The Paradox of Thought:

A Proof of God's Existence from the Hard Problem of Consciousness

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Published in the Journal Philosophy and Theology

Citation: Morgan, Christopher. "The Paradox of Thought: A Proof of God's Existence from the Hard Problem of Consciousness ." *Philosophy and Theology* 29.1 (2017): 169-90.

Abstract

This paper uses a paradox inherent in any solution to the Hard Problem of Consciousness to argue for God's existence. The paper assumes we are "thought machines", reading the state of a relevant physical medium and then outputting corresponding thoughts. However, the existence of such a thought machine is impossible, since it needs an infinite number of point-representing sensors to map the physical world to conscious thought. This paper shows that these sensors cannot exist, and thus thought cannot come solely from our physical world. The only possible explanation is something outside, argued to be God.

Introduction

This paper offers a potential proof for the existence of God. Many have tackled this problem, offering many convincing arguments both for and against this proposition. Many of these, however, have been negated by rebuttals such as "God has his hidden reasons for doing X" or "X is likely the result of some natural cause." The greatest miracles on one side are reduced to idiosyncrasies of natural law, and arguments from incredulity do not resonate with one steeped in differing experiences and worldviews. Both might be convincing according to strongly held subjective values, but not according to others' prejudices. This proof, however, attempts a different course, and if it does not completely cast away subjectivity, I hope it gets close to doing so.

What lines of attack are open to such a proof in favor of God's existence? First, we must try to avoid value judgments themselves, on whether something is proper or fitting for God to do. We also must minimize reliance on natural law and our perceptions thereof, only relying upon pure logic and its relevance to reality. This proof does not completely meet this goal, as it relies on our continual conscious experience of the world, but that should be all it relies on. In fact, solely through examining the riddle of the origin of consciousness and paradoxes inherent in our experience, it appears one can necessitate the existence of God.

Hard Problem of Consciousness

We perceive the universe and think many thoughts concerning it, but how and why do we do so? It is a mystery why we even have conscious thought. What makes our brains different from an inert rock, which presumably lacks thoughts at all? One might classify existing objects into two groups: beings with minds and everything else. The first group, including ourselves and other animals, uses our minds (some more so than others) to think, observe, and (if one believes in free will) manipulate the world. The other does not, at least as far as we know. What differentiates the two groups?

This quandary is the Hard Problem of Consciousness, which asks how our conscious experience can arise from physical properties (Weisberg). One can say that blood feeds the brain, the brain is alive and controls the body, etc., but in the end, it all comes down to physical interactions of elements such as hydrogen, oxygen, iron, and

carbon, and subatomic particles such as protons and electrons. Thus, what interaction of particles or subatomic particles allows thoughts to come into being? Does the interaction occur in electric or magnetic fields? What guarantees the interaction occurs in the brain instead of just rocks? How do we avoid the case of the theoretical philosophical zombie, whose outward actions mimic that of humans in every way, but who is actually just a machine lacking its own thoughts (Kirk 2012)?

There are a number of potential responses to the Hard Problem, from eliminativist denials of consciousness, to tying consciousness to physical traits, to dualism (Weisberg), with its decoupling of the mind and body (Calef). Whatever the link between the physical world and consciousness, we can only begin with, "I think, therefore I am." All we know is that we observe what appears to be a world that we are participants in, and it may or may not exist outside our minds. We may be completely part of the world, partially part of it (say, the bodies that we inhabit, but not our minds), or the world itself may not be present, and is just a figment of our imagination. Whichever of the last two the consciousness-universe relationship is, I will argue that we are not completely part of the world because of the paradox that entails. Through this argument, I hope to give proof of the existence of God.

Assumptions

Before we continue along this path, however, let us first define a few background assumptions that we will be taking into the proof and then give justifications for them. The first assumption is that, in a "space" with a size of zero, there is nothing. Matter, energy, and other conceivable substances are not present in a volume that by definition cannot contain it. I am not saying that points do not exist as mathematical and abstract constructs, but that there is no way a spatial object of one dimension or greater can be contained in a point. In addition, since the size is zero, then this "space" cannot affect physical reality in any way. This may seem obvious and tautological, but remember this in the future. I define "space" loosely, in that it can refer to our normal space-time or some other planes, dimensions, and combinations thereof that we cannot see.

