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# CRITICAL DISCUSSION OF SEUNGBAE PARK'S 'THE PROBLEMS OF DIVINE LOCATION AND AGE'

Jan Dejnozka\*

*Union College, Department of Philosophy, Schenectady, New York, U.S.A.*

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## Abstract

This paper explores the interconnections between Science and Theology in General relativity theory and Quantum physics. In a paper published in this journal, Seungbae Park raises two problems which he says are as important as the problem of evil: (1) "it is not clear where God existed before He created the Universe", and (2) "it is not clear how old God was when He created the Universe". I argue that Park's ontological claim that 'to exist is to exist in a certain place' makes no scientific sense even for a rock or a tree, since there is no such thing as a place in physical reality, either in General relativity theory or in Quantum physics. Thus in Physics today, the 'scientific magnitude' of these problems is zilch. I also show that Park is confused on the relation of Science to Philosophy and the nature of abstract entities. Park also overlooks that Einstein and the great quantum physicists are far more open-minded about God than Park is, because of their better understanding of the relationship between Science and religion. In fact, some of them believe in God, and find that perfectly complementary (Heisenberg and Bohr's term, and the main topic of section 9) with Science. To sum up, Einstein and the great Quantum physicists would reject Park's ontological claim, and Park's two problems are literally nonsensical even for a rock or a tree, much less for God.

*Keywords:* General relativity theory, Quantum physics, God, space, time

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*The situation may be expressed by an image: Science without religion is lame,  
religion without Science is blind.  
(Albert Einstein)*

## 1. Introduction

This paper is a critique of Seungbae Park's 'The Problems of Divine Location and Age', which was published in this journal [1].

Is God is best seen through the telescope of Science? Is a scientific conception of God best, or even possible? Is a scientific conception of God's creation of the world best, or even possible? On Park's scientific conception of God, not only did God did not create the world, since no time existed before the Big Bang for Him to do it, but God does not even exist, since unlike a rock, He

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\* E-mail: [dejnozka@umich.edu](mailto:dejnozka@umich.edu)

does not exist in a specific place or have a specific age. Park's scientific conception of God, and Park's attendant scientific conception of God's creation of the world, are the topics of this paper.

I hope to show that Park overlooks everything of importance: Einstein's rejection of space, time and place as being literally nothing in physical reality; Einstein's conception of causation as timeless, since physical laws are invariant across all temporal frameworks; Einstein's view in General relativity theory that there is no objective sense to saying that *anything* is earlier than, later than, or even simultaneous with anything else, and regardless of whether it is a cause or an effect; and Einstein's admitting God not only *consistently with* his science, but even *based on* his scientific sense of the harmony of the laws of Nature. Park also overlooks that in Quantum physics, no quantum exists in a certain place. Thus if either General relativity theory or Quantum physics were rejected, but not both, some physical objects would *still* not exist in a certain place. In religion, Park overlooks the distinction between sub specie aeternitatis and sub specie temporalis, and the mainstream conception of God not as some abstract and powerless entity, but as the most concrete and powerful entity there can be.

## 2. Park's two problems with God

Park says: "Anyone who [holds that God created the world] should be able to answer the following two disconcerting questions. Where was God before he created the Universe? How old was he when he created the Universe? These two questions lead to the problems that I call *the problems of divine location and age*. The problem of divine location holds that it is not clear where God was before He created the Universe. The problem of divine age holds that it is not clear how old God was when He created the Universe. Like the problem of evil in Philosophy of religion, these two new problems present serious challenges to the theist belief that God exists." [1, p. 162, Park's emphasis]

Park never says why he thinks these problems of divine location and age are problems at all. Most people would think that God always exists everywhere, problems solved. Thus it is hard to imagine any reason he might have for thinking these are problems at all, other than that he thinks they follow from his view that "To exist is to exist in a certain place" [1, p. 162]. But he never actually says that they follow from that view.

Park does not say whether his view, "To exist is to exist in a certain place", is a *claim* or a *definition*. Out of charity, I shall consider it an ontological claim, not a definition, and I shall call it 'Park's ontological claim'. For if it is a definition, it is plainly circular, since it mentions existence in the definition of existence. And if it is a definition, it is doubly circular for Einstein, since Einstein already operationally defines (merely relative) places (which Einstein finds non-existent in physical reality) in terms of real bodies that occupy or fill up certain places relative to a certain framework of reference. Thus for Einstein, it is not 'If no place, then no body'. It is the other way around: 'If no body, then no (merely relative) place'. That is, Park gets Einstein backwards.

Park does not tell us anything about his ontological claim. Is it a definition or a claim? Is it analytic or synthetic? Is it a priori or a posteriori? Is a 'certain place' a specific place or a known place? Is a 'place' spatiotemporal or only spatial? Thus it is multiply hard to understand what his claim even means, much less evaluate it. Park only states the bare words of the claim as I quoted them. His readers will have to make do as best they can. I myself plan to show that his ontological claim is false regardless.

### **3. Seven problems with Park's two problems**

I find seven problems with Park's problems of divine location and age.

First, Park's ontological claim implies that if God exists, then He exists in a certain place. And this implies further that if God exists, then He must be the Sun, or a mighty oak, or a stone, a hat rack, a ping pong ball, or some other entity that is in a certain place.

Second, classical theists who hold that the immanent God is always equally everywhere, and who hold that more deeply, the transcendent God is never anywhere (i.e. is outside space and time), will simply contrapose Park's implicit argument. They will simply contrapose it to 'God exists, therefore to exist is *not* to exist in a certain place'. They will also contrapose Park to 'God created the world, therefore *if* there was no time before the Big Bang, then causation is *not* always earlier in time'. More deeply, they will contrapose Park to 'God is temporally eternal, therefore time did *not* begin with the Big Bang'. And most deeply, they will contrapose Park to 'God is timelessly eternal, therefore his creation of the world did not occur in time at all, and therefore did not occur earlier in time than the world'.

