

# Towards an Understanding of the Mutual Dependency of Consciousness and Matter

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## Abstract

The notion in quantum mechanics that observation causes the collapse of the probability wave function brings consciousness directly into physical theory. To date, however, there has not been an adequate explanation as to how this could be the case, a circumstance that leads some to view this notion as unparsimonious and speculative. This paper attempts to provide an *a priori* reason for the mutual dependency of consciousness and matter by considering the consequences of the indistinguishability of elementary particles and the temporally extended nature of consciousness. In doing so, it is hoped that an ontology is elucidated which is applicable within many mainstream interpretations of quantum mechanics.

## Introduction

This paper will examine the core nature of matter and existence in light of the well established empirical evidence of nonlocality (Aspect, 1999; Aspect, Dalibard, & Roger, 1982; Aspect, Grangier, & Roger, 1981; Weihs et al, 1998) and new evidence refuting even a nonlocal realism (Gröblacher et al, 2007), where realism pertains to the idea that measurement outcomes are due solely to the properties of objects independent of measurement. Doing so will highlight the fact that matter does not exist in the way that it is normally conceived of, as having an absolute and objective presence. This necessary reappraisal of the nature of matter demands a shift in the foundations of scientific thought to accompany it. The many interpretations of quantum mechanics attempt to do just this. However, at the present time, they are not testable against each other within physics; they are interpretations, which all have an equally valid claim to correctness as far as they explain experimental results. Therefore, at this point, in order to move forward in our understanding of physical existence, a priori reasoning and contributions from other disciplines must be used to supplement the apparent stalemate in the empirical domain.

This paper will present an ontological framework where consciousness and matter hold a mutually dependent existence. This stance may be considered theoretically aligned with previous theoretical work in the consciousness causes collapse interpretation of quantum mechanics (Goswami, 1993; Schwartz & Begley, 2002; Stapp, 1993; von Neumann, 1955; Walker, 1998; Wigner 1961), an interpretation which holds that the measurement paradoxes in quantum mechanics such as Wigner's friend (Wigner, 1961)

can be explained by bringing conscious observation into physical theory as the mechanism that collapses the wave function. This investigation, while indebted to this approach, will attempt to move a step past it and provide an a priori explanation for the mutually dependent existence of consciousness and matter that is beyond the specifics of any one interpretation of quantum mechanics. This will be accomplished not by an analysis of data in empirical physics, but rather by a careful reevaluation of the nature of the existence of matter and consciousness consistent with generally accepted physical theory. It is hoped that the ontology that will be elucidated could be applicable within many mainstream interpretations of quantum mechanics.

This framework will be developed in the following steps. First, the primacy of the principle of consistency in being will be established as the fundamental ontological force. It is through this force of consistency that the current ontology will be based. Next, both the nature of matter and the nature of consciousness will be examined in terms of how they relate to consistency, focusing particularly on issues of temporality and distinguishability in being. Doing so will require us to rename these constructs in terms of this relationship as a means of apprehending their nature free of their contextual baggage. Thirdly, this framework will then be applied to help explain not only the necessary existence of consciousness, but also how probabilistic causation at the micro level evolves into deterministic causation at the macro level. Finally, there will be an examination regarding the question of whether it is possible for matter to exist in a nonquantized state.

## The Ontological Force of Consistency

In order to understand existence one must at least arrive at a working definition of what constitutes a being in existence. By this, we mean to give a general criterion that distinguishes beings that are real from beings whose existence is false or imaginary, those in a state of nonbeing, or nothingness. To this end, we may simply state that a being in existence may be defined as that which is entangled with other beings. An existing being is one that is connected to and influences, or is influenced by, other beings in the world. It has a relationship to the rest of existence; it has being in the world, our world. Existence, by extension, can be characterized as the totality of all the being in relationships in which we, human investigators, are entangled. That which is outside of this relationship, existing only unto itself, has no being in the world with us and is out of the realm of science and possibly all other logical human enterprise. This stance is consistent with the underlying positivistic paradigm of modern science, where the ontological emphasis is placed on that which can be directly experienced, as opposed to hidden and inaccessible realms.

