Telos and Complexity

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Abstract

I will develop a general model of causality, based on conditionality. From there, I will develop a topological hierarchy whereby distinct categories of natural phenomena are modeled according to their relative complexity. I contend that it is only in doing so that the function of telos can be convincingly discretized and defined relative to other phenomena that exhibit no teleological properties. I will then show how both quantitative and qualitative modes of describing conditioned states arise as expressions of teleological function. I will conclude by summarizing some of the broad implications of what the entire model suggests regarding telos and the human condition.

Introduction

Ours is a universe of complexity, and *telos* is its highest expression. In order to show how this is indeed the case, a broad model of causality based on the ideas of the Indian philosopher Nāgārjuna will be presented. Then, a way to topologically differentiate this broad model into discrete orders of complexity will be developed such that the emergence of *telos* (i.e. purpose) can be clearly identified and defined. To do this, it will be necessary to distinguish the difference between *intrinsic* and *extrinsic* properties of complexity. By intrinsic properties, I mean the inherent conditions that give rise to some subject, while extrinsic refer to properties projected upon one subject by another. Take for example, a fork; mass, shape, and molecular composition are all intrinsic properties that define a fork. Many of these properties can be quantified with great precision. However, one cannot quantify the telos that a fork has to food, or to the humans who use it; as such properties don't depend only upon intrinsic determination, but are extrinsically created and projected upon forks by our own intrinsic *subjective agency*. I contend that, although every element of space and time expresses itself as an intrinsic *subjective condition*, all extrinsic properties are created by some intrinsic subjective agency. I further contend, that subjective agency is indeed the equivalent of teleological agency, and that such agency is only expressible through and as animate entities. Therefore, by describing how animate entities come into being as a specific order of complexity, I will also be describing how telos comes into being. My conclusion will show how the deeper implications of the relationship between teleological agency and non-teleological phenomena suggest a new way to understand humanity and our place in the cosmos.

Background

Circa 250 CE, the Indian Mahayana Buddhist philosopher Nāgārjuna introduced the doctrine of Dependent Co-origination (Pratītya-samutpāda)[1]. Through this doctrine he asserted that all phenomena are completely conditional and therefore *empty* (Śūnyatā)[2] of any unconditioned reality, character, or characteristics (svabhāva). This position stands in general contrast to Western-style empirical approaches, where either actual or abstract building-block-type entity(s), forces, or fields are often considered as fundamental[3]. Thus, according to Dependent Co-origination, no objectifiable conditions nor non-material subjective qualities (e.g. panpsychic or implicate conditions) can describe the universe in its fullest sense, as any such constituents must always themselves be conditional. Rather, it is only the dynamic interaction between some set of

conditions that continuously gives rise to all expressions of complexity. Therefore, I propose three postulates that are common to any conditioned state:

Postulate 1. Unity; there is an aspect to every conditioned state that corresponds to some single, commonly held boundary, either physical or imaginary.
Postulate 2. Polarity; there is an aspect to every conditioned state that corresponds to some relative diversity within the boundary of that state, describable in terms of a set of conditional opposites, whose sum over time defines that relationship.
Postulate 3. Change; there is an aspect to every conditioned state that corresponds to the change brought about through the simultaneous and continuous interaction between the conditional opposites that constitute that state.

A General Model of Causality

In order to illustrate a simple causal model in terms of these three postulates, let two polarized circles, one black and one white, continuously merge and then separate from each other. Thus, in Fig. 1, *Postulate 1* is modeled by the overall relationship that includes both black and white. *Postulate 2* is modeled by the division of that overall relationship into the conditional opposites of black and white. *Postulate 3* is modeled by the function of the two conditional opposites switching places with respect to each other.

In their initial state, black is completely polarized from white. In this state, no subjective entity can be modeled because there is no way to intrinsically draw contrast between black and white. However, when black and white begin to overlap via their functional interaction, a new and completely conditional area of grey overlap is created. It is this area of overlap that I contend models an intrinsic *subjective condition*. Note that once grey is formed, the remaining portions of the two original circles make up a contextual, bifurcated object-field relative exclusively to that newly formed subjective condition. For this reason I will refer to the entire conditioned state *after* the subject has been formed, as the *entity-context*. For example, when a male and a female of some species mate, it's not until their offspring is born that they become 'mother' and 'father'. Here, the pre-subjective context, i.e. male-female, is transformed through the birth of their offspring into the new and unique conditions, relative to the child, we call mother and father. The entity-context includes both the child and the parents. Therefore, if the above grey area could think and talk, it would be able to recognize its own intrinsic relationship to both opposites of black and white because it has the unique condition of sharing in the content of both. This quality cannot be modeled by either black or white in their initial polarized state. The area of gray overlap can also be abstractly understood as *information* because it models the creation of intrinsic *data* within a given set of parameters in a way that is not coupled to an outside observer[4].