Third, Park might think all this merely creates a standoff in which he has the upper hand, since he thinks he is on the side of Science. But scientific realism, i.e. the thesis that Science determines or best determines what is real, is not itself a scientific thesis. For scientific claims are empirically verifiable, and scientific realism is not. Scientific realism is philosophy. We cannot empirically refute Berkeley by kicking a stone, nor refute Zeno by walking about. For Berkeley has an idealistic interpretation of kicking a stone, and Zeno has a static interpretation of walking about. Likewise for scientific realism.

Fourth, Park's ontological claim implies that if God exists, then God is a logically contingent entity, hence logically subject to coming into being, change, corruption and cessation. For all entities that exist in a certain place are logically contingent. The Sun, an oak, a stone, and a hat rack are all logically subject to coming into being, change, corruption and cessation. But no mainstream thinker would ever hold that a God worthy of the name could be logically contingent, much less be logically subject to coming into being, change, corruption or cessation.

Fifth, any God worthy of the name would be self-caused. How could God's existence depend on anything outside Himself? But how could a self-cause happen at any certain time? And if it could not happen at any certain time,

how could it happen in any certain place? Did God cause Himself to exist at this place or that, or at this time or that? ‘And now I will cause myself to exist. Let me see. Where and when should I do this? But how can I exist before I cause myself to exist?’ That is the incoherent picture of God’s self-cause that Park is bewitched into by his simply assuming without argument that all causes are earlier in time than their effects.

The word ‘cause’ is said in many ways. And the scientific way, efficient cause, is not the theist way. In the case of God’s self-cause, the cause is temporally eternal (*sub specie temporalis*) and is thus temporally simultaneous with God. More deeply, it is timelessly eternal (*sub specie aeternitatis*), and is thus as timeless as God.

Sixth, on the classical theist conception of God, Park’s ontological claim that to exist is to exist in a certain place implies that a grain of sand is incomparably more real than God. For a grain of sand exists in a certain place, and God does not. Thus for Park, the grain of sand exists, and God does not. And to say the least, what exists is incomparably more real than what does not. Here too, classical theists would simply contraposit Park. They would argue that God exists and is supremely real, therefore God is incomparably more real than a grain of sand, therefore to exist is not to exist in a certain place.

Here too, Park might think there is a dialectical standoff in which he has the upper hand, because he thinks he is being scientific and the classical theists are not. But if we contraposit this in turn, we see that the very question of God’s existence is metaphysical, not scientific, in the first place. For what scientific evidence could be relevant to the question? Thus the theists have the upper hand, since they are metaphysical and Park is not.

Seventh, Park’s ontological claim is inconsistent with current Science. For quanta do not exist in a certain place. And if even lowly quanta do not exist in a certain place, why should God have to? And for Einstein there is no such thing as an objective place to begin with.

This concludes my presentation of seven problems with Park’s ontological claim. Each and every one is a *reductio ad absurdum* of his ontological claim.

#### **4. The problems of divine shape, duration, finitude and contingency**

Park’s two problems are exactly on a par with four others.

The first is The Problem of Divine Shape. If God does not exist only in a spatial point (compare the point-person in Abbott’s *Flatland*), or only in a line or plane, then he must be three-dimensional. For if to exist is to exist in a certain place, then God cannot exist everywhere. Then we can raise Park-style dilemmas about the problem of divine shape. Is God round? Is he a cube or a pyramid? Is He fat or thin?

The second is The Problem of Divine Duration. For if God does not exist only at a single point in time, then he must exist for a certain finite period of time. For if to exist is to exist at a certain time, then God cannot exist all the

time. Then we can raise Park-style dilemmas about the problem of divine duration. Will God last for a thousand years or but a day in our sight? Will he last longer than the sun, or a tree? Will he live until the end of the age, or is he already gone? 'Where was God when we needed him?' 'Didn't you hear? He stopped existing last year'.

The third is The Problem of Divine Finitude. If God exists only in a certain place and only at a certain time, then God is finite and limited in both respects.

The fourth is The Problem of Divine Contingency. If God exists only in a certain place and only at a certain time, then the existence of God is logically contingent. For how could it be logically necessary that anything exist at a certain place or time, as opposed to always everywhere, or outside of space and time?

## **5. Park's discussion of abstract entities**

When the positive case for a claim is bad, sometimes the best defence is an offense. That is, one can try to show that the case for the other side is even worse.

Park carries the warfare into the enemy camp by invoking the distinction between concrete objects and abstract objects. Park suggests that theists could "pursue a new strategy" [1, p. 167]. Namely, he says they have the 'option' of claiming that God is not a concrete entity that must exist in a certain place, but is an abstract entity that need not. But Park is not really trying to be helpful, since according to his ontological claim, there *are* no entities that do not exist in a certain place. In fact, at bottom, that is just how he aims to shoot this option down. Park's strategy is very transparent!

Unfortunately, Park misunderstands the concrete-abstract distinction, and overlooks that in philosophy, 'concrete' and 'abstract' are said in many ways. Thus he does not see why no classical theist would ever say that God is an abstract entity, certainly not in the non-causal sense of 'abstract'. That is, he does not see why this cannot be an option for classical theists in the first place.

Park says: "Abstract entities are aspatial, atemporal, non-causal, eternal, and unchanging [2].... An abstract entity is, by its nature, non-causal. It can have a causal efficacy neither on another abstract entity nor on a concrete entity.... If God is an abstract being, he is a non-causal being, and hence he cannot even move a stone. Thus, the proposal that God is an abstract being clashes with the view that God is omnipotent." [1, p. 167-168]

We may call this Park's (really Balaguer's) Blunderbuss Definition of abstract entity. For it blasts out of its huge muzzle five very different requirements at once, sounding very impressive but actually hitting only a few kinds of entities - numbers, classes, Platonic forms, and so on. For only such kinds of entities satisfy all five requirements of Park's definition. A court of law would say Park's definition is 'a one-size-fits-all sledgehammer that makes hardly any attempt to account for differences'. In fact, it makes no attempt.

