The 'No-Jootsing Theorem' and the Nature of Consciousness

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ABSTRACT

Douglas Hofstadter coined the acronym 'Jootsing' to describe our endless ability to *Jump Out Of The System* (of rules, axioms, concepts, styles, etc.). Hofstadter viewed this as something possibly unique to human consciousness, which AI has not yet duplicated. Our minds can transcend computational and Gödelian limitations and contemplate totalities. In this paper I argue that there is in fact a *hard limit* to jootsing (the "no-jootsing theorem"), but it is a limit that holds potentially important secrets about the nature and role of consciousness. This appears to be a generic result of theories that aspire to totality (theories that include observers/agents in addition to what they observe/interact with). I show how we are faced with a pair of potential stances that have a distinctly Gödelian flavour and that both include some kind of limitation on theories of totality: eternal inflation of knowledge versus closed loops. Using ideas from a recent version of dual-aspect monism based on the decomposition of a totality, I consider whether the two apparently conflicting stances can be reconciled, arguing that they can indeed and this reconciliation reveals what is special about consciousness.

Keywords: Theories of everything, Gödel, strange loops; self-reference; jootsing; cybernetics

1 INTRODUCTION

> The psyche cannot leap beyond itself. It cannot set up any absolute truths, for its own polarity determines the relativity of its statements.
> C. G. Jung[1]

In his book *Metamagical Themas* (Basic Books, 1996) Douglas Hofstadter coined the acronym *jootsing* ("jumping out of the system") to describe our (and for him a distinctly human) ability to expansively step outside of a system of rules or axioms ("to ever wider worlds" as he puts it—see below), to consider alternatives and survey matters from a meta-perspective. And we can do this without limit according to Hofstadter:

> [A]rt progresses towards an ever wider vision of beauty — a "prospective" vision of beauty — by a series of repeated "diagonalizations": processes of recognizing and breaking out of ruts. As I like to put it, this is the process of jootsing (jumping out of the system) to ever wider worlds. ... This endless jootsing is a process whose totality (so says Gödel) cannot be formalized, either in a computer or in any finite brain or set of brains. Thus one need not fear that the mechanization of creativity, if ever it comes about, will mark the end of art. Quite the contrary: It is a day to look forward to, for on that day our eyes will open — as will those of computers, to be sure — onto whole new worlds of beauty. ... [T]he possession of this ability to break out of loops of all sorts seems the antithesis of the mechanical. Or, to put it the other way around, the essence of the mechanical seems to be in its lack of novelty and its repetitiveness, in its trappedness in some kind of precisely delimited space. (ibid., p. 26 and p. 541)

[1] *Memories, Dreams, and Reflections*, New York: Random House, 1965, p. 322.

This ability to 'go meta' *forever* is thus taken to account for our genuine creativity and novelty, and for the edge we have over AI in this regard, thus far.[2] A Turing machine, for example, must simply write and erase in a step-wise, linear fashion. An AI utilizing transformer technology won't fare much better since it too simply converts inputs to outputs, and amounts to an information/data processor (encoding and decoding), despite its parallelism:[3] it will only work with what it is trained on, and if all art and creativity depended on its mechanism, then the future would be exactly a kind of a trapped looping, an Ouroboros, since it (or whatever team of networks are generating works) will then have to train itself (use as inputs) its previous outputs (creative works). This is a degenerate process which should be avoided at all cost: we should not, in other words, become too reliant on AI for creative work.

Searle's famous Chinese Room is still an effective antidote to viewing such systems as involving any kind of *understanding* of the strings coming in and going out. But that is just one element that distinguishes our minds from machines. Our ability to 'joots' enables us to make new games by rewriting the very rule systems in which we find ourselves; something AI does not appear able to do, unless specifically programmed to alter its rule system as part of a deeper system of rules (which it will instead be constrained by). We might call it an *act of will* to jump in the first place and this element is presumably located outside of the game or system thus transcended. We might even think of free will as whatever 'fire' it is that enables us to joots, and avoid living in a mechanical, repetitive world. I tend to think that AI has not yet shown a way to access such a domain, and finds itself always immersed in its particular game which must still be specified by a human agent in possession of the necessary fire. This harks back to Aristotle's famous distinction between the natural and artificial, with only the former having *self-generative* ability and production within themselves.[4] We find a not dissimilar notion in Confucius' "Mandate of Heaven" according to which nature moves according to its own fire, a divine will (*Tao*) that humans would do well to align themselves with, if they wish for harmony, and this of course includes bringing the art and technological objects of humans into that same order.

But I don't wish to enter the debate of whether AI or technology will ever be conscious or possess free will, since if it did manage this feat, which it may for all I know, it would still face the limitative result I *do* wish to introduce and explore. It is a limitative result that would even apply to God, and amounts to a limitation on the possibility of total and true *omniscience* in the sense of knowing a totality which includes oneself as knower.[5] Of course, Hofstadter linked such meta-perspectivalism to Gödelian issues, and Escher's paradoxical artworks, and we are unavoidably pushed into similar territory here. The psychoanalyst C. G. Jung, as seen above, was surprisingly insightful about this issue, writing that "all statements which seek to overstep the limits of the psyche's polarity—statements about a metaphysical reality for example—must be paradoxical if they are to lay claim to any sort of validity" (ibid., p. 322). This, and the opening epigram from him, basically amount to expression of what I will call the "no-jootsing theorem" (*theorem*, because I will deduce it from what I take to be a general model of a 'total worldview' in which subject and object, knower and known, are both included). Any and all examples of what we call "jootsing" happen within a primordial epistemic condition out of which we cannot joots, enforcing a relativity to all jootsing and so all knowledge claims, as well as imposing a boundary on what a theory of everything could be. There is a paradoxical sense, as we shall see, in which jootsing is unlimited ("endless" in Hofstadter's terms) *and* limited (in something like an ineliminable strange loop, to employ another Hofstadterism). It is here in this paradox that there lies an important lesson about the nature of the mind and its role in this glorious cosmos.

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[2] In his "Minds,Machines and Gödel," John Lucas famously argued that humans outstrip machines in Gödelian ways since "a conscious being can both consider itself and its performance and yet not be other than that which did the performance" (*Philosophy* 1961, **36**(137): 112-127). This paper will disagree: we cannot observe a totality of which we are a part. It is impossible. To consider itself, there must be a separation into a perspective from which the conscious being is considered and the version of the self considered from that perspective, which will always be less than a totality: the 'I' defining a conscious being will always be screened off, so that there will always be an unknown remnant.

[3] The issue of Turing completeness of transformer networks remains somewhat controversial, which probably says something about our grasp of deep learning processes.

[4] See Bernard Stiegler's magisterial trilogy *Technics and Time* (Stanford University Press, 1998) for a thorough study of the evolution of this idea, including an argument that suggests an adjustment to Aristotle's division that only happened recently. While I disagree with his main argument, which suggests something like the free movement of technological objects, we will traverse some similar territory in what follows. *Cf.* also Michael Eldred, *Movement and Time in the Cyberworld* (De Gruyter, 2019) for an account of how algorithms can encroach into free will outside of the cyber-sphere, putting humanity in real peril.

[5] But, to be as clear as possible, note the issue is that *Knowing* is simply not an appropriate category for infinite, unbounded *Being*, since knowing, by its very nature, must bound and set apart an object of knowledge to make it fit for knowing. Knowing is in this sense an 'inferior' category to Being.

