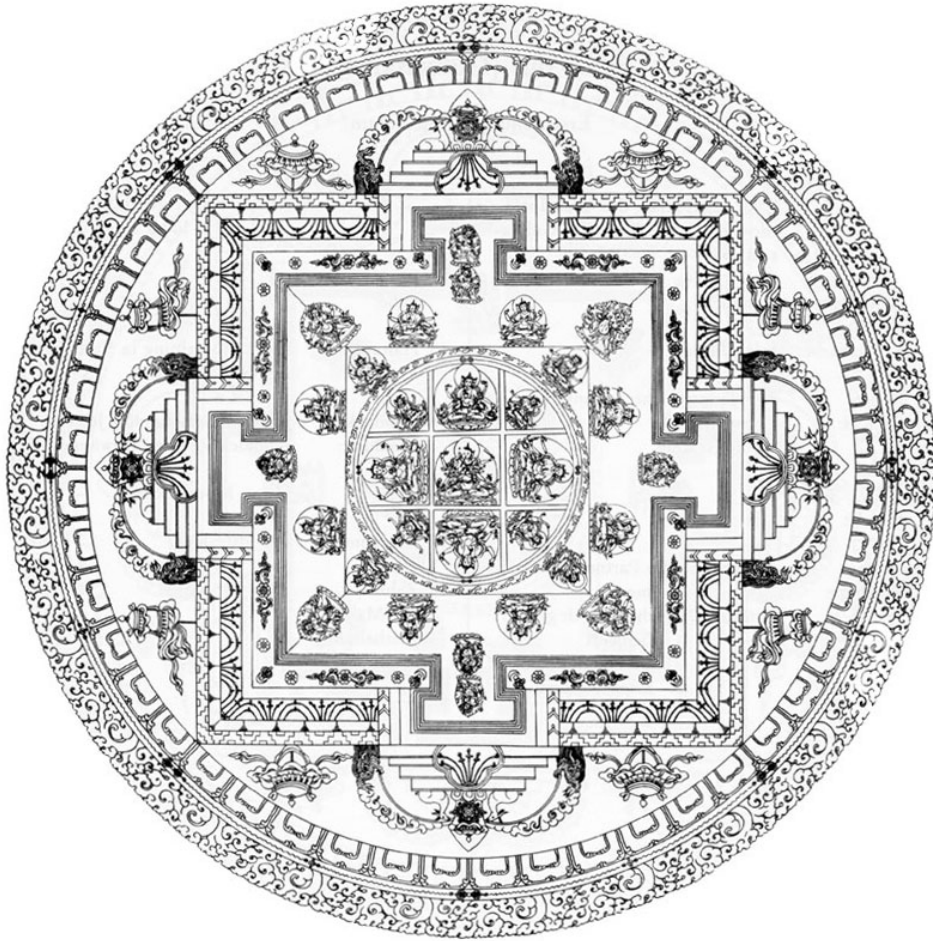


An Inquiry into the Fundamental Composition of the Universe



ACU Professor
Yurika Imagawa

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1 Introduction

Are you familiar with the concept of *mandala*? Originating from Hindu and Buddhist practices, the Sanskrit word “mandala” is derived from the root “manda,” which means essence, to which the suffix “la,” meaning container, has been added, leading to the loose translation of “that which contains essence.” A mandala generally takes on the form of a plan, chart or geometric pattern that represents the cosmos metaphysically or symbolically - a microcosm of the universe from the human perspective.

We can distinguish various types of mandala. They can most broadly be subdivided into meditational mandala, and mandala used primarily for worship. The former is a purely spiritual form of mandala, existing only within the mind, while the latter is usually a structural depiction of Buddhas in the form of a sculpture or painting. Starting from the fourth century, when Buddhism began to adopt the many Indian myths and religious gods into its teachings, the latter became the generally accepted notion of mandala. However, the word originally meant to refer to the former: a mental image that attempts to portray the true form of the universe.

In this paper, we apply both scientific and philosophical notions in an attempt to derive the truth behind the cosmos, or indeed, the full multiverse. Our work is analogous to the act of painting a mandala, utilizing *scientific methodology* as our brush and *conception* as our canvas. Will our scientific mandala be able to provide us the answers to the mysteries of the universe?

1.1 On Our Worldview

A philosophical worldview proposed by German philosopher Arthur Schopenhauer in 1851 lies at the foundation of the considerations explored in this work.

According to Schopenhauer, “Our image of the world is shaped through the ordering of external impressions bestowed upon the mind by time, space and causality.”

Time, space and causality are said to be an a priori of thought. In other words, they are the prerequisites to be able to think - they are properties of the mind, not of the perceived. Only after the events we come across in the outside world have been translated to these three properties can we begin to comprehend what we perceive as our “worldview.”

The various laws that govern time and space are already familiar to us. In the following section we attempt to expand several of these laws in order to create a mathematical model of a worldview that incorporates the additional notion of causality.

2 A Mathematical Worldview Model

We see our worldview as being shaped by time, space and causality, and consider a change in the world to be a transformation from domain Ω_1 to Ω_2 , where each domain represents a worldview with different time, space and causality parameters. We will henceforth refer to this domain as *concept space* (see figure 1).

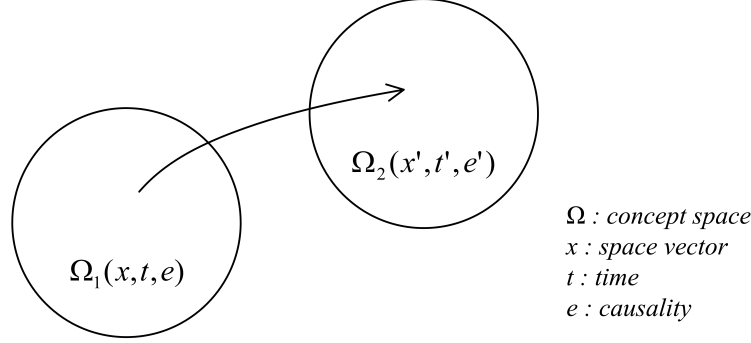


Fig. 1: Concept space.

We regard concept space as a type of flow field whose flow is expressed by the continuously differentiable potential function ϕ .

Definition 1. If we set the value at a given reference point O to ϕ , then the function value at a point P at spatial distance a becomes $\phi + a \cdot \nabla \phi$ (see figure 2a).

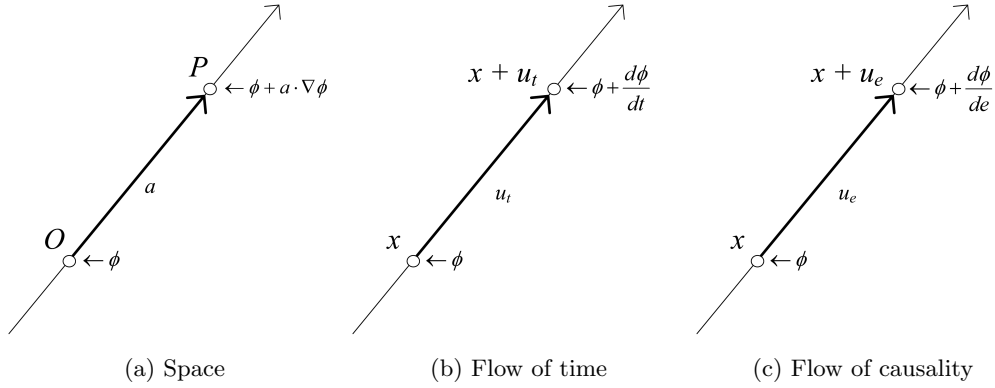


Fig. 2: Concept space transformations.

Note 1. $a \cdot \nabla$ is the scalar operator representing the change over a given distance a .