Examining existence as a totality of entanglements brings us to consider the necessary presence of an ontological force that would give the entanglements their fundamental nature. We find in the basic nature of entangled relationships that the beings in the relationships are consistent with one another in their being. This consistency in being “is” the relationship, the entanglement that defines a being as having existence in our world, as per our earlier definition. A lack of consistency in a relationship between beings in existence is impossible, as it is a contradiction in terms; a relationship without consistency is no relationship and consequently has no part in the totality of

entanglements that comprise existence. Therefore, consistency in being with other beings in existence can be considered the fundamental ontological force. Its power is derived from its ability to define being in the world, existence, which is what characterizes it as an ontological force. The force is fundamental, as all other forces, physical or psychological, rely on its existence for their existence. The force of consistency is conceptually far removed from physical forces, which are “push” forces, thought to be reducible to specific force carrying particles. The ontological force of consistency does not move something or make something happen, but rather, having derived its power from its defining of existence, it works as a force of constraint.

This constraint, this shaping of the possibilities of being, by the force of consistency can be observed in several areas. For example, tests of relativity theory demonstrate that all points of observation have an equally valid perspective on reality. In this way, the constraint-based force of consistency shapes the being of space and time, preventing contradictory answers to our questions of nature. Experimental approximations of the EPR paradox (Einstein, Podolsky, & Rosen, 1935) demonstrate how the fundamental attributes of elementary particles are subject to only the force of consistency for their existence or annihilation (Aspect, 1999; Gröblacher et al, 2007). Therefore, we find that the manner of a being’s existence in a reality is constrained by the ontological force of consistency to be consistent with that reality as a requirement for its inclusion in that reality. In such a way, consistency allows what exists. By doing so, consistency becomes existence itself. Given this, the next step in this investigation requires us to examine what being must be for the force of consistency to be present and thereby allow existence. Through this squaring of being with the force of consistency, we will better see why the paradoxes of quantum mechanics are necessary for the very existence with which we are connected.

## Essential Being (The Being of Matter)

It is the nature of certain types of beings to have all of their being contained in their essence. We will refer to them as *essential beings* for this very reason.<sup>1</sup> To start with an abstract example, let us consider the concept of the number 3. Its existence is solely and entirely its essence. It ‘is’  $2 + 1$ , or  $5 - 2$ , or any other mathematical expression of its essence. Nothing can be said about the number 3 that is beyond its essence. While one can give an infinite number of expressions of its essence, such as the half way point between 4 and 2, or the square root of 9, it can never allow something new to be known about itself. By its nature, we can never extract any more information out of it beyond the simplest statement of its essence; in this way, it is beyond empirical investigation. It cannot change with time because it has no being over time. It is a thing which exists as, and only as, its definition. In this, it is its own universal, its own platonic form, free of the idiosyncrasy of the particular case. As such, its nature, and the nature of its interactions with other essential beings, can be accessed a priori.

A second characteristic of essential beings, which follows directly from their existence being contained in their essence, is that they are indistinguishable from others of the same type. All 3’s are on equal footing and are indistinguishable from one another. They exist only as their essence, and those essences are the same by definition. There is

no way to tell one 3 apart from another as they all have the same fundamental properties; they exist only as these fundamental properties. It should be noted that esseential beings could exist in different positions relative to a point of reference, physical or psychological, and remain indistinguishable. For example, the first 3 in a number such as 333 has a different meaning than the last 3, in that it is in the hundreds place and represents a different value due to that position. However, conceptually speaking, those are indistinguishable 3's; their position relative to each other or some other number does not change the fact that they exist in themselves, as and only as, their essence, i.e.  $2 + 1$ . The difference in meaning amongst 3's of different place values is a project of our subjective consciousness, our point of reference, and does not arise from the 3's in themselves.

Numbers, symbols, and other subjective human constructs are not the only beings in existence that exist solely as their essence. Consider an elementary particle; the standard model of particle physics currently contains 28 of them, 12 quarks, 12 leptons, and 4 gauge bosons.<sup>2</sup> These elementary particles combine to form over 300 different subatomic particles, which comprise the matter and energy of the physical universe. In a nontrivial way, these elementary particles exist solely as their essences, as a type of number 3 for the physical world. We define an elementary particle by its mass, charge, and spin, which constitute a description of its essence. All 28 of the elementary particles that comprise the physical universe can be defined and distinguished in such a way based on these measurements. We can ask the question, would it be possible for the elementary particle to exist in a mode beyond its essence, or more simply put, can it exist in a way that makes it distinguishable from other elementary particles of the same type? The answer from physics is no (French, 2004). Every elementary particle, like the number 3, exists solely within its essence. It is theoretically and practically indistinguishable from every other elementary particle of the same type that has ever existed anywhere in the universe. The elementary particle has no individual history. It has nowhere to put it. Since its existence equals its essence, there could be no physical manifestation that would give it a distinguishable history, a retraceable path of its objective existence over time. Therefore, it appears self-evident to conclude that elementary particles, being esseential, have no objective existence over time.

