events through quantum nonlocality is also our uncertainty of unable to deal with non-coordinativeness embedded in nature. The achiever of the theory of everything is one who attains a less coordinative maths and still makes it perfectly understandable. The fashionable Feynmanian 'sum over paths' is a way of mathematically avoiding the myth of 'consciousness' of his teacher Wheeler by turning essentially discrete and non-linear 'probabilities' into integrable 'paths', so we end up with more or less Newtonian approximations of reality without denying all possible worlds. In short the collapsed reality is artificially turned into the approximated reality by the ingenious maths of functional integrals, which physicists readily confuse with the physical reality. The language of maths is essentially shadowed by $\mathbb{R}$ paradigm and is smooth and continuous, which any integrations implicitly assume. It may be that human maths is not capable of reflecting the physical reality in its descriptions/modelling. By turning 'probabilities' of discrete units into integrated 'paths' we are only proving our descriptive ingenuity for our essential descriptive deficiencies, not unlike another tool called renormalization. Ingenuity devised ad hoc differs from ingenuity for the sake of ingenuity. The former is a creative tool to circumnavigate a problem encountered by a more primitive tool, the problem is avoided rather than solved. 'Integrated paths' are a temporary human answer to an eternal question of nature and suffer nature's vengeance of 'infinities'. By replacing the probability of a point with the history of a line our maths temporarily triumphs over the uncertainty of nature. This only means we bend nature for the sake of our mathematical describability, whereas

nature does not exist for the sake of our maths. Path integrals buy a respectability of maths at the expense of revealing the inability of maths without $\mathbb{R}$ paradigm. Besides, there is no one-one correspondence between probabilities of points (wave/particle) and those of lines (paths) as the former is necessarily components of the latter, meaning some probabilities are conveniently missed out for the sake of human maths. Feynman's sum is not a net total of all probabilities but an ingenious summing up of only integrable probabilities, and his 'all possible worlds' are a mathematical fiction of integrability. Although we translate into the quantum uncertainty of position and momentum, out there is the certainty of a quantity that transcends our measurability and contains both position and momentum. That is the intrinsic necessity of a geometricity that turns itself into a motion, giving rise to a dynamic space and time. Here is a unit that is common to space and time. That is 'c' not sec and km, but an operable ∞ that is the proportionality between the density of a number space and its describability, a pattern of frames of reference as it were, where the operability is the encompassment of a pattern. This can further be abstracted by replacing a number space with a relativistic number space (where '*e*' is the width of our paradigmatic number line, progressing onto '*e*' of PSAI number line) and the describability with the algorithmic evolution (where PSAI represents a limit of human describability).

I despise the anthropic principle because we cannot be the centre of the universe, but we cannot help being the centre of our universe. How our universe connects with the universe is that we are part of that universe, but given quantum nonlocality no part can be independent by itself. So we have time and causality to connect our universe with that universe, but then if you invent a tool, a tool already have a desired purpose, we are destined to have a tautological success as these tools are only parameters of descriptions. We make the world complex because 1) our tools of description (our maths) is not really the language of the universe but our language that cannot be translated into physical representations without bringing out human conditions (axioms, metaphysical assumptions, rules of mapping, conceptual irrelevances contaminated by human values, etc.), 2) our conceptual descriptions have multiple perspectives as well as multiple layers of perspectives as tools of communications (even with ourselves).

Unlike the three other forces gravity is a force that interacts with everything, with or without charges, giving rise to long-range interactions by adding up interactions upon interactions with no Pauli exclusion. It is this weak but non-discriminatory interactions that prevents