The second assumption is that our specific thoughts must have a corresponding basis in some ultimate reality. As you read this paper, some state of an object in the

ultimate reality corresponds to the thought of you looking at and processing the text. In short, for the ultimate reality, our thoughts are a property of something tangible therein, just as color, mass, velocity, etc. are properties of matter in our space-time experience. Because an ultimate reality object or set of objects either exists or is in a particular position or configuration, our thoughts occur as a result. Thoughts do not come from nothing, and we cannot ascribe their origins to something else.

To expand further, I am assuming that the qualia we experience arise from the configuration of these ultimate reality objects, as a natural law. For example, gravity in a simplified Newtonian universe just happens to be a property of matter, with separated objects somehow attracting each other. Aesthetically it may seem arbitrary, as one could imagine a model of reality without gravity, without objects pulling together. Yet gravity exists as a "property" of matter. Likewise, I am assuming that qualia, or the experience that we identify as qualia, are a property of these ultimate reality objects. When an object, or a collection of objects, is in a particular position, a thought occurs as a byproduct.

As one model, imagine an 8x8 chessboard, with some squares empty and some squares having chess pieces. The chessboard corresponds to a machine that generates thoughts, taking as input a particular configuration of chess pieces and empty squares and outputting a thought, or quale. Each thought is a permutation of all the squares either having a chess piece in them or not having a chess piece.

Some form of the chessboard model is what exists in reality for our consciousness, at its root. In more familiar models, one can substitute the brain for the chessboard, and stimuli such as light, taste, and the resulting firing neural synapses and brain activity for the chess pieces (with their absence corresponding to empty squares). The thoughts we think are the brain machine's output. As the brain's activities supposedly represent what we are thinking at a particular moment, with one object measuring the physical state of other objects, so will our chessboard model. I will be using the chessboard model, however, because it will help with the points I am illustrating.

As we progress through time and progress to thinking of different things, the chess pieces will have changed position on the board. Whatever it is that represents our

consciousness, it will have a variety of different sensors ("chessboard squares") measuring different states ("does the square have a chess piece?") that aggregated together will represent what you are thinking at the current moment. A particular combination of sensors, each in a state such as "occupied" or "empty", will represent a unique thought. Other combinations will represent different thoughts.

The third and last assumption concerns when one moves from one thought to a different thought. When doing so, the physical objects measured by the sensors, originally in a state combination representing the first thought, will be in a different physical position. The sensors in their original positions will then register a new thought. A particular configuration cannot mean the same thing when read at one time and a different thing when read later. Since nothing is different physically, how can the property linking the thought to that combination change? The laws of nature will not just change arbitrarily.

The Paradox

With the background assumptions defined, I can now illustrate the paradox that will form the heart of the proof. Let us return to the chessboard metaphor for thought in the second assumption above. Squares will be either occupied or empty, and each thought we experience results from some combination of chess piece positions. To change to a new thought, the piece positions must change.

This chessboard model represents what our brain theoretically does when the human body interacts with a variety of different stimuli in the space-time realm. Say that our consciousness is the result of "squares" of brain cells, subatomic particles, or some combination thereof. As we interact with the world, these brain cells undergo stimulation from the external world both directly and from organs (such as the eyes and ears) that relay information from the world. After this occurs, these "squares" are then shifted into new states, forming a new thought in our consciousness. Further stimuli will result in even more thoughts.

The problem, however, occurs in the transition between thoughts. Keeping the chessboard metaphor, imagine what happens if you pushed a chess piece from one square

to an adjacent square. Your finger exerts force on it, and the piece slowly moves from one square until it is completely in its neighbor. The question, however, is what state the two squares register when the piece is in transit, not fully in either. It is in some state not accounted for in our model. The model as it stands now thus has a flaw, and we must somehow account for these intermediate states.

At first glance, this does not seem to be much of an issue, as it seems we can just fine-tune the model to remove any irregularities. We could have each of the intermediate steps of the piece-shifting action represent a new state, and have our thoughts now represented by a unique combination of all the chess pieces in transit or completely in a square. For example, we could divide a chess square into ten pieces, a.k.a. ten different sensors, each measuring whether its fraction of the square is completely occupied by a chess piece. The length could be the same as before, but the width is divided by 10 (or vice versa if moving the other way). Then when the first tenth is occupied, one state is triggered, and when the second tenth is occupied, another state is triggered. However, we still run into the problem of what to do about intermediate fractions of the ten subdivisions. We could subdivide further into hundredths, thousandths, millionths, etc., but the problem remains.