2 THE GREAT GAP

> There are a number of famous disasters in the history of philosophy, and Descartes is one of the greatest disasters.
> John Searle[6]

The disaster of which Searle speaks is, of course, the introduction of a dualistic logic of the world in which there is an objective, physical component (the world: *res extensa*), and a separate, independent subject (the mind: *res cogitans*) that in some sense mirrors it without being a causal part of it. This independence puts the mind outside of the natural sciences, hovering around it like a ghost. It is a disaster precisely because it makes life difficult for would-be physicalists who would like to reduce everything to matter. It was basically an early recognition of the hard problem of consciousness. Searle (ibid.) goes on to write:

> We live in one world, not two or three or several, and what we think of as consciousness and the mind is a biological feature of certain kinds of organisms. Descartes was unable to see that because he thought that consciousness could only exist in a soul, and the soul was not a part of the physical world.

But even if we take the mind to be just another part of the physical world as Searle suggests[7], and as the scientific-naturalist orthodoxy of our times would certainly agree, there is still a very clear division, as Searle elsewhere agrees, between the subjective and objective presentation of this "one world" that proves interminably difficult to bridge ("the hard problem of consciousness" referred to above).

In fact, this essay will argue that Searle's view is incorrect as it stands since it rests upon the idea of an absolute, objective 'way the world is' that our scientific theories aim to capture (what philosophers would call an 'externalist approach' to epistemology). This naive objectivism (which Searle, like many, simply assumes, often without a firm grasp of the theories of science in the first place[8]) is what I will challenge, and what the no-jootsing theorem flatly rules out. Quantum mechanics ought to already have placed such a view in the past, or at least placed extreme pressure on it. Yet even a more 'mystically-oriented' philosopher such as Manly Palmer Hall (with a strong aversion to materialism), in his book *Pathways of Philosophy* (Philosophical Research Society, 1947), would seem to go along with[9] something like Searle's methodological view, writing that:

> Science is nothing more than the image of truth. Absolute truth is truth of being, and relative truth is truth of knowing. These differ only as a direct ray of light differs from a refracted ray; thus the difference is in degree rather than in substance.

This supposes something absolute out there that we can make *images* of if only we have the correct camera. When we do, we have fidelity of representation and reality, and could be said to *know things as they really are*. I disagree. While I agree with Hall's claim that "Absolute truth is truth of being, and relative truth is truth of knowing," the rest I strongly disagree with, and the nature of the disagreement is at the core of this essay. Hall's position in fact suggests something like the 'verisimilitude' of Karl Popper, of 'getting closer to truth' such that if we just keep going in stacking up relative truths eventually we can reach the absolute. But I will aim to show that the difference is one of substance rather than degree. The difference is radical: no amount of relative truth—no amount of moving up the scale of degrees—will deliver absolute truth. Rather, being and knowing stand as a complementary pair: being excludes knowing

[6] "Brain, Mind, and Consciousness: A Conversation with Philosopher John Searle," March 3, 2015 by Dan Turello; `https://blogs.loc.gov/kluge/2015/03/conversation-with-john-searle/`.

[7] Which we need not, of course. Idealism is another response to Descartes' disaster, in which we view the apparently physical world to be 'just another part of the soul.' There is also the possibility that Descartes (and dualism) is correct, with the soul standing out from the material world in a higher-dimensional domain hidden from the five senses, thus providing at least a kind of home for jootsing. I present another response in the next section in which neither the mind nor the physical world are fundamental, but are descended from something neutral with respect to them both, which also provides a home for jootsing.

[8] I suspect it is true of a great many so-called scientific naturalists that they haven't more than a popular-level knowledge of the theories they root their view in: this is simply faith of a different kind, which is perfectly fine, so long as we recognise it for what it is. I also find a willful refusal to see, from an extrapolation of history, that our current scientific worldview will appear quaint or comical to our descendants in 1000 years, with the naturalist's rigid adherence striking us like the boasts of Ozymandias.

[9] Elsewhere he makes remarks closer to the impossibility of unlimited jootsing. See, e.g., *Lectures on Ancient Philosophy*, Tarcher-Penguin, 1929, p. 1: "No mind is capable of visualizing an appropriate symbolic figure of the Absolute". However, I use his claims apparently to the contrary in the foregoing since they set up so well the nature of the problems I wish to discuss.

and knowing excludes being, yet both are necessary for the *world*. In the next two sections I introduce a framework (decompositional dual-aspect monism) that makes this clear, and allows one to see what a theory of everything *qua* totality would look like, and what limitations it brings with it.

3 DECOMPOSITIONAL DUAL-ASPECT MONISM

> "[A] universe comes into being when a space is severed or cut apart."
> G. Spencer-Brown, *Laws of Thought*

Eastern thought and Western thought[10] tend to differ in the relative weight they assign to the material (objective) and to the mental (subjective or spiritual). In their limit of maximum weightings, these lead to the monisms of materialism and idealism. It is often thought that the only way to merge these two approaches is within the Cartesian, dualistic model of reality, in which both material and mental are equally fundamental yet somehow are able to occupy the same world and interact. But all three face seemingly interminable problems: materialism struggles with explaining our experience (the inner or subjective world), on which the very enterprise of science is founded. Idealism struggles to explain the very clear successes of science, based as it is on what seem to be objective facts concerning a stable, lawlike external world rather than private, conscious experience.[11] Dualism faces the problem of explaining how and why there is the interaction between mind and matter (inner and outer) if they are entirely distinct kinds of entity: how does the ghost move the machine which is surely part of the causal order of nature? In addition to their internal problems, each theory stands clearly at odds with the others, allowing no room for harmony—we might add that this situation leads to further disharmony between those elements of society that 'side' with one or other of these viewpoints (e.g. science versus religion or spirituality).

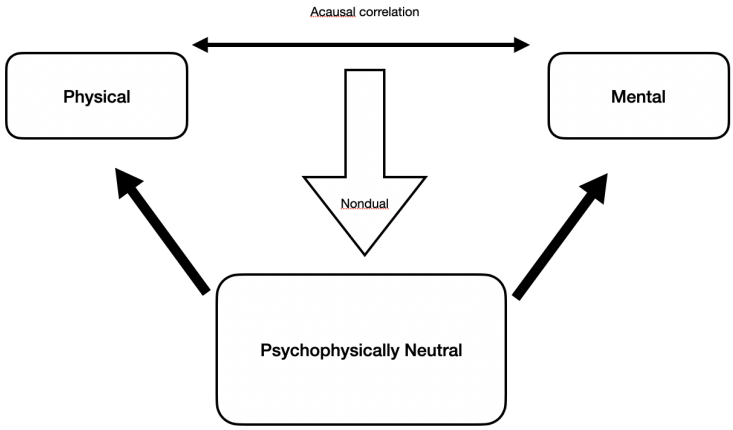
Decompositional dual-aspect monism[12] argues that neither mind nor matter is fundamental. Instead, it postulates a deeper reality that is *neutral* with respect to mind and matter ("psychophysically neutral"), but that leads via decomposition (i.e. being severed or cut apart) to a universe of mental or physical aspects, albeit with an epistemic rather than ontic status, in which there is no causal link between these aspects, only correlation (see the figure below). This structure holding between mind and matter is analogous to the mutual states of a pair of entangled particles in a spin-singlet state, in which there is a spin number of zero for the combined system, despite the particles having spin-values + or - $\frac{1}{2}$ (with a perfect anti-correlation holding between these values, accounting for the total spin = 0 state).[13]

[10] These terms are overly simplistic, of course, but they reflect a basic truth, which is that scientific materialism, often associated with Western or non-indigenous culture, tends to ignore our inner experience (of necessity, since that experience cannot by its nature be made objective) while the spiritual or religious viewpoints tend towards idealism, and tend to privilege the inner at the expense of the material, objective world.