We consider a fluid particle at point x at time t , its function value ϕ , and temporal flow velocity u_t . We define the additional causal flow velocity as u_e , to obtain a combined flow velocity vector $\mathbf{u} = \{u_t, u_e\}$. After unit time, the fluid particle will have moved to point $x + \mathbf{u}$, so taking definition 1 into account, its function value becomes $\phi + \mathbf{u} \cdot \nabla \phi$. On the other hand, given an irregular flow, the function value at point x will become $\frac{\partial \phi}{\partial t}$ after unit time (figure 2b), and $\frac{\partial \phi}{\partial e}$ after unit causality (figure 2c). Combining these results leads to:

Theorem 1. The function value for a fluid particle at point $x + \mathbf{u}$ given an irregular flow is expressed by

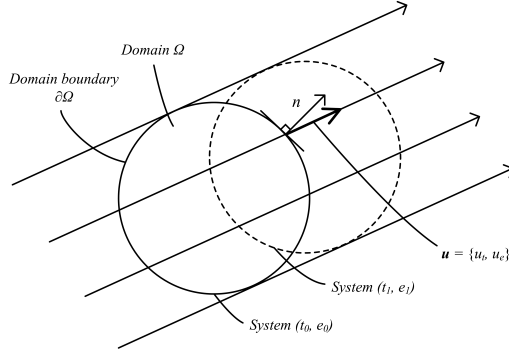
$$\phi + \frac{\partial \phi}{\partial t} + \frac{\partial \phi}{\partial e} + \mathbf{u} \cdot \nabla \phi \quad (1)$$

where $\nabla \phi$: spatial gradient, $\frac{\partial \phi}{\partial t}$: time convection term, $\frac{\partial \phi}{\partial e}$: causality convection term.

We choose to name this potential function ϕ the *event potential*.

2.1 Derivation of Fundamental Worldview Equations

We can derive fundamental equations pertaining to the flow field that comprises our worldview based on fluid mechanical principles.



We regard M as the mass (equivalent mass) that exists on the space, time and causality axes within a given domain. This simultaneously acts as an indicator of the mutual inertial forces of time and causality.

$$\text{Inertia} : M \left(\frac{d^2 \mathbf{X}}{dt^2} + \frac{d^2 \mathbf{X}}{de^2} \right) \quad (2)$$

Fig. 3: The flow field with domain boundary.

The change in equivalent mass per unit time and unit causality within the given domain can be expressed as:

$$\frac{\partial}{\partial t} + \frac{\partial}{\partial e} \int_{\Omega} \rho d\Omega \quad (3)$$

We can calculate the outflux of equivalent mass from the domain with

$$\int_{\partial\Omega} \rho n \cdot \mathbf{u} dS \quad (4)$$

where ρ is the *event density* and $M = \int_{\Omega} \rho d\Omega$.

The mass equation is then given by:

$$\int_{\Omega} \left(\frac{\partial}{\partial t} + \frac{\partial}{\partial e} \right) \rho d\Omega + \int_{\partial\Omega} \rho n \cdot \mathbf{u} dS = 0 \quad (5)$$

Applying Gauss' divergence theorem, we obtain

$$\int_{\Omega} \left\{ \left(\frac{\partial}{\partial t} + \frac{\partial}{\partial e} \right) \rho + \nabla \cdot \rho \mathbf{u} \right\} d\Omega = 0, \quad (6)$$

and since this holds within any arbitrary domain, we can derive the following theorem.

Theorem 2 (Continuity equation). *Given a worldview that encompasses causality,*

$$\left(\frac{\partial}{\partial t} + \frac{\partial}{\partial e} \right) \rho + \nabla \cdot \rho \mathbf{u} = 0 \quad (7)$$

represents the continuity equation effective within this worldview.

Corollary 1. *Given mass–energy equivalence, where the destruction of equivalent mass leads to the generation of energy (the system's mass and energy is not conserved) we get*

$$\rho \rightarrow (\rho - \bar{\rho}), \quad (8)$$

where $\bar{\rho}$: lost event density ($\bar{\rho} = 0 \Rightarrow$ law of conservation of mass).

In an analogous way, the change in momentum per unit time and unit causality can be expressed as

$$\left(\frac{\partial}{\partial t} + \frac{\partial}{\partial e}\right) \int_{\Omega} \rho \mathbf{u} d\Omega + \int_{\partial\Omega} \rho \mathbf{u} \mathbf{n} \cdot \mathbf{u} dS, \quad (9)$$

and since this is equivalent to the external energy (domain forces + boundary forces: the forces in effect on the entire domain and on the domain boundary only, respectively) in effect on this system, we get

$$\int_{\Omega} \left(\frac{\partial}{\partial t} + \frac{\partial}{\partial e}\right) (\rho \mathbf{u}) d\Omega + \int_{\partial\Omega} \rho \mathbf{u} \mathbf{n} \cdot \mathbf{u} dS = \int_{\Omega} \rho \mathbf{f} d\Omega + \int_{\partial\Omega} \mathbf{n} \cdot \Phi dS, \quad (10)$$

where \mathbf{f} : domain force vector corresponding to unit equivalent mass, and Φ : boundary force vector corresponding to unit equivalent mass.

Theorem 3 (Equation of motion). *As before, we can apply Gauss' divergence theorem and subsequently set the integral function to 0 in order to obtain*

$$\left(\frac{\partial}{\partial t} + \frac{\partial}{\partial e}\right) \rho \mathbf{u} + \nabla \cdot \rho \mathbf{u} \mathbf{u} = \nabla \cdot \Phi + \rho \mathbf{f} \quad (11)$$

where $\nabla \cdot \Phi$: domain forces and $\rho \mathbf{f}$: boundary forces. This equation represents the equation of motion for a worldview that encompasses causality.

Corollary 2. *In case we consider the destruction of mass, we again set $\rho \rightarrow (\rho - \bar{\rho})$.*

Analogously, we can derive the energy equation from the first law of thermodynamics (the change in the internal energy of a system is equal to the amount of heat supplied to the system, minus the amount of work performed by the system on its surroundings).

Theorem 4 (Energy equation). *Skipping the derivation for brevity, the resulting energy equation for a worldview that encompasses causality becomes*

$$\left(\frac{\partial}{\partial t} + \frac{\partial}{\partial e}\right) E + \nabla \cdot E \mathbf{u} = \rho \mathbf{u} \cdot \mathbf{f} + \nabla \cdot \Phi \cdot \mathbf{u} \quad (12)$$

where E : internal energy (this includes but is not limited to kinetic energy, potential energy, heat, strain, surface force and electromagnetic force).

Corollary 3. *As before, in the case where there is mass-energy equivalence,*

$$E \rightarrow E + \int_{\Omega} \bar{\rho} C^2 d\Omega \quad (13)$$

where C : event element velocity, and $\int_{\Omega} \bar{\rho} C^2 d\Omega$: the mass-energy equivalence term taken from the expanded Einstein law (see section 2.2).

Equations (7), (11) and (12) represent the fundamental equations for a worldview that encompasses causality.

2.2 The Expanded Einstein Law

In a worldview that includes causality, the law of conservation of mass does not necessarily hold, and mass-energy equivalence arises, i.e. destruction of (equivalent) mass leads to creation of energy and vice versa.

Einstein already predicted that energy would be generated as a result of the annihilation of mass ($E = mc^2$, where c is the speed of light, see appendix A for a derivation), and we can expand this law to incorporate causality.

Theorem 5 (Expanded Einstein law). *If we define the energy created/consumed due to the annihilation/formation of equivalent mass as causal energy, we can formulate the expanded Einstein law as follows:*

$$E = M(x, t, e) (C(e))^2 = \int_{\Omega} \rho(x, t, e) (C(e))^2 d\Omega, \quad (14)$$

where E : causal energy, $M(x, t, e)$: equivalent mass destroyed/created, $(C(e))^2$: event element velocity, $\rho(x, t, e)$: event density.

Here, event elements are the elements that propagate causality, which cannot happen at a speed faster than the event element velocity.

Corollary 4. *It follows that causal energy is bounded in $C(e)$.*

Naturally, "velocity" here refers to the combined vector velocity of the time and causality axes.

In the present world (i.e. the world that we can normally experience), we can consider the maximum speed for the propagation of causality to be the speed of light, and event elements to be equal to photons. This means that we ignore the causality axis even at faster-than-light speeds by defining event elements = photons (clearly, at superluminal velocities, event elements \neq photons). The theory of relativity dictates that a contradiction arises once an object exceeds the speed of light, since the relativity equations would yield complex numbers at faster-than-light speeds (see appendix A), which is something the laws of physics do not allow.