At the present time, all elementary particles in the standard model of particle physics are indistinguishable from one another of the same type, and therefore have all their existence bound up in their essence. This is an amazing state of affairs, but is generally failed to be interpreted as such. The popular metaphor that elementary particles are "building blocks" misleads us to feel intuitively comfortable with the concept of esseential matter, as if it were the same as a child's toy. However, if all elementary particles are esseential, all that is comprised of them, the physical objects in the universe, exist only as their essence. The complexity of the information held in this essence increases exponentially as one moves from an elementary particle, to subatomic particle, to the Great Wall of China. However, simply increasing the information in something's aggregate essence does not allow the thing to move beyond it. Consider the example used earlier of the numbers. Suppose we had ten elementary particles, and each one corresponds to a digit one to ten.<sup>3</sup> We could right a number a million digits long that would have tremendous complexity, but it could still be described completely in terms of its essence. In this sense, matter (energy) is like a collection numbers, abstractions of

type, and should be ontologically viewed as such.

In the modern day, we have a wealth of empirical findings from particle physics that leads to the conclusion of esseessential matter. However, the roots of matter's esseessential nature were accessed a priori by the Greeks of antiquity. In approximately 440 BC, Leucippus of Miletus suggested that all matter is composed of atoms, which are bits of matter too small to be seen, and that these atoms cannot be spilt into smaller portions. (By definition what Leucippus refers to as atoms we refer to as elementary particles) He further concluded that these atoms were homogeneous, meaning without internal structure. These thoughts appear to bring him to the verge of declaring matter esseessential, without the aide of any technology that could apprehend the problem empirically. Indivisible and homogeneous in internal content, how could a physical being with those attributes possibly be anything but esseessential?

Even though empirical findings strongly support this idea of esseessential matter, it is difficult for us to conceptualize and accept matter, the standard of "hard" objective existence, as being fully contained in its essence. It detracts much from the permanence, the inevitable causal force, and the raw naturalism that we expect from the stuff that would make up our physical world. The idea of esseessential matter is paradoxical to our natural human understanding; it is conceptually bizarre and seemingly beyond metaphor. However, it appears to be an empirical truth, almost regardless of one's preferred interpretation of quantum mechanics. It is the reason that we have not yet and will not ever arrive at quantum realism. Therefore, we have two options at this point. We could speculate theoretically in a vain attempt to restore matter to its former glory, free of the truth of its esseessential nature, or we could follow the implications of esseessential matter to their logical conclusions. Doing the latter will require the consideration of other types of being, which have the capacity to move beyond their essence.

## Existential Being (The Being of Consciousness)

Reality is not solely comprised of esseessential beings. There are beings whose existence is not completely contained in their essence. Their existence, rather, is spread out over time and is irreducible to information. We shall call such being *existential being*, similar to what Sartre may call "Being For Itself," or Heidegger's "Dasien". Consciousness is the example of such a being, in that in its existence over time its being is always beyond its essence. Although it is constrained and supported by esseessential matter via the brain, the nature of consciousness itself is thought by many to be nonphysical (Chalmers, 1995; Stapp, 1993; Walker, 1998). It has been effectively argued that consciousness, if accurately conceived of as the qualia of experience, cannot be reduced to, only correlated with, brain functioning (Chalmers, 1995). We must not mistake this correlation for identity. The phenomenological contents of consciousness, the redness of red or the pain of a burn, of course have specific neurological events that coincide with them, but these events, these particles in motion, cannot be in themselves the redness of red. They cannot be pain. They are esseessential particles, not experience, no matter how perfect the natural supervenience. Therefore, we can consider consciousness as a real but nonphysical being, the point at which we human investigators are entangled with the rest of existence. It is precisely this nonphysicality that allows consciousness to escape the trap of esseessential existence to which the elementary particles

are doomed. It does not have to be its own essence, or stated another way, the being of consciousness lacks an equivalence with itself (Sartre, 1953). It cannot be described in its totality by information. This irreducibility of consciousness separates it ontologically from matter. Matter exists only as essence, while consciousness always exists beyond its essence through its irreducibility and being over time.