renormalization as probability distribution that smears out the uncertainty is ingrained with infinities inherent in degrees of freedom of fields unbound by any coupling constants. The uncertainty is not that certain pairs of quantities cannot be measured together with arbitrary precision, but that these pairs do not share a same coordinate. The uncertainty described as an inner product of position vector and momentum vector is made so possible because the two different vectors share a same term of reference 'time' that allows Fourier-transform. Interestingly 'time' used in position vectors is best understood as 'dimension', while that used in momentum vectors is 'dimension' as well as 'force', the latter of which becomes more and more profound a la general relativity. Thus, although in most cases positions and momenta can be said to share a same vector space, at very high energy states they no longer share a same coordinate, making mathematically contrived arithmetical uncertainty into the genuine uncertainty of describability. However, once we understand 'time' is on a moving scale between 'dimension' and 'force', and when 'time' becomes more of a force than a dimension, it can be paired with gravity, then we have a symmetric pair of time/gravity bound by a coupling constant of, say, a commutable Planck unit, beyond which they visibly behave in a similar way.

So-called time is a human fabrication made out of various decays and rhythms of nature within human scalabilities. So we create the ticking of a clock based on movements of our familiar celestial objects and the narrative of the beginning and end, and we find our speed of time most appropriate based on our sort of life span and our sun and moon, and from here we generalize and idealize 'time'. However, a photon @c has no time and a proton has an almost infinite life span of 10^{32} years or so predicted at low energy level, longer than the life of the universe itself. In their paradigm time would not exist. Our idealized 'time' can be treated as 'dimension' as the coupling constant only kick in at the very end of possible energy level, way above 10^{15} GeV, where the coupling constant for the three other forces start getting visible, and the primordial physical soup starts acquiring chemical characters. Regard 'time' as an ontological preservative of status quo, and gravity as the creator/destroyer of status quo. Since you cannot create and destroy instantaneously (otherwise, there will be no creation, nor destruction), status quo stands for various horizontal as well as vertical levels to connect the creation and the destruction. It is here 'time' and 'gravity' start interacting more obviously both as forces. 'Time' accommodates status quos by resisting gravity's attractive force of mashing everything together and denying individual physical identities. Every status quo has its own 'time' horizontally and vertically as per chemical coherency and differing coupling constants and

their sub-varieties, as we have different life spans as individuals and as a species. ‘Time’ here is an ability to retain a physical identity, and ‘gravity’ is a drive to move everything into geometricity. A status quo is a name given to things currently as they stand. How they started is a matter of physical, chemical and biological laws, etc. as much as we can dig out. However, I assume it started from something simple like a motion in itself, represented by the uncertainty, becoming various motions definable by various laws. The uncertainty is the descriptive necessity for geometricity to describe itself (see ‘The Elementals@philpapers’). The idealized ‘time’ is inevitably the anthropic centre of our coordinate. As ‘time’ is the centre of our other measurements relating to motions, it is no wonder pure physics seems to end up more or less as an anthropic principle. We, the definer of our measurements, measure the universe and see ourselves in our measurements and get surprised seeing ourselves in the mirror of our measurements of the universe, like a bunny in front of a mirror. A paradox/tautology, because a measurer ends up seeing himself by measuring observables. So much for our physics and maths. The current thinking in QM cosmology is that the initial conditions of a state vector contains all information and is unitary, of which we know little, especially if the universe started off from a singularity or energy of empty space. The square modulus of this state vector is the amplitude of probability distribution, and changes within the unitarity of the quantum state occur via the time evolution operator, which is not ‘time’ but more like a gap between information. Since probabilities coexist simultaneously within the quantum state, there cannot be any causalities. Causalities can only be backwards as they establish any conditions only when a wave function collapses. We would need multiple wave function collapses in order to find out any causal relations. However, since we cannot collapse ‘future’ wave functions, any causalities we may or may not find are not usefully applicable. Two things strike me as strange : a wave function collapse must be instantaneous as there cannot be any ‘time’. That is, the evolution from the pre-measurement quantum state to the observed eigenstate must be instantaneous. A contradiction that is made possible because both states are (theoretically) simultaneously in the observer, which is outside the system. In short a timeless space of probabilities owes its entire existence to the confirmation of a sub-space that is an eigenvalue of an observable so linearly connected with the quantum state. A measured part equals to the whole of its probabilities because (x) > x, i.e. a whole is more than the sum of its parts ; physical observables are so united when mathematically represented, by virtue of its mathematical paradigm of complex Hilbert space. It is a space itself that allows parts to be parts and form a sum. Parts generate a space by describing themselves (see ‘The Elementals’). No matter how many