[11] A very worrying, relevant remark appears in Murray Shannan's book *Embodiment and the Inner Life: Cognition and Consciousness in the Space of Possible Minds* (Oxford University Press, 2010): "A moment of self-presence that left no trace of itself behind would be just a chimera, no better than a nothing" and so '[w]e should make no appeal to anything outside the activities of groups of users of a common language" and "forget the dubious 'hidden light'." This is a backwards step to the likes of Skinnerianism, and should be avoided at all cost: the 'dubious inner light' is what makes you human and what AI lacks. Why someone would say such a grotesque thing is completely beyond me, but I show further down that this inner space is part of why we can seemingly joots forever (though with a strong constraint, as I also explain). Shanahan's other claims of "human-level artificial intelligence" and our being outperformed by it (e.g. his "Satori Before Singularity," *Journal of Consciousness Studies* **19**(7–8) 2012: pp. 87–102) have zero force if we keep the 'hidden light' in sight. Yet most if not all of the modern debates surrounding the mind are premised on the idea that we must look to matter for all answers, so the questions take the form: how do selves, awareness, subjectivity, minds, meanings etc, come from matter?

[12] Described in detail in H. Atmanspacher & D. Rickles, *Decompositional Dual-Aspect Monism and the Deep Structure of Meaning* (Routledge, 2022).

[13] In quantum mechanics, we would say that the individual electrons cannot be written as a *product state*, so that the total, combined system is not factorizable into definite sub-systems that can be viewed as each having an independent, objective existence. It is the existence of the total state, however, that determines or constrains the allowable states of the individual electrons, since they must always be consistent with the total spin = 0 state. This generates the correlated (or entangled), but non-causal connection known as non-locality.

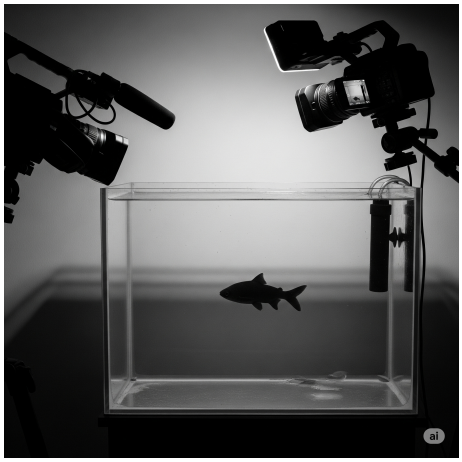


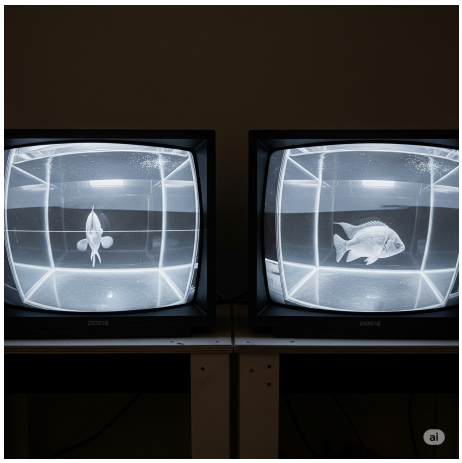
The basic problem with decompositional dual-aspect monism is trying to make sense of the neutral domain (the domain labelled "psychophysically neutral" in the diagram) and, in addition (and closely related), trying to make sense of the splitting into the Physical and Mental poles (which we can think of also as 'Objective/3rd Person' and 'Subjective/1st Person' poles) in such a way that they don't simply come out as full-blown Cartesian elements of reality.[14] In the quantum mechanical case, we view the total state of the combined system (with both electrons) as 'becoming' some particular values in a probabilistic manner. But this might seem inappropriate in the case of the mind-matter poles, so the full analogy is clearly strained here, though there is a similar transition from a potentiality (perhaps to be modelled also as a non-product state, which we can view as 'non-Boolean' or non-binary) to the actual manifestation of a world (in which a product state is legitimate, which we can view as a 'Boolean' structure, with definite features).

Perhaps the best way to understand what is going on here is to borrow a simple example from David Bohm, in which he describes the psychophysically neutral domain as a "multidimensional implicate order" (with the dual aspects, the mental and material poles, then being *explicate* orders). Bohm thinks of decomposition into the dual aspects in terms of *projections* out of this higher-dimensional order which does not itself possess (as *expressed* qualities) those qualities that result from the projection.[15] Bohm describes an aquarium in which a single fish swims. There are positioned a pair of video cameras on orthogonal sides, feeding a video stream to a pair of displays (see the figures below—courtesy of *Gemini* AI).

[14] Terrence McKenna expressed the problem well: "Jung in *Mysterium Coniunctionis* is at great pains to say that the realm of the psychic and the realm of the physical meet in a strange kind of never-never land that we have yet to create the intellectual tools to explore" (interview by Jeffrey Mishlove, "Aliens and Archetypes"). Hence, this is really the beginnings of a research project that goes beyond the usual 'mind-matter' options. Because of its novelty, it is looked upon as something inherently unscientific, but this is so only if we limit science to what is already known—surely the anti-thesis of science?

[15] See his *Wholeness and the Implicate Order* (Routledge, 1980, p. 237) in which the context is that of explaining quantum non-locality—though he explains that mind is bound up as simply a different aspect of one and the same universal outward projection from a deeper structure. See chapter 5 of the aforementioned Rickles & Atmanspacher book for an argument that Bohm's position amounts to a version of decompositional dual-aspect monism.





The aquarium and the fish are taken to represent the high-dimensional reality (the implicate order) that we are not directly privy to. We are only able to access the information on the pair of displays, which represent the *unfolding* (via the feeds from the video cameras) of the implicate order into explicate order, which provides its expression. We can say, as Bohm does, that the various possibilities for displaying the fish onto the screens are *enfolded* into the implicate order. Depending on where we place a camera, and what kind of camera or measuring device we use, we will receive different information or expressions, which is relative to the choice. This is akin to the complementarity of quantum mechanics, in which we can view both the wave and particle aspects of the quantum world as enfolded in a deeper (non-commutative) structure, which can only be unfolded as one or the other of a pair of complementary observables (e.g. position or momentum), but not both simultaneously. Indeed, we can view the existence of such complementarity as *evidence* of a higher-order of reality which cannot be expressed in our accessible 5-sensory/3D world other than through non-simultaneous events and processes—one can think of this in much the same way that a solid can only be 'accessed' (and never in its totality or fullness) in a plane through a sequence of distinct projections.

The interesting part about this example is that given access only to the screen we might view this as two separate fish, albeit with curiously correlated movements such that when one moves so does the other, and always in a predictable contrary motion.[16] Yet there is no causal connection between the two fish, as we know; rather, there is a higher source projected out which naturally generates such correlations for free, as it were. Such is the nature of the entangled state in relation to the entangled particles, and such is the relation of the psychophysically neutral domain to its mental and material poles according to dual-aspect monism.[17]

[16]There might even be all kinds of debates and battles about who has the 'truer' image of the fish, or even the One-True-Fish (the *adaequatio intellectus et rei* of Aquinas), much as our various religious *and* scientific traditions tend to do!