Remark 1. It is for this reason that it was thought that objects would never be able to exceed the speed of light. This is a causal law in effect on the present world (given that the event element velocity \leq the speed of light).

Nevertheless, this is a highly thought-provoking phenomenon all the same. Put simply, this means that the time axis can theoretically be expressed by a complex number that divides the time axis into *two* axes - the real part, and the imaginary part that arises at faster-than-light speeds - which, in a mathematically equivalent way, can be thought of as a division into a time axis and a causality axis (figure 4).

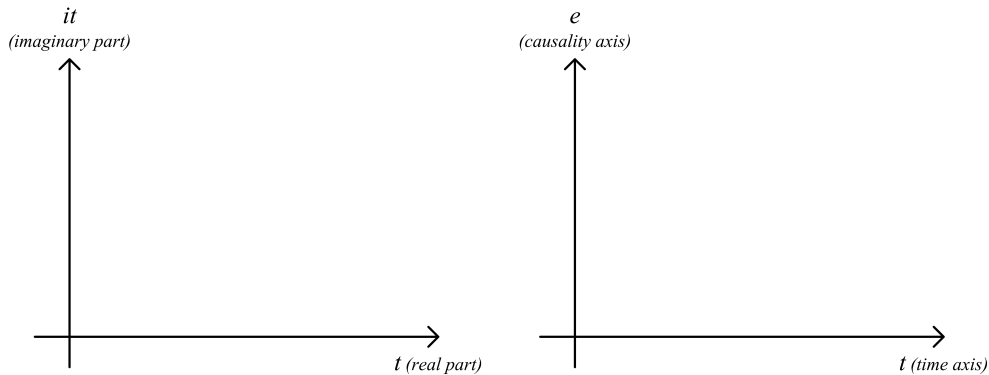


Fig. 4: Axis equivalence.

We have hereby managed to obtain supportive evidence for a worldview that includes causality from a most unexpected location.

2.3 Conclusion

In this section we have extracted the concepts of time, space and causality from Schopenhauer's philosophical view of the world, then, based on established fluid mechanical theorems, constructed a mathematical model that describes these dimensions within an Euler coordinate system, and finally, derived the fundamental equations pertaining to a worldview that encompasses causality. As a result, we have mathematically reduced our worldview to a boundary value problem, allowing us to analyze the results and predict fundamental principles with regard to as yet unresolved problems and inexplicable phenomena within the field of physics.

In the following sections, based on our ideas about causality, we will perform further inquiries into the subject of parallel worlds - a notion which the natural sciences have never before fully managed to adopt into their domain.

3 Dirichlet and Neumann Universes

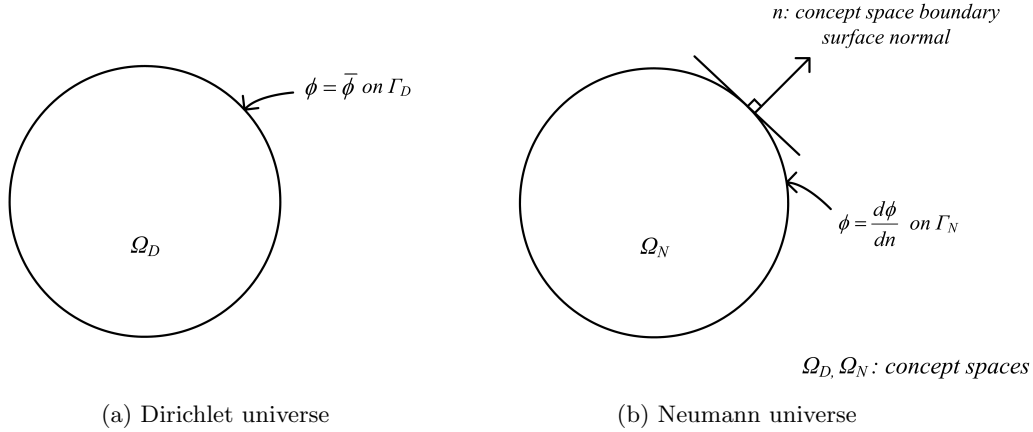


Fig. 5: Dirichlet and Neumann universes.

We define two different types of universes:

Definition 2 (Dirichlet universe). A Dirichlet universe is a world without intake or discharge of potential to or from its concept space (expressed as event potential $\bar{\phi}$ on the boundary. In the vast majority of cases $\bar{\phi} = 0$). See figure 5a.

Definition 3 (Neumann universe). A Neumann universe is a world with intake and discharge of potential to and from its concept space (expressed as the event potential flux on the boundary). See figure 5b.

The world that we perceive is usually (given a present world where we do not assume parallel worlds to exist) a Dirichlet universe, but in the rare cases in which interference with a nearby parallel world occurs, both worlds become Neumann universes. Dirichlet universes are closed systems within which event potential is preserved, and therefore causality fully applies (i.e. the laws of physics hold true). However, in Neumann universes, there is in- and outflux of causality at the domain boundary, and as a result, the laws of causality that applied within the closed system no longer hold. For example, a person that should have existed might disappear (violation of the law of conservation of mass), or someone could go back in time and interfere with his past self (violation of the theory of relativity). Additionally, someone might experience the prediction of an event that has yet to materialize - for instance, one might “sense” the death of a loved one at a location far away (manifestation of *synchronicity*, see section 5). Phenomena such as mysterious disappearances, predictions of the future and bad premonitions have historically proven inexplicable by science. In Neumann universes, however, such violations of the law of causality are in fact a matter of course.

If we define concept spaces as compact regions within the present world rather than as the world in its entirety, we can consider Neumann universes to exist *within* the present world as well. For instance, if we treat the aggregations known as “civilizations” as concept spaces, then whenever two civilizations come into contact with each other, both concept spaces will become Neumann universes. When the Incan Empire was invaded by Spanish conquistadors commanded by Francisco Pizarro, their characteristic culture broke down and disappeared. After a double invasion of foreign cultures into Japan - the first time during the Meiji Restoration, and the second time due to the democratization brought about by the Supreme Commander of the Allied Powers shortly after World War II - the culture and worldview that the country had cultivated up until that point were forced to undergo drastic alterations. We can equate these two cases to a breakdown of causality within each system due to the influx of causalities from the outside world. Similarly, a “revolution”

can be seen as the collapse of former causalities due to Neumann universification caused by *internal* stimulation, aroused from within the system itself.

In a completely analogous way, each individual human being can be seen as a system, and the interaction between two people as interference between their concept spaces.

As such, humans themselves can be thought of as Neumann universes. Every person is constantly exposed to an influx of causality from the people around him, and lives by upholding a balance through the continuous revision of the causality of the self. Additionally, one's internal causality is updated as a result of stimulation produced by one's inner unconsciousness. In other words, we are, as it were, the embodiment of the law of conservation of causal energy. We have thereby obtained supportive evidence for a worldview that includes causality from a most proximate location.

4 Analogy Between Causality and Fluids

“Causality” denotes the systematic relationship between cause and effect as they occur in nature; in other words, it is the fundamental principle by which cause and effect are interconnected. Causality is, more or less, synonymous with the concept of *karma*, which has its origins in Indian ideology. Arguments for the existence of a casual relationship between natural phenomena or human behavior and their results are a striking feature prevalent throughout Indian religions. After the establishment of the philosophy of *samsara*, the nature of the actions committed during the course of each lifetime - good or ill - began to be seen as the determining factors of the future destiny of each being. The concepts that *samsara* describes have become moral foundations across all Indian religions, including Buddhism. Given the deterministic nature of *past actions*, one might be tempted to regard this philosophy as a form of fatalism. However, if we change our viewpoint and regard the *present self* as the main driving factor for the regulation of one’s future destiny, this ideology instead becomes one which values effort, with an emphasis on individual ethical responsibility. The majority of philosophical systems are in fact composed of a mixture of these two types of ideas - although the western philosophy of a single God governing over all creation is somewhat different. Nevertheless, by instead thinking of this singular God as the conductor of all causality - in other words, the root cause of all events - and the people who enjoy this God’s graces as the effects “He” has brought forth, then even Western religions can accurately be categorized as large-scale causal systems.