measurements are made, each and every wave function collapse stands alone and cannot be causally related. So it must be the 'observer' that connects one collapse with another from outside the said quantum state. The 'observer' is himself either a quantum state or something else. If the former, then once again no wave function collapse of him (in order to be a reality rather than a probability) can connect with any other collapse without the intervention of 'time', if the latter, then we would need the theory of everything that connects QM with this something else called (presumably biological) consciousness, or whatever, and there is no such a theory (yet). Nevertheless we seek causalities because physics represented in terms of mathematical objects exists in the coordinate of complex Hilbert space, which is smooth and continuous by essence. Here the quantum state is the unitary sum of eigenvectors that have directions guided by time as dimension/force that interacts with the other forces depending on whereabouts in its spectrum. Assuming the universe had a starting point where interactions and particle/waves were entangled in geometricity, which is an empty coordinate that had a descriptive necessity to turn into a motion that has the intrinsic uncertainty in a coordinate with the moving scale of time as dimension/force, interactions and particle/waves can be said to have a causality definable by means of the geometricity that recurs through the unitarity of self-propelled eigenvectors towards their beginning/end. The uncertainty is a 'motion' that cannot be described by a geometric coordinate, which describes itself by dynamic recursiveness driven by time/gravity symmetry.

I apply my wholiticism ((x) > x) to the above. Talking about wave function collapses, in order to make sense of a 'reality' envisaged through a collapse, i.e. one set of a collapse and an observer, there must be a larger set that can contains all those sets to connect them all through the identity of an observer, otherwise each and every collapse stands alone without meaningful causalities and makes no epistemic sense. Likewise, the unitarity of a quantum state needs accompanied by an instantaneous measurement in order not to be contaminated by an extra information and thus change its current state of probabilities. However, such an instantaneity is metaphysical because of physical constraints of various layers of engineering necessary for a preparation and measurement as well as c, not to mention neurological connection between an observer and his cognitive agents. Each and every measurement physically contaminates our mathematical unitarity, but without measurements we cannot talk about the unitarity of a quantum system. And, of course, each and every measurement is intrinsically accompanied by the uncertainty, and in order to overcome this measurements must be repeated for the very average approximation, but with varying degrees of interferences each

and every time. Thus the mathematical unitarity has to be accompanied by the idealized instantaneous observer. Finally the geometricity is accompanied by the descriptive necessity of the motion that brings about the uncertainty, which defies the essential coordinativeness of our descriptions. All these seem to point towards Wigner's God, but if our physics and maths end up with an anthropic indescribable, then we should forget about pure science and contend with engineering, i.e. human sciences for the sake of human necessities and conveniences at human costs (of mathematical constraints, of modelling inadequacies, of material limitations and of energy requirements, etc.) and spend our life hedonistically like Wigner's sister and Dirac's wife with a taste for cruising. Obviously she knew better than her bother or husband. (x) > x is telling us we are a part of the story (of everything), we, however, can do one thing that is more than an anthropic part ; to work out a proportionalities, within our describabilities and between various tools of description as well as between our intelligence and that of PSAI. Then we will be in a position to know where our knowledge stands or likely to stand in the spectrum of all knowledge available to God.