The phenomenological investigations of Heidegger (1962) and Sartre (1953) provide the framework for how the temporality of consciousness is instrumental in its escape from essence. In these explorations, there is a shared line of reasoning that consciousness is spread out in its being toward the future. There is a sense of consciousness existing in a perpetual state of incompleteness due to its becoming, and having its past be essential while its present is always beyond its essence. These ideas roughly form the philosophical foundation for what will now be presented in a more reductive and specific way as the means through which consciousness escapes its essence.

Consciousness's escape from essence is a result of two structures of its being, its temporality and its irreducible experiential quality, the second being a direct consequence of the first. It is through the necessary presence of both of these structures that consciousness finds existence as being over time and moves beyond its essence or supporting neural functioning. Let us first consider the temporality of consciousness, as in this structure we find the means towards its irreducibility. In doing so, we are immediately confronted with a temporal discrepancy between the being of consciousness and the essential brain matter with which it is correlated. The physical interactions in the neurology supporting consciousness occur at a rate of time that cannot be experienced by consciousness. Neurons can fire at rates of 100's of times a second, and the chemical interactions leading up to synaptic transmission can be infinitely subdivided into a series of infinitesimal instances of time. This is a sharp contrast to human consciousness, which experiences discrete stimuli presented in rapid succession as occurring simultaneously once a temporal threshold has been crossed. For example, two sequential flashes of light appear to consciousness as occurring simultaneously if the time lapse between them is small enough; the same could be said for other modes of perception. Such findings have led some researchers to conclude that perception (consciousness) is best conceived of as being discrete rather than continuous, with an estimated duration of about 100ms (Allport, 1968; Stroud, 1955; VanRullen & Koch, 2003). Although neuroscience is still working out the details regarding discrete vs. continuous perception (Fingelkurts & Fingelkurts, 2006), for the purposes of the current ontology all that would be necessary is

for consciousness to proceed in whole units of time which are greater than the infinitesimal, which is obviously the case. This is all that is needed to empirically demonstrate the relatively self-evident ontological disparity between consciousness and matter. Elementary particles have no existence over time, while consciousness does.

Examining this situation further requires us to introduce the concept of a temporal extension to clarify this temporal discrepancy between the two modes of being. Consciousness exists in the mode of a temporal extension because the contents of consciousness are being supported in their existence by the information held in the essential interactions of neural activity that occur during a time period inaccessible to consciousness. Therefore, a nonphysical phenomenological content of consciousness

must be temporally extended relative to the esseessential being that supports it. It can be thought of as a chunk of time of maybe about 100 milliseconds, maybe less. This is a substantial span of time relative to the infinitely divisible time segments occurring in the physical interactions in the brain and in the larger physical universe. Within this time chunk, or temporal extension, the infinite totality of the physical points of time exist as phenomenologically co-occurring equals. This temporal discrepancy is what allows consciousness to exist as existential being. Esseessential matter is infinitesimal, having no existence over time, while the smallest unit of consciousness holds on to its unique and distinguishable existence over a definite span of time, relative to that of esseessential matter. Therefore, from its beginning to its end every piece of consciousness exists temporally as an indivisible unity of being. It cannot be separated. In this way, consciousness, by its temporally extended nature, becomes an example of actual being over time and moves toward existential being.

The irreducibility of the phenomenological content of consciousness, which finally allows it to escape its essence, is a necessary consequence of its temporally extended nature. A temporal extension of consciousness cannot be directly correlated with any one particular infinitesimal frame of neural functioning. Any attempt to completely and accurately correlate the phenomenological content with esseessential information would necessitate a correlation of nothing less than the totality of the frames existing during the entire extension, a number consequentially on the magnitude of infinity. Therefore, such a complete equivalence could only be possible once the temporal extension has past. At any one point within the temporal extension, the phenomenological content must necessarily exist as an indivisible unity of being. This existence over time of the phenomenological content literally precedes the completion of its correlate essence, thus demonstrating Sartre's dictum that existence precedes essence. Therefore, we can say that consciousness that is currently existing is always in a mode of irreducibility to its essence. It becomes its essence only in the past, but while it is existing, it is always beyond its essence, because no complete correlation is possible until the completion of the temporal extension. As a consequence of this, consciousness exists as being forever projected into the immediate future, constantly leaving its essence, the neural activity that supports it, behind. This temporal discrepancy functions not only to free consciousness from its essence, but it can also be shown to provide the mechanism that gives rise to its efficacy in directing behavior. This idea is fully explained elsewhere (Lucido, 2005).