In recent days, “causality” generally refers to the various laws as they occur in the natural sciences, and is rarely still employed in relation to the more religious concept of karma. Since natural science is fundamentally built upon the construction of proofs through experimentation, one could say that the various experimentally verifiable laws (such as Newton’s law of universal gravitation, for example) have been extremely important “causal laws” to the advancement of the natural sciences. However, notions of causality such as karma and *samsara* are not perceivable by the eye of exact science, therefore have never been considered natural scientific phenomena. Nevertheless, we can conclude that people have always been aware of these forms of causality from time immemorial, grounded on innate observational abilities, or intuition - this holds true especially for the Orient. And while it is indisputable that over the many years, the natural sciences have managed to amass a solid foundation of objectively provable facts, they have been drastically running behind in the exploration of these notions.

Remark 2. Einstein’s theory of relativity and Heisenberg’s uncertainty principle, among others, have shown us that the influence of the observer can never be completely eliminated from an experiment. This fact imposes a hard limit on the natural scientific approach.

In order to surmount the barrier that natural science was unable to, we therefore go against tradition and choose not to rely on hypotheses and proofs derived through experimentation. Instead, we attempt to solve the riddles of causality and the world aided by naught but mathematical and logical argumentation, and physical insights gained from established theories. We are confident that as long as said logic is impeccable and complete, there will come a day when these principles will be proven.

The flow of causality Causality flows from cause to effect as time flows from past to future. Analogies exist that liken the passage of time to the flow of a river; we can apply similar logic to causality. After causality has drifted from cause to effect, this effect will become a cause for an effect further downstream, and so forth. Causality propagates as if it were a moving fluid particle: we have named these fluid particles *event elements*. In other words, the *flow of causality* refers to the propagation of causality through a river of event elements.

Under the assumption that causality is a fluid, it would be logical to consider causality to possess the same properties as the fluids that we are familiar with. It is well-known that

flows of liquids (e.g. water) can be either laminar or turbulent. Laminar flow is characterized by smooth, constant fluid motion, while turbulent flow is characterized by chaotic and stochastic property changes. The Reynolds number Re can be used to gauge whether a flow is laminar or turbulent (Re is a dimensionless number determined by the mean flow velocity and liquid viscosity, i.e. it gives a measure of the ratio of inertial forces to viscous forces). Laminar flow occurs at low Reynolds numbers, where viscous forces are dominant; turbulent flow occurs at high Reynolds numbers and is dominated by inertial forces (flows where $Re > 10^3$ are typically turbulent; at these values the flow of water, for example, is almost always turbulent). Now let us hypothesize the existence of laminar and turbulent states of causality.

Given a laminar flow of causality (i.e. a laminar manifestation of events), causality is propagated (events manifest themselves) according to the laws (field equations) in effect over the entire system. Even events located far away from the point of observation can be predicted with relative ease. The field equations that govern this system are the fundamental worldview equations derived in section 2.1. The propagation of causality within the system is determined by the application of the domain boundary conditions (ergo the fundamental equations in section 2.1 correspond to causality in a laminar state).

This leaves us with the question of what a turbulent flow of causality (i.e. a turbulent manifestation of events) would look like. We already have sufficient knowledge about the properties of turbulence to formulate the answer. A turbulent flow is composed of many *eddies* of different sizes. The large eddies are unstable and eventually break up originating smaller eddies, and the kinetic energy of the initial large eddy is divided into the smaller eddies that stemmed from it. These smaller eddies undergo the same process, giving rise to even smaller eddies which inherit the energy of their predecessor eddy, and so on. In this way, the energy is passed down from the large scales of the motion to smaller scales until reaching a sufficiently small size such that the viscosity of the fluid can effectively dissipate the kinetic energy into internal energy. In order to sustain a turbulent flow we must therefore continuously supply kinetic energy to the system.

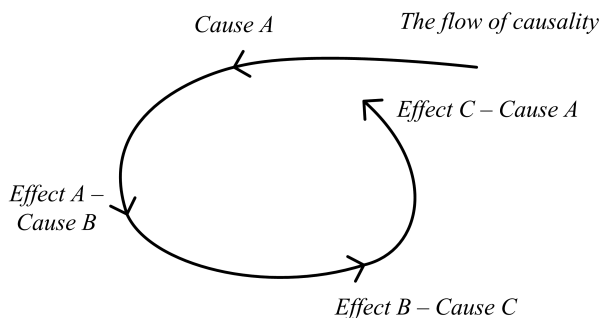


Fig. 6: A causal eddy.

Assuming an analogous relationship between causality and fluids, we can consider a turbulent flow of causality to be produced as follows: casual energy is supplied to the system from the outside world, and when the ratio of causality propagation velocity to event viscosity (the amount of drag experienced when transferring from the current event to the event that follows) exceeds a certain value, the flow of causality becomes unstable, and causal eddies are formed (see figure 6).

The existence of a causal eddy implies that some cause along the flow of causality has been generated by an effect further downstream. On a micro scale, think of phenomena such as the never-ending vicious cycle of being unable to escape from a difficult situation, return on investment in economics, and the biological food chain. On a macro scale, there is reincarnation through samsara, as well as the influence of karma upon one's future life (think of the phrase "what goes around, comes around"). Over the entire system, causality adheres to the field equations, while on a local level, causal energy is being exchanged back and forth between the causal eddies (and new, smaller eddies generated by these eddies) as described above. This process forms a flow field. A causal eddy will continue to generate new eddies until the causality propagation velocity (sustained by the energy supplied to the system) drops below a certain value, dependent on its ratio to the event viscosity of

the system. Once the propagation velocity falls below this value, the causal eddies will dissipate and the flow will become laminar. Consequently, we can alternatively define a turbulent flow of causality as “a laminar flow with eddies on a local level.” In cases where the eddies have significant influence on the flow, its behavior will be chaotic, making it extremely difficult to describe local event manifestations in detail (figure 7).

The flow of causality

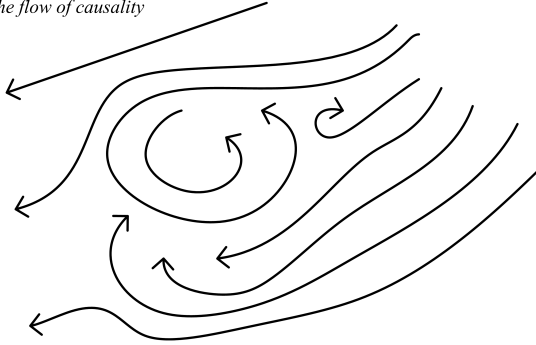


Fig. 7: Formation of causal eddies.

that manifest themselves on this path can rightly be called “fate.” Nevertheless, due to its field-like properties, causality incorporates several divergence points along its flow. The flow will prioritize directions where event potential is low or where the inertial force of the flow is high. We recognize that this concept is similar to the view of life and the workings of the unconscious mind that we know. Pinpointing the true nature of causality enables us to explain a multitude of phenomena: from the worldview as perceived by man, to the internal workings of the mind; or, in other words, the mechanisms of the world that man *cannot* perceive.

We must take care not to lose sight of the fact that maintaining a state of turbulence requires a continuous supply of kinetic energy from the outside world. Cut the investment of funds and the economic wheel will collapse; one cannot break free from the chains of samsara and obtain nirvana without the cleansing of past sins; and one will not find happiness in the future without doing good deeds to raise one’s karma in the present.

Furthermore, if causality is indeed a fluid, then its streamlines are guideposts to one’s destiny, and the events

5 A Causal Interpretation of Acausality

The laws of the natural sciences are statistical truths, and are in full effect when handling macroscopic physical quantities. We choose to call these laws *causal laws* (within our system). However, modern physics as established by Heisenberg et al. has already made it clear that these laws do not generally apply when considering the domain of the microscopically small.

At the conceptual foundation of the natural laws lies a causality in the form of a philosophical principle: it is the idea that some causal connecting principle acts as the glue to hold together two events. Then what would an *acausal* connecting principle be? This is something that is not categorized as a natural law; it does not connect two events together, and is statistically cast aside. In other words, in any experiment, it would be registered and discarded as a one-in-a-million coincidence. Over the course of our lives, we make many choices in many different situations (i.e. we encounter many different events) - be it consciously or unconsciously. Most of these choices we only come across once in our lifetimes, and in most cases, we do not detect any form of causation in the circumstances that brought forth these situations. Put differently, we walk many different paths by coincidence, and therefore observe many different events by coincidence. Can we conclude that there is an acausal connection between events at play here?