Thus, we cannot rescue the model by subdividing into smaller and smaller sensors and triggering a new state when the chess piece reaches a milestone. We might consider another potential solution, one that asks why we even need to subdivide. Why can our model not just recognize that, at any particular moment in time, the piece is 45.2345843234% of the way to its final state, or any other percentage we might hypothesize? We could define an infinite number of states for any position the chess piece might find itself in at any particular moment.

The issue with this example is a little subtler. Unfortunately, while we might recognize that the chess piece is a certain percentage of the way to its final state, the chessboard (personifying it for a minute), if it needed to register whatever position the piece is in through these fractional square sensors, could have no way of knowing it. The chessboard would need a sensor to register whatever position the piece is in, but it could not supply one for every potential position because there are an infinite number of board positions. The sensors themselves must take up some volume, as they cannot perform

their job with a volume of zero (remember the first assumption). However, an infinite number of volume-needing sensors means the chessboard must be infinitely large, and as this is not possible, the model must fail.

Note that there are no other ways to mitigate the chessboard model, and indeed any other possible model, that are not permutations of these adaptations. Any attempt to define some system of volume-filling sensors will fail because of undefined subdivision states. The only way to avoid undefined states is to have infinite sensors for the infinite states. However, the universe could not contain infinite volume-filling sensors, due to the infinite size needed. By contrast, if the sensors do not take up space and can register changes at the level of, say, a point in space, then they have a volume of zero, and thus cannot exist. This is the paradox. It is impossible, in a continuum, to have a physical property (such as thought) that is dependent upon changes of the exact points of a given space, which thought must be dependent upon.

Avoiding the Chessboard Model

One might attempt to sidestep the paradox by finding flaws in the chessboard model. The following list contains a few possible objections, and a rebuttal to them.

I. Messages

Could the chessboard somehow send a signal about what state it is in to another medium, which would then analyze the current state? This is perhaps better illustrated through mechanical devices, where text appearing on a computer monitor indicates the pressing of computer keys, or a guitar string vibrating that a string has been plucked. One could measure secondary outcomes, such as what text appears on the computer screen instead of the key presses themselves.

However, this just moves the problem down one level, as you still need something to measure what is appearing on the computer screen. Applying messaging to the next level pushes it down another level, and so on. Similarly, our brain may process our thought-generating neural impulses in a variety of ways, but we cannot reduce the

problem to an abstract series of messages occurring in our brain. The messages must go somewhere that has sensors for determining states, and that place is still subject to this paradox.

II. Input Method

One may also attempt to sidestep this problem by abandoning the chessboard model's input method for another. Why must the states result from the position and movement of chess pieces? Is there not another method for state input that avoids this problem? Unfortunately, how else can one change the innate qualities of an object that does not involve some kind of movement?

Imagine that a rubber ball represents our consciousness. To convey it to a different state, we must somehow deform it so that the sensors on the ball can "know" to form a new thought. If we do not deform it, then how can the unchanging ball, which has no knowledge of the outside world, "learn" anything? Remember that we must rule out any signals sent as messages to or from it, as it pushes the problem down further. Thus, the ball is on its own, and thus the consciousness property is innate to the ball itself and is not dependent on other objects.

To illustrate this, imagine if your hand is next to or even touching the ball. The ball would have no way of knowing it, because the ball does not itself change and cannot receive messages about the state of the outside world. One also cannot appeal to certain abstract forces like gravity, for while they may change the position of the ball in space, they do not change the ball itself. If the position is important, then the ultimate model is not the ball, but that which incorporates the position, and we then ask our questions for the higher-level object. The higher-level object would have sensors for the position of the hand itself, and the paradox remains.

Thus, deformation is necessary for generating new thoughts. Any such deformation will require movement of the shape of the ball, and thus present an instance of the overall paradox. For the ball itself to register a new state, it itself must change in some way. However, by shifting its internal state, it is still subject to the overall subdivision paradox of movement. If it does not move, one avoids the paradox but the

ball itself does not change, violating the third assumption as the ball's current state must represent two different thoughts at two different times.

III. Not Building a Machine; Property Just Is

A third solution is to propose that, while this paradox might hold true if we were building a machine to determine what someone is currently thinking, this paradox may be inapplicable for a physical law. While it may be impossible to build a machine that measures a physical medium and generates a thought, it is possible that the property still exists. Similar to Heisenberg's Uncertainty Principle, in that while we may not be able to measure the position of an electron at all times because the act of measurement itself corrupts the data (Hilgevoord, Uffink 2012), that doesn't mean that the electron isn't somewhere…

The problem is that, unlike Heisenberg's Uncertainty Principle, this paradox does not rely on any particular physical law for its validity, but rather on the logical impossibility of such a property even existing. If a physical law was different, say, in that measuring electrons did not affect their position, then the Heisenberg Principle would not apply. However, we can't change the fact that any change of thought must register as a change in an ultimate reality space, and if the laws of the universe enable it, then any change could be visible through sensors.