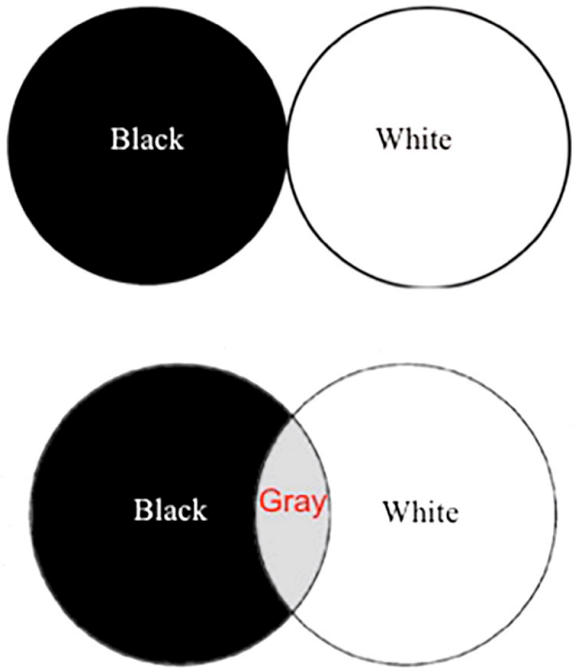

Fig. 1 The Intrinsic Entity-Context

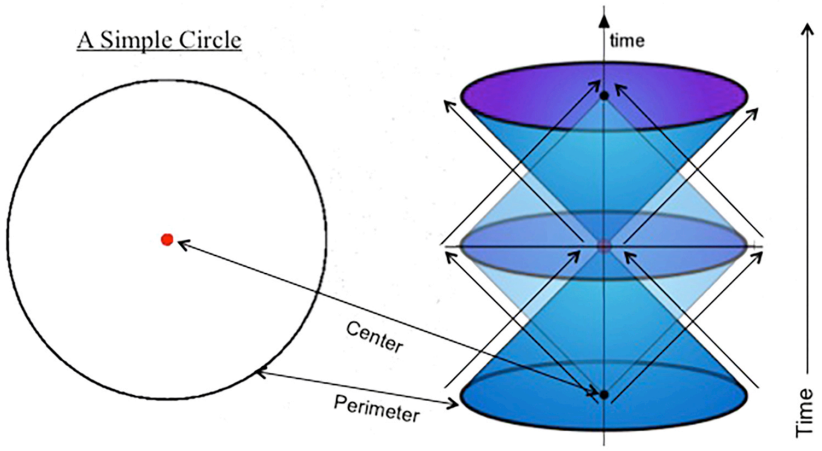

Fig. 2 Conditional Opposites Change over Time

In order to illustrate the above ideas in a more formal, causal model, let us begin with a simple circle (Fig. 2). Let this circle represent any single boundary imaginable (Postulate 1). Let us set the pair of conditional opposites that defined the circle as being the circumference and the exact center (Postulate 2). In order to model continuous and simultaneous change (Postulate 3), let the circumference and center continuously switch places.

In Fig. 3, the two opposing functions of circumference and center are indicated at Polarity I. These two functions change with respect to each other (Prehistoric) and eventually meet at Unification I. This initial point of unification models a state of relative non-differentiation (i.e. unity) between the conditional opposites, relative to their initial polarized state. After unifying, the conditional opposites switch functions with respect to each other. That is, what was functioning as center, now functions as the relative circumference and vice-versa. In so doing, an area of overlap between the switched functions is formed and expands (Fig. 3, Historical Event; Formation). This area of overlap expresses the same relativistic condition between the opposing functions modeled by the grey area in Fig. 1, but is now depicted as dynamically bounded by the contracting circumference (turned relative center) and the expanding center (turned relative circumference). Thus, the growing area of overlap between the progressing functions models the creation of any intrinsic subjective entity surrounded by its opposing contextual limits. This can alternatively be understood as any historical event, or (as stated above) as the creation of information. This new condition will grow until the opposing functions reach the origins of their conjugal opposite (i.e. Polarity II). Then, as continuous change is required, the opposing functions of center and circumference must begin to move back towards their original orientations. When this begins, the entity-context will simultaneously begin to decay. At the area where the returning functions meet at their