Park is mixing up five very different concepts into his definition of abstract entity: “aspatial, atemporal, non-causal, eternal, and unchanging” - six, if we distinguish two kinds of eternity, temporal and timeless.

Park defines ‘abstract entity’ as, among other things, non-causal, and then concludes that if God is an abstract entity, then God is non-causal. Park might as well define ‘abstract entity’ as, among other things, non-purple, and then conclude that if God is an abstract entity, then God is non-purple. As Lucian would say, ‘Egad, what scholarship!’. (Lucian of Samosata was an ancient Greek satirist.) Or as we say today, this does not advance the analysis.

In fact, classical theists would simply contraposit this to ‘God is powerful, therefore God is not an abstract entity, or is at least not abstract in the sense of being non-causal’.

Because Park commingles five senses of ‘abstract’ into a single definition, he overlooks some rather basic distinctions. Some non-causally abstract entities have spatiotemporal locations, and even move about. In a famous passage, Gottlob Frege says: “I distinguish what I call objective [i.e. abstract in the non-causal sense] from what is handleable or spatial or actual [i.e. concrete in the causal sense]. The axis of the Earth is objective, [and] so is the centre of mass of the solar system, but I should not call them actual in the way the Earth itself is so.” [3]

And of course the axis of the Earth moves right along with the Earth, at least relative to the heliocentric framework. The number two cannot even do that much.

For classical theists, God is the most causally concretely real of entities. He is uniquely causally concrete on two counts. Not only is he the only self-caused entity, but he is also the only omnipotent entity!

To paraphrase Panayot Butchvarov, ‘We cannot answer the question, Does God exist? by making *God* mean something quite different from what it ordinarily means’ [4]. Yet that is exactly what Park is doing when his ontological claim entails that for God to be an entity at all, God must exist in a certain place, and must also have a certain age. Park is playing ‘Let’s change the subject’.

## **6. Einstein - there is no such thing as space, time, or place in physical reality**

Einstein is Park’s hero. Park mentions Einsteinian conceptions and frameworks seven times in his paper. Park even says that “theists should operate under the Einsteinian framework of time” [1, p. 165]. Yet Park never says how General relativity theory might bear on his ontological claim. Park does not discuss, quote, cite, or even mention a single work of Einstein. Einstein is not even listed in Park’s references section. The question then arises, what does Einstein actually say? Would Einstein actually accept or reject Park’s ontological claim?

Einstein says in Appendix 5 to the fifteenth edition of his book *Relativity*: “On the basis of the General theory of relativity..., space as opposed to ‘what fills up space’, which is dependent on the co-ordinates, has no separate existence.... [T]here does not remain a space..., but absolutely *nothing*, and also no ‘topological space’. ....There is no such thing as an empty space.... [5, Einstein’s emphasis, cite omitted]

In his June 9, 1952 ‘Note to the Fifteenth Edition’ of *Relativity*, Einstein says: “I wished to show that space-time is not necessarily something to which one can ascribe a separate existence, independently of the actual objects of physical reality. Physical objects are not *in space*, but these objects are *spatially extended*. In this way the concept of ‘empty space’ loses its meaning, [and therefore so does the concept of ‘objective place’].” [5, p. vi, Einstein’s emphasis]

Likewise, of course, for time. Einstein’s criterion of physical reality is not being in a certain place or at a certain time, but completely the opposite: it is being *invariant* across all spatiotemporal frameworks and all their ‘places’ and ‘times’. As Einstein so often puts it, ‘nature does not care’ what framework of spatiotemporal reference we choose to use, nor what ‘places’ and ‘times’ we choose to assign to bodies relative to that framework. Henry Margenau says: “To achieve *objectivity* of basic [theoretical] description, [Einstein’s] theory must confer *relativity* on the domain of immediate observations [including observations of location in space and time].... In Newton’s physics space and time were objective because they manifested themselves unmistakably in everyone’s experience. But this idea of objectivity was completely shattered [by Einstein]. Objectivity becomes equivalent to *invariance* of physical laws, not [observer-relative] physical phenomena, [locations,] or observations....” [6, Margenau’s emphasis, my transposition of sentence order]

Park’s dilemma is that Park wants to have, and might actually believe he has, an Einsteinian conception of reality. But Park holds that to exist is to exist in a certain place, while Einstein holds that there is no such thing as a place. Therefore for Einstein, it follows that if we accept Park’s ontological claim, then *nothing* exists. For Park says that to exist is to exist in a certain place, and Einstein says there is no such thing as a place!

The solution to Park’s dilemma, of course, is easy. Park can drop his ontological claim and replace it with Einstein’s very different ontological claim that to be objectively real is to be observation-independent, that is, invariant across observational frameworks of spatiotemporal reference. But then Park’s new dilemma would be that the classical theist God very easily meets that requirement.

Andrew Ushenko says: “[Einstein’s theory of] spatio-temporal invariance... solves the puzzle of alternate differentiation between space and time within frames of reference which are set in relative motion. The illustration brings out *invariance as the ultimate criterion of physical reality*. In accordance with this criterion[,] variable or alternative perspectives of differentiated space and time are relegated to the status of shadowy being: hence Einstein’s

endorsement of Minkowski's dictum that 'henceforth space in itself and time in itself dissolve into shadows and only a kind of [invariant] union of the two retains an individuality'." [7, my emphasis], quoting [8]

Even in the 1916 first edition of *Relativity*, there is no such thing as anything's being earlier than anything else, because being 'earlier than' depends on your point of view. That was the whole point of Einstein's famous moving train example. This includes not just God's causing the world earlier than the world, but anything's being earlier than anything. For Einstein, physical reality is temporally invariant across frameworks of reference, and this includes the laws of Nature. No cause is earlier than its effect. For there is no such thing as anything's being earlier than anything else. We cannot tell when *anything* takes place. And that is just what we ordinarily call 'temporal' causation! We cannot even tell *where* any cause takes place. For we cannot tell of *anything* whether it is moving or in a certain place. And this is not even to mention God's timeless Creation of the world.