[17]There is an important difference between the fish example on the one hand and the quantum and dual-aspect monism cases on the other, namely that the higher-order reality does not come as an object as we ordinarily construe it, with properties attached

Note that given that we are involving both mind and matter in this framework, with the task then being that of finding a suitable neutral basis out of which they are projected or decomposed, we have here an example of a theory of "reality *in toto*" (the term is Harald Atmanspacher's), including the subject (that is: the experience) and the object (the world experienced as out there) in one and the same overall structure. As we will see later on, this suggests a role for (2nd-order) cybernetics, since we are modelling the modeller (ourselves) and the world modelled by that modeller, as should be the case in theory that aspires to be truly a theory of everything. However, the argument that follows does not depend on agreeing with the full metaphysical view of dual-aspect monism. In particular, one need not buy into the idea that the poles are related by meaning relations, rather than causal relations, as is one of the key elements of the full position. Rather, it requires that one accept that a complete theory must include the knower as well as the known (both poles) lest it fall woefully short, leading to the deluded idea, expressed with utter certainty, that the world experienced as external has nothing to do with us. In this case, the polar decompositions amount to ways of manifesting the neutral substance, without which it cannot become manifest to us.[18] However, once manifest, it becomes non-neutral[19], and so the knowledge is always relative to the decomposition: it does not provide an *image* of the psychophysically neutral structure. To return to the fish example, we can never capture the fish as an object of knowledge in one or even infinitely many aspects, since that would require stepping out of those aspects to compare, which would itself simply be viewing from another aspect, and so on *ad infinitum*. This leads us into the no-jootsing theorem.

You might insist that we can know, even without being able to compare our representation with the world 'from the outside.'[20] But can we be said to know if we can't know that we know? Such metacognitive leaps are precisely the business of jootsing, but this is precisely what is impossible through anything another other than an infinite regress or a loop (neither of which deliver absolute knowledge, but only relative knowledge). If we accept this about knowledge (that it must involve a split, and therefore a relativity), and we accept the reality of the endless jootsing of Hofstadter, then something like the scheme of decompositional dual-aspect monism is required, since a domain beyond the subject and object of the knowledge relation must be presupposed.

4 THE NO-JOOTSING THEOREM

"[E]very distinction is a trinity."
James Keys (aka G. Spencer Brown), *Only Two Can Play This Game*

The cyberneticist Heinz von Foerster once parodied Molière's " Bourgeois Gentleman," Monsieur Jourdain, writing that "I am living in an Environment! I have always lived in an Environment! I have lived in an Environment throughout my whole life!" Jootsing demands for its definition a distinction between the environment and the agent occupying it as part of the circuit in which the mind operates. The system that the agent seeks to gain knowledge about must be part of this circuit too. If this was all there was

waiting to be discovered by revelation. Rather, there is a co-creative element involved in which the aspects did not pre-exist in the final form within the enfolded order (waiting to be fished out...), though their *potentiality* did, given an appropriate participatory context—for more on this fature, see Rickles, "Your Cosmos Needs You: From Nothingness to Quantum Existentialism," in D. Rickles and L. Stein (eds.), *Varieties of Nothingness* (Chiron, 2024).

[18] We might also say that this is how the substance itself attempts to know itself, if only relationally. Louis Kauffman views this as a principle of cosmology: "The Universe is constructed in such a way that it can refer to itself ... the universe can pretend that it is two and then let itself refer to the two, and find that it has in the process referred only to the one, that is, itself" ("Reflexivity and Eigenform: The Shape of Process," *Constructivist Foundations* **4**(3), 2009: p. 134).

[19] Hence the complementarity of being and knowing, much like position and momentum measurements in quantum mechanics: as soon as we endeavour to find out the position of a particle, we rule out knowledge of its momentum, and *vice versa*. This is, of course, at the core of the double-slit experiment which so perfectly captures the strangeness of quantum mechanics. Indeed, the deeper framework of quantum theory (as opposed to specific mechanical or field-based implementations) can be seen as something like an expression of dual-aspect monism.

[20] "Outside" here meaning outside of the mode of epistemic access. By way of simple example, consider how me might calibrate a detector by employing another *outside* detector to check the fidelity of the first relative to its target (what it is aiming to detect). But really to be sure (for who calibrates the calibrator? to paraphrase Juvenal's *Satires*), this new detector would also require another detector to check it. This quickly leads to an infinite regress of detectors such that there is no absolute footing to knowledge gained by any detector. We find a curious parallel—swept under the rug since the entire edifice of science rests on ignoring it—in metrology. Our system of constants of nature, which inform the laws of nature and *vice versa* constitute an inter-linked framework of mutual dependence with no single element grounded in absolute knowledge. For example, constants of nature are defined through laws of nature (specifying invariances), but those very laws are defined in terms of constants of nature, so that science must bootstrap itself into existence as a self-supporting loop of sorts.

to reality, however, jootsing would not be possible. The agent must be in the same environment as the system under study, but must also have a foot elsewhere, beyond. If I desire to leave a room I'm in, to see some object in a different way, then there must be some notion of a separation between me and the room as well as me and the object. Jootsing is the shifting to another, usually, larger or different environment (or room). But it involves the perception of a separate environment or world or domain in the first place. If this separation is non-existent, then jootsing becomes incoherent. In dual-aspect monism the separation is non-fundamental, if not quite illusory, and yet we clearly do seem to be able to joots. In fact, Hofstadter never discusses into what 'space' these jootses happen. There must at least be the *possibility* for such jootsing. It must be rooted in something, and explicating this space of possibilities demands a response. One cannot think outside of a box if there is not only no space, but also no possibility of new space.

von Foerster goes on to say: "when we perceive our environment, it is we who invent it".[21] In other words: without you, your environment does not exist, much as the particular aspect of the fish does not exist without that particular camera feed to the screen. This has much in common with Sir Arthur Eddington's remark, in *The Nature of the Physical World* (Cambridge University Press, 1928), that "mind is the first and most direct thing in our experience, and all else is remote inference." He goes on to point out that such "mind-stuff (thought-substance) is part of perception [and] is not separate from what it describes." Eddington took this to mean that the physical universe itself is mind-stuff, but this should not be read superficially as signaling panpsychism since Eddington viewed both as subsisting in what he described as a "spiritual universe" (which has the form of a psychophysically neutral domain which takes form when subject-object polar decomposition occurs).

For Gregory Bateson too, the world was always necessarily constructed (rather than sitting in waiting, fully formed) through experience.[22] For Bateson, you do not see me and I do not see you: all is image. There is no escape from this, and we must exist in a kind of 'metaphysical locked-in syndrome.' Niklas Luhmann[23] likewise lands himself in quasi-zen koanesque contortions through similar reasoning: "constructed reality is...not the reality referred to" and "[r]eality is what one does not perceive when one perceives it". In more detail:

> [C]ognition is a self-referential process. Knowledge can know only itself, although it can—as if out of the corner of its eye—determine that this is possible only if there is more than mere cognition. Cognition deals with an external world that remains unknown and, as a result, has to come to see that it cannot see what it cannot see.