There may still be some confusion at what exactly I mean by sensors, and whether they are physical objects. They may be identified with physical objects (such as the parts of the brain "measuring" neural activity to generate a thought). However, they do not necessarily have to be physical objects, and they are just the implicit agents in a particular medium (say, 3-D space) that aggregate the physical state of the medium and map it to a thought. One may think of them as a property of the space matter moves in, at the most abstract level, although they may be tied to matter in some way (as the brain seems to be). The chessboard is a good metaphor, for while the sensors are tied to the physical squares of the chessboard, they are really the space right above the chessboard, and whether or not the space is occupied by a chess piece.

The chessboard model and the resulting sensors may make one think that this paradox, if valid, only applies to a machine. However, in order for a thought mapping to change, the mapped objects must change position, and "sensors" are just the 3-D spaces that once contained an object, and now no longer do (and vice versa). Sensors are thus simply the agents by which a 1-to-1 space to thought mapping occurs in nature, and the permutation of whether or not all are filled determines the mapped thought. It doesn't matter whether a machine can read the sensors or not. Sensors are simply the tool through which a spatial thought mapping property would function. Because of the impossibility of static sensors, covering all states of a given 3-D space, it is impossible for such a mapping to occur, whether or not it is actually measured.

Again, there are many paths one can take in attempting to resolve the Hard Problem of Consciousness. One may consider the full spectrum for consciousness's generation, from mind/brain identity views, tying thought completely to the material realm (Smart 2014), Epiphenomenalism, where thought does not affect the material realm aside from its original generation (Robinson 2015), or dualist examples more fully separating thought from physical states. One may consider how the physical and mental worlds work together to determine causality, through free will or thought as a deterministic byproduct. Whatever paths one takes in these and other questions, there is something such as the sensor system I have described. Some object or spatial region represents a mind, and this item has a number of particular configurations that somehow represent different thoughts. If not, then assuming universal laws did not change, how could past thoughts differ from current thoughts, in whatever space the mind occupies? These differing configurations are just another way of referring to the sensor system already described.

IV. Undefined States

A fourth solution is to ask whether we really need to worry about the undefined states. Could we modify the chessboard model so that nothing happens when an undefined subdivision state is triggered, and only generate thoughts when the model is in a valid state? The problem is that one will still need some form of sensor or set of

sensors to determine whether the chessboard squares are in an invalid state. Building these sensors pushes the problem down to a new level of sensors, as with the messaging proposal.

V. Dimensional Manipulation

If we are stuck with the chessboard model for our space-time experience, we might attempt to solve the paradox through attacking another of its assumptions: our 4-D space-time experience itself. However, any other spatial-temporal dimension combination has the same problems as this model. Let us say that there are hidden dimensions that we cannot experience (as in string theory, with some theories having 11 hypothesized dimensions). If we add another spatial dimension, the problem of how this spatial dimension interacts with the original temporal dimension remains. If we add another temporal dimension, the paradox of the temporal dimensions with the original spatial dimensions remains. Any additional combination of multiple temporal and spatial dimensions will have this problem.

We also cannot subtract any of the four dimensions we experience when defining properties for our thoughts, because any physical solution to the problem must account for them. We might say that if point X is occupied by our brain, then we think one thought, and if it is not occupied, then we think another thought. However, if the assumptions mentioned earlier are valid, then we cannot do this. Take the example of a 0-D point, 1-D line, or 2-D plane in 3-D space. While points, lines, and planes are useful abstractions when describing functionality in 3-D space, they lack either length, height, and/or width. Thus, since they have a volume of zero, there is no way a sensor in 3-D space can notice whether our brain occupies space strictly in a lower dimension. Conversely, a sensor in a lower dimension cannot measure space in a higher-level dimension, because the area it occupies and could measure has a volume of zero.

To reinforce this point, imagine a light switch that one can flip on and off. If the switch is on, then a target object exists. If it is off, then it doesn't. Such a target object, if confined to a point, line, or plane, will not exist in 3-D space, as it has no volume. If it does not exist in 3-D space, then how can it measure or have any properties in 3-D space?