Thus when Park says things like 'South Korea needs a place in order to exist', he is turning Einstein upside down. And when he speaks of "the Einsteinian conception of time that the flow of time depends upon physical processes" [1, p. 164] and says "time stops if there are no physical processes" [1, p. 164-165], this is literally nonsensical. For Einstein, there is no such thing as a place, and no such thing as time, in physical reality. Space and time only have a relative existence - relative to us as observers in our own local space and time. And physical reality is invariant regardless of what we observe. Places, and questions like how could God have existed or done anything before time started with the Big Bang, are just Minkowskian shadows in the puppet theatre of our observations. If that sounds like Plato's cave of illusions, that is exactly right. Park is in Einstein's cave of illusions, and needs to move into the sunlight of general relativity theory. And if Park rejects God's timeless causation, then he is also rejecting Einstein's timeless (invariant) laws of Nature. Park even overlooks Kurt Gödel's and Einstein's famous discussion of paradoxes of causation and of time travel. The paradoxes arise from the fact that what is earlier than what depends on your point of view [9, 10]. What appears earlier to one observer can appear later to another, and simultaneous to a third; and that include causes, effects and travel. But in objective reality, everything without exception is timeless.

Park can rewrite his ontological claim to say 'To exist is to exist in a certain *relative* place'. Of course, then his claim would not be about physical reality - certainly not for Einstein. But at least Park would be distinguishing for the first time between the real and the relative in General relativity theory. And Einstein would be the first to tell us that we can only *do* science in the relative world. For that is where we make all our observations, do all our experiments, and formulate all our scientific theories. But that is all in the cave of illusions. In the world of physical reality, all of that is timeless too.



One might object that earlier-than can be defined in a light cone, really an expanding sphere of light emanating from an event E. In the light cone of event E, event F is earlier than event G just in case F is closer to E than G is. And the speed of light is invariant across frameworks. My reply is that this applies only to the future light cone of E. There is also the past light cone of E, on the other side of the 'hypersurface of the present' on which E is located. And nothing in general relativity theory can tell us which cone is which. Thus we still cannot tell past from future. (Einstein holds a strict physical determinism on which, in classical terms, the Universe can run either forwards or backwards with total predictability.) Thus the Einstein-Gödel sort of time paradoxes are only postponed. By parity of reason, even simultaneity is not physically real.

One might object that if the speed of light is invariant across frameworks, then the speed of light exists in physical reality. And since speed is distance over time, space and time exist in physical reality after all. My reply is that the speed of light is a timeless constant in the timeless law  $E = mc^2$  (see section 11).

One might object that if there is no such thing as time in physical reality, then there is no such thing as cause in physical reality either, since a physical cause is earlier than or at least simultaneous with its effect. My reply is to agree that it would be better to speak of timeless law than of cause in physical reality. In fact, for Einstein, it is not things making other things happen so much as it is things gliding along curved space-time paths relative to frames of reference.

One might object that if there is no such thing as cause, then God did not create the world either, and is not his own cause. My reply is to recall that cause is said in many ways. Even if there is no such thing as efficient (physical), agent (mental), or temporal cause, there can still be timeless metaphysical ground.

One might object that while Einstein invented General relativity theory, he is far from the last word on it. As Park knows, Science moves on. My reply is that I am merely reporting what Einstein actually says, to correct Park on what he says is 'Einsteinian'. Also, many writers have already discussed whether Big Bang theory implies that God could not have created the world, such as William Lane Craig, Quentin Smith, Richard Swinburne, Daniel Linford, and Stephen Hawking. But since Park does not mention them, I shall only mention them here.

## **7. Heisenberg - quanta do not exist in a certain place**

Park does not discuss how quantum physics might bear on his ontological claim.

Werner Heisenberg says: "Bohr has taught me that we cannot describe [a quantum] process by means of the traditional concepts, i.e. as a process in time and space" [11].

Heisenberg explains: "The many talks I had... with Niels Bohr, Wolfgang Pauli, and many others over the years had convinced me that it was impossible to build up a descriptive space-time model of interatomic processes - the discontinuous element Einstein had mentioned to me in Berlin as a characteristic

feature of atomic phenomena saw to that” [11, p. 71-72].

Thus for theoretical reasons of Physics, quanta cannot exist in a certain place or at a certain time. If a quantum did exist in a certain place, then its momentum would be totally uncertain. And quanta move about in time too. Thus since observations always change things, observations in the present change things in the past. So if Park wants to keep his scientific realism, and keep the most observationally confirmed scientific theory there ever was, he will have to give up his view that causes are always earlier than their effects. I must leave the interface of quantum physics with general relativity theory to the reader. Quantum physicists could call the two theories complementary.

## **8. Einstein - God exists, as shown by the lawful harmony of the physical world**

Park even overlooks that Einstein admits the existence of God and argues for the existence of God based on the lawful harmony of the physical world, which he (Einstein) senses as a scientist. That is, Einstein accepts the argument from design, an argument that Park rejects as bad [1, p. 161, 170]. Thus, Park also overlooks that Einstein rather obviously regards the existence of God as perfectly compatible with his (Einstein's) General relativity theory regarding space (place) and time (age).