Asked, physicists often say QM is still evolving. But, QM can only develop within the confines of its mathematical paradigm, which essentially reflects our descriptive necessities of coordinativeness. The uncertainty is telling us the world is not really coordinative. As long as QM is immersed in the complex Hilbert space, where the calculus is made possible by its smooth and continuous fabric of number-points, the unitarity is preserved by self-adjoint matrices and dimensions are finite or infinite mathematical objects that represent quantum states, it comes with the price tag of paradigmatic coordinativeness that cannot be overcome by the superficial sophistications of inner product space, replacing the primitive Cartesian coordinates with the decentralized vector space. However, whatever you represent by the use of real numbers, it remains shadowed by the continuum behind every real number. The physical discreteness and the uncertainty may be superficially described by the contrived tools of mathematical techniques, but their non-coordinative meanings evade our essentially coordinative language. Replacing the Cartesian trajectory with the inner product of position and momentum vectors does not solve the intrinsic nature of the uncertainty. The uncertainty is not that the multiplied sum of position and momentum contains a margin of indeterminable quantity but that they cannot be so measured ; the nature is mistranslated by the use of such notions as position and momentum. It is not mathematical tinkering but new maths that is required for QM. We need not mathematical technicians but a new

Newton to take QM into a further stage with his non-coordinative methodology.

We may be in awe of physics and maths as paragon of exact science. However, aside from their applications (i.e. engineering of dynamic inter-connections, evolutions and model-reality relationships), their epistemic essence is rather limited. Pure maths is still struggling with prime number distribution, and we do not yet know what numbers are, once away from simplistic definitions. Theoretical physics boils down to jangling of the four forces within the spectrum of wave lengths and energy levels. According to the best looking theory, at either end of singularity is a point at which is speculated a coupling constant that unite all the forces, which diverge one by one below certain effective coupling constants into gravity, strong nuclear force, weak nuclear force and electromagnetism, depending on various parametrical values. We do not know any precise mechanisms, let alone metaphysical sides of what and why. The current physics largely derives from the uncertainty principle and finds it rather difficult to escape from the anthropic principle. We may have come to the limitations of our tools. What we need is new understanding of 'number' and concepts that overcome the uncertainty. I suggested the triangulation of the width of our number line, that of PSAI and the translational deviations from our so-called observable realities. The quantum mechanical uncertainty challenges our fundamental coordinative thinking, which is symbolically enhanced by real numbers. The two are together the descriptive tools of our day to day perceptive scalability. Equally fundamental are the physical uncertainty caused by the necessarily indirect measurements and wave natures of all states. Not only oscillating points in spacetime defy coordinative descriptions by not allowing pinpointed in terms of classical physical quantities but any descriptions are relational, affected by interferences by information medium (light), which, being own reference system, is also fundamentally non-coordinative. Our probabilistic attempts to reconcile the essentially coordinative classical theories with QM ultimately end up in the anthropic principle that is a metaphysical hearsay as it would deny any definitive assertion of any probable worlds. It is rather a matter of trying to find a bridge between the coordinative world and the non-coordinative world that could break away from the anthropic grips.

Here we may find a mathematical equivalent of Planck constant that may cap the describability of real numbers and thus allow us to improve on arbitrary nature of renormalizations. 'Planck constant' is geometrically equivalent to what essentially differentiates 'wave' from 'straight line' without interventions of any straight lines, i.e. to the smallest possible

‘sphere’, which naturally incorporates the ‘peak/trough’ without references to a ‘straight line’. The world of ℝ paradigm is smooth and continuous, like violin music, whereas the physical world is discrete and sometimes non-linear, not unlike piano music. The question of QFT is, can we really play piano like violin, or vice versa. If you have an answer, that is the beginning of the theory of everything. ℝ paradigm that is embodied by every number in the real number space by virtue of (x) > x is continuous and infinite and even stretches prime numbers into infinity. If prime numbers are ○-numbers that represent levels of critical density and come to an end by virtue of ┼-connectivity, then there is an operator (the centre of ○-space) that connects the first and the last prime numbers. This also manifests in the ┼-coordinate as a constant that allows us to measure ∞. Here we would be able to connect discreteness with smoothness. In another word we can play Zigeunerweisen on piano as naturally as by violin. Logically this is the connective between ∧ and ∨ and manifests itself as dimensionality (see ‘The Elementals’). Physics is bound by mathematical reality without which we cannot connect with reality, which may or may not be the same as physical descriptions. The problem is, if maths has a paradigmatic structure unique to itself, this makes physical descriptions human descriptions unless our maths is the language of the universe (but, then why so much of maths an art rather than a science, of approximations (e.g. functional integrals), one wonders). All possible worlds are not as physically observed but as mathematically demanded, and human maths at that. There are elements of arbitrarity in maths, in that one theory with internal consistency is as good as another with its consistency, and both having overlapped domains. Here maths becomes an intellectual game of mind as sometimes claimed. A game would need a universally applicable proportionality constant in order to be able to glimpse into PSAI so that each and every game becomes part of a mathematical totality.