Abstracting a little more, we would assume that our thoughts are a property of some X-dimensional space, with X ranging from one to infinity. Sensors, to measure an exact position, would have to be confined to a lower dimension (X-1, X-2, etc.). These dimensions have no volume in X-dimensional space, and thus cannot interact with X-dimensional space. Thus, any possible X-dimensional space cannot have properties dependent on the exact position mapping to our thoughts. X also cannot be 0, because space just encompassing one point can only map to one thought. Any change in the mapping violates our third assumption.

VI. Zeno's Paradoxes

Those who are familiar with ancient Greek philosophy may regard this paradox as parallel to Zeno's paradoxes of motion and plurality. As an example, Zeno argued that one cannot have more than one object existing in the universe because of the infinite number of possible divisions multiple objects entail. To create multiple objects, one could divide a single into a front and a back half, and those halves into other halves, and so on infinitely, with each partition a new object. Since there are infinite objects, they must have an infinite size, which is not reasonable. Similarly, for motion, one cannot move between two different points, because of the infinite number of distances one must traverse to move from point A to point B. One would first have to move halfway to point B, but before that one must move a quarter of the way, but before that one must move an eighth of a way, and so on (Huggett 2010).

Unlike Zeno, however, I am not denying that a 3-D object can move in 3-D space, or that there can be multiple objects in 3-D space. His paradox may or may not be valid, but it is not the paradox I am addressing. What I am saying is that it is impossible to completely map the space-time realm, whether by a machine or through nature, to another realm (such as thought), through ingrained properties of positions in the space-time realm itself.

It is true that we have mathematical functions, such as $f(x) = y$, that map one input domain from one state, and then render the results in another. Could we just have x be the position of objects in a space-time realm, and y be the resulting thought, and this would cover all points on a potential map of properties? The problem is that there needs

to be something for which f(x) can be a property. In order to capture all states in 3-D space, it would have to be a property of a point or collection of points, as we can't have 1-D, 2-D, or 3-D sensors. However, a point does not have any existence in 3-D space, and thus the thing for which f(x) is a property does not come from 3-D space.

We have formulas for the laws of gravity, motion, etc. which might seem to refute this, but I would argue that the mappings of such functions referring to points are simply abstractions for the sum of the objects that they represent. Take the case of gravitational attraction between two objects (X and Y, with their centers at points x and y). One might say that object Y is being pulled toward point x, and X is being pulled toward point y. However, if you divide X into two halves (X_1 and X_2), Y is really being pulled toward points to the right of x and the left of x (x_1 and x_2), with the total sum simply being point x. One could divide X further, with Y being pulled toward x_1, x_2, x_3, x_4, etc.

How does this division relate to our paradox? My point is that Y is not really being pulled toward point x through some innate property of point x, but really as a result of properties of X_1, X_2, etc. Thus, y moving toward x is not f(x), but $f(X_1) + f(X_2)$. It is not x which is causing the attraction, but X_1 and X_2. Movement by gravity can thus come from 3-D space, in addition to other laws of motion, which is in contrast to what Zeno might say. However, we can't apply the same functions toward thought, as such a function cannot be expressed as $f(X_1) + f(X_2)$. To map X_1 and X_2 to thought, something foreign to 3-D space, we need to know exactly where they are in 3-D space, which requires properties of the exact points surrounding the objects.

To illustrate this point further, gravity, according to classical models, is independent of the exact location, and more of a static field of force in 3-D space, affecting other 3-D objects within its medium if they exist. X will always draw any object in Y's position to it, whether or not it is there. Gravity is thus position-independent. For a thought mapping though, we must know Y is in a particular position in relation to X. The position points are the only changing variable as Y moves in relation to X, while everything else remains the same. If we want X and Y to map to more than one thought, we must use the only thing that changes as input, and thus rely on the position.

VII. Continuum

One may object to my apparent assumptions of the models having a discrete and finite set of states. Could the thought machine not just recognize a continuum as input or output and process accordingly? Why am I arbitrarily dividing what we experience, insisting on an infinite regress of point sensors?

According to my second assumption, thoughts have a basis in ultimate reality. Going back to the chessboard model, I'm thinking one particular thought because the chess piece is in one square, and later I am thinking another thought because the piece is in another square. Thus, something has changed, and a different thought is output by the thought machine. The thought machine doesn't arbitrarily output a different thought, but requires a physical change, and some non-point part of reality recognizing the physical state change. The non-point part of reality is divided into an area that recognizes that it has changed, and, if valid, the part that recognizes it hasn't changed. These parts that have changed and not changed are the same as the sensors of our models, the tangible parts of the whole whose combined readings result in a mapping to a thought. At minimum, there must be one sensor that covers the exact subarea, and only the exact subarea, of the relevant change (although further sensors can subdivide this area). We can't just assume a continuum is indivisible and leave it at that, but must see how a continuum can map to different thoughts. Parts of the continuum change, and thus the implicit sensors in the continuum change their output.