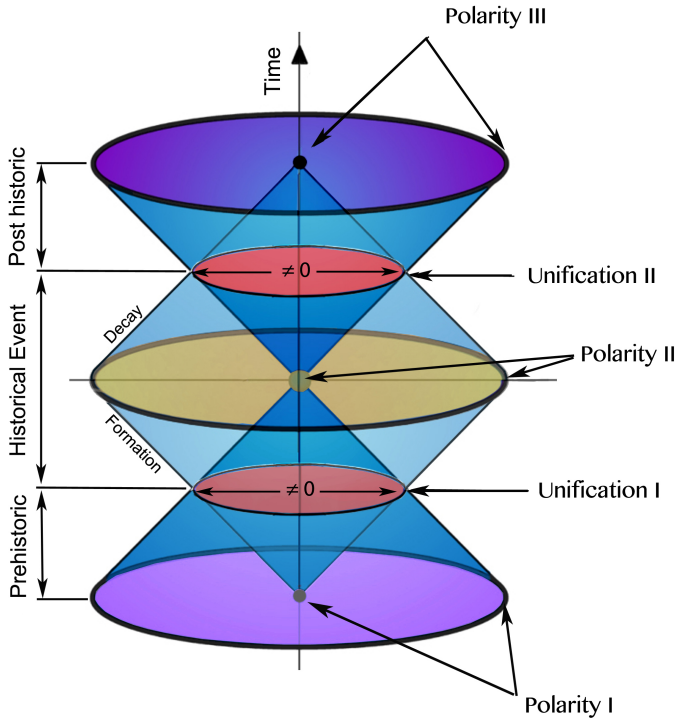

Fig. 3 The Cycle of Change

second point of unification (Unification II) and cross back into their original functions, the annihilation of the entity-context is complete (although a new one will immediately be formed). Thus, every entity-context relationship (i.e. Historical Event) is necessarily 'bookended' by pre-event and post-event conditions relative to itself. Thus, 'Pre-historic' and 'Post-historic' conditions intrinsically create pre-information and post-informational states relative only to the intrinsic Historical Event i.e. entity-context.

Complexity

What I've shown is that a general model for the conditioned nature of subjectivity and objectivity can be described using Nāgārjuna's ideas about Dependent Co-origination and a few simple diagrams. I will now show how diverse expressions of intrinsic complexity can be described such that the essential differences between animate and inanimate conditions are made clear. In order to do this, a model made up of four (ultimately five) orders of complexity that correspond to different types of conditional entity-contexts will be presented so that their differences might be understood in terms of relative complexity rather than from any purely objective states or qualities. However, I am not a scientist, and the following is meant to be a philosophical thought experiment using broad swaths of different phenomena as a way to explore a link between teleological and non-teleological entity-contexts. The list below in no way implies that it is exhaustive of all possible orders of complexity, but hopefully these four can serve as an interesting beginning.

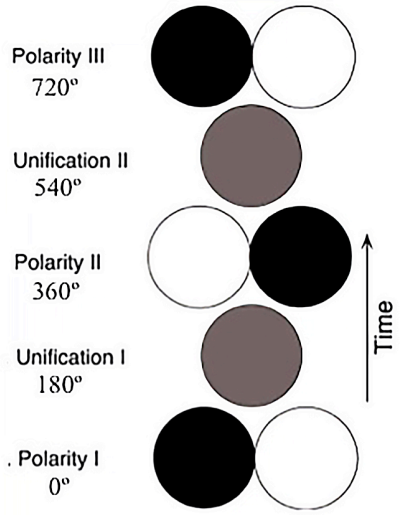

Fig. 4 Abstract Cycle of Change

The four orders of complexity will be:

1) *Massless entity-contexts in quantum super-position*.
2) *Massive entity-contexts in quantum super-position*.
3) *Inanimate macro-level entity-contexts*.
4) *Animate macro-level entity-contexts*.