Lastly, it should be noted that the processes just explained hinge on the esseessential nature of matter. If matter is erroneously assumed to be existential, the concept of the temporal extension and consciousness's escape from essence become unnecessary to understand the relationship between mind and matter. An erroneous assumption of existential brain matter leads easily to the conclusion of an epiphenomenological consciousness that can be reduced solely to the material. Falsely granting the attributes of distinguishability and being over time to the material appears to be mistake many have made when investigating the relationship between consciousness and matter.

## Integration of Esseessential and Existential Being

The logical consequence of esseessential matter is the loss of direct physical

causation from one elementary particle to another. These interactions of essences fall within the domain of mathematics and a priori reasoning, while causation is born from existence beyond essence, being over time. By itself, information cannot interact with another piece of information to cause a third piece of information to exist. The result of such purely esseential interactions could only be a potential growth of the total amount of information and not a causal transformation of it. This is because there is no intrinsic force in the essences themselves that causes, for example,  $2 + 3$  to become 5. All that can be said is that  $2 + 3 = 5$ , but this is merely a relationship without causal direction. Esseential beings can hold relationships amongst themselves and exist as other potential expressions of these relations, but these relationships are frozen in time, as are mathematical expressions of essence, e.g. Schrödinger's wave function. They in themselves have nothing to allow them to move forward in time and obtain objective existence in one part of the relationship as opposed to the other. Has the 2 interacted with the 3 to become 5 yet? This is an absurd question. The physical concept of energy provides us no assistance in this dilemma. Energy is quantized, a form of esseential being like matter. Energy may exist as the plus between the 2 and the 3, and while in this analogy it may provide a general causal impetus, it in itself, being esseential, cannot force the 2 to interact with the 3 via the nature of its plusness and cause the 5 to have an objective existence, not just a potential one. This is exactly what is seen experimentally. The measurement problem in quantum physics is the logical result of esseential matter. Since all of a particle's existence is bound up in its essence, there is none left to interact with other particles. This is meant quite literally. The solid existential presence of matter is what our everyday experience would lead us to believe moves causation. Since we know that matter is solely esseential it cannot have in itself that which makes causation possible, objective existence across time. This existence over time is the sole property of existential being.

As discussed earlier, esseential beings are indistinguishable; they cannot hold on to physical manifestations of their history. Without this, they have nothing with which to demand consistency with the rest of the beings in existence. If they have nothing that allows for entanglement with other beings, they exist only unto themselves as an isolated abstraction, thereby not existing at all. This is the dilemma of the esseential being. Without any being beyond its essence, there is nothing in its existence to hold on to its being as its essence. Its essence would exist as a void, a nothingness, if it were not contained and maintained by some external structure. That structure is the ontological force of consistency, which confers existence upon a being by connecting it with the rest of existence. Existential being is the necessary mediator in this process as the nature of its being is to lack essence. Therefore, it can serve as that which allows for the entanglement of essences through its temporality, the nature of that entanglement being consistency as described earlier. It is by an analysis of the interaction of esseential and existential being through this constraint-based force of consistency that the conceptual problems posed by quantum indeterminacy and nonlocality can be resolved.

Consider the piece of paper you are now reading. Your consciousness, in observing the paper over the span of its temporal extension, is bringing it, along with the rest of the esseential beings also tied to the observation, into a consistent relationship with the history of being that preceded and brought the current situation about. From one temporal extension to the next, the elementary particles comprising the paper must



behave in a manner consistent with the three levels of entanglement that have bearing on this situation. These entanglements are the direct ones occurring within the same temporal extension, concurrent entanglements with other existential beings, and the historical entanglements that have given rise to the current situation. For the purpose of clarity, we will explain each of these levels separately. However, in reality, entanglement is best understood as a unitary structure.

Consistency of esseessential being within a temporal extension is the most straight forward level of entanglement. The word being read on the paper cannot both be what it is and at the same time be something else. To be so would be an inconsistency that could not exist in the indivisible unity of being that is a temporal extension. Therefore, esseessential being in a temporal extension must have a certain measure of specificity regarding its essence. That specificity, constrained by what has come before, will constrain all that comes after. More than just the words on the page are entangled in this situation. For example, the esseessential particles in the light that allows you to see the words, the lamp that is the light source, and the power lines all the way to the power station are all directly entangled within the temporal extension. You could even go further and include the fossil fuels being burned to produce the power and their creation millions of years ago. All of these macro esseessential beings necessary for this grand chain to occur have gained a consistent existence as their specific essence. However, this chain of consistency involving only one temporal extension has limits. From the perspective of only the single direct entanglement, questions regarding the average age of the employees working at the power company that day and how long my lawn has overgrown can have many different answers. The answers to these questions can be almost anything. They are only limited by the force of consistency to the point that at which they would make the direct entanglements of reading by the lamp light impossible, such as no one is at the power company or my grass is 10 meters high and interfering with the power lines. Fortunately, reality does not allow for such gross ambiguities, as entanglements are at work on two other levels.