The paradox is in the inherent nature of these implicit sensors. These continuum sensors will be either an infinite regress of point sensors or a finite number of sensors each taking up a specific region of space. With my first assumption, I argue that in a "space" with a size of zero, there is nothing, and thus the number of sensors are finite. Finite states lead to a discrete number of potential states.

However, to support a continuum, without an infinite volume, one would have to redraw the location of the sensors at each point of a time interval, in order to have a machine mapping an input state to an output thought at all points of the time interval. This is similar to changing the location of the chessboard squares at all points of the time interval in the chessboard model. Arbitrarily changing how the thought machine functions violates my third assumption where the laws of nature change arbitrarily. I am

also assuming input states will always map to an output thought, because otherwise would cause the laws of nature to change arbitrarily (meaning we can't shut off the thought machine until it is in a valid state). The only alternative is point-sized sensors, if the thought machine is to keep the same rules over an interval of time. We've already shown though that we can't have point sensors.

It is very tempting to discard the division into sensors and just say that there is a property outputting a thought at any point that needs to be mapped, perhaps tying the properties to the adjoining space and objects if we can't ascribe it to the points themselves. However, violating our assumptions, such a vision does not result in a physical thought machine working according to predefined physical states. We must always break down what is happening as we are changing states and resulting mappings, assuming the mappings have a basis on a spatial level without delving to individual points. We must say, "If area A_1 has an object, then thought T_1 will result. If an object then covers a different area of A_2 instead, then the output thought will be T_2." The sensors (A_1 and A_2 above, or subdivisions thereof) must have one all-encompassing state valid for their whole space in order for the thought machine to work (in the chessboard model "filled" or "not filled"), and combined these states will output to a thought. If not measuring all-encompassing physical states through a series of discrete spans, however infinitesimal, then what is the thought machine measuring? We can't measure the points or other lower-dimensional regions, which is the only way to register the infinite positions on an interval or area of a continuum. We must measure something "real", meaning in all the thought machine's dimensions, on a physical non-point level.

Similarly, if one sensor represents a state change from one configuration to another configuration, and its status is the reason why the thought mapping changes, we can't switch this sensor and the sensor's properties off when moving to a third configuration which does not cleanly overlap the sensor space. We cannot say that the sensor's physically measured input value is not important in the new configuration. We cannot just redraw the chessboard, constructing a new thought machine with different regions of space acting as input sensors, as we go. One may appeal to the region of space being the same for the whole thought machine, but the physical properties, tied to discrete inputs in predefined atomic regions of space, are not the same.

Again, it is easy for us to just look down on the situation and say 45.237317% or any other percentage of a chessboard square is occupied, which means one particular thought occurs. However, the machine is not us looking down on the situation from above, but at the most fundamental level, is part of the measured dimensional space, in addition to the property measured. As shown in the earlier discussion of adding dimensions, there is no higher dimension in which we can look down upon the situation and see the 45.237317%. If 3-D space was the most fundamental spatial level of reality (as an example), the property must have a particular length, height, and width. The inputs to the machine, or sensors, must also have a particular length, height, and width for a particular moment, and for all moments, of time, which is the only way to actually measure this 3-D space. The machine must build its permutations from an atomic level where it knows for sure that all atomic sensors are fully encompassed by the property. Otherwise, how will it actually know that it has correctly captured any instance of the property being measured? The property itself might move around in a continuum, the property in the chessboard example being the presence of a chess piece. The machine, however, is immutable in its subdivisions' boundaries per my assumptions[1], and cannot reform its sensors around the current position of the chess piece to register the position.

In short, as I envision it, the thought-machine can't support either a continuum with an infinite regress of point sensors, which violates my first assumption, or where the sensors aren't points, which violates my third assumption. Thus, it cannot support a continuum.

VIII. Quantized Space-Time

You can have a system that does two of three things, but not all three: move items through space in a continuum, have the region of space "know" the position of items (allowing for the mapping to a thought), and have fixed, immovable sensors that do not change. I require the last item by my assumptions. Thus, in order to disprove the paradox and map the system's state to a thought, we could challenge the necessity of a continuum.

