

THE PHILOSOPHY OF SUPERDETERMINISM ON THE LOGOS

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The philosophy of superdeterminism is based on a single scientific fact about the universe, namely that cause and effect in physics are not real. In 2020, accomplished Swedish theoretical physicist, Dr. Johan Hansson published a physics proof using Albert Einstein's Theory of Special Relativity that our universe is superdeterministic meaning a predetermined static block universe without cause and effect in physics. The unity of our universe originates from its creation from the same nothingness under the zero energy universe theory. However, nothingness cannot actually cause a universe to exist on its own under superdeterminism due to the absence of cause and effect in physics. Moreover, nothingness is the absence of anything real and cannot logically be the reality underlying our universe. Consequently, our universe must exist from the reality of the logic or Logos underlying our physical reality resulting from the origination of our universe from the same nothingness or common creation. Because logic allows for a definer of logical states to the exclusion of other logical states, such as "if A, then not B," then a supremely intelligent definer of those logical states must have the ability to define logical states to the exclusion of other logical states resulting in the creation of physical reality.

The philosophy of superdeterminism is based on a single scientific fact about the universe, namely that we live in a predetermined static block¹ universe without cause and effect in physics.² In 2020, accomplished Swedish theoretical physicist, Dr. Johan Hansson proved by applying Albert Einstein's Theory of Special Relativity to what has already been scientifically verified about spin measurement correlations observed in entangled particle pairs³ that cause and

¹ Imagine a cosmic four-dimensional block, where the three familiar dimensions of space (length, width, and height) are combined with a fourth dimension of time. Every single moment in history would occupy a specific location within this block. From this perspective, there is no special "now" moment that separates the past from the future. They all exist equally.

² Hansson, Johan. "Bell's theorem and its tests: Proof that nature is superdeterministic – Not random." *Physics Essays* Vol. 33, No. 2 (2020). Dr. Johan Hansson, a professor at Luleå University of Technology in Sweden, has been awarded the "Honorable Mention Award" by the Gravity Research Foundation, a prestigious foundation aimed at advancing the understanding of gravity in fundamental physics. This recognition places him among a group of previous winners that includes Nobel laureates and world-renowned physicists. www.ltu.se/en/latest-news/news/news/2023-05-23-awarded-prestigious-prize-in-gravitational-research#:~:text=Johan%20Hansson%2C%20a%20professor%20at,of%20gravity%20in%20fundamental%20physics.

³ Dr. Hansson's version of superdeterminism proves that we live in a predetermined static block universe without cause and effect in physics. The other version of superdeterminism posits hidden causal variables responsible for the correlations observed in quantum entangled particles, and thus relies on cause and effect in physics. Indeed, Dr. Hansson's version of superdeterminism disproves any competing version of superdeterminism that relies on cause and effect in physics to posit hidden causal variables.

effect⁴ in physics⁵ are not real. Dr. Hansson demonstrated that the opposite spin measurements observed in entangled particle pairs cannot occur unless cause and effect in physics are not real. Experiments have shown that when the spin of the first entangled particle is measured, then the spin of the second entangled particle will always be the exact opposite spin regardless of how far apart you place the particles when measured.⁶ However, the spin of the first entangled particle measured for spin-1/2 particles, like electrons, will always be a purely random 50-50 result between Up or Down spin. This raises an inconsistency with Einstein's Special Relativity when observed from different inertial frames of reference.⁷

⁴ Dr. Hansson wrote that “[e]verything is predetermined, including the experimenters (non) free will, the ‘random’ orientation of the spin-analyzers at either end, and anything else you can think of. Each measurement does not create but merely uncovers what already is embedded in space-time. All events leading up to, and including, the ‘act of measurement’ itself are already there. . . . Bell’s theorem and its many experimental tests thus are proof that nature at its fundamental level is superdeterministic – not random. A ‘cause’ cannot alter the ‘effect.’ The events in global space-time are predetermined and fixed, much like pebbles cast into a concrete block. . . . What an experimenter seemingly ‘chooses’ to do at either end A or B is the only thing she can do, and cannot ‘cause’ either the event at her own position or the event at the other end. All events in the global space-time ‘block’ we call the universe (past, present and future), observed or not, are superdetermined and unalterable.” Hansson, Johan. “Bell’s theorem and its tests: Proof that nature is superdeterministic – Not random.” *Physics Essays* Vol. 33, No. 2, at 217 (2020).