Scientific methods do not permit us to answer this question. After all, as explained above, the natural laws of science cannot handle coincidences by definition, as they are considered statistical exceptions to the rule.

Consider the following anecdote by Swiss psychiatrist Carl Jung:

“I noticed the following on April 1, 1949: Today is Friday. We have fish for lunch. Somebody happens to mention the custom of making an ‘April Fish’ of someone. That same morning I made a note of an inscription which read: ‘Est homo totus medius piscis ab imo.’ In the afternoon a former patient of mine, whom I had not seen in months, showed me some extremely impressive pictures of fish which she had painted in the meantime. In the evening I was shown a piece of embroidery with fish-like sea monsters in it. On the morning of April 2 another patient, whom I had not seen for many years, told me a dream in which she stood on the shore of a lake and saw a large fish that swam straight towards her and landed at her feet. I was at this time engaged on a study of the fish symbolism in history. Only one of the persons mentioned here knew anything about it.”

(From: Jung, C.G.; Pauli, W: *The Interpretation of Nature and the Psyche*. (1955))

Jung called this a case of *meaningful coincidence*; in other words, not a causal, but an acausal, meaningful linkage of events.

Sigmund Freud has reported similar cases in his works. Freud, however, attributed what he called uncanny coincidences to *unconscious memories*. He thought of this uncanniness as nothing new or foreign, but something familiar and old, established in the unconscious mind that has been estranged by the process of repression. The unconscious holds on to memories that the ego has forgotten, and as a result of actions taken driven by these very memories, a connection between events that the ego cannot comprehend as being causal - that is, a “coincidence” - is formed.

So what is our answer to this phenomenon of “meaningful” or “uncanny” coincidence? We have already established the pieces required to form our explanation. Given these pieces, the outcome will become self-evident.

We propose that *all event manifestations are in fact causal*. This is, however, not to say that we dismiss Jung’s ideas in favor of Freud’s - saying that both interpretations are correct would represent our view most accurately. In Freud’s explanation, there is a clear causal relationship: the unconscious knows about both events. But in Jung’s case, we cannot establish the existence of a causal relationship since the person in question is, after all, unable to perceive his unconscious memories.

Then is it valid to conclude that there was some other necessity at play that caused Jung to take the actions he took?

As a matter of fact it is. Thinking of it on a conceptual level, we can consider Jung to have become a Neumann universe, subject to influx of event potential from the domain boundary. The causality that Jung speaks of is the causality *within his own system*, and now that he experiences influx of event potential, the causal laws within his system partially fall apart. Hence, the “meaningful” or “acausal” connection that Jung mentions in fact refers to newly created causalities (by *external* factors) due to influx of event potential into the system.

Then let us go back to Freud’s case. In this situation, Freud has also become a Neumann universe, where event potential flows in from his own unconscious. The causalities that were unknown to him were created by event potential influx from his own unconscious, i.e. generated by *internal* factors. By adopting these new causalities into his own system, he was able to capture the connection between events in a causal way.

What we can gather from these examples is that causality is subject to constant transformations, and that it happens regularly that the person concerned is unable to perceive some of said mutations. This being the case, the existence of causality that is imperceptible over the entire domain - that is, the manifestation of events that no one within the domain knows about (i.e. a manifestation of events that have no relation whatsoever to any of the events existing within the system, and must therefore inevitably have been generated outside the domain) - is in fact all but logical. They are the different possibilities for the choices that we have made over the course of our lives. Staying in line with general naming conventions, we choose to call the manifestation of events external to the domain of reference “parallel worlds.”

6 On the Composition Principles of Parallel Worlds

In this section we expand upon the various theories we have devised regarding the composition of parallel worlds. We enumerate plausible world models and explain the principles behind inter-world migration within these models.

6.1 Simple Parallel Model

In this model, the same worlds exist simply in parallel to each other (figure 8). This is the traditional parallel world theory. Three systems can be considered based on this model.

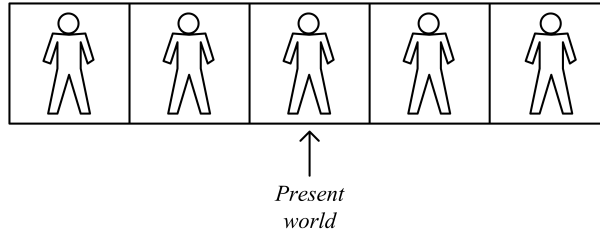


Fig. 8: The simple parallel model.

- (1) **(Infinitely) Fixed Room Number System.** Whenever one moves to a neighboring world, the copy of oneself already there will be pushed out to the next neighboring world, and the copy already there will be pushed out to the *next* neighboring world, and so on, with the last person transferring back into the world one originally left from (hence it is impossible to meet yourself). See figure 9.

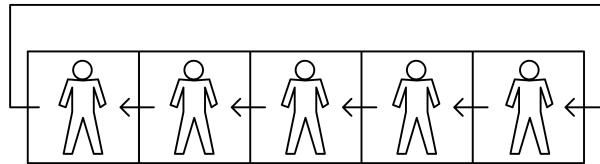


Fig. 9: (Infinitely) Fixed Room Number System.

- (2) **Infinitely Multiplying Room Number System.** A transfer causes a copy of the present world to be created, resulting in both a world where one is present and a world where one is absent (the number of worlds potentially increases to infinity). See figure 10.

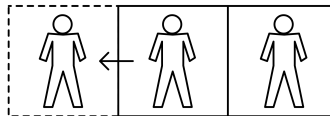


Fig. 10: Infinitely Multiplying Room Number System.

- (3) **(Infinitely) Fixed Room Number By Multiplication/Annihilation System.** A transfer causes a copy of the present world to be created, however along with this migration, the parallel world that has the slimmest potential for existence - in other words, the least realistic world - is annihilated (figure 11).

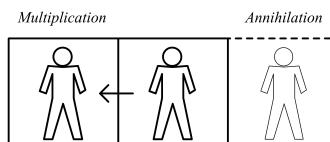


Fig. 11: (Infinitely) Fixed Room Number By Multiplication/Annihilation System.

6.2 Series-parallel Model

The worlds of the simple parallel model are superimposed upon each other to form layers (figure 12). Interference between worlds is fundamentally only possible within the same layer (transfers within a layer are in accordance with the effects outlined in section 6.1 (1)-(3)).

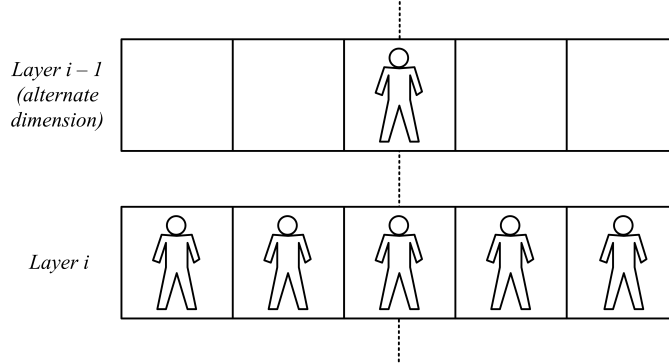


Fig. 12: The series-parallel model.

Special case: an interlayer (interdimensional) transfer. A transfer between layers means that one will “disappear from one’s current dimension,” i.e. all copies of the transferee in layer i must move to layer $i-1$ (see figure 13).

Each world in layer i operates in accordance with its own causal laws, but the event of “disappearing from layer i ” due to an interlayer transfer gets priority over every single causal law in effect on layer i .

→ The causalities (accumulation of coincidences) in effect across layer i will cause the event “transfer to layer $i-1$ ” to manifest itself in each world in layer i (since every world within the layer will move to an upper layer, the required energy for a transfer will naturally be an order of magnitude higher than a transfer within a layer).