One potential way to avoid the paradox is a model wherein space-time is quantized. The specifics of these models are outside the scope of this paper, but in short

this means that time does not occur in a continuum, but that an event will last for a minimum duration before proceeding to the next. As an example of the differences, take two points, "x" and "y", with the distance between them defined as "d". We will have an object take "t" seconds to move from x to y at a constant speed. If an object is moving in a continuum, you will see it at t/4 seconds a quarter of the way between the two points (x+d/4). At t/2 seconds, it will be halfway (x+d/2). Thus, for any fraction of the total time the object takes to move between the two points, it will be that fraction of the total distance between the two points.

However, this is not necessarily true of quantized space-time. Say the size of the minimum quantum of time is t/3. Thus, using our example, from t to t/3, the position will remain at x. From t/3 to 2t/3, it will be a third of the way (x+d/3). From 2t/3 to t, it will be two thirds of the way (x+2d/3). At t, it will finally reach point y (x+d). Thus, the object remains frozen in one position until a third of the time has passed, at which point it jumps to its next position. A good metaphor is looking at objects moving in a strobe light. They are frozen in place in one frame of the light, and at the next frame they have jumped to another position.

What does this have to do with our paradox? If you have objects jumping between points in space seemingly instantaneously, then one can define a sensor in space that covers the smallest area an object can move in a quantum of time. Think of the chessboard, with a sensor being a square on the board. If a chess piece moves from one square to the next, moving forward each quantum, then we avoid the problems of defining such a sensor when a piece is halfway in each square. In a continuum, this state must exist, but in quantized space-time, the piece just jumps between the squares and avoids the problematic intermediate step.[2]

However, I believe there are problems with a quantized space-time model, at least with respect to our assumptions. The first, speaking as a physics layman, is that you somehow have the ultimate fabric of reality freezing for an arbitrary duration of time, and then shifting at an infinite velocity to a new state, only to begin the process all over again. The laws of physics seem to change arbitrarily, with the object not moving in one point and then shifting for some reason at another point.

The second objection to the lack of a continuum is that there is no scope or place for different objects to interact. Say that, on a chessboard, there are two pieces that are two squares away from each other. They have a velocity of one square per time quantum, and they are both moving toward each other. In the next quantum of time, they should both be on the same square, which should be impossible as two objects cannot occupy the same space. In a continuum, they at some point would collide and bounce off each other, but there is no place they can do that in a quantum.

There are a number of potential ways to address the second objection, such as saying that the configuration of objects in the universe is such that this case may never occur. However, these do not address the fundamental inconsistency of the natural law, and I would argue that a universal law should address all cases, and that if a law is open to a paradox, then it is not sound. One cannot say you can divide any number by any other, and just never divide by 0.

Another way is to deny the law of conservation of matter and energy, and say matter and energy just appear and disappear out of nothing ex nihilo as one shifts between quanta of time. There would thus be no momentum, as matter only lasts for a quantum, and we can avoid the objection. However, this also makes the laws of physics change arbitrarily. There are also other contradictions depending on whether thought was a property of either matter or the surrounding space-time itself. If matter, then we should not exist after each quantum of time, violating thought's continuity, as the underlying matter disappears. If space-time, since we exist between quanta, then the same space must exist between quanta, and it's curious that a property of space-time (the existence or non-existence of matter) could somehow not exist between quanta and violate the matter / energy conservation law.

IX. Dualism

This paradox incorporates any materialist model where any particular configuration of matter, or ultimate substance, maps to or results in consciousness. It incorporates models where the brain or any other hypothetical physical medium “causes” our thoughts. However, another potential objection is that, although this paradox applies

to physical solutions for the Hard Problem of Consciousness, it does not apply to other potential dualistic models.

For example, can the mind somehow be independent of a physical medium, and yet think different thoughts? The difficulty in this case lies in what potential form the mind might take. I would argue that even if one decoupled the mind from our particular space-time medium, the mind is in essence a thought machine. To register changes, it must register the state of some "spatial" medium and output a conscious thought, as per the paper's second assumption. If this medium follows the assumptions mentioned in the start of the paper, then it presents the same problems as our current space-time experience.

I did avoid cases that violate my second assumption, where thoughts are a property of something tangible in an ultimate reality. Thus, I didn't mention, say, more idealistic cases, where thoughts exist by themselves, yet are somehow linked together. These models I fear could lead to a violation of my third assumption, with consciousness arbitrarily shifting between thoughts.