Einstein says: “Scientific research is based on the idea that everything that takes place is determined by the laws of Nature, and therefore this holds for the actions of people.... For this reason, a research scientist will hardly be inclined to believe that events could be influenced by a prayer, i.e. by a wish addressed to a supernatural being.... But, on the other hand, everyone who is seriously involved in the pursuit of Science becomes convinced that a spirit is manifest in the laws of the Universe - a spirit vastly superior to that of man, and one in the face of which we with our modest powers must feel humble. In this way the pursuit of Science leads to a religious feeling of a special sort, which is indeed quite different from the religiosity of someone more naive.” [12]

Einstein says: “My religiosity consists in a humble admiration of the infinitely superior spirit that reveals itself in the little that we, with our weak and transitory understanding, can comprehend of reality” [12, p. 66].

Einstein says: “I believe in Spinoza's God, who reveals Himself in the lawful harmony of all that exists, but not in a God who concerns Himself with the fate and the doings of mankind” [13].

Spinoza's God is supremely real, has the essential attributes of infinite extension and infinite thought, is timelessly self-caused, and exists timelessly. Thus, Spinoza's God is timelessly everywhere. Thus, God does not exist in a certain place, and has no age. Spinoza invented the terms ‘sub specie aeternitatis’ and ‘sub specie temporalis’ to describe the difference, and their application goes back far earlier. Of course, for Einstein nothing exists in a certain place or at a certain time as a matter of logically contingent physics, while for Spinoza, God's placelessness and timelessness are logically necessary.

But for Einstein and Spinoza alike, this is not theism but pantheism, and is agent (mental) cause, or at least metaphysical/ontological ground.

How Einsteinian, then, can Park's conception of God really be? How Einsteinian can Park's ontological claim really be? How scientific can Park really be?

Park says of the two hypotheses, (1) God and the Universe came into being and (2) the Universe came into being, "Ockham's razor dictates to us to choose the latter hypothesis over the former" [1, p. 164, see 169]. Ockham's razor is basic, but it dictates nothing, least of all for Einstein. For Einstein and for any good scientist, the razor is not a mechanical procedure for 'bean counting' entities, but must be weighed against the adequacy of explanation; and there is no principled way to do that. And if God is the ground of the universe, as Einstein believes, then the Big Bang is simply an inadequate explanation. Einstein always discusses balancing the razor against adequate explanation. Even Park gets the razor right when he says, "The simpler hypothesis is better than the more complex one, *ceteris paribus*" [1, p. 169]. Why then does Park forget his own *ceteris paribus* clause and simply let the razor dictate to us on God? That clause is about adequate explanation! But unlike Einstein, perhaps Park feels that the only adequate explanation of the Universe is scientific.

## **9. The Quantum physicists on God**

In his essay 'Science and Religion', Heisenberg [11, p. 87] recounts a discussion of Science and God which he had with Wolfgang Pauli, Paul Dirac, and others at the Solvay Conference in Brussels in 1927, and his (Heisenberg's) later discussion of that conversation, "probably in Copenhagen" [14], with Niels Bohr.

One quantum physicist expresses shock that "a scientist like Einstein should have such strong ties with a religious tradition". Another replies that Max Planck is even more strongly tied to religion than Einstein is, and seems to believe that Science and religion "are perfectly compatible" [11, p. 82; 14, p.s. 11]. Heisenberg then says: "I assume", I must have replied, "that Planck considers religion and Science compatible because, in his view, they refer to quite distinct *facets of reality*... As far as [Planck] is concerned [,] the two realms - the [two] *facets of the world* - are quite separate...." [11, p. 82-83; 14, p.s. 11-13], my emphasis

Pauli then says, implicitly referring to the argument from design: "Einstein's conception is closer to mine. His God is somehow involved in the immutable laws of Nature. Einstein has a feeling for the central order of things. He can detect it in the simplicity of natural laws. We may take it that he felt this simplicity very strongly and directly during his discovery of the theory of relativity. Admittedly, this is a far cry from the contents of [traditional] religion. I don't believe Einstein is tied to any religious tradition, and I rather think the idea of a personal God is entirely foreign to him. But as far as he is concerned

there is no split between science and religion: the central order is [translationally] part of the subjective as well as the objective realm, and this strikes me as being a far better starting point.” [11, p. 84; 14, p.s. 13-14]

Pauli then suggests that science itself can no longer admit “the idea of an objective world running its course in time and space according to strict causal laws that produced a sharp clash between Science and the spiritual formulations of the various religions. If Science goes beyond this strict view - and it has done just that with Relativity theory and is likely to go even further with Quantum theory - then the relationship between Science and the contents religions try to express must change once again.... The concept of complementarity,... which Bohr considers so crucial to the interpretation of quantum theory, was by no means unknown to philosophers.... However, its very appearance in the exact sciences has constituted a decisive change: the idea of material objects that are completely independent of the manner in which we observe them proved to be nothing but an abstract extrapolation, something that has no counterpart in Nature.... If we think about the wider context, we may in the future be forced to keep a middle course between these extremes [of purely objective science and purely subjective religions], perhaps the one charted by Bohr’s complementarity concept.” [11, p. 84-85; 14, p.s. 14-15]

Pauli is saying that Science itself can no longer hold that there is an observer-independent physical reality. For Science itself must now accept different but complementary descriptions of physical reality, i.e. particles and waves, such that neither description can be proved to be the one ‘objectively true’ view, and in fact both descriptions are needed for the full picture. Pauli then suggests that therefore it may be best to view science itself on the one hand, and religion on the other, as different but complementary descriptions of the world, such that neither description can be proved to be the one ‘objectively true’ view, and in fact both descriptions are needed for the full picture.