⁵ Physics is the fundamental science that studies matter, energy, motion, and force. Physics explores everything from the incredibly small (subatomic particles) to the unimaginably vast (the cosmos).

⁶ Aspect, A. et al. “Experimental Realization of Einstein-Podolsky-Rosen-Bohm *Gedankenexperiment*: A New Violation of Bell’s Inequalities” *Physical Review Letters* Vol. 49, No. 2 (1982).

⁷ An inertial frame of reference is a frame of reference in which an object at rest remains at rest and an object in motion moves in a straight line at a constant speed unless acted upon by an external force. Essentially, it is a reference point that is not accelerating. Think of it like a smoothly moving train: if you're inside and not near the windows, you can't tell if the train is moving at a constant speed or stationary. This is because the train is an inertial frame of reference.

Observers in different frames of reference can observe a different entangled particle measured first due to the relativity of simultaneity.⁸ As a result, two different observers each observing a different entangled particle measured first can observe conflicting spin measurement results for the pair. If Observer 1 sees particle A measured first with an Up spin, then particle B must show a Down spin for Observer 1. But, if Observer 2 sees particle B measured first with an Up spin, then particle A must show a Down spin for Observer 2. Observers 1 and 2 would see inconsistent spin measurement results for the pair of entangled particles. This potential conflict in spin measurement results occurs because of the random 50-50 chance of observing either an Up or Down spin on the first particle observed to be measured.

The only way to explain how the spin measurement results can be consistent for all observers regardless of inertial frames of reference is to say that the spin measurement results must be predetermined for all observers.⁹ If Observer 1 is predetermined to see particle A measured with an Up spin, and Observer 2 is predetermined to see particle B measured with a Down spin, then the spin measurement results between the two Observers can always match even though the spin measurements still appear to the Observers to be completely random

⁸ The relativity of simultaneity in Einstein's Theory of Special Relativity means that two events that occur at the same time for one observer may not occur at the same time for another observer who is moving relative to the first. This idea challenges our intuitive understanding of time. In our everyday lives, we tend to think of time as absolute, flowing uniformly for everyone, regardless of their motion. However, special relativity tells us this is not the case. This happens because the speed of light is constant being the same for all observers regardless of their motion. To visualize this, imagine two lightning strikes hitting opposite ends of a moving train simultaneously from the perspective of someone standing on the platform. To someone on the train, the lightning strikes might appear to happen at different times due to their motion relative to the platform. This concept might seem counterintuitive, but it is a cornerstone of modern physics and has been experimentally verified.

⁹ Dr. Hansson concludes that "[t]here is no other possibility than that the outcomes at A and B both are predetermined." Hansson, Johan. "Bell's theorem and its tests: Proof that nature is superdeterministic – Not random." *Physics Essays* Vol. 33, No. 2, at 217 (2020).

results. This is an example of predetermined randomness¹⁰ and not caused randomness. If the random spin measurements were actually caused when the first entangled particle observed was measured, then there would be an inconsistency in spin measurement results which would violate the principle that there is no preferential frame of reference in Special Relativity or quantum mechanics. Consequently, Dr. Hansson proved that actual cause and effect in physics cannot be real using Einstein's Theory of Special Relativity, because eliminating cause and effect in physics is the only way to explain how the spin measurement results can be consistent when viewed from any inertial frame of reference.