X. Conclusion

Thus, we cannot abandon the chessboard model for a more suitable one because of messages, input method, ability to measure, undefined states, space-time dimensions, Zeno's Paradoxes, a continuum, quantized space-time, or certain dualist models. Any other system that treats our conscious minds as a product of space-time is ultimately reducible to the chessboard model. Our thoughts somehow change as we progress through time, and these thoughts result from some material in a variety of different states, however we define the material and states. This is all that the chessboard model represents, and what any other potential model needs to incorporate.

The Remaining Possibility

There is only one solution that I see. You can probably guess that I am referring to God. However, I do not wish to leave it here and have God through seemingly magical properties somehow ensuring our existence. While God may in fact do this

through prerogatives and powers unknown to myself, there is a way our existence is explainable through reason.

If a physical space-time fabric merging spatial and temporal dimensions is impossible, due to the chessboard model, then we must rely on what is possible. There are two possibilities open for consideration (as far as we can discern), a reality with all-temporal or all-spatial dimensions. We can rule out an all-temporal, or time-only, reality because it gives the universe a spatial volume of zero, meaning there's no room for anything to exist or change. Thus, the ultimate reality, if in a space-time framework, consists in fact of all spatial dimensions, and the unchanging, static objects that inhabit them.

How then does our experience of space-time find itself in this static reality? Note that our experience of space-time comes through our mental processes. Generalizing, we experience it through thought. Recall the second assumption where our thoughts have an ultimate basis in reality. In our proposed solely spatial universe, we must regard our thoughts as the resulting property of an object or objects in this reality.

With this in mind, I propose to define one of the spatial-dimension objects as God. We may not know much about God in his spatial reality, but I propose assigning to him the thoughts that make up our universe. The whole tapestry of our space-time world would be one single, unchanging thought in the mind of God. It is unchanging because there is no time in the spatial reality through which it can change, and thus no opportunity for the mind to think something else. The thought always has been, is, and ever will be. This reflects the idea of God as being outside of time.

Even if one accepts that our thoughts result from these static objects, are there no other models for representing our thoughts? For example, could we each be one of these static objects with our thoughts resulting from them? The problem with this view is that our thoughts change as we experience progress through time. I am not now thinking the same thoughts from 10 years ago, nor am I thinking thoughts I may have 10 years from now. My thoughts would be changing without cause in the ultimate reality, violating the third assumption. Thus, what we think throughout our entire lives results from a thought of a static object greater than us.

Another model is a polytheistic one. Could there be a number of static objects that each thinks a different thought, with each of these objects a "god". Somehow, these thoughts would interweave to produce our universe, but none of the static objects would be thinking of the entire universe. The problem with this model is that this would violate the atomicity, or indivisibility, of the "thought" that is our universe. How could we experience our continuum of thought if the continuum must jump between the thoughts of many different static objects?

Also, since there is no time, there is no arena for these "god" figures to communicate with each other, whether explicitly or through a linking property. Sending a message between objects requires travel over space, and travel takes some amount of time. The physical laws of the spatial universe cannot negate this need for communication, since the separate objects that do not occupy the same space must somehow merge and intertwine their independent thoughts.

Concluding this section, the ultimate reality must be solely spatial, since the mixed temporal and spatial reality suffers from the paradox and the all-temporal reality has a volume of zero. Since we are not static objects due to our variety of thoughts, the spatial-universe objects must encompass the thoughts from our mind through grander unchanging thoughts. However, our universe and thus our thoughts can only come from one of the static objects, since there is no way to intertwine independent items through physical laws without a time dimension. This object who thinks these thoughts can be defined as God.

Conclusion

A strong proof for the existence of God should rely on pure logic as much as possible, filtering out subjective value judgments in order to examine objective reality. I believe I have come closer through an inquiry into the Hard Problem of Consciousness, examining how we perceive the world and the paradox inherent in it. Through the impossibility of representing change in our thoughts in any solely space-time model, change in such a model is impossible. Because of this, our thoughts in the ultimate reality never change, which is contrary to our experience. Some thought underlies all the

others, and by ruling other potential models out, this thought comes from a being whose thoughts are the basis of our thoughts, a being which may be defined as God. While this is not meant to completely define what God is, or demarcate his powers and relationship with us, I think it is a useful baseline to establishing as a floor what his minimum role must be.

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[1] The machine could still be tied to an object and move around with it, such as the brain, but with respect to the items/properties being measured, it will not change. Think of the machine as standing still and the measured item moving in relation to it.

[2] This situation with quanta is also useful when addressing Zeno (Huggett 2010).