In Heisenberg’s later discussion with Bohr, Bohr offers perhaps the most deeply considered view of the complementarity of science and religion. Bohr is worth quoting at length: “[I]f religion does indeed deal with objective truths, it ought to adopt the same criteria of truth as science. But I myself find the division of the world into an objective and a subjective side much too arbitrary. The fact that religions through the ages have spoken in images, parables, and paradoxes means simply that there are no other ways of grasping the reality to which they refer. But that does not mean that it is not a genuine reality. And splitting this reality into an objective and a subjective side won’t get us very far. That is why I consider those developments in Physics during the last decades, which have shown how problematical such concepts as ‘objective’ and ‘subjective’ are, a great liberation of thought. The whole thing started with the theory of relativity. In the past, the statement that two events are simultaneous was considered an objective assertion, one that could be communicated quite simply and that was open to verification by any observer. Today we know that ‘simultaneity’ contains a subjective element, inasmuch as two events that appear simultaneous to an observer at rest are not necessarily simultaneous to an observer in motion.

However, the relativistic description is also objective inasmuch as every observer can deduce by calculation [i.e. translate] what the other observer will perceive or has perceived. For all that, we have come a long way from the classical ideal of objective description. In Quantum mechanics the departure from this ideal has been even more radical. We can still use the objectifying language of classical Physics to make statements about observable facts.... But we can say nothing about the atoms themselves. And what predictions we base on such findings depend on the way we pose our experimental question, and here the observer has freedom of choice. [Thus] it is no longer possible to make predictions without reference to the observer or the means of observation. To that extent, every physical process may be said to have objective and subjective features.... Admittedly, even in our future encounters with reality we shall have to distinguish between the objective and the subjective side, to make a division between the two. But the location of the separation may depend on the way things are looked at; to a certain extent it can be chosen at will. Hence I can quite understand why we cannot speak about the content of religion in an objectifying language. The fact that different religions try to express this content in quite distinct spiritual forms is no real objection. Perhaps we ought to look upon these different forms as complementary descriptions which, though they exclude one another, are needed to convey the rich possibilities flowing from man's relationship with the central order." [11, p. 89; 14, p.s. 18-20]

Thus Bohr extends the quantum principle that there are complementary descriptions of reality which are strictly contradictory, but which are both important and revealing ways of viewing and understanding things, and neither of which we can really do without, to the topic of science versus religion.

What is Quantum physics? David Lindley says: "Heisenberg's stroke of genius was [that] *rather than thinking about the position and velocity of an electron as its primitive, defining characteristics*, he wrote down expressions representing position and velocity indirectly, as composites of the atom's elementary vibrations - that is, its characteristic spectroscopic frequencies. [Thus] *quantum particles have no intrinsic properties that neatly correspond to position and velocity*, and... measurement forces a quantum system to cough up values for these quantities *in a way that depends on how the measurement is done.... The quantum world is not a world of waves and particles, of positions and velocities....* Any attempt to describe the quantum world in [such] classical language is guaranteed to run into inconsistency and contradiction. Relativity furnishes a less controversial example of this principle." [15, my emphasis]

This shows two things. First, *there is no such thing as 'being in a certain place' in the quantum world*. Second, *the principle of complementarity is a general principle that has applications outside of Quantum physics*. It provides a clear analogy, based on advanced Physics, which illustrates how other seeming conflicts can be explained as based on different but complementary pictures of reality. Pauli and Bohr apply it to resolve the seeming conflict between Science and religion, and even to resolve seeming conflicts among different religions.

## 10. Concluding remarks on Park

I suspect that no good scientist today would accept Park's ontological claim, much less Park's view that if God exists, then He must exist in a certain place and have a certain age. If there were even one such scientist, surely Park would have told us. But Park does not even allege that any scientist ever accepted his ontological claim. Park says that our conception of God must be 'scientific'. Specifically, Park says it should be 'Einsteinian'. Yet Einstein admits a God who does not exist in a certain place, nor have a certain age, and says there is no such thing as space, time, or place in physical reality in the first place, on the basis of General relativity theory. And there is no such thing as place in the quantum world either. Thus Einstein and the quantum physicists would reject Park across the board. In Science today, Park's problems of location and age are literally nonsensical even for any physical object, much less for God. How scientific, then, is Park's scientific conception of God?

In light of Park's insistence on keeping up with the latest science, it is ironic that Park's own ontological claim "[relies] on an obsolete scientific idea" [1, p. 165] which is pre-Heisenberg and even pre-Einstein. In fact, no doubt the reader has been thinking all along that Park's 'scientific idea' is really 17<sup>th</sup> century Newtonian physics, where space is independently real and every physical object has an objectively real place in it. But even Isaac Newton would reject Park's ontological claim. For Newton says, in the General Scholium that ends *Philosophiae Naturalis Principia Mathematica*: "This most elegant system of the sun, planets, and comets could not have arisen without the design and dominion of an intelligent and powerful being.... It is agreed that the supreme God necessarily exists, and by the same necessity he is *always* and *everywhere*." [16, Newton's emphasis]

Thus, just like Einstein, Newton accepts the argument from design as based on Physics. And Newton rather obviously finds the existence of God perfectly compatible with his physics. Thus, even though their conceptions of God and especially their physics are different, Einstein and Newton are as one on the relation of Science to religion. For both would find Park's ontological claim and his two new problems hopelessly confused. For Newton, real space does not exist in a certain place any more than God does. For both are everywhere. Likewise for the Universe, defined as everything there is. Park destroys his own ontological claim when he admits: "[E]ven if we cannot even talk about the location of something, that thing might exist. Suppose that someone asks you where the Universe is located now.... Given that the Universe is all that there is, you cannot answer that question. Even though you cannot answer the question, the Universe exists." [1, p. 163]

Thus according to Park himself, even the Universe falsifies his ontological claim! But the main thing is that Einstein, the quantum physicists, and even Newton are all more open-minded about God than Park is, because of their better understanding of the complementary relationship between Science and religion.

## 11. Comments on an anonymous reviewers

I have been asked to respond to an anonymous reviewer's comments. I hope this section may help readers understand the issues better.