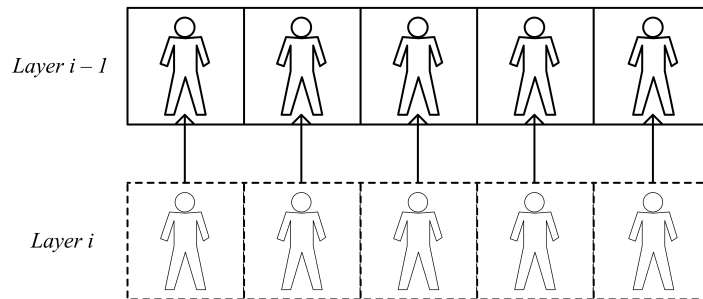


Fig. 13: Interlayer transfer from i to $i-1$.

6.3 Pyramid Model

This model enables us to define three worlds that immediately neighbor the present world: the “*original world* that conceived the present world,” the “*parallel world* with an equivalent existence potential to the present world,” and lastly, the “*subordinate world* formed due to division of existence potential (division of fate) in the present world.” See figure 14.

The worlds derived and formed as a consequence of actions conducted in the present world are all classified as subordinate worlds, and worlds generally known as “parallel worlds” denote those subordinate worlds identified as running parallel to the present world.

Transfers between subordinate worlds follows in accordance to section 6.1 (1)-(3), but transfers from within a subordinate world that extend to affect the present (that is, a

transfer from the subordinate world to the present world by ascending through layers) requires one order of magnitude more energy than a descent through the layers. The reason for this is outlined in the special case mentioned in section 6.2.

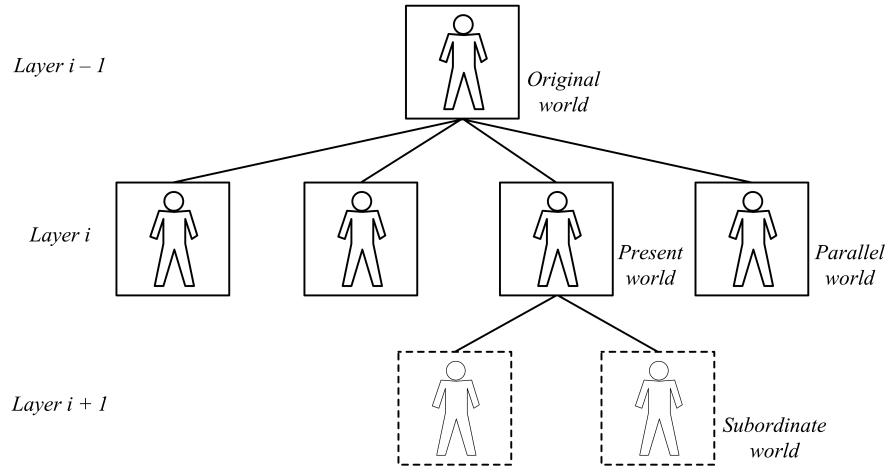


Fig. 14: The pyramid model.

- (1) **Transfer to a higher layer.** A transfer from a subordinate world to the present world means one will “disappear from the subordinate worlds,” i.e. “the subordinate worlds of which one was a part of will vanish” (see figure 15). Hence, such a transfer would require the creation/annihilation energy of all subordinate worlds in layer $i + 1$.

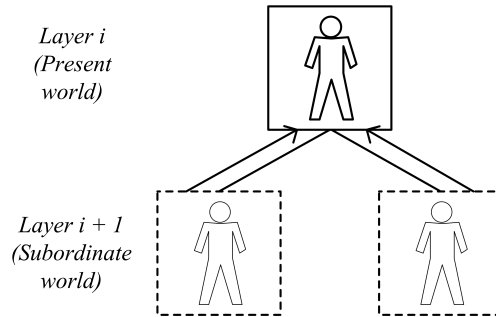


Fig. 15: Transfer to a higher layer.

- (2) **Transfer to a lower layer.** This is equivalent to “creating a new subordinate world from the present world” (see figure 16). A transfer requires the creation energy of one subordinate world.

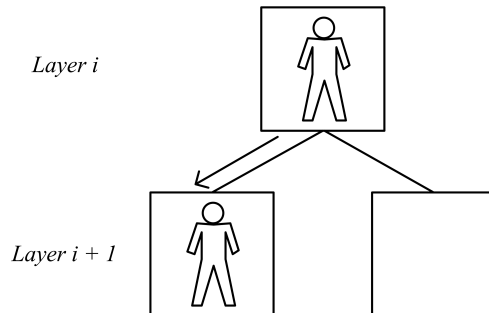


Fig. 16: Transfer to a lower layer.

6.4 On the Creation/Annihilation Energy of Subordinate Worlds

It is possible to apply the expanded Einstein formula to the creation/annihilation energy E .

Theorem 6 (Creation/Annihilation Energy Equation). *The energy required/released upon the creation/annihilation of subordinate worlds (figure 17) can be expressed by*

$$E = \sum_{j=1}^m M_j (\rho_j, \varphi_j, H_j, t_j) (C_j (\rho_j, \varphi_j))^2 \quad (15)$$

where:

E : causal energy

j : dimension (world) index

m : number of conserved subordinate worlds

M : dimensional equivalent mass

ρ : event density (probability density of an event happening in the present world)

φ : event potential (potential energy expressing the number and realism of events)

H : conserved space within a dimension

t : conserved time within a dimension

C : event element velocity

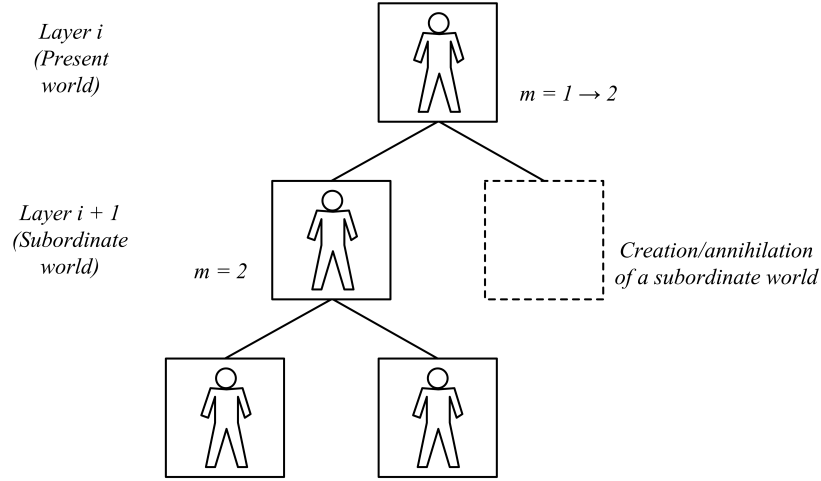


Fig. 17: The creation/annihilation of worlds.

Corollary 5. *Given a system comprised solely of a present world, with event density and event potential fully constant, we have*

$$C_j (\rho_j, \varphi_j) = c \text{ (speed of light)} \quad (16)$$

and

$$M_j (\rho_j, \varphi_j, H_j, t_j) = m \text{ (object mass)}. \quad (17)$$

Hence $E = mc^2$ holds. The fact that the speed of light cannot be surpassed is the most fundamental causal law in effect on the present world.

6.5 Other Plausible Models for Parallel Worlds

Ouroboros and Klein Bottle Models The cause is the effect, and the effect is the cause. The infinite parallel worlds have been reduced to one, making this world the source for the infinite possibilities of an infinite number of worlds (figure 18a).

→ It is a domain of God that humans cannot possibly make sense of.

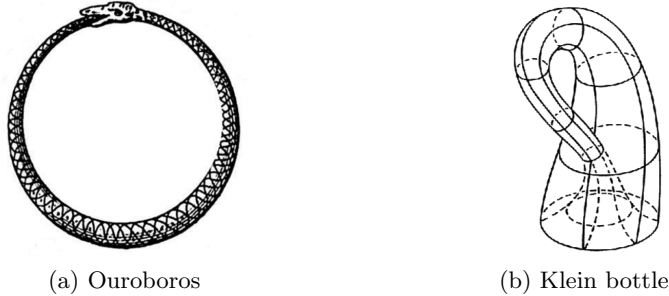


Fig. 18: The Ouroboros and Klein bottle models.

Distributed Network Model Many worlds interfere with each other little by little. The formation of a world is equal to the addition of a world to the network.

Migration between worlds is relatively simple (it is, in a sense, similar to the Internet).