In Fig. 4, we see the same oscillation between polarity and unification as in Fig. 3, expressed as simple black, white, and gray circles, and described as a 720º cycle. Of course, this diagram only shows a single cycle. In reality the cycle repeats, continuously creating new, completely conditional expressions over time. Therefore, if we take the Abstract Cycle of Change in Fig. 4 and join its pre- and post-event polar states, we get a continuous 720º loop (See Fig. 5).

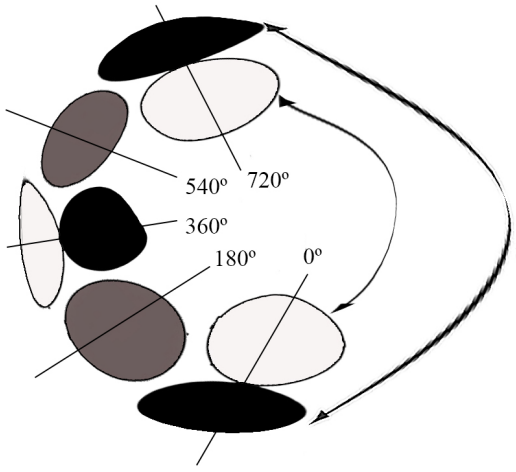

Fig 5 Abstract Cycle Loop

This 720º loop can be modeled topologically using a shaded Möbius strip (Fig. 6). The Möbius strip is a two-dimensional manifold with only a single edge and one side[5]. However, in cross-section, that one side can be divided into two conjugal faces at every point along it. Let each cross-section represent the conditioned state at an instant of change. Let the conjugal faces represent the conditional opposites that define any overall conditioned state. To exactly

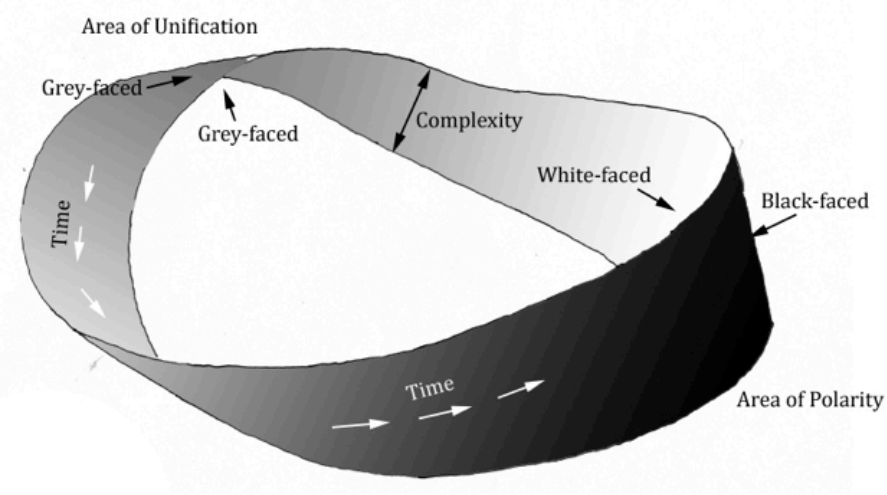

Fig. 6 The First-order Complexity

mirror the abstract diagram for change (Fig. 4), at some point along the strip, let one face be completely black and the other white. At the point 180° from this black/white area, let both faces be uniformly gray. Let the area between the black/white faces and uniform gray gradually transition to each other. Because it takes a 720º progression (i.e. two times around) along the face of any Möbius strip to return to the starting point, if we begin on the point of greatest polarity on the black face, it will take a 720º progression to return to that same black/white orientation, but in so doing, the orientations of black, white, and gray will have cycled through the unification and polarized "switching", relative to their conjugal face; in perfect keeping with the Abstract Cycle of Change (Fig. 4). In all the topological examples to follow, let the longitudinal dimension represent the temporal change for whatever system of opposites is being modeled, while the latitudinal width and curvature will represent the relative degree of complexity within the entire four-order system.