The word "Logos" is a Greek term that represents the underlying principle of order and rationality that governs the cosmos. In the Gospel of John, the Logos is identified with Jesus Christ, seen as the divine reason and creative force behind the universe.¹¹ The reality of the Logos is supported by the philosophy of superdeterminism. In the absence of cause and effect in physics, the laws of physics cannot actually cause the existence of the universe. However, under the zero energy universe theory,¹² the universe is comprised of positive matter energy¹³ and

¹⁰ The idea of "predetermined randomness" simply means an initial encounter with pre-existing pure randomness. So, in our static block universe where all purely random events exist equally whether in the past, present or future, one can encounter pre-existing purely random events for the first time as one enters future portions of the static dimension of time.

¹¹ "In the beginning was the Word, and the Word was with God, and the Word was God." John 1:1. The original text of the Gospel of John uses the Greek word "logos" or λόγος to refer to the "Word".

¹² The zero energy universe theory says that the positive matter energy is exactly balanced by the negative gravitational energy, so that the total energy of the universe is zero. The idea is that "positive matter energy" encompasses the various forms of energy associated with the existence and interactions of matter, while "negative energy" represents a counterbalancing force, such as the gravitational potential energy.

¹³ Positive matter energy encompasses the energy associated with the existence and interactions of the particles and fields that constitute the universe. It includes the energy equivalent of the mass of particles namely Mass Energy ($E=mc^2$); the energy of the motion of particles namely kinetic energy; the energy carried by electromagnetic waves such as light and radio waves; and the energy stored within the nucleus of atoms namely nuclear energy.

negative gravitational energy¹⁴ that perfectly cancel out to the same nothingness as verified by the flatness of spacetime.¹⁵ The unity of our universe derives from this common origination from the same nothingness. However, nothingness is not a substance, but rather the lack of anything real. The lack of anything real cannot logically be the reality of our universe.¹⁶ Rather, our universe is unified because of the logic of the positive matter energy and negative

¹⁴ Negative gravitational energy encompasses energy associated with the attractive force of gravity between masses. Physicist, Lawrence Krauss believes that dark energy contributes to the negative energy balance within the zero-energy universe theory. Krauss believes that the effects of dark energy, particularly its influence on the expansion of the universe, can be interpreted in a way that contributes to the overall negative energy balance. Dr. Hansson believes that full nonlinear gravity itself has the potential to explain cosmological observations without the introduction of dark energy and dark matter. Hansson, Johan. “Oversimplified Standard Cosmology results in Fictional Dark Energy & Dark Matter” (Gravity Research Foundation 2024 Awards).

¹⁵ In General Relativity, the theory of gravity, massive objects can curve spacetime. However, the cumulative curvature of spacetime in our universe from all the matter, energy, dark matter and dark energy results in a perfectly flat universe meaning that light rays travel in straight lines, and parallel lines remain parallel forever. This happens because our universe possesses zero net total energy. If the universe possessed a net positive energy, our universe would curve negatively in a saddle shape. If our universe possessed a net negative energy (gravity), then our universe would curve positively into a sphere shape. Because the positive and negative (gravity) energies of our universe perfectly cancel each other out, then our universe has zero curvature meaning the universe is flat.

¹⁶ Because nothingness being the lack of anything real cannot be the reality of the universe, then our notion of the universe being made of a substance cannot be correct because nothingness cannot be a substance. Rather, our notion of substance is an idea in our minds resulting from the underlying logic of the universe or Logos. Under superdeterminism, ideas or concepts in the mind are an aspect of the physical reality in our brains. So, the logic underlying the universe or Logos is responsible for our perception that the universe is made of a substance. But, in truth, we are actually present in a created exhibition of the logic or Logos of our universe. Because there is no actual moving substances in nothingness, then our universe is not a mechanism or something in motion. Moreover, all aspects of the logic or Logos of mechanisms need not be displayed in our universe in order for the mechanisms to appear to work. For example, the entire logic or Logos of a quantum computer need not be exhibited in our universe in order for the qubits to appear to work, because a quantum computer does not actually consist of moving parts that must exist in order for this mechanism to appear to work.

gravitational energy sharing the same origination. Our universe must therefore exist on the basis of the reality of the logic underlying the cosmos or Logos.¹⁷