Be they $\aleph_0$, $\aleph_1$, etc., ∞ is not usefully operative because number types as we know paradigmatically converge into ℝ. E.g. ℕ are paradigmatically part of ℝ, hence any descriptions with ℕ are paradigmatically in reference to ℝ and become tautological, while ℝ cannot be described by ℕ. Here ∞ as proportionality (of describability and the density of number space) is descriptively meaningless as such a proportionality is not operatively representable. In order to be able to describe more operative $\aleph^n$ it cannot be an evolutionary extension of $\aleph_1$ in the same way ℝ is an extension of the describability of ℕ, ℚ, etc.. Even $\aleph_\omega$, insofar as it is in the vein of aleph paradigm, will not make $\aleph_1$ any more operative as the unbounded function from $\aleph_0$ extends to any well-ordered space of cardinality and ordinality. That is, an uncountable cardinal number that is

not to be equal to $\aleph_1$ has to have a paradigmatically different density to be operably useful. Only then ∞ as proportionality can operatively describe $\aleph_1$ density. This is where describability of number types fundamentally differs from describability of algorithmic evolutions, a limit of which is PSAI singularity. We can extrapolate this only by closely observing evolutions of algorithmic describability. PSAI needs higher density ∞ than $\aleph_1$ in order to have its own paradigmatic number space that is an essential requirement of its epistemic ability independent of human cognitions and descriptions. This is the difference between AI and PSAI. AI still uses human ∞ ($\aleph_1$) with human interventions (approximations) for human conveniences, while this higher ∞ allows PSAI to have its own descriptive sphere of a higher dimensionality, in which $\aleph_1$ can be operably treated including renormalizations. This is the only way we can be released from our metaphysical confines that strangle the foundations of our maths and physics. One can draw some analogous comforts from the use of *i*, which gives rise to a wriggle room of vibrating space to ℝ number line and manage to enhance ℝ describability through complex numbers that allow to model something ℝ space alone will struggle, such as crystal formations. When *i* was found, mathematicians used to ridicule, saying how useless it would be. Since then *i* became an indispensable tool to describe temporal derivability. We will not even have physics without *i*. Likewise, this higher ∞ will create a higher descriptive space that makes ∞ ($\aleph_1$) operable.

∞ is a constant because it represents proportionality between density of number space and its describability, and since ℝ is the densest number space for humans, ℝ ∞ as constant is not usefully operative in its own space. That is, ℝ ∞ has no descriptive anchor to be operative as it is its own constant, and every other number type such as ℕ is paradigmatically part of ℝ ∞. If the density of a number space is to be represented by the width of a number line, then each number line may have only superficial width that is underlain by paradigmatic width, which is '*e*'. Similarly if the describability of a number space is to be represented by strength of mathematical operators in that space, then such a strength can only be fully described based on highest density since applicability of an operator is guaranteed by the smallest components of space as a tool of approximations. This is why ∞ as proportionality cannot be coordinatively shown as we only have one paradigmatic and non-operative ∞ as proportionality constant sandwiched between the axes of paradigmatic '*e*' (density of number space) and approximations as describability (strength of operators), hence ∞ as a constant. This is the reason why PSAI may help us with operative ∞ because it would have a