However, in the first-order of complexity (Fig. 6), there is a difference in how the Cycle of Change is modeled. That is, in the Cycle of Change diagram (Fig. 3), the entity-context (Historical event) is produced as a new spatially distinct condition, created by the switching circumference and center. However, in the case of the *first-order of complexity* (Fig 6.) there is no new spatially (or temporally) distinct area created *between* the conditional opposites of black and white. That is, relative "space-time" does not manifest at this simplest levels, although the principled cycle of change still holds. Rather, the "switched" expression of these most fundamental of opposites (i.e. some massless micro-level particle in relationship to everything that is not that particle) only expresses a kind of temporal re-orientation (from black/white to white/black, etc.). One might say that these simplest expressions manifest *as* time rather than *within* it. The first-order of complexity can be modeled using the example of a single photon in direct relationship with the rest of the Cosmos (*Massless entity-contexts in quantum super-position*). It is this type of one-to-one relationship that offers a simple explanation for quantum *entanglement*[6]. That is, even when the photon is itself divided into two sub-particles (by various means), there can be no *intrinsic* "distance" separating them because spatial dimensions are not possible at this level of complexity. Therefore, both entangled parts of the split photon are still *intrinsically* unifying and polarizing as a single photon from the rest of the Cosmos. It is only we, as complex, higher-order systems, who observe distance and a *non-local*[7] correlation between the two, what we *extrinsically* perceive as, spatially separated sub-particles, and label as "spooky action-at-a-distance"[8].

The difference in complexity between our own, higher-order conditioned state and the first-order of complexity also suggests a possible explanation for why the speed of light is the universal "speed limit", and is always measured as constant, regardless of the speed of its source[9]. That is, since first-order complexities are the simplest expression of conjugal opposites possible, the speed of light could simply be understood as the fastest rate that any Cycle of Change can occur. Therefore, it

also stands to reason that no matter how fast any particular macro-level entity *embedded* within the universe is traveling, the speed of the "light" i.e. electromagnetic wave, originating from it will always be the same (when measured by any macro-level observer) because every photon is, by my definition, definitively engaged with the cosmos as a whole. It's as though any pair of macro-level eyes are the universe's eyes, and so every pair sees photons polarizing from itself at the same rate, regardless of how fast different sets of "macro-level" eyes are moving relative to each other. One could paraphrase John Donne's famous lines from "Devotions Upon Emergent Occasions"[10] to read; *Ask not from what the beam of light is bursting forth from (nor be concerned with the speed of its point of origin) for it bursts forth from Thee!* (i.e. everything that is not that beam of light).

How then to model Massive entities in super-position? In the *second-order of complexity* (Fig. 7) we must not only begin to vary the width of the strip, but also include the addition of a lateral curve. This lateral curve is not arbitrary. Rather, it indicates some level of transition of the Möbius strip topology towards that of a Klein bottle (i.e. the third-order of complexity). This transitional curvature models some profound differences relative to the first-order. Therefore, let the width of the second-order Möbius strip become wider where black and white is polarized, and more narrow towards the gray area (see Fig. 7). The open edge of the first and second-orders represents the lower limit of complexity: as freely moving entity-contexts in quantum super-position i.e. a wave-function[12]. But, the second-order's lateral curve literally introduces a bend into the previously flat, first-order expression of time. Thus, I contend that the lateral curve represents the simplest expressions of gravity necessarily present for any *massive,* micro or macro-level entity-context. Longitudinally, the second-order curve results in a topological *asymmetry* created over the 720º Cycle of Change (in contrast to the topologically symmetric first-order) and thus models the *Fermi exclusion principle*[13] indicating mass. Therefore, in this general mapping of complexity, first-order complexities correspond to massless spin-1 *bosons*[14], and second-order to *fermions*[15].