But what is having the experience here? Where is the experiencer located? We are given the clue that there is "more than mere cognition," but what sense can we make of this if any? In particular, what sense can we make of the expression: "Knowledge can know only itself"? This is of course precisely in the arena of self-reference and paradox. Let us unpack it, and in doing so also highlight a curious self-referential paradox, which I don't seem to have encountered before, with the philosopher's task encapsulated in the Delphic Maxim of Apollo's Temple: "Know Thyself". This allows us to present the no-jootsing theorem in a simple to understand manner. If knowledge (a self's knowledge) could know itself, then it would have to become the object of knowledge. This would require a splitting off of a subject which would know it. This leaves a 'portion' unknown (namely, the 'I'), much as an eye can never observe itself directly, but only through images and reflections. This is a general feature of the epistemic condition: a portion (the knower) will always be separated off, like the veiled area in Solomon's Temple, unknowable by construction. Hence, we can either perform repeated jootses according to which we separate off knower and known (in this case our self, and our knowledge), which has no end; or we can accept the loop-like closure involved here, and see that any knowledge is necessarily relative knowledge. Absolute knowledge is forbidden in both cases.

And yet we joots. Any joots will force a re-invention of environment or a reconstruction of a world.

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[21] From his talk "On Constructing a Reality" at the Fourth International Conference on Environmental Design Research on April 15, 1973, at the Virginia Polytechnic Institute in Blacksburg, Virginia: `https://sites.evergreen.edu/arunchandra/wp-content/uploads/sites/395/2018/05/constructing2.pdf`.

[22] See his 1969 essay "Pathologies of Epistemology," reprinted in his *Steps to an Ecology of Mind* (University of Chicago Press, 2000).

[23] Niklas Luhmann, "The Cognitive Program of Constructivism and the Reality That Remains Unknown," in William Rasch (ed.), *Theories of Distinction: Redescribing the Descriptions of Modernity*, trans. Joseph O'Neil et al., Stanford University Press, 2002, p. 129.

The additional neutral domain of dual-aspect monism provides a 'space' to make sense of such jootsing,[24] to redefine the subject-object links that we consider to be our experience of a world out there. Without this, there is nowhere to perform the kinds of clear creative re-imaginations of the world (and ourselves) that we do. The dual-aspect monist framework allows us to see the re-workings of the apparent empirical world (the objective pole), while occupying a vantage point in the psychophysically neutral domain [behind the Solomonic veil], rather than the subjective pole. Yet we cannot know this neutral domain other than through relative aspects, as with the Bohm example. Hence, the relativity of knowledge is preserved, and we see the limit to jootsing exemplified. The hard limit to jootsing is that we cannot know ourselves, and therefore we cannot ever determine the absoluteness of our knowledge claims. We cannot joots in such a way that it will allow us to know what is behind the curtain, for any attempt to do so will simply create another curtain behind which is an unexperienced/unknown experiencer/knower.

Heinz von Foerster's "Principle of Undifferentiated Encoding"[25] is another way of understanding the no-jootsing idea as pointing to a prohibition on absolute knowledge:

> The response of a nerve cell does not encode the physical nature of the agents that caused its response. Encoded is only "how much" at this point on my body, but not "what." That is, the brain does not perceive light, sound, heat, touch, taste or smell. It receives only neuronal impulses from sensory organs. Thus the brain does not "see light," "hear sounds," etc.; it can perceive only "this much stimulation at this point on my body." The practical consequence is that all perceptions, let alone "thoughts," are deductions from sensory stimuli. They cannot be otherwise. All observations are therefore partly the function of the observer. This situation renders complete objectivity impossible in principle.

This amounts to something like a version of structural realism in the philosophy of science: we can know the relational structure (the contours, intensities, and so on), but not the causes or essences. Structure but not nature. This much can be found already prefigured in Kant, of course, but also even more closely in Poincaré, and Eddington. However, it should be noted out that the "sensory organs" of which von Foerster speaks are also part of the input, and cannot therefore be bracketed off as *objective*. Just as there is no true way the world is, there is no true way the self is: both are veiled in a cloth weaved out of paradoxes, themselves weaved from self-reference.

Reality seems to be structured like a Theater, in the sense of *Thea* + *Ter* (Goddess + Three, which I suspect to be the correct, forgotten etymology of this word): the trinitarian, triple-aspected Goddess. A manifested reality demands a subjective and an objective pole, but these exist in a relational mode that depends on a ground that allows them to reconfigure and be related (every distinction is a trinity). We have something like the transcendental subject from Kant's philosophy, namely a subject that represents a necessary condition for experience, as opposed to anything that might be found through empirical investigation (which realm it transcends). But there is a crucial difference in that we do not invoke a pre-formed noumenal world that we are taking structural outlines of: the neutral domain is just that: without form in any sense we can know.

One might point to so-called *transcendental*, *non-dual*, or *ecstatic*[26] states as a counterexample to this theorem. But while there are indeed experiences that can *reduce* some duality out, or turn down the reducing valve of mind to use F. C. S. Schiller's idea[27], they can never entirely eliminate the experiencer if there is any experience at all. This ought to have the status of a tautology: no experience without an experiencer. Yet it does not seem to be seen as such, with cases of non-dual experiences understood as somehow managing to sidestep this constraint. The claims often have a large degree of immodesty about then, suggesting that in simply having a more expansive alternative view of the cosmos, it must

[24] In this sense, it is not unlike the *imaginal realm* (or *mundus imaginalis*) described by Henry Corbin in his study of Islamic mystics (e.g. in *Alone with the Alone: Creative Imagination in the Sufism of Ibn 'Arab*, Princeton University Press, 1998). It is a realm outside of sensory experience, a kind of third world, that is not imaginary in the sense of unreal, but more like the Platonic realm that mathematicians will often speak about visiting.

[25] "On Constructing a Reality," 1973, in H. von Foerster (ed.), *Understanding Understanding*, Springer, 2003, p.38.

[26] In this case, the very word means to stand apart and one can find, e.g. in the work of Ludwig Klages (*Of Cosmogonic Eros*, translated by K. J. Elliot, Anarch Books, 2023) the idea of experience-beyond-the-subject and "being outside oneself" (p. 38). It is interesting to note, as Klages goes on to, that such ecstatic experiences can often be interpreted as the I being taken over by something external, or possessed, which Klages views as "de-selfing". While the 'small self' might well be transcended in such moments, if an experience remains then it is simply from the vantage point of a larger, higher self.

[27] *Riddles of the Sphinx: A Study in the Philosophy of Evolution*, London, S. Sonnenschein; New York, Macmillan, 1894. William Blake offered an earlier example, though not so explicity expressed.

somehow be the correct, unconditioned one. But there must be a separation of some kind, even if the experience and experienced come from the same source in some sense—hence, where there is a dual split in a monistic system, there is a trinity: the subject, object, and source.[28] One can have non-dual ontology (i.e. monism) without non-duality in the expression of that monism, as dual-aspect monism clearly shows. Yet such experiences do offer a vital clue to the existence of something *other than* the everyday material existence—we might view such experiences as evidence for a larger, less filtered self (e.g. Aldous Huxley's "Mind at Large"). Such experiences can provide clues to a deeper non-dual domain of being, but that domain can never be an object of experience, of necessity. The psychoanalyst Wilfred Bion[29] puts it well:

> The belief that reality is or could be known is mistaken because reality is not something which lends itself to being known. It is impossible to know reality for the same reason that it is impossible to sing potatoes; they may be grown or pulled or eaten, but not sung. Reality has to be 'been'; there should be a transitive verb 'to be' expressly for use with the term 'reality.'