The logic or Logos underlying physical reality is the reason for our universe exhibiting mathematical laws of physics.¹⁸ Mathematics does not contain cause and effect. Because our universe exhibits mathematical laws of physics, then one should not expect that our universe contain cause and effect in physics, because math does not contain cause and effect. Rather, one should expect that our universe be a predetermined static block universe, because such a universe does not require cause and effect in physics. Indeed, the fact that our universe exhibits mathematical laws of physics at its most basic level of physical reality highlights the importance of mathematics to the existence of physical reality¹⁹. So, the fact that mathematics does not

¹⁷ Our predetermined static block universe without cause and effect in physics is not a simulated or virtual reality. Rather, it is three static dimensions of space and one static dimension of time. Human beings are appearances on static hyperplanes of spacetime in the dimension of time as opposed to beings interacting with a generated environment, which would require the actions of human beings to cause an effect in the generated environment.

¹⁸ The laws of physics are described by mathematical equations, which often operate with continuous quantities like real numbers, where there are infinite values between any two points. However, under superdeterminism in the absence of cause and effect in physics, the laws of physics described by continuous mathematical operations cannot actually cause the existence of the universe. Consequently, the universe need not exhibit everything these mathematical operations allow for, nor must the universe exhibit infinite continuity or values. Traditional logic generally operates on discrete values, so there is no reason that the logic of the universe or Logos must exhibit infinite continuity or values.

¹⁹ The logic underlying the physical reality of our universe as described by mathematics and defined as a separated state of existence by God through creation is a static and timeless logical and mathematical consistency that unifies the structure of spacetime. However, logic and mathematics themselves cannot cause the universe to exist in the absence of cause and effect in physics. Moreover, the universe comes from the same nothingness which God separates into equal parts of positive and negative energies. But, because an infinite amount of positive energy cannot cancel out an infinite amount of negative energy, i.e. infinity minus infinity is undefined under mathematical principles, then these energies must always come in finite quantities that can cancel each other out. Consequently, the universe must be comprised of discrete finite physical reality and not the infinitely divisible physical reality consistent with a purely mathematical description with infinitesimals.

contain cause and effect is compelling evidence that cause and effect in physics are not real. The additional assumption that cause and effect in physics are real despite the absence of cause and effect in mathematics is unnecessary, because our universe can operate as normal as a predetermined static block universe without cause and effect in physics. Occam's Razor states that when faced with competing explanations for a phenomenon, the explanation that requires the fewest additional assumptions should be selected. Because cause and effect in physics are an unnecessary additional assumption, then Occam's Razor requires explaining our universe as a predetermined static block universe without cause and effect in physics.

The logic of the origination of our universe from the same nothingness is what leads to its separation into positive matter energy and negative gravitational energy. Nothingness itself does not have an actual presence being the lack of anything real, so the sameness of the nothingness from which our universe derived its positive matter energy and negative gravitational energy is actually the presence of logic or Logos. The beginning of physical existence always starts with randomness, because with no prior state governing the emergence of its existence, the beginning state of physical existence would have to be random. And because pure randomness is itself logically possible²⁰ and an aspect of the Logos given the pure randomness occasionally called for by our laws of physics, then God can begin physical realities, like our universe, with a random quantum fluctuation.²¹

²⁰ Pure randomness is logically possible, because an existing point can logically act as a beginning or cutoff despite any means of determining that point as the beginning or cutoff.

²¹ Although quantum fluctuations are fleeting events, the early universe underwent a period of incredibly rapid expansion like cosmic inflation. This rapid expansion could have stretched a small quantum fluctuation to enormous size essentially locking in the existence of the universe. This stretching effectively amplifies the initial fluctuation preventing it from simply collapsing back into nothingness.