Concurrent entanglements, the temporal extensions of other existential beings, also constrain esseessential being. Using our previous example, the person working at the power company, in his existential being, is also part of the web of consistency, as is the person taking a walk outside observing that your grass is not interfering with the power lines. What they observe must fit with what I observe in my reading by the lamp. In other words, the esseessential beings existing in a temporal extension must be consistent with every other concurrent temporal extension, or as Einstein might say, all points of observation must hold an equally valid perspective on reality.

Lastly, historical entanglements bring about the physical law with which esseessential beings must be consistent. Consistency must be shown in between direct entanglements occurring in sequential temporal extensions. The paper in your hands cannot simply fail to exist during the temporal extension following the one where it did exist. That would violate thermodynamics and Newton's laws. These laws have power due to their historical embeddings in the web of consistency. In so far as the esseessential being in a previous temporal extension is consistent with such laws as those in classical physics, that consistency must be continued in subsequent extensions. These laws are carried forward in time by the force of consistency through existential being. They are not a result of the particular nature of esseessential beings, for they have no being over time

with which to carry the laws that would be necessitated by their nature.

To illustrate this, consider a room with only one door and no windows, having no other connections to the outside world. A person looks inside and sees that there is a chair in the center of the room. She leaves the room and stands in front of the door to be sure that no one else has entered. She then enters the room five minutes later to find the chair in the same spot. The laws of classical physics held, obviously, for the state of the chair in the room even though it was not in a direct entanglement. The laws of classical physics that the room must show consistency with were being carried in the temporality of the existential being in-between the observations of the room. Her being, between measurements of the state of the room, was connected to the rest of existence in a multitude of entanglements, each reaffirming classical physics by their prior state. The state of the room by the second observation must be consistent with the totality of entanglements that the existential being brought to bear on the situation.

Thus far, our investigation has been carried out at a macro level. We have shown how a world filled with esseessential matter allows for classical causation through existential being and the force of consistency. Without yet directly saying so, we have explained the difficulties of entanglement and nonlocality, through an examination of the logical consequences of esseessential matter, as these are only problems when matter is falsely assumed to be existential. If matter is regarded as esseessential, it can easily conform to the demands of consistency in entanglement. We must now shift our focus to that of the micro level to examine the phenomenon of indeterminacy through our framework.

As it is normally conceived in the standard model of particle physics, physical force moves causation through the erroneously presumed existential nature of the force carrying particles, the gauge bosons. These forces are conceived to function as a “push,” meaning the nature of the force necessitates a reaction on the matter with which it interacts. There can be no interaction without an effect. This view invariably leads us to necessitate universal determinism at all levels and into conflict with the empirical data that indicates micro indeterminacy within the wave function. This empirical indeterminacy is ubiquitous in particle physics, with only one exception; observations on particles in an entangled system constrain the results of subsequent measurements to a degree that would force consistency with the previously measured attribute (Aspect, 1999). These measurements, and these alone, appear to be determined exactly by what has already occurred existentially. Thus, we find that the only true determinism is the result of the force of consistency. Given this, it seems to be advantageous to consider the ontological force of consistency as the fundamental causal force in reality and to regulate other forces, such as the four known physical forces, to the domain of the mathematics of esseessential being, objects subjugate to and defined by consistency. If the only true causal force is that of consistency, then micro indeterminacy moving to macro determinism becomes the logical conclusion. This is because the force of consistency is not conceptually mandated to exist on all levels the way that the traditional “push” forces of physics are. The force of consistency has a floor, beneath which it has no power. For example, consider as before the paper that you are now reading. The esseessential beings in your temporal extension must show consistency with the three levels of entanglement as shown earlier. However, every specific detail not in a type of entanglement exists as a non-being underneath the power of the force of consistency to confer it with an exact