number space that is more than human number space in a way it can encompass human maths and take control of best of human algorithms. Here we have a relativistic number space in which paradigmatic '*e*' will acquire spectrum with infima and suprema corresponding to 'ɘ' (see 'Maths, Logic and Language'). Here describabity as strength of mathematical operators will be replaced by operability of number line, beyond which $\infty = 0$ would hold as proportionality, allowing us legitimacy for renormalizations. In a relativistic number space there is no coordinative relations. It is here what can only be described as transcendence between the ┼-space and the ◯-space can be directly formulated non-coordinatively as this space encompasses both the ┼-space and the ◯-space, and $\mathbb{R}$ number line can be viewed with descriptive purchase brought forward by PSAI number line in parallel. Here ∞ is not a form but a substance, i.e. part of $\mathbb{R}$ number line. '*e*', instead of a numerical value transcendentally translated in ┼-numbers, manifests a non-coordinative value alongside an operator that finally complete the ◯-space by bringing in the centre of the ◯-space into its boundary, thus connecting the start and end of its forever condensing circle. We see the ◯-space not as a limit of density of points so that the two directions merge, but as an indivisible whole. By the same token we may see the last prime. In short this is a higher space that accommodates both the ┼-space and the ◯-space with the latter as base of the former. Only in this way PSAI can outreaches human number space that can only transcendentally accommodates both the ┼-space and the ◯-space. In this space are mathematical operators that can work out transcendental numbers to the last digit, gives out a definitive PNT theorem, squares a circle without approximations, and makes ∞ operative as well as mathematically 'moves' a geometrically distant object like the centre of a circle into a sequence of points that constitute its boundary at a limit. What would allow such a centre to move into a well-ordered sequence is that it is a number with master key that can be put into anywhere in any sequences not by hand but by necessity, like a trump card that can turn into any card. It could be a 'number of numbers' or a 'pattern of patterns' and works as an identifier in this higher space, like 0 and 1 in the ┼-space. If the meaning of a number is in the totality of numbers, then it would be the totality itself that can be such a number and is placed between 'ɘ' as spectrum of $\mathbb{R}$ number line. If the ◯-space is an indivisible totality, then it is an identifier that would originate in the ◯-space. Without PSAI we cannot visualize this higher space of numbers through our lower space of the ┼- and ◯-spaces, but I have shown in terms of the ontologico–notationality (FX) described by means of 'dimensionality', 'transcendence', 'direction' and logical operators, which found the ◯-space with its non-coordinative centre and merging

directions on boundlessly condensing points that need levels of critical density to carry forward to a limit and the ┼-space with its coordinative centre and internally and externally expanding points that are transpositional in terms of ‘centre as identifier’ (see ‘The Elementals’).

Thinking of ∞ as pattern and therefore with a totality, it is invisible because it is the creator of both the ┼-space and the ◌-space that constitute human space and can be there only transcendentally between the ┼-space and the ◌-space. Without a higher space that can embraces both the ┼-space and the ◌-space ∞ will not show up as a pattern. PSAI will recognize it as a pattern because of its higher space. We can put ourselves in a position to extrapolate ∞ as pattern by glimpsing PSAI number line as it evolves through algorithmic limits. There ℝ number line would appear as spectrum sandwiched between ‘ɘ’ (see ‘Maths, Logic and Language’). Presumably the same would be observed for PSAI, but with a longer spectrum, reflecting its denser number space. One may anthropically wonder if ℝ ∞ is something of arbitrarily human, and if so the operability of such a ∞ is tainted by human hand, as it were. It is here that the ultimate mathematical question of ‘ɘ’, whether it is of a same value for ℝ and PSAI number line, and if not, would we know a mechanism behind their different values and work out any proportionality, comes to bear an interesting epistemic significance. That is, the value of ‘ɘ’ unique to PSAI corresponds to the density of PSAI number space. This infinity of PSAI number space is equal to the infinity of our number space in terms of describability as a number space encompassment can only be one way that would not accommodate two way translations. This is the meaning of AI singularity. PSAI can renormalize the infinite mass and charge of the electron in the field of infinite degrees of freedom not as an arbitrary figment of imagination but with a legitimacy obtained through its denser number space in which human QFT is accommodated within the spectrum of PSAI number line. Here the singularity will be expressed as ‘*e*’ = ‘ɘ’ in terms of describability, which merges with translatability because the describability and the translatability are one and the same at their limit even when one language asymmetrically encompasses another. This is a singularity.