First, I said in the Introduction that for Einstein, "...there is no objective sense to saying that *anything* is earlier than anything else". The reviewer says, contradicting Einstein, "That statement is too general, since it implies that it is possible to observe an effect before its cause". The reviewer is mixing up Einstein's world of physical reality with Einstein's world of observation. My statement was clearly about the world of physical reality ('objective sense'), but the reviewer's comment is just as clearly about the world of observation ('possible to observe'). And in the world of physical reality, the implication is the exact opposite of what the reviewer thinks. For the statement implies not only that there is no objective sense to saying that causes are *earlier* than their effects, but also that there is no objective sense to saying that causes are *later* than their effects, and no objective sense even to saying that causes are *simultaneous with*, i.e. *at the same time as*, their effects. For Einstein's theory is precisely is that *there is no such thing as time* in physical reality. For Einstein, there is *no* earlier than, *no* later than, and *no* at the same time as, in physical reality, for *any* two events in physical reality, whether they are causally related or not. For Einstein, all three of those temporal relations belong not to the world of physical reality, but instead to the world of framework-relative observation. Again, my statement that for Einstein "...there is no *objective sense* to saying that *anything* is earlier than anything else" is very clearly about Einstein's world of physical reality, not about his world of observation. And the reviewer is just as clearly mixing up those two worlds by bringing possible observations into the picture of physical reality.

Second, the reviewer says, "As the (albeit fictional) Professor in George Gamow's *Mr. Tompkins* puts it, 'no observer could see the consequence before the cause. You have never got drunk before opening the bottle, have you?'" [17]. Here the reviewer continues the same mix-up. The reviewer's first quoted sentence is about the world of observation because it mentions observation. And the sentence is false. For the paradox of Einstein's thought-experiment of going faster than the speed of light is precisely that things *will* then appear to be, i.e. will be observed to be, going backwards in time, relative to what we are used to observing as observers who are going slower than light. The reviewer's quoted second sentence is about the world of physical reality because it does not mention observation; it is about how things really are as opposed to how we observe them to be. And that sentence is false too. For there is no such thing as 'before' in physical reality. And that is precisely why the paradox is resolved in the world of physical reality. The paradox cannot be resolved in the world of observation. In fact, to observers who move faster than the speed of light, the way things look to them *is* their forward. And if they perform a thought-experiment about how things would look to observers who move slower than the speed of light, that would be their backward, relative to what they are used to

observing as observers who are going faster than light. That is, observations of forwards and backwards, and of earlier and later, flip around for *both* sets of observers as they cross the border of the speed of light from their own side of the border. The paradox is resolved only in the world of physical reality, where there is no time at all. In fact, in the world of physical reality, there is *no such thing as the speed of light, except as a timeless constant*. In physical reality, light is as timeless as anything else. For speed is distance in space over time. And there is no such thing as either space or time in physical reality. Einstein's laws do not apply to space or time, since there is no such thing in physical reality, but they *translate* universally to all possible frameworks of *observational* space and time. In the timelessly true law  $E = mc^2$ , the speed of light is the logically contingent but nonetheless timeless constant; and energy and mass are the variables that translate into worlds of observational space-time. Instead of consulting Gamow as an expert in the field, perhaps the reviewer should consult Einstein and Gödel. For the confusion is right in Gamow. It is even in the reviewer's slight misquote of Gamow. In contrast, Einstein and Gödel are well aware that to an observer travelling faster than light away from the Earth, the earthly drinker appears to get drunk *before* uncorking the bottle. But they are also well aware that this is only an illusion relative to that observer's frame of reference. They also know that the earthly drinker's appearing to himself to uncork the bottle first is just as much an illusion. Gamow and the reviewer overlook the whole point of general relativity theory.

Park is right that there is no earlier time in which God could have created the world. But he is right for the wrong reason. It is not that time started with the Big Bang, but that time never started at all, since there is no such thing as time in physical reality. Park overlooks that there is no time earlier than *any* event, not just the Big Bang. For there is no such thing as time, and no such thing as a history of the world, in physical reality. The history of the Earth as it appears on earth is an illusion of our earthly frame of reference. That same history would appear to run backwards to anyone travelling away from the Earth faster than light, and would appear unchanging to anyone travelling away from the Earth at the speed of light. And all three of those observations would only be illusions that occur only within the observers' respective frames of reference.

In fact, there is no period of time *either* before *or* after the physically real Big Bang, or for that matter, either before or after the whole of physical reality. For there can be a before or after only relative to things that are *in* time, and the physically real Big Bang, and for that matter, the whole of physical reality, are timeless. For Einstein, any observations of things that appear to be in time can only exist in a framework of reference, i.e. in the world of relativistic illusion. In physical reality, there are no periods of time even *there to be* either before, or after, or even during, the Big Bang, or even the whole of physical reality, in the first place. The whole of physical reality does not even happen in an instant! For instants of time are time, and there is no such thing as time in physical reality. Periods of time do not *exist* in physical reality. Even infinitesimal temporal



instants do not *exist* in physical reality. How then can time be earlier than, later than, or at the same time as, the Big Bang, or even the whole of physical reality? For Einstein, there is no such thing as time!

Third, the reviewer says, "In his fifth objection to Park's Problems Dejnožka actually criticizes Park for 'assuming without argument that all causes are earlier in time than their effects', but Park is seemingly correct about this". The reviewer overlooks once again that for Einstein, in the world of physical reality, the opposite is true: *no* causes are earlier in time than their effects. And no causes are *later* than their effects, and no causes are even *at the same time as* their effects. For in the world of physical reality, Einstein keeps telling us, *there is no such thing as time*. Thus for Einstein, *all physical causation is timeless*. Indeed, for Einstein *the whole of physical reality is timeless*.