Reality cannot be known, it can only be *been*. You can be IT, but can't know IT. To know requires a constriction or limitation into some frame, which involves a splitting. Indeed, the very etymology of the word "know" (coming from the Old English *cnawan*) indicates this: "to be able to distinguish." This splitting is inherent in knowing and this is precisely what decompositional dual-aspect monism respects, through its epistemic understanding of the subject-object poles.[30] The esoteric text *The Kybalion*[31] makes much the same point, with which I concur, (though expressed here without real argument) as follows:

> The Hermetists believe and teach that THE ALL, "in itself," is and must ever be UNKNOWABLE. They regard all the theories, guesses, and speculations, of the theologians and metaphysicians regarding the inner nature of THE ALL, as but the childish efforts of mortal minds to grasp the secret of the Infinite. Such efforts have always failed and will always fail, from the very nature of the task.

Another potential objection is the pure experience or direct realism theory of, e,g William James, according to which what we see is what there is [WYSIWYG ontologies], with no 'representational gap.' Again: this is an impossibility. It is true that what one sees is what there is in the sense of monism, but if one is seeing (an experience) then there is an automatic separation which amounts to a splitting of subject and object (even if the object and subject are ultimately one). Hence, this is often misinterpreted to mean that there is no experiencer [self] experienced [world] split, which is not true, since it would imply that there is no experiencer. There still exists the duality of subjective and objective poles, only without any ontic split. Given this, the experiencer still persists as a kind of unviewable source of experience (the jootsing limit).

This way of presenting things allows us to state the no-jootsing theorem even more simply, in terms that do not necessarily rely on the dual-aspect framework. One can simply see that knowledge is a relation, and that involves at a bare minimum *twoness* and so a degree of separation from the thing known. One can have a self-reflexive relation of course, where a relation points a thing back to itself (which is what is happening in the maxim to Know Thyself), but this is no better, since the twoness must either force its way in through a splitting, or else it is not a relation of knowing at all—we are back to the problem of the eye (or I) not being able to see itself, but only being the source of such seeing. If the I, the subject which knows, cannot know itself, then it cannot know anything else other than in a relative way.

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[28] As Elliot Wolfson likes to put it: "every unveiling is a re-veiling," as much concealment as revelation: "All that exists is but a veil hiding the one true being, the necessary of existence, but it is precisely through this concealment that the invisible is rendered visible" ("Unveiling the Ka'ba," *Tablet*, September 17, 2015). Any exit of Plato's cave, must result in entering another cave of sorts. Here I disagree with William Blake's famous remark that "If the doors of perception were cleansed every thing would appear to man as it is, Infinite". Impossible: if it is to appear at all, it must involve division into an experiencing self and what is experienced.

[29] *Transformations*, Karnac Books, 1991: p. 148.

[30] Interestingly, the etymology of *belief*, usually contrasted with knowing, has its root in "beloved" (since *lieve* and *lief* correspond to 'love'). In this way, one might come closer to absolute reality through belief than knowledge.

[31] The Three Initiates, *The Kybalion: A Study of The Hermetic Philosophy of Ancient Egypt and Greece*, The Yogi Publication Society, 1908: p. 60.

5 STRANGE LOOPS AND THE CYBERNETICS OF TRUTH

> [T]his feeling that I am nothing without a *not*-I which is at the same time my *own* being, is the religious feeling. But what part of me is I and what part is not-I?
> Ludwig Feuerbach, *Lectures on the Essence of Religion*.

Heidegger was, at the end of his life, convinced that cybernetics marked the end of the project of philosophy. This was not seen in a positive light, but something to be overcome.[32] My account here is, in some ways, an attempt to do just this.[33] The problem, or one aspect of fit, is the self-reflexivity of "I," a single-step strange loop pointing right back at itself, and in doing so immediately screening itself off from any *not*-Is. The observer (you and me) has entered the universe of their own observations, so that any apparent not-Is are also contained therein, as aspects of the observer. As mentioned, the I is very much like the Eye in that neither can ever see themselves directly, only through things that are not it. But in order to assess fidelity of image and object (e.g. a reflection of our eye and our eye itself), we would need to joots to compare, yet we cannot joots out of ourselves (we are captured in a deep loop). Hence, while the creation of the I sets up a division of self and world, as a kind of dividing screen or interface, it is, epistemically, a one-way affair, staring out from a kind of abyss. The cybernetic nature of knowledge in this way of thinking seemingly implies no access to anything beyond the self-referential loop, and so is, seemingly, entirely groundless. von Foerster explains[34] the nature of the problem thus:

> If the properties of the observer (namely to observe and describe) are eliminated, there is nothing left; no observation, no description. However, there was a justification for adhering to this principle [of not allowing the observer into our physical theories–DR], and this justification was fear; fear that paradoxes would arise when the observers were allowed to enter the universe of their observations. And you know the threat of paradoxes. To steal their way into a theory is like having the cloven-hoofed foot of the devil stuck in the door of orthodoxy.

"Only a God can save us now," cried Heidegger[35], for exactly this reason: Because we need something that is *exterior* to the loop (an *other*). Yet since we cannot joots outside of the basic self-loop, there seems to be no exit. But the existence of jootsing within this fundamental loop suggests the existence of a space (which can function as God in the sense of *ground*) in which there is the possibility of reconfiguring any loop we happen to be involved in. This is the crucial aspect of consciousness (understood now as beyond the simple subject-object distinction): not as jumping as such but *re-interpreting*. It is an hermeneutic phenomenon. From within a closed system, a subject-object or I/not-I loop (in which there is no demonstrable ontic distinction between the subject or I and the object or not-I), there remains infinite freedom that must be rooted in something beyond the loop. Our mind is such that even if we do inhabit a strange loop, as 'I's we can perpetually re-imagine. What Hofstadter calls a "rut" or the trappedness is simply an exhaustion or stagnation of one particular interpretive loop. This is where the human plays a cosmic role[36] that AI seems unable to mimic. We are now accustomed to thinking of ourselves as mere specks in a vast cosmos. Yet does not this extraordinary power of the mind to generate infinite universes show rather the reverse? That the mind has a vastness within it that far exceeds any single, exterior cosmos?

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[32] Martin Heidegger, "The End of Philosophy and the Task of Thinking," in *On Time and Being*, trans. Joan Stambaugh (New York: Harper & Row, 1972).

[33] Yuk Hui argues that "[c]ybernetics marked the triumph of the scientific method that rendered philosophical reflections redundant" (*Cybernetics for the 21st Century Vol.1*, Hanart Press, 2024). I do not share this viewpoint, and find that cyberneticists were almost forced to become expert epistemologists (if not ontologists). It is quite true that the project of Being takes a hard knock, but my argument here allows us to bring back the question of Being, even within this cybernetic context.

[34] "Ethics and Second-Order Cybernetics," 1991, in H. von Foerster (ed.), *Understanding Understanding*, Springer, 2003, pp. 287–304.

[35] Interview of Heidegger (Rudolf Augstein and Georg Wolff), "Nur noch ein Gott kann uns retten," *Der Spiegel*, 31 May 1976: 193–219.