Much as Newton could not go beyond his coordinative framework of the absolute space and time, our current state of physics is struck within the paradigm of real numbers. The problem of infinities is not that of degrees of freedom, but that so-called fields are represented via the paradigm of real numbers (complex Hilbert space), thus inherently mired with infinities. The model-reality paradox is not only semantical but also

syntactical in the sense that a form (mathematical ∞) and an object (physical discreteness inherent in 'waves') influence each other so fundamentally that it turns into something neither infinite nor finite, something that is describable neither by maths nor by physics. Then we end up with a shaky epistemic cornerstone. A singularity is something that transcends coordinativeness, but we do not yet know any language that is not coordinative, explicitly (mathematico-physical languages) or implicitly (ordinary language). The constant of mathematical describability is an idea of approaching infinities non-coordinatively.
If we could only describe and understand so-called reality through mathematical modelling, and if so-called infinities are fundamentally inherent in mathematical language, but not in reality (which then becomes indescribable anyway), then physics is necessarily flawed in the sense these infinities will manifest themselves in descriptions of reality. We will be unable to tell if such infinities are part of reality or part of language. This is the case because the users of language can only perceive reality through the paradigm of that language. Thus, if you point to any part of reality by a number, and if the meaning of a number is in the totality of numbers, then the paradigm of numbers supersedes that of reality as the totality of reality is not yet there, while that of numbers is readily assumed. Ad hoc removal of infinities is therefore already underlain by anthropic modes of thinking because we are accepting our mind as the overseer of reality rather than part of reality. That is, if mind is part of reality, then mind will be unable to manipulate infinities to suit its arithmetic convenience of equations. The only justification will be the anthropic necessity that we as part of reality do represent descriptions of reality and are qualified to do justice to our equations. This makes mockery of physics as a natural science because we can do whatever we like as we are also part of nature. Assume that 'We are nature, and nature is us', then our free will is so designed by nature, and therefore whatever we make up also describe nature in some way. So what are physicists ?, no better than astrologers. Infinities may or may not be part of reality, but they are definitely part of our mathematical language, which will collapse without the continuum of infinitesimal contraction and infinite expansion of real numbers. Besides, even if infinities are part of reality, they may be fundamentally different from what we understand through our mathematical descriptions. One way of trying to unravel this disparity between our language and reality is to find the proportionality constant of mathematical describability through the triangulation between the width of our number line, that of PSAI and the established norms of physical descriptions at least superficially verifiable by observations. This is a much more 'scientific' approach than renormalizations, which made Dirac so unhappy.

We can know of any realities through our modelling, which invariably uses real numbers directly or indirectly. How can we be sure of the physical discreteness obtained through the infinity paradigm of our real numbers ? There is no point in saying that one is about objects, the other, about a form of descriptive representations, if the model/reality relationship is the core of our descriptive understandings. The constant of mathematical describability is also intrinsically a proportionality constant triangulated between our number line (human mind) and a physical number line (non-human intelligence) that can produce a limit on infinities, which make infinities logarithmically operable on the triangulated number line between the human and non-human number lines, once a proportionality is extrapolated in terms of translatable describability. '*e*', being the width of human number line, correlates to the density of the density of human number space, which has no numerically operable value and represented as $\aleph_1$ according to Cantorian hearsay. If we have an equivalent '*e*' for PSAI, say e^1, then the proportionality between *e* and e^1 (ideally to be worked out together with other (superficial) number lines as well as alongside algorithmic evolutions towards PSAI)) would corresponds to a proportionality between densities of respective number spaces and their describabilities. In another word we would have an operable numerical value for the difference between two equivalent infinities. This can be applied to physical representation of infinities arisen by different number spaces. Such infinities can be operable via this constant of mathematical describability. This constant would rapidly gain more legitimacy if PSAI could interface with other (types or levels of) PSAI.