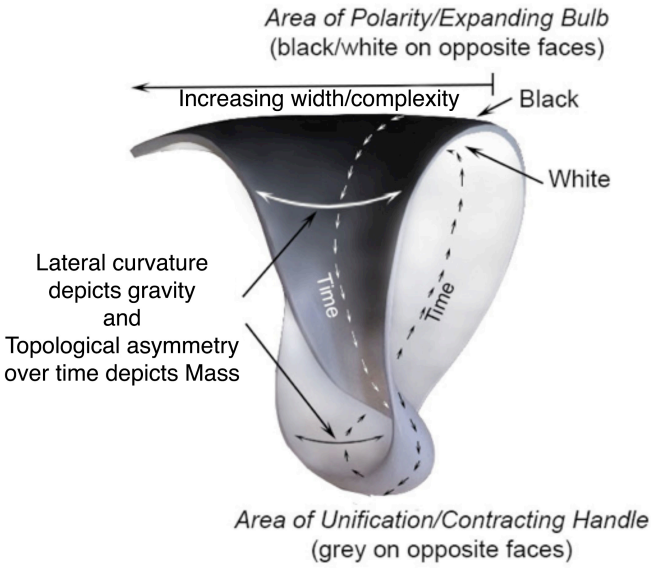

Fig. 7 The Second-order complexity

The *third-order of complexity* (Fig. 8) is illustrated as a modified Klein bottle (MKB), and depicts a cycling entity-context that topologically has no edge. This means that the system represented does not exist at the lower limit of complexity, i.e. not as a quantum *super-position* between some entity and its own context. Rather, third-order expressions give rise to localized, structurally distinct entity-contexts embedded within some larger context. Therefore, the exact point of transformation from freely moving lower-order super-positions (first/second-order complexities) into a third- (or fourth-) order complexity can be understood as the *collapse of the wave-function*[16]. Diagrammatically, there are differences between a normal Klein bottle and the MKB shown in Fig. 8. One of the most important being that at the point where both faces are uniformly gray, the handle of the bottle narrows to the smallest point of unification possible for the system (corresponding to Fig. 3, Unification I). Then, in keeping with the Cycle of Change, inner and outer faces pass through and actually invert their functions with respect to each other. Diagrammatically, this creates an

advancing "wave" representing the progressing third-order entity-context (See top of Fig. 8). That is, the third-order effectively represents an inanimate, localized, and historical event. By contrast, in the first two orders of complexity (see Fig. 6 & 7), there is no such temporally limited and spatially structured *space-time* created between the cycling opposites. The lack of such structure in the first two orders makes super-position and entanglement possible for them, and largely impossible for third-order entities (with qualified exceptions). That is, because every third-order entity-context is characterized by being embedded *within* a spatial and temporal context rather than manifesting *as* the totality of it; they have a local space-time past, present, and future that changes according to local interactions. This is just another way of saying that third-order complexities evolve *deterministically* rather than *probabilistically*. Thus, once the elements making up third-order conditional opposites have been identified, then its future entity-contexts can be causally determined, often with great accuracy. This is modeled by the third-order MKB having only a single handle through which its entity/context decays, disappears, and is re-formed. However, although third-order complexities are *inanimate macro-level entity-contexts* that are causally determined, they exhibit no subjective agency.