existence in our world. If an electron in the paper could have a different position or momentum here or there that would not have a macro effect on the levels of entanglement, then that electron has no specific existence as its essence. It has rather a constrained essential existence. Its existence as its essence is spread out over a set of all the possibilities (Schrödinger's wave function) that are congruent with the entanglements with which it must show consistency. This probability distribution represents the general pattern of results needed over time to show consistency with the entanglements having bearing on the situation. Below the force of consistency there is literally nothing to require the essential being to be exactly this or that. The point where it does not matter what being is chosen to make the consistency work is the point at which the only true ontological and causal force runs out of power. It has the means to force an outcome but not the force to specify it exactly. Meaning, when we measure details of a particle not previously regulated by consistency to a measure of specificity, we need to get a result (the collapse of the wave function). When we measure, there needs to be a particle there whose state would be congruent with consistency. If there was no such particle, that would result in an inconsistency with the macro entanglements, which would be impossible. However, the state of these essential particles is determined solely by the need for consistency, not by their previous state, position, momentum, and so on. The controlled randomness of quantum mechanics follows directly from this. There is a causal force, but that force is a force of constraint not one of exertion. Conceptualizing the force of consistency in such a way allows us to explain random fluctuations at the micro level while holding on determined physical causation at the macro level. The classical/quantum border becomes the point at which consistency loses its power to specify essence.

Objective physical existence is something that we observers enjoy constantly, but this particular level of existence, this mix of existential and essential being, is the result of the process of the entanglement of these two modes of being. It is not a given from essential matter. Essential matter in the mist of a direct entanglement seems to be conceptually removed from its typical mode of being, in that during that time it appears to have both consistent existence across time and an existence that is fully contained in its essence. This is what we are used to when we consider the physical world. However, getting to this state of being is the result of the blended dichotomy of essential and existential being.

## Impossibility of Existential Matter

Ontological inquiry, while it must be consistent with observation, should never stop at the level of the empirical. The question must be asked, why should reality operate this way and not another? Could the physical world just as easily have been comprised of existential matter? What would a world of existential matter look like, if it were to exist through some arbitrary assignment of natural law? The idea of existential matter is certainly congruent with our common sense logic, as the macro physical objects that our logic is designed to deal with are functionally existential in an everyday sense. However, upon careful examination, it can be shown that a physical universe comprised of existential elementary particles is impossible, as being physical and being existential are mutually exclusive attributes.

If they were to exist, existential elementary particles would first need to have an ability to carry a distinguishable history. Without this initial step, they could hold on to no existence beyond their essence because their essences would be identical to others of the same type. This necessary distinguishable history would have to be carried physically, as we are examining a world where elementary particles have an existential nature in themselves. To have an elementary particle carry its physical history would mean it would have to hold subtle physical manifestations of its history, going back possibly to the time of the big bang, to make it distinguishable from others of the same type. This is difficult to conceive of, as we have no place to put the markings of a history. The standard model of particle physics suggests that elementary particles are point-like, having little or no spatial extension. Will these physical manifestations of distinguishability be bumps, scrapes, or other slight variations of mass or charge that are present in the body of an elementary particle? Does not the idea of an elementary particle imply that it cannot have such physical variations that are necessarily of an order of size less than that which is considered elementary? We can see already in this world of existential matter that the concept of an elementary particle would not be useful, as everything would have the potential for an infinite regression to smaller and smaller scales. In this hypothetical world, matter would not be composed of “building blocks” but rather completely unique particles, which consequently would preclude a normative chemistry as well as mathematically based descriptions of physical laws that can be generalized from one situation to another. It may appear no wonder that our current physics can be explained so well with mathematics, as essential matter is perfect for such an explanation.

Even if, in our hypothetical world, every elementary physical particle were distinguishable in its mathematical description, that would not be enough for matter to gain its existential independence. It would still have to be able to escape the essence of that mathematical description; it would have to be irreducible. If not, we would have, in a sense, a world full of trillions and trillions of individually novel elementary particles that remain exactly their essence. This is no different conceptually from having 28 that remain exactly their essence. To escape essence, they need to not only carry a distinguishable history, but they need to be perpetually incomplete so they cannot be described entirely by their essence, which would result in their being essential. They would have to lack equivalence with themselves. They would need to constantly exist as having some yet indefinable properties so their existence could never be completed. If their being ever became completed, their existence would at once equal their essence, and their being would therefore become essential. The impossibility arises from the fact that existential elementary particles, being physical, would require a physical manifestation for all of their unlimited information regarding their essence. This would require each particle to be physically infinite, perpetually growing physical manifestations of its incompleteness to escape becoming its essence. If the information for existential matter’s perpetual growth were contained in the physical particles themselves, or even in their physical neighbors, we would be right back to where we started from. They would be essential because all of the information would be contained in the physical system.