So, it is not surprising that our universe would begin with a random quantum fluctuation. Indeed, the fact that our universe exhibits behavior consistent with mathematical laws of physics with the occasional purely random quantum leap demonstrates the presence of logic or Logos in our universe. Our static block universe without cause and effect in physics is also consistent with logic being a static framework.²² The actual existence of cause and effect in physics would argue against the beginning of our universe as a random quantum fluctuation, because pure randomness cannot have a discernable cause. But actual cause and effect in physics implies that our universe has always existed due to an infinite regression of prior causes. And God, like Atlas, would be spending eternity conserving the existence of our universe. So, as between an eternally burdened God conserving our universe forever and a God who creates our universe as one and done, the philosophy of superdeterminism supports the existence of a God relieved of the unnecessary burden of maintaining cause and effect in physics for eternity.²³

²² In the absence of cause and effect in physics under superdeterminism, physical reality cannot be caused to exist in time. Physical reality is therefore timeless. Logic is also timeless. So, the notion that physical reality is a display of logic or Logos is consistent with the timelessness of physical reality under the philosophy of superdeterminism.

²³ Cause and effect in physics requires time for the cause to lead to the effect. By conserving the existence of our universe where cause and effect in physics are real, God would have to act in time because God would have to act to conserve time. Every act of God conserving each moment of time would be an act corresponding with that moment of time. Consequently, conserving a duration of time would involve a series of acts of conservation by God all corresponding with the moments of time that pass in that duration of time. This correspondence between each moment of time and an act of conservation by God would mean that God acts in a series corresponding to each passing moment of time, which is the equivalent of God acting in time. In other words, if God must act continuously to conserve each moment of time, then God becomes subject to the constraints of time, essentially existing within the flow of time. Anything acting in time is limited by the amount of time. If something acts within the framework of time, it means its actions are subject to the constraints of time's passage. The amount of time available limits the extent of action. For example, a runner has a limited amount of time to complete a race. If God is subject to time, then God is limited by time. How God uses the amount of time available to Him creates a burden on the use of His time. But, an omnipotent God possesses unlimited power and resources, and therefore, God cannot be burdened by any task or responsibility. This creates a time paradox for an omnipotent God subject to time.

The logic underlying the universe or Logos also explains the creation of physical reality. Because underlying physical reality is logic or the Logos, then physical reality is actually this logic or Logos. But, logic allows for one thing to be real and not another, and vice versa. For example, the logical statement “if A, then not B” calls for the reality of A without the reality of B or the reality of B without the reality of A. Thus, an aspect of logic must be real that can define logical states that include the reality of some things excluding the reality of other things.²⁴

²⁴ Mathematics also allows for the definition of states that exclude other states. When we define a state, we are often implicitly or explicitly setting boundaries. These boundaries define what is *included* in that state and, by extension, what is *excluded*. Mathematical statements, often using inequalities or logical operators, can precisely define which states are allowed and which are not. For example: $x > 5$ defines a state where x is greater than 5. Any state where x is less than or equal to 5 is excluded. $10 < x < 20$ defines a state where x is between 10 and 20 (exclusive). All other values of x are excluded. When we define a state space, we often impose constraints. These constraints define the *allowed* region of the state space. Any states that violate these constraints are excluded. For example, in a physical system, we might have a constraint that the temperature must be below a certain limit.

The implication operator (often read as "if...then") is the closest logical operator to expressing causality. While this does not explicitly say "A causes B," it establishes a conditional relationship where A's truth necessitates B's truth. This is a crucial building block for reasoning about cause and effect. By combining logical operators like implication, conjunction (and), disjunction (or), and negation (not), we can create complex statements that model causal scenarios. For example, we might have a statement like: " $(A \text{ and } B) \rightarrow C$," which could be interpreted as "if A and B both occur, then C will occur." This starts to resemble a causal relationship. These systems can be designed to infer causal relationships based on the information they are given. For instance, a system might learn that "if the light switch is flipped (A), then the light turns on (B)," and thus infer a causal link between A and B. But, mathematics is a highly abstract system. It deals with symbols, relationships, and structures, but it does not inherently imbue those symbols with causal meaning. Math can help us identify correlations between variables, but correlation does not equal causation. Just because two things are mathematically related does not mean one causes the other. Many mathematical equations describe static relationships or patterns. They do not inherently include the notion of time or the process of one thing leading to another. Logical operators in mathematics are inherently correlations and not causation. Because the logic underlying the universe is described by mathematical laws of physics, then the logic underlying the universe implicitly exhibits only mathematical correlations and not causation. Causation only occurs when God defines a state that excludes other possible states, because causation via creation is necessary to exclude the defined state from God's omniscience of all excluded states. Mathematics itself does not contain omniscience, but logic does dictate the exclusion of other possible states from God's omniscience in order to define a state that excludes these other possible states. So, it is the