[36] Indeed, there is some kinship to the Islamic philosopher Ibn Arabi's notion of the human as a *barzakh* (literally "limit") acting as a kind of interface between God and the world, with the imaginal realm (our neutral domain) acting as the threshold between God and world (understood as unknown and known)–see Salman Bashier's *Ibn al-Arabi's Barzakh: The Concept of the Limit and the Relationship between God and the World* (State University of New York Press, 2004). Compare this with the following remark from Heidegger (also from the *Der Spiegel* article): "It is not through man that the world can be what it is and how it is – but also not without man. In my view, this goes together with the fact that what I call "Being" (that long traditional, highly ambiguous, now worn-out word) has need of man in order that its revelation, its appearance as truth, and its [various] forms may come to pass".

Strange loops can be turned into strange spirals by the application of interpretation (of a change of *meaning*, that is). This is the meaning of *genius*: the creative power in the mind. For the time being, we are something like the genius for AI systems themselves. They require us to be creative. Perhaps something stands to us as we stand to AI. However, this requires another arena or space as mentioned earlier: if the loop is all there is, then such reinterpretations do not seem possible, and there is the trapped scenario Hofstadter describes, and that Heidegger might be read as pointing towards. Here we see the problem with AI as a form of consciousness: it exists entirely along the P(hysical) pole only. It requires our minds to provide it with a foothold in the M(ental) through our involvement, and it requires our ability to step outside of both M and P to provide meaning to such systems (e.g. in large language models, which are, from the point of view of P alone entirely without meaning). One of the claims made for various neural network devices is that they exhibit understanding of some kind, and so are able to access the mental domain. Take the infamous *Numa-Rete* from the Biological Computer Laboratory at The University of Illinois:

Is the *Numa-Rete* a kind of mind? In one sense it is, since it finds distinctions between things, which can be seen by its *counting* random shapes (as above). But there is no changing what is counted. No reinterpretation of things. But it could count the 4-sided things only. Or the 5-sided things, Or cluster into triplets.[37] On the other hand, we are able to generate infinitely many worlds from this small group: constellations. The reason is that we are not exhausted by the relations between the mental and physical poles, and so must have our source elsewhere, much as the mathematician has a source elsewhere that enables their ability to endlessly think of new structures or models for a single Platonic, abstract structure.

Let us briefly make a final remark about the possibility of AI in the sense of artificial *consciousness*. The issue of whether we can ever engineer consciousness is viewed from a quite different perspective given the foregoing, since it views consciousness as something forever screened off in its essential nature through I-generation. It is precisely that which is *not* modellable. Back in 1973, Weston and Foerster, at the Biological Computer Laboratory, made a simple point about our efforts to create artificial consciousness that remains as true now as then: "[H]ow are we to know that we have succeeded in rendering the likeness of something that is in itself not known?"[38] And indeed, McCulloch and Pitts, who devised the initial correspondence between neurons and a logic that could be implemented on machines [surely a strong contender for the 'birth event' of AI], insisted that the correspondence was simply a "formal equivalence" that was not to be viewed as a grounding or explanation of the nature of minds.[39] But it is not just that consciousness (the self) is not known, it is not knowable *simpliciter*.

[37] Even here, it is still we who select the results that concur with our determinations of the correct distinctions. Our determinations are ours. A very large being might well coarse-grain over what we distinguish. A small being might see distinctions we do not see, and count differently.

[38] Paul Weston and Heinz von Foerster, "Artificial Intelligence and Machines that Understand," *Annual Review Of Physical Chemistry* **24**, 353-378, 1973, p. 353).

[39] "A Logical Calculus of the Ideas Immanent in Nervous Activity," *The Bulletin of Mathematical Biophysics* **5**(4) 1943: 100–101

6 LIMITS WITHOUT LIMITS: ETERNAL INFLATION VERSUS LOOPING

I utter myself by seeing.
Paul Foster Case, *The Book of Tokens*

The notion of a limit or boundary is essential to the world of things, of course. Anaximander famously spoke of the *Apeiron* as that which has no boundary, which precisely ruled out any forms and things, and indeed the world was dissolved to be born anew through dissolution into it. One of the deeper reasons for wishing to do away with infinities in the foundations of mathematics, in favour of constructivist approaches, is precisely to retain a grasp of things, and a retaining of decidability and consistency.[40] The grasp is temporary and local, and the fact that there is no end to the possible constructions suggest a source beyond what is concretely given here.

Within the looping we are part of an apparently shared structure that generates the appearance of an objective world that we can agree on. We are limited by this shared structure in terms of what we consider possible and impossible. This is what we think of as reality. This much holds just as well for the endless jootsing model. Indeed, the only difference between the two schemes is how we see that structure at any one time. For the inflationist they will see it as incomplete but decidable. For the looper they will see it as complete, but undecidable. Yet both can switch in some sense. The inflationist jootses to a larger scheme that can in some way allow the previous scheme to inhabit it. The looper cannot adopt this viewpoint, but must view any switch not as a joots (since there is nothing to joots to: the scheme being complete) but a reconfiguration brought about deciding the undecidables in a different way. Were there is no longer an eternal inflation of theories and worldviews in one sense, there can be something that is identical, for all practical purposes, even within the loop, and it is precisely another kind of jootsing that enables this, namely a reinterpretive jootsing in which undeciables are, let us say, 'weakly decided' (we can call this not-quite-jootsing, hermeneutic-jootsing or, better, weak-jootsing). We can see how we already operate in this way, despite declarations to the contrary. Scientific objectivity demands that it be 'the one and only worldview,' yet it co-exists in parallel with completely orthogonal worldviews (claims about the totality) held by people who seem to also manage to live and adapt to their environment defined by a distinct set of answers to undecidables.

The originator of quantum theory (which in Niels Bohr's hand at least embodies much of what we have been saying here), Max Planck was aware (if not in name) of the no-jootsing theorem. He famously wrote that "Science cannot solve the ultimate mystery of nature. And that is because, in the last analysis, we ourselves are a part of the mystery that we are trying to solve" (*Where is Science Going?*, Allen & Unwin, 1933, p. 215). There are, as we have already described, two ways of dealing with this mystery: an ever-expanding approach, in which every time we wish to know about a totality, we must enlarge to another system that includes the original totality in some sense; and the loop approach, in which we accept the inability to know totalities of which we are a part. Clearly, the former is incomplete since every expansion will result in the same problem. While the latter results in undecidability, since we know that there are truths about the system that must remain forever unknown. An interesting defense of the former comes from Freeman Dyson[41], who viewed it as a boon:

> Gödel proved that the world of pure mathematics is inexhaustible; no finite set of axioms and rules of inference can ever encompass the whole of mathematics; given any set of axioms, we can find meaningful mathematical questions which the axioms leave unanswered. I hope that an analogous situation exists in the physical world. If my view of the future is correct, it means that the world of physics and astronomy is also inexhaustible; no matter how far we go into the future, there will always be new things happening, new information coming in, new worlds to explore, a constantly expanding domain of life, consciousness, and memory.