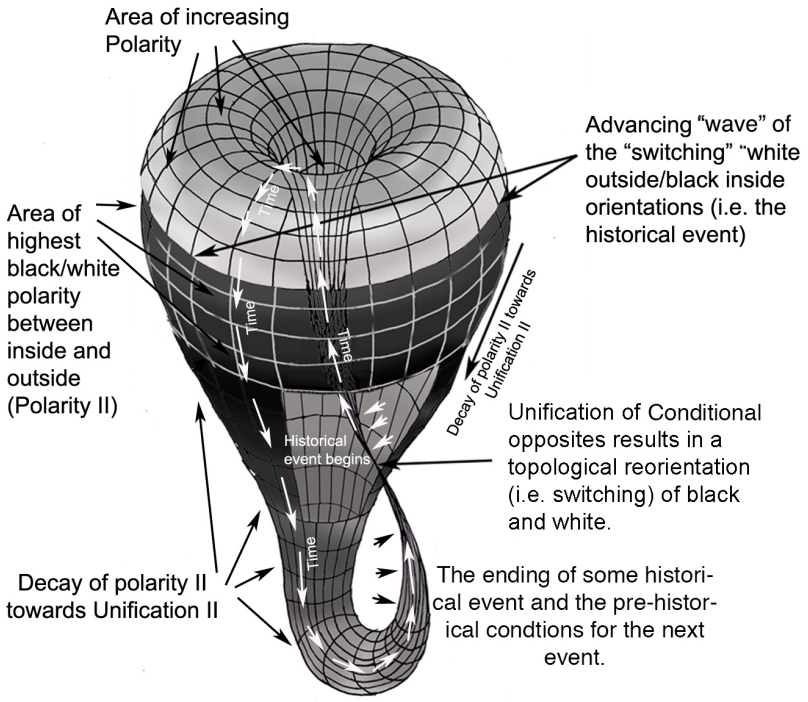

Fig. 8 The Third-order Complexity

The *fourth-order of complexity* (Fig. 9) is distinguished from the third-order in that it manifests a completely new level of ontological organization beyond those that merely account for quantum or mechanistic expressions. Specifically, the fourth-order gives rise to an intrinsic, *non-material* condition that expresses *subjective agency* (i.e. an animate entity) and a corresponding context. Going back once more to Fig. 1, this subjective agency might be crudely modeled by the actual line that differentiates the grey area of overlap from its black-and-white context. Indeed, the simplest animate entities require little more than specialized membranes[17] surrounding primordial "goo" in order to function. These membranes help to *regulate* the manner in which their inner and outer conditions reconnect over time (at Unification II, Fig. 3). However, it is a fundamental error to mistake only the membrane itself for the fourth-order agency. Rather, it is the actual, non-material expression of regulation itself that *is* the fourth-order subjective agency, not the material constituents that allow for such agency. That is, regulation is the *product* of inner and outer environs, not the environs themselves.

To regulate is to *control*, and at the simplest biological levels, this control transforms inner and outer environs into the contextual vehicles for the continued *survival* of that control. Once this level of intrinsic complexity comes into being, evolution begins: increasing the number of successful ways (via natural selection) to regulate inner and outer conditions. These *alternatives* are modeled

in Fig. 9 via the addition of extra handles to the modified Klein bottle. Each alternative depicts a different type of inner and outer connection possible for some subjective agency that in turn, gives rise to a new subjective agency. The more alternatives, the greater the number of inner/outer circumstances that can be usefully regulated, i.e. *controlled*. This cycle is depicted as the progressing "wave" illustrated at the top of Fig 9. From this approach it's not hard to see how primitive fourth-order entity-contexts evolve into those with more and more sophisticated, interactive alternatives yielding greater and greater success at survival. Thus, *control* evolves towards *behavior*, and behavior towards subjective *experience* (i.e. *qualia*[18]). I contend that it is with-and-as the arising of intrinsic subjective agency (i.e. an animate entity-context) oriented toward survival, that *telos*, in all its forms, comes into being.

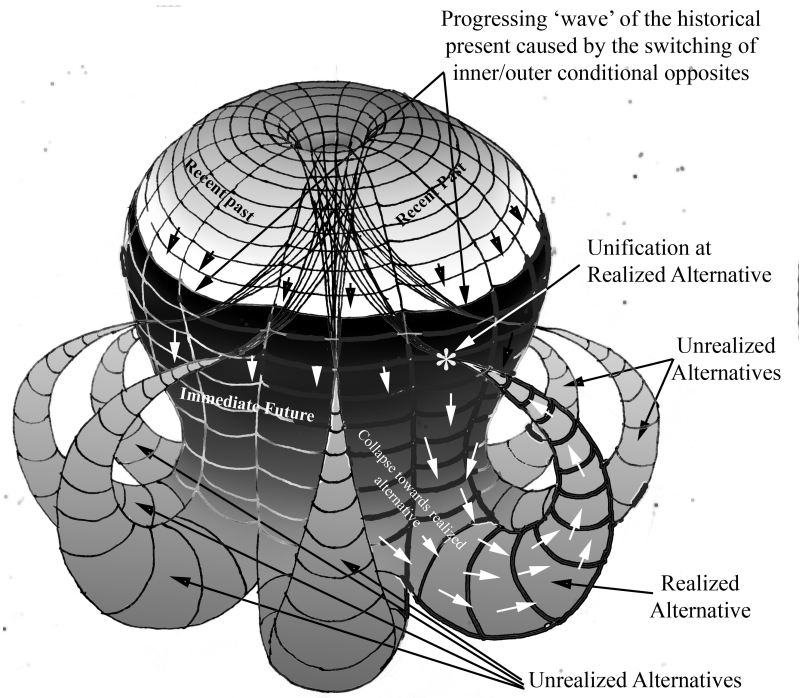

Fig. 9 The Fourth-order Complexity

Of course, one might argue that this is not true purpose; that it is just the various processes of the universe mimicking purpose. But if, as I contend, the universe is fundamentally founded upon complexity, then I would argue that its function is indistinguishable from purpose, in that there is a definitive and hierarchical *goal*. Specifically, that goal is: *to bring about greater complexity whenever circumstances allow*. And, since subjective *agency* is the sole vehicle through which the universe can bring the fourth-order of complexity into being, then it is also necessarily a *teleological agency*. As to the question of intentionality of said hierarchical goal, it is not something that we, as limited denizens of this universe can conclusively either affirm or refute, as any such answer is, as it were: "above our pay grade".