To summarize, existential elementary particles would have to be “existence over time”, free of a specific essential definition, while simultaneously being distinguishable

physically from all others of the same type. These requirements for existential being are paradoxical when applied to matter. They cannot both be true. How can an elementary particle carry within itself that which allows for an extremely specific physical manifestation of its history, and at the same time, be irreducible? However, these requirements for existential being fit nicely when applied to consciousness as we have shown earlier. Therefore, it appears that existential being can only exist nonphysically through temporal extensions based upon an essential physical. Physical existential being is impossible, as elementary particles must be essential. However, for sake of argument, if this impossibility was ever to occur, we can see that all being would be separated, as interactions would be impossible due to the necessary perpetual incompleteness of matter. The capacity for entanglement between beings would be lost because nothing could ever interact. As far as we hold to our definition of existence as the capacity for entanglement with other beings, we must finally conclude that the necessary properties of a universe comprised of existential matter would preclude all existence everywhere.

## Further Considerations

The consequences of accepting the ontology presented here are mild considering the alternatives. No new areas of existence are being explored beyond what is already known and must be dealt with in a complete description of reality: elementary particles and consciousness. The mathematics of quantum mechanics and the rest of classical physics continue, obviously, to work and be true when considering the interactions of physical systems. However, it is being contended in the current ontology that the mathematics should not be considered mere representations of an erroneously presumed existential physical but the actual reality in itself, remembering of course that the nature of the physical is to be essential, which makes it completely accessible by mathematics.

The illusive goal in fundamental physical theory to derive the origins of the seemingly disjointed values of the physical forces, particles, and laws with a more elegant reduction is based on an assumption that physical law was present at the inception of the universe. This assumption may be invalid. Under the current ontology, it may be more reasonable to assume that the values of the essential entities were first formulated unsimultaneously and underneath the floor of consistency, in the domain of probabilities, the domain of nonbeing. As the web of consistency grew, these values became locked in, appearing arbitrary and random, which in fact they are to a degree. In this, our ontology provides a priori reason for natural law based on the limits of the force of consistency. This explanation may be more parsimonious than current “theories of everything” based only in physics, which require ten or eleven dimensions, as well as parallel universes, to explain the origins of physical forces, particles, and laws. Of course, such mathematical extremes are necessary if one assumes that the physical is all that exists. Mathematical physics is an extremely successful enterprise, however, it will never arrive at a “theory of everything” until it recognizes the need to incorporate the other “stuff” of existence, consciousness. It is my view that a valuable ‘theory of everything’ will need to be just that, an ontological framework that does not ignore fundamental constituents of reality, like consciousness.

## Conclusions

In congruence with empirical findings, it has been demonstrated a priori that the physical world cannot be comprised of existential matter. Therefore, matter is, and must be, by necessity, esseential. Furthermore, it has also been shown that in order for matter to retain its essence, which is what allows it to exist as a physical entity in the first place, there must exist temporally extended existential being to give the esseential its being in the world, its capacity for entanglement. Through existential being, matter is able to hold on to its existence as essence, and physical causation becomes possible from the demands of consistency in entanglement. Existence requires the mutual dependency of esseential and existential being. If considered separately being becomes lost. Therefore, it appears that consistency in being is the fundamental ontological force. Its power as a force is a given by its nature as that what defines being in the world, existence. In order for it to occur, being must occur in two forms, as pure information (esseential being) and as the irreducible temporal extensions that give that information the capacity for entanglement (existential being). Both aspects of being are necessary for consistency, and both aspects of being are a given from consistency having a force derived from its ability to confer existence on a being. In this ontology, reality emerges as the force of consistency in the entanglements of essences through irreducible temporal extensions.

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## Footnotes

<sup>1</sup>The term *essesential*. is being created here to describe being that exists entirely within its essence. Also, the question may be raised as to whether *essesential* being, as being described here constitutes a being in existences by our definition. The answer will become clear latter in the article.

<sup>2</sup>Only three of the gauge bosons have yet been observed, those responsible for the electromagnetic, strong, and weak forces. The graviton, thought to be responsible for the force of gravity, remains a hypothetical particle, however many physicists are confident in its existence and think that it would be classified as a gauge boson.

<sup>3</sup>This number ten is being used for simplicity as it coincides with our number system; there is no reason that we cannot use an alternative number system with 28 or 128 novel integers in this analogy.