I called this the 'eternal inflation of knowledge systems.' But: this accepts the impossibility of absolute knowledge of course: we will never be able to say we have found absolute truth. It is endless jootsing to new systems of merely relative knowledge. The jootsing approach secures temporary consistency, at each new joots, but demands ever newer jootsing, and so is incomplete despite local appearances to the contrary (which look as if we have no undecidables once a joots has occurred to fix values), with each

[40] *Cf.* P. Carani, "Infinity and the Observer: Radical Constructivism and the Foundations of Mathematics," *Constructivist Foundations* **7**(2): 116–125.

[41] *Infinite in All Directions*, Harper-Collins, 2004.

totality depending on another in an infinite tower that since it never terminates cannot secure anything beneath. We never lock into a final, complete theory. Planck made a similar statement (ibid., p. 199):

> [W]e must admit that in no case can we rest assured that what is absolute in science to-day will remain absolute for all time. Not only that, but we must admit as certain the truth that the absolute can never finally be grasped by the researcher. The absolute represents an ideal goal which is always ahead of us and which we can never reach. We are always struggling from the relative to the absolute.

Interestingly, Planck cites mental health reasons to joots indefinitely, rather than accepting that we are limited to relative facts only and so ending the movement of ideas. Planck quotes Gotthold Lessing, that it is not the truth but the effort that brings joy! I would add to this, as I discuss more below, the importance of *play* in addition to effort: the two are not mutually exclusive.

The alternative is precisely such a closed, complete approach. Here, there is no expansion in the sense of jumping to know a totality, by generating a new totality, but an acknowledgment of the relative nature of knowledge claims, and a clear understanding that the true nature of the totality must ever remain undecidable. Peter Kingsley describes implications of such an approach:

> To keep pushing back the boundaries of knowledge is quite the opposite of getting to the edges of knowledge. In fact, it's simply a way of extending the hangman's rope. What we need is to be able to reach so far we can touch the noose that binds us. ... [I]n the experience of completeness there is nothing to become. There is nothing else to look forward to. The endless searching is over.[42]

But, while Kingsley is correct that there can be a kind of completeness in knowledge (indeed: this is the same cybernetic end that Heidegger worried about), it does not mean that the story stops. We saw that a kind of 'internal' Jootsing can occur within completeness (understood here as accepting that all knowledge attainable is relative knowledge). Hofstadter suggests that there might be a kind of unlimitedness too: "Implicit in the concept of Strange Loops is the concept of infinity, since what else is a loop but a way of representing an endless process in a finite way?" (*I Am a Strange Loop*). However, I have a different sense in mind. It is not just the absence of an edge that a loop involves, but more the ability to reinterpret a loop.[43] Hence, we can in a sense have our cake and eat it: we can explore the nature of this world of relative relations which we know will never be exhausted (following Dyson), and accept that all of these explorations are ultimately missing the true/ultimate nature. Hence, we can accept that all knowledge is of relative facts only [which it must be], so that we will never be able to access absolute knowledge. But we can play with the undecidability that allows us to perpetually joots (weakly), and explore all that is possible in the limited space of relative facts. It is like an endless playground of possibilities that can be manifested with the appropriate questions or styles of observation.

Let it not be mistaken that this is a free-wheeling, anything goes relativism here. There are quite clearly, once a loop has been adopted, laws holding within the loop, just as surely as an axiomatic system allows only certain theorems to be proven. Moreover, it also seems clear that not any old loops are possible. The psychophysically neutral realm constrains what is possible. It is not neutral *simpliciter* and can be thought of in terms of something like mathematical structures or archetypes. This in fact gives us a way of making sense of the apparently paradoxical way in which we can generate infinite worlds through weak-jootsing, while being restricted in a more global sense by something unknowable, *beyond the loop*. For archetypes, like mathematical structures, have within them the possibility of infinite representations: they are not *like* anything because they do not have the level of concreteness required to manifest to us. They manifest through this world, and they they pick up 'likeness.' We cannot destroy them or exhaust them. A myth for example, can be expressed through infinite stories. Information, such as computer programmes, can be brought into this world in any number of substrates. A work of music,

[42] *Reality*, Golden Sufi Center, 2003, p. 283 and 288.

[43] I suspect Yuk Hui has something similar in mind in his *Recursivity and Contingency* (Oxford University Press, 2019), when he writes that "[r]ecursivity is characterised by the looping movement of returning to itself in order to determine itself, while every movement is open to contingency, which in turn determines its singularity". The contingency here needs a space in which it is 'hosted,' which cannot be simply mental or material, since they are the very elements undergoing reconfigurations. This allows us to interweave necessity (the ground) with contingency (our decisions about the undecidable statements), and boundlessless (again, the ground) with boundedness (our world-in-the-loop).

also possessing this same quality, cannot be exhausted no matter how many times it is performed: it is ageless, because it is not something that exists in a single loop. We ourselves appear to be the vehicles for making these higher-order, unphysical unknowables manifest, even if only in an unfaithful fashion. We are, in this sense, like a theater for their unfolding. There is no new play under the sun if the loop alone exists, but the addition of the neutral ground, off-stage, provides ample space for new interpretations and re-imaginings.

The psychophysically neutral domain in which weak-jootsing occurs, might, as we mentioned above, be viewed as the imaginal world, which fits the bill, as neither mental nor material. This framework enables us to achieve the remarkable creative feat, perhaps more impressive than the novelty Hofstadter discusses, since we are able to generate entirely different stories from the same materials (albeit inscrutable materials). We can infinitely reinterpret any scene. We can reinterpret our own past and generate a different person with a different history through an act of will and belief. As von Foerster explains:

> [W]e are under no compulsion, not even under that of logic, when we decide on in principle undecidable questions. There is no external necessity that forces us to answer such questions one way or another. We are free! The compliment to necessity is not chance, it is choice! We can choose who we wish to become when we have decided on an in-principle undecidable question.[44]

If we ever get stuck, or stagnant, or even repulsed by our web of beliefs (decisions for undecidables, such as claims about totalities), we can switch them by our decisions, by free choice. There are no absolutes within the web (though there are relative truths): warring over absolute facts (about the correct nature of God, and so on) becomes null and void, though part of the play if one so desires. A weak-joots can be so extreme as to alter our notion of ourselves as well as the world—the two often go in parallel, of course. The acceptance that one is at the core of the worldview, deciding undecidables as a kind of 'cosmic dramaturge,' places huge responsibility on each individual. It amounts to a cosmic role for each such player, without which what we consider the physical world cannot exist.[45]

Thus, the ability of consciousness to infinitely reinterpret both mind and world leaves open a space of infinite play ('Hermeneutic Infinity:' openness in closure) that would otherwise terminate in Kingsley's deathly stasis. What could be worse than finding out the answer to all mysteries? What then?[46] The trapped, relational loop means that we can in one sense know something absolute—that we cannot ever know the absolute—while leaving open the freedom to redefine what that mystery might be by utilizing the 'behind the scenes' ground the absolute provides. We can see then that the realm of relative knowledge does contain features that can allow inference to a 'world beyond the loop.'

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All that we see or seem is but belief within a loop.[47]

[44] "Ethics and Second-Order Cybernetics," 1991, in H. von Foerster (ed.), *Understanding Understanding*, Springer, 2003, pp. 287–304.

[45] There is something like an optimization of materials involved here—much as time allows for the infinite reuse of each point of space—here there can be many worlds occupying one so long as we are present as interpreters and re-interpreters.

[46] *Cf.* James P. Carse's *Finite And Infinite Games* (Free Press, 1986).

[47] Proviso: Which requires a ground to explain intra-loop belief changes!