Every fourth-order agency-context gives rise to a unique expression of ontological organization. This is expressed on different levels of organization. That is, the qualia of a human differ from those of a bat, and each individual bat or human also express their own unique qualia. Yet all are completely dependent upon transforming and incorporating lower or like-orders of complexities into their own intrinsic fourth-order alternatives. Therefore, just as a photon (first-order) hitting a stone (third-order) is physically transformed into the stone's third-order entity-context (via its molecular structure), the fourth-order human can also physically "collapse" a photon's first-order state into its own fourth-order condition. However, the fourth-order human does so through the mere act of experiencing it as alternatively existing either "here" or "there" (via some physical observation/measurement). Even though the Quantum Measurement Problem[19] is not the topic of this essay, it is this same principle that I contend, explains how and why all *measurements and observations* can *extrinsically* transform lower or like-order complexities into higher, fourth-order alternatives i.e. qualia. Essentially, through observation (or any thoughts, actions, or sensations) we

are able to *collapse* first, second, third, and other fourth-order conditions into our own *non-material* fourth-order content. Thus, our quantitative knowledge about a fork, no matter how precise, is still not an *actual* third-order fork, but rather, is an extrinsic fourth-order transformation of some of the vast, third-order conditions that give rise to a bit of steel that we reductively call; "the accurate measurements of a fork". However, because fourth-order experiences are not limited only to quantitative analyses, we are also able to transform the fork into other astoundingly complex qualitative abstractions that allow us to conceive of and *actualize*, as we use forks in a multitude of ways.

In so doing we literally create a truly new dimension of reality: a world of fourth-order imagination. That is, mathematical formulas, observed photons, as well as poetry, or any ideas about the best way to use a fork, all spring from and return to the exact same source; our own intrinsic ability to transform lower or like-order surroundings into new fourth-order experiences synthesized from our inner and outer conditions. However, It is undeniable that quantitative analyses are far more useful for describing lower-order or mechanistic fourth-order experiences than say, poetry. This is because mechanistic and quantum-level systems all tend, due to their intrinsic complexity, towards single deterministic or probabilistic pathways (see Fig. 6, 7, and 8); pathways that can be precisely determined using mathematics or other forms of quantitative summation. But, even if our mathematics progressed far beyond our current capabilities and allowed us to predict complex fourth-order experiences, such calculations would still be just further stunning, fourth-order expressions of the human condition, extrinsically transforming more and more of our inner and outer environs into our own ever-expanding and purposeful content. However, there is something much more profound than our intrinsic ability to transform and describe elements of both lower and like-orders. That is, all orders of complexity share in a single common cycle of change, i.e. an ultimate *algorithm*, that itself intrinsically gives rise to everything from a photon, to a sad love song, to the universe itself.

I will say no more about this ultimate algorithm here, but this leads me to one last order of complexity in this already perhaps too-elaborate thought-experiment. That is, suppose the entirety of the universe is also engaged in its own continuous Cycle of Change as a *fifth-order of complexity*. Then, just as in the third and fourth-orders, perhaps there is a "moving wave" of the currently expanding universe, where space-time is continuously "ripped" into existence by its own crisscrossing and expanding, ultimate opposites. Perhaps each great, universal cycle alternatively gives rise to matter- and then anti-matter expressions of itself. Of course, this would mean that all lower-orders of complexity would necessarily be part of this great, shared and universal cycle. This would explain the Arrow of Time i.e. entropy as the general and inexorable universal flow of time in one direction experienced by all.

Conclusion

If, as I have just suggested, the universe as a whole, and all of its known parts, can be understood as various interacting and evolving orders of complexity, then the vast expanses of space and time, energy, size, and speed: all of the things we feel dwarfed by in-and-as this vast universe, are in fact, dwarfed by us, in terms of intrinsic complexity. That is, since the fourth-order of complexity is the most concentrated expression of complexity we have yet encountered, and is the sole vehicle through which a wondrous and uniquely supervening dimension of reality comes about, could not the whole universe be understood as evolving towards purposeful agency? Evolving towards us? Does this not make the human condition indeed the pinnacle of creation?

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