Because such a defining aspect of logical states would have to know of and understand all logical states, then this definer of logical states would have to be supremely intelligent.²⁵ Consequently,

existence of God and His omniscience, and not mathematics, that allows for the creation of the universe.

Mathematics operates within formal systems defined by axioms and rules of inference. These systems, while powerful, are inherently limited. Gödel's Incompleteness Theorems, for example, demonstrate that any sufficiently complex formal system of representation will contain true statements that are unprovable within the system itself. This means mathematics cannot even know all truths *within its own domain*, let alone everything else. Consequently, the creation of physical reality cannot solely be a mathematical function, because the defining of states that exclude other possible states requires omniscience of all possible states. So, the logic underlying the universe or Logos necessitates an omniscient God who is not a system of formal representation in order to define states that exclude all other possible states, but that, in turn, requires creation of physical reality in order to exclude those other possible states from God's own omniscience of those excluded states. And omniscience of all possible states implies knowledge of everything or an uncaused state of everythingness. And knowledge of everything is not a system of formal representation, because knowledge of everything is not purely symbolic and rule-based, but encompasses aspects of understanding that go beyond symbols and rules. It is more akin to a direct and complete grasp of reality itself, rather than a representation of it.

²⁵ A supremely intelligent definer requires free will to make choices on defining possible states. Such a choice cannot be predetermined by knowledge of everything, because knowledge of everything could not include knowledge of the act of selection among everything. A freely willed choice already known is not a freely willed choice. Because such a freely willed choice lies outside of God's knowledge of everything, then such a freely willed choice cannot increase God's knowledge of everything. A freely willed choice is not knowledge and cannot be part of God's knowledge of everything. Such a freely willed choice is a logically necessary aspect of God's knowledge of everything or omniscience as a definer of possible states, and can be applied to His knowledge of people such that God can freely choose as a human being would freely choose. Because God is not subject to time, then God's freely willed choices cannot be ordered in time. Moreover, we cannot order freely willed choices as knowledge, because a freely willed choice is not knowledge. Because a freely willed choice is not knowledge, then God's use of cinematism to exhibit our freely willed decisions is not an aspect of God's knowledge but rather an aspect of the logical necessity of God's capacity to choose in defining possible states from His knowledge of everything or omniscience.

However, time is a static dimension in which things can appear in sequential order. Without this dimension of time, things can appear without being sequentially ordered relative to one another. Things that appear that are not sequentially ordered cannot act as a timeline for God, because they do not appear before or after one another. God's knowledge of His actions is not temporally prior to His actions, because the concepts of "before" and "after" do not apply to God's actions outside of time. The concept of "sequential ordering" does not apply to God's actions, as they exist outside of time. So, an infinite number of actions by God does not make God infinitely old. Nor a finite number of actions by God mean that God is done acting. The relationship between God's knowledge and His actions is outside the framework of temporal

because logic or Logos underlies physical reality and because logic itself includes a defining aspect of logical states, then the supremely intelligent definer of logical states must have the ability to create the logic or Logos underlying physical reality and hence the ability to create physical reality. A supremely intelligent definer who has omniscience of all logically possible states cannot define a logical state that includes the reality of some things excluding the reality of other things without creating that state, because the supremely intelligent definer cannot exclude from omniscience.²⁶ So, the creation of physical reality is not a magic trick, but rather an aspect of the underlying nature of reality as logic or Logos²⁷ labeled *creatio ex logica*.²⁸

concepts like “before,” “after,” or “simultaneous.” God can have knowledge of His own freely willed decisions and our freely willed decisions without adding to His own knowledge, because His actions and knowledge are outside a temporal framework. Indeed, God can freely choose and also know what He will freely choose, because God is outside of time. Timeless logic underlies physical reality and not temporal causation. So, these observations make sense in their own framework of timeless logic.