Fourth, the reviewer says, "As to relying on perspective sub specie aeternitatis, Park would presumably reject any such argument altogether (which would undermine his own materialist argument, but that's a different matter)." Once again, the reviewer is contradicting Einstein. The reviewer overlooks that for Einstein, all physical causation is timeless. For Einstein, *physical reality, including all physical causation, can only be viewed sub specie aeternitatis!* And if all *physical* entities are timeless and all *physical* causation is timeless, then what is Park's problem with admitting a timeless God who timelessly creates Einstein's timeless physical world? - Is it the timelessness? And what is Einsteinian about Park's view? It looks very anti-Einstein to me! The truth is that God's creation of the world could only be timeless for Einstein, since for Einstein there is no such thing as time in the first place.

For Einstein, physical reality can only be viewed sub specie aeternitatis, since it is timeless. And temporal relations among events, which can only be viewed sub specie temporalis by definition, can only occur as observational illusions within some relative framework of spatiotemporal reference.

If all physical causation is both logically contingent and timeless, then why can not God's creation of the world be both logically contingent and timeless too?

For Einstein, physical laws are timeless not because they are logically necessary, but because on Einstein's theory, as a matter of logically contingent fact, time itself is not physically real. Thus for Einstein, all physical laws are timelessly true, yet logically contingent. Thus for Einstein, all such truths are counterexamples to Panayot Butchvarov's thesis that "A [logically] necessarily true proposition is one that is true and has as its subject-matter nontemporal entities" [4, p. 149], that is, to the thesis that logically necessary truth is timeless truth. For in Einstein's theory, all truths about physical reality are about nontemporal entities all right, but not a single one of them is logically necessary. In fact, to refute Butchvarov, Einstein's theory need not even be true. It need only be intelligible and logically possible that physical reality is timeless in the way Einstein says it is.

As is well-known, Einstein accepts the classic view of physical reality as mind-independent and observation-independent. That was precisely his objection to observation-dependent Quantum physics. Now, it seems to me that Einstein might implicitly also accept the classic view of all truth as timelessly true. For what is objectively true, and not merely true relative to some viewpoint, cannot change over time. And that view applies to all truths across the board, not just to truths in physics or truths about causation. Putting the two views together it seems to me that Einstein might implicitly accept a correspondence theory of truth in which all truth is timeless and timelessly corresponds with timeless reality. Or he might implicitly accept such a correspondence theory at least for Physics. And I sometimes get the feeling that he does when I read him. But we need not reach such questions of deeper Einstein interpretation in this paper. I note only that such a correspondence theory of truth for Physics would leave all the room in the world for a holistic epistemology, which for Einstein would be based on all possible frameworks of observational reference.

Fifth, I had said, “But no mainstream thinker would ever hold that a God worthy of the name could be logically contingent, much less be logically subject to coming into being, change, corruption or cessation”. The reviewer says, “Isn’t the question actual existence, hence ontology rather than a formal contingence? The oak tree across the street doesn’t depend on logic, it really exist[s] [due to] the contingent fact that someone planted it. Its ‘coming into being, change, corruption, or cessation’ is part of its nature, which is rather not a contingent relationship.” This is multiply confused. I never used the term ‘formal’ once in the paper, until just now. God is neither formally nor intuitively a logically contingent being, and an oak tree is neither formally nor intuitively a logically necessary being. And the essential *nature* of an oak as a logically contingent being does not make the oak a logically necessary *being*. Quite the opposite. The essential *nature* of an oak as a logically contingent being logically *prevents* the oak from being a logically necessary *being*. There is all the difference between what a thing is and whether it is. Even in the ontological argument from God’s nature to his existence, God’s nature and existence are different, though distinct only in reason. For otherwise the argument would be arguing from God’s existence to his existence, which is circular and question-begging. And that is only if the argument is logically valid. If the argument is logically invalid, then God’s nature does not logically imply his existence any more than the nature of an oak tree logically implies the existence of the oak tree.

Most philosophy majors know that the term ‘logic’ is used both in a narrow formal sense and in a wide intuitive *a priori* sense. Intuitive (i.e. nonformal) logical truths and logical reasoning are called synthetic *a priori*. On the face of it, they range from lowly synthetic *a priori* truths like ‘Red is a colour’ all the way up to the synthetic *a priori* truths (if any) of Ontology and Metaphysics. Plainly, I am using the term ‘logic’ in its wide *a priori* sense, since I am discussing Ontology and Metaphysics. Formal logic only brings formal

clarity. No philosophically interesting problem can be solved by mere formal logic, since formal logic is 'garbage in, garbage out'. Instead, logical reasoning in the wide *a priori* sense must be used. Of course, formal logic is *a priori* too. It is analytic *a priori*. These classifications of logical reasoning have been basic for centuries. And on the face of it, intuitive logical validity is intuitively logically prior to formal logical validity. For on the face of it, we would never accept a formal logic if it were intuitively invalid. The only exception would be the so-called paraconsistent logics, which are studied for their formal properties alone, at least if logicians have any intuitive common sense. Returning now to the case at hand, 'Oak trees are logically contingent' is, if true, a *logically* informal synthetic *a priori* truth about the *metaphysical* form or essence of oak trees. And that very truth implies that oak trees are *not* logically necessary beings, i.e. that their existence does *not* 'depend on logic', either formally or intuitively. And of course the just-refuted thesis, 'Logically necessary truth is timeless truth', is about logically necessary truth in the wide *a priori* sense. It emerges that the term 'formal' is used in two main ways as well. Formal logic is logic that is true or valid in virtue of its logical form. But formal metaphysics is intuitive synthetic *a priori*, certainly in Aristotelian metaphysics about categorial forms. (For Aristotle, form and essence are not exactly the same thing, but we can let that pass.)

Park contradicts Einstein in all the same ways the reviewer does. Perhaps Park, too, should have consulted Einstein and Gödel. In any case, through their application of the quantum concept of complementarity to the relationship between Science and religion, the great Quantum physicists clearly agree with Einstein's conclusion that "Science without religion is lame, religion without Science is blind" [13, p. 390]; see [18, 19], while Park rejects Einstein completely on the relationship between Science and religion, which is the central topic of both our papers.

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