Note 2. Physiologically, the human brain is thought to function according to a neural network not unlike this world model.

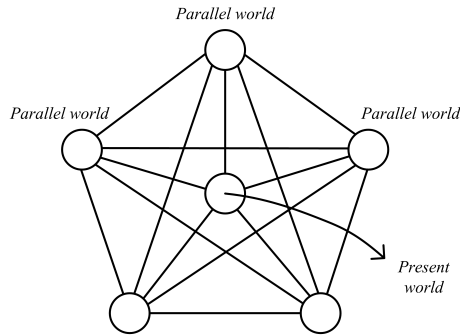


Fig. 19: The distributed network model.

ES Model All worlds theoretically exist in parallel to each other, but in order to come into existence, a world's causal energy has to cross a certain world manifestation threshold.

Between parallel worlds with similar amounts of existence potential, interference easily occurs (a world's necessity is regulated by the strength of its causal energy).

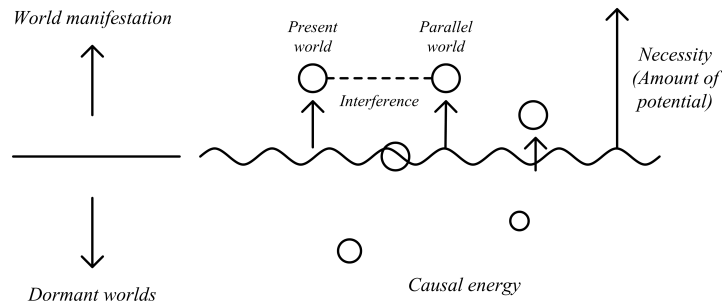
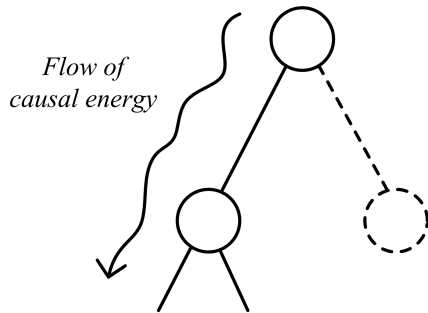


Fig. 20: The ES model.

6.6 The Flow of Causal Energy and the Properties of World Formation



As a fundamental rule, causal energy flows from the upper layers to the lower layers. In other words, while creation/migration from an upper layer (present world) to a lower layer (subordinate world) is easy, the inverse direction is a challenge (think of trying to advance upstream a river). It becomes easy to comprehend if we visualize causal energy as the flow of a river.

Fig. 21: The flow of causal energy.

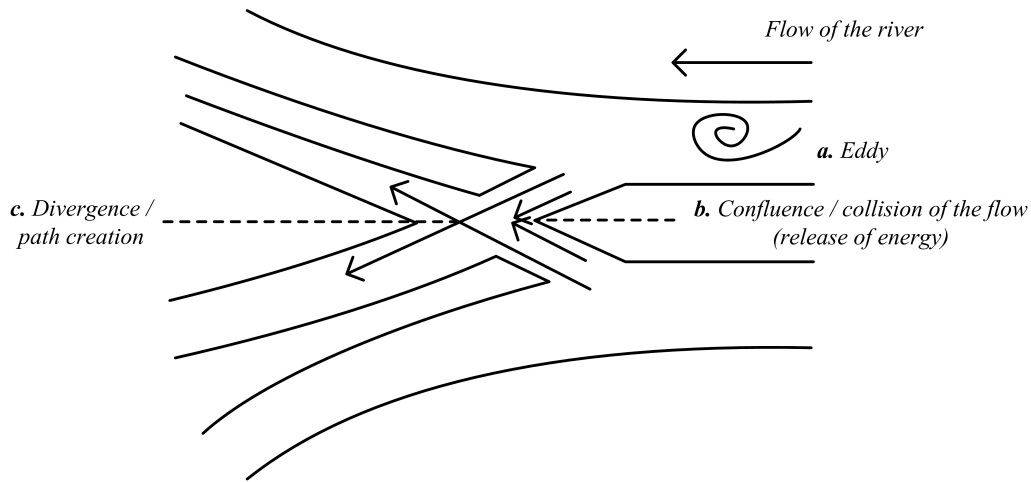
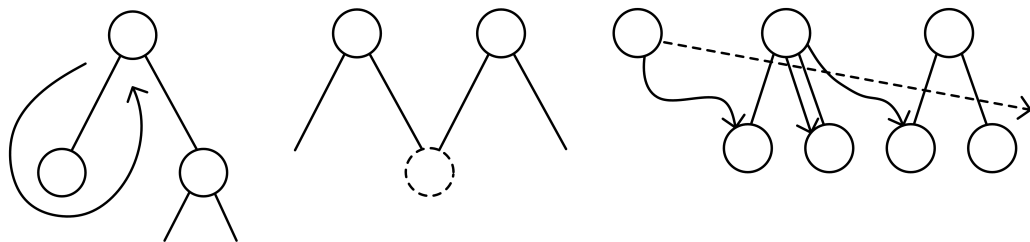


Fig. 22: The flow of causal energy visualized as a river.



(a) An eddy of causal energy (repeating the same world over and over again. This happens rarely)

(b) Mutual annihilation (two neighboring subordinate worlds manifest themselves at the same location and are annihilated)

(c) Creation of a cross-over path (during subordinate world creation, the generated path intersects with a path of another subordinate world, making mid-path divergence possible. This is an energy-wise unstable situation)

Fig. 23: Possible anomalies in the flow of causal energy. (a), (b) and (c) correspond to **a**, **b** and **c** of figure 22 respectively.

7 Causality Controller (Reflector) Operating Principles

In this section we attempt to elucidate the working principles behind the Reflector Device.

7.1 The Event Density Counter Explained

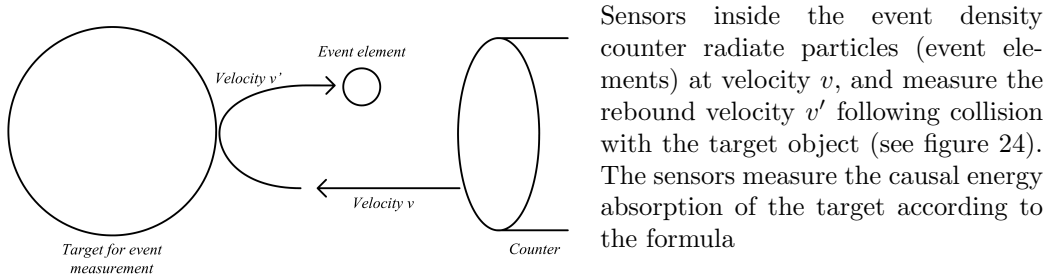


Fig. 24: Transmission and reflection of event elements.

$$\frac{1}{2}m(v - v')^2 \quad (18)$$

where m : event equivalent mass, and determine a *causal energy absorption function* (figure 25). This function is expressed in terms of target event density and physicality of event elements.

Definition 4 (Event elements). We define event elements as particles that course through imaginary space. We theorize them to be anti-photons that correspond to the photons that exist in the real space that we are familiar with.

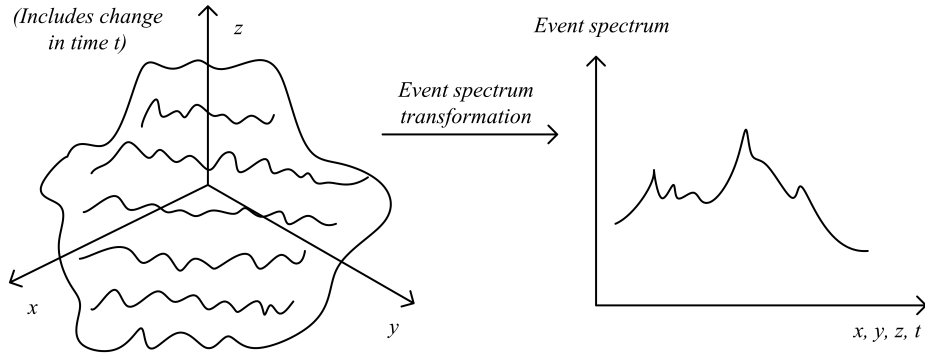


Fig. 25: The causal energy absorption function.