²⁶ One might argue that all logical states could exist in physical reality as an infinite multiverse without the need of a Creator God. But, then that aspect of logic which allows a logical state to exclude other logical states would be impermissibly nullified, because all logical states would have to co-exist with one another in order to claim that all logical states existed which defies the logic which allows logical states to exclude other logical states.

²⁷ Creation is an aspect of logic in defining a logical state that excludes other logical states. Our static block universe is a defined state of logic or Logos that excludes other logical states. Nothing actually moves in our static block universe, because our universe is a defined state of logic and logic is a static framework. God is knowledge and understanding of everything. Brute fact foundational reality is an uncaused state of everythingness as opposed to an uncaused state of absolute nothingness meaning the absence of any and all knowledge or understanding. An entity with complete knowledge and understanding of logic would inherently know and understand what constitutes a violation of those principles implying knowledge and understanding of what is not logical. Because defining by exclusion is a logical operation, then God cannot create an illogical state by definition.

²⁸ “*Creatio ex logica*” is a Latin phrase meaning creation from logic. The principle of *creatio ex logica* states that the creation of physical reality is the defining of a state that excludes all other states pursuant to the logic underlying physical reality which necessarily requires the separation by the supremely intelligent definer of that state from the definer's own omniscience of those other states.

Modal logic contains possibility, such as “if A, then B is possible.” But, possibility is not a defined reality by definition.²⁹ Consequently, the underlying logic of physical reality can encompass the modal logic of possibility, but it cannot be defined in physical reality by definition. This explains why physical reality can exhibit the defined results of the modal logic of possibility, but cannot directly exhibit the logic of possibility in physical reality. For example, there is no direct scientific evidence that the quantum state of a qubit in a state of evolving superposition is a real physical entity. The measurement of the qubit provides a mathematical result without the real physical reality of any solution space for the quantum calculation. The fact is that physical reality only directly shows us the mathematical result without showing us the purported evolving quantum state of superposition. The purported quantum state of superposition cannot be a reality, because possibility cannot be real by definition. But, the logic underlying physical reality defined by God can encompass a defined logical state that exhibits the results of modal logic that cannot appear in physical reality by definition.³⁰ Consequently, our predetermined universe can be created by God to exhibit the results of the application of an underlying logic of the possible set forth in quantum mechanics without also exhibiting the physical reality of quantum states in superposition that cannot be real by definition.³¹

²⁹ Possibility refers to the realm of what *could* be, as opposed to what *is* real.

³⁰ Our universe exhibits behavior consistent with quantum superposition. However, quantum superposition which consists solely of possible quantum states cannot be real by definition, because possibility refers to the realm of what could be – as opposed to what is real. However, the logic and mathematics which describe quantum superposition under quantum mechanics must transcend physical reality as a metaphysical ontological reality, because the quantum superposition it describes is not real but physical reality does exhibit behavior consistent with the logic and mathematics describing quantum superposition. Accordingly, the logic and mathematics that describe our universe through the laws of physics also transcend physical reality as a metaphysical ontological reality, because quantum superposition is encompassed by the laws of physics.

³¹ The logic of possibility inherent to a quantum state of superposition still follows the underlying logic of our universe, because the measurement results of a quantum state of

superposition exhibited in physical reality never violate the laws of physics of our universe. However, because the logic of possibility cannot be defined in physical reality by definition, then the logic of possibility encompassed by defined physical reality must be known to God while only the results are exhibited by physical reality. The results of the logic of possibility so exhibited in physical reality are obtained from God's freely willed choice among the possible.