Since actual parallel worlds hold vast amounts of “potential,” the measured event spectrum values are compared one by one to the present event (reality), and each time, the event density is corrected and updated. The device proceeds to select event densities of target events in accordance to Darwin’s natural selection principle.

- *Event spectrum resolution*: the spectrum value corresponding to the event chosen as target event (i.e. the wave frequency of some event happening) is the desired event density.

7.2 Formation of Event Density Waves

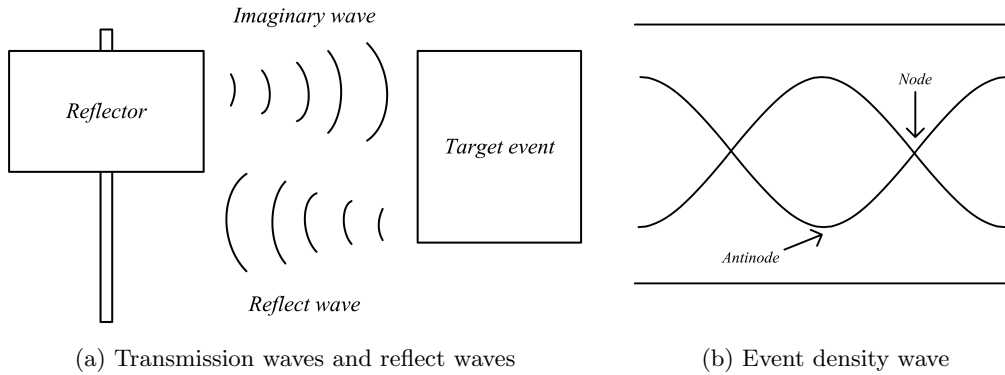


Fig. 26: The formation of event density waves.

An event element wave (a light wave in imaginary space) is emitted from the Reflector, and radiates according to the intrinsic event spectrum of target events. Due to resonance in the event spectrum, excited event element reflect waves are sent back to the Reflector (figure 26a).

Interference between the transmission wave from the Reflector and reflect waves from target events subsequently causes nodes and antinodes to form along the event element waves, creating event density waves (figure 26b).

Nodes → points where event density is lowest, i.e. “unlikely worlds”

Antinodes → points where event density is highest, i.e. “highly likely worlds”

7.3 Event Buckling

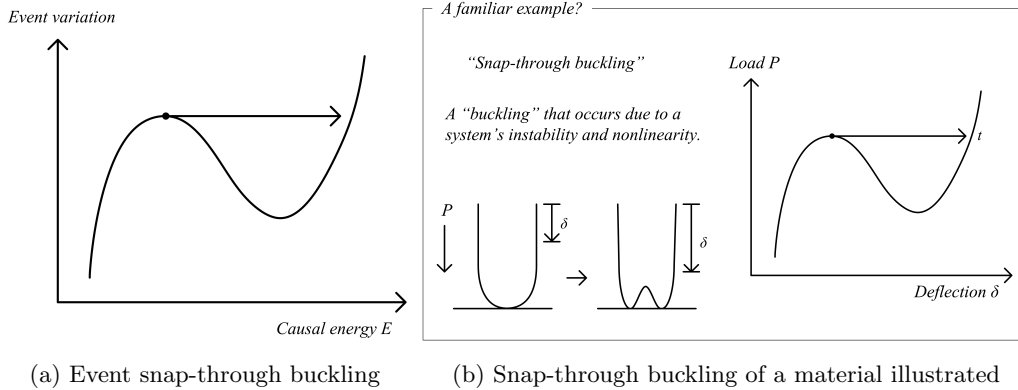


Fig. 27: Event migration by means of a “snap-through buckling.”

By manipulating event density wave interference to set nodes to present event (present world) conditions, and antinodes to target event (the neighboring parallel world) conditions, a “causal flow” that facilitates present event → target event migration will take shape.

Following the formation of this event density-rooted unstable system, we can steer causal energy toward the target event to arouse an artificial *event collision*. As a result, a present event to target event *event snap-through buckling* which takes advantage of the instability of the system is spawned, and instant migration from present event to target event is made possible (see figure 27).

7.4 How Can a “Causality Controller” Exist?

The event element wave - a light wave in imaginary space - is an imperative component for the Reflector to work.

A certain special mineral contains a property that transforms light into event element waves (by applying luminal energy to the mineral, excited event element oscillations are generated, and an event density wave is formed).

The coincidental discovery of this mineral has brought the artificial creation of event density waves into the realm of possibility, making inter-event migration through event wave interference a reality!

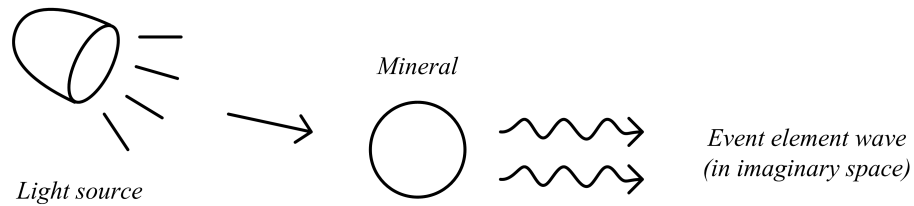


Fig. 28: The transformation of light into event element waves.

(Ed. note: the paper ends here, although the table of contents of the original scans imply that there should have been more. However, this has either never been published, or simply does not exist in the first place.)

A Appendix: Einstein's Special Theory of Relativity

For his special theory of relativity, Einstein derived the following two fundamental postulates:

Postulate 1. *Aether (a medium for the propagation of light) will not be discovered.*

- The motions that we can observe are all relativistic, with motionless aether being the sole non-moving object in the universe (special relativity still holds even without assuming the existence of aether).

Postulate 2. *The speed of light is always constant relative to the observer.*

- The speed of light is the maximum possible speed imaginable. Additions that result in speeds faster than light are invalid: even if two objects traveling at the speed of light collide with each other, their relative velocity will still not exceed the speed of light.

We can derive a number of surprising results from the second postulate in particular.

- (1) **Increasing the velocity of an object will cause it to shrink (Fitzgerald-Lorentz contraction):**

$$L' = L \sqrt{1 - \frac{V^2}{C^2}} \quad (19)$$

L' : length of system B as observed by system A

L : the proper length of system B

V : relative velocity

C : speed of light

⇒ At the speed of light, L' becomes 0.

- (2) **Increasing the velocity of an object will cause its mass to increase:**

$$m' = \frac{m}{\sqrt{1 - \frac{V^2}{C^2}}} \quad (20)$$

m' : Mass of system B as observed by system A

m : The proper mass of system B

⇒ At the speed of light, m' becomes ∞ .

- (3) **Simple additions are invalid for relative velocities:**

$$V = \frac{V_A + V_B}{1 + \frac{V_A V_B}{C^2}} \quad (21)$$

V_A : Velocity of system A

V_B : Velocity of system B

V : Relative velocity between systems A and B

⇒ $V \neq V_A + V_B$

- (4) **Increasing the velocity will cause time to slow:**

$$t' = t \sqrt{1 - \frac{V^2}{C^2}} \quad (22)$$

t' : Time of system B as observed by system A

t : The proper time of system B

In particular, for equations (19), (20) and (22), if $V > C$, the radicand of the root becomes a negative number, causing L' , m' and t' to become complex numbers.

→ This is a physical impossibility.

Therefore, the speed of light is the greatest speed imaginable.

Lastly, as a main result of the special theory of relativity, we have the **mass–energy equivalence equation**:

$$E = mc^2 \tag{23}$$

E : energy converted from mass

In other words, an object's mass will increase along with its velocity, which in turn will increase energy (the energy increase involved with the increase in mass is equivalent to the mass increment $\times c^2$). Therefore, it can be said that the mass of a body is a measure of its energy content. As factual proof for this theory, we look at the release of energy as a result of nuclear reactions.

According to experiments conducted by Cockcroft and Watson in 1938, a lithium nucleus split in two after colliding protons with it, and a tremendous amount of energy was released. It was proven that, as predicted, the sum of the masses of the two fragments (i.e. the nuclei born through nuclear fission) had become smaller in comparison to the mass of the original nucleus.