



Kai-yan Chan

On Sean Carroll’s Case for Naturalism and against Theism

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Among atheist scientists, Sean Carroll is one of the most careful critics of theism and defenders of naturalism. He has provided two arguments for naturalism and against theism – one earlier argument and another later argument, which is built upon the earlier one. This article is intended to articulate and critically assess Carroll’s arguments. I shall argue that Carroll’s two arguments fail. The earlier argument fails because there is a crucial step of inference in the argument that is logically incorrect. The second argument fails because some of its key premises are dubious.

Among the atheist scientists, Sean Carroll is one of the most careful critics of theism and defenders of naturalism/materialism.¹ My article will articulate Carroll’s major arguments for naturalism and against theism, and critically examine them. I shall argue that none of Carroll’s arguments are cogent.

Carroll’s main thesis is the following:

C: By scientific standards, the materialist hypothesis should be accepted and the God hypothesis should be rejected.²

Carroll provides two arguments to support his thesis: one argument put forward in his earlier writing, “Why (Almost All) Cosmologists Are Atheists”; and a second argument that is built upon his earlier argument and is put forward in his later works.³

Carroll’s Earlier Argument

Carroll’s first argument for his thesis C, which is presented in his paper “Why (Almost All) Cosmologists Are Atheists,” is as follows:

1. Science has been extremely successful at constructing theories which accurately model reality.
2. In the various ways in which the God hypothesis might have been judged to be a helpful hypothesis, there are alternative explanations

which are no less plausible than the God hypothesis, but which do not require anything outside a completely formal, materialist description.

- ∴ 3. Appealing to physical factors alone is already sufficient to explain the universe – why it exists, why it has the laws it has, and why its laws are fine tuned to the existence of intelligent life; adding God would just make things more complicated (i.e., the postulation of God to explain the universe is redundant). [Since 1 and 2]
6. There are no other considerations (or data) which could lower the probability of the conclusion. (This is the requirement of total evidence.)
- ∴ C: By scientific standards, the materialist hypothesis should be accepted and the God hypothesis should be rejected. [Since 3 and 6]

Premise 6 above is not explicitly stated in Carroll’s early paper “Why (Almost All) Cosmologists Are Atheists,” but it is

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a hidden premise required for the derivation of the conclusion from the other premises.

In order to support premise 2, Carroll points out that there are in particular two possible ways in which theism could be judged more compelling than materialism:

- a. There are phenomena which cannot be explained in materialism, but which can be explained by theism; and
- b. There are patterns which theism can explain better than materialism.

For possibility a, the beginning of the universe may count as a candidate, and for possibility b, cosmic fine tuning may count as a candidate.

Carroll then turns to rebut both possibilities. With regard to the first candidate (or the kalam cosmological argument, which appeals to such a candidate), Carroll's rebuttal is this: We do not have good reason for thinking that the universe has a boundary. There are possibilities to avoid a boundary: (i) The Big Bang is nonsingular (the Hartle-Hawking no-boundary proposal), and (ii) The universe is eternal. These possibilities have not been eliminated yet, and they deserve our serious consideration. Carroll said,

There is no way to decide between [the no-boundary proposal] and eternal cosmologies on the basis of pure thought; both possibilities are being actively pursued by working cosmologists, and a definitive judgment will have to wait until one or the other approach develops into a mature scientific theory that makes contact with observations.⁴

With regard to the second candidate, cosmic fine tuning (or the fine-tuning design argument, which appeals to such a candidate), Carroll's rebuttal is as follows:

- i. There are two serious holes in the argument: we do not know what the universe would look like if the parameters of the standard model were different, nor do we know what the necessary conditions are for the formation of intelligent life.
- ii. There are features of the laws of nature which are irrelevant to the existence of life. First, [in] a cosmological context, the most obvious example is the sheer vastness of the universe; it would hardly seem necessary to

make so many galaxies just so that life could arise on a single planet around a single star.⁵

Second, there are particles which are completely superfluous.

All the processes we observe in the everyday workings of the universe would go on in essentially the same way if those particles didn't exist. Why do the constituents of nature exhibit this pointless duplication, if the laws of nature were constructed with life in mind?⁶

In other words, the existence of these features, according to Carroll, disconfirms the design hypothesis.

- iii. It might turn out that the constants of nature could not have had any other values. They may be calculable from a single underlying parameter.
- iv. It is possible that a multiverse exists. If a multiverse exists, then it will not be surprising that there is a universe whose laws are fine tuned to the existence of intelligent life. The existence of a multiverse is predicted by a combination of the theory of eternal inflation and string theory.

So, according to Carroll, no arguments for the role of God in explaining the universe are successful. There are naturalistic alternatives, which are no less plausible than the God-hypothesis and which are also simpler than the God-hypothesis.

A Critical Evaluation of Carroll's First Argument

Because of the limitation of space in this article, I have to postpone my critical evaluation of Carroll's critique of the kalam cosmological argument and the fine-tuning design argument to another paper. (However, a brief comment on each does accompany this article in an appendix.) Here I want to put forward only one criticism of Carroll's first argument: Statement 3 does not follow from premises 1 and 2.

Let us first note that in Carroll's argument, two *ultimate explanations* of the universe are being compared: the God hypothesis and the materialist hypothesis. By the term "ultimate explanation," I mean an explanation in which the factors appealed to in explaining phenomena are claimed to have no further explanation. In the materialist hypothesis,

the existence of laws of nature and the existence of matter/energy are taken to be ultimate brute facts; and in the God hypothesis, God is taken to be the first cause of the existence of everything else.

How is statement 3 supposed to be derivable from premises 1 and 2? The derivation seems to proceed in this way. According to the principle of simplicity, other things being equal, the simpler hypothesis among a set of competing alternatives would be the most rationally preferable one.⁷ If there are naturalistic ultimate explanations of the existence of the universe and its laws that do not require anything outside a completely formal, materialist description, then they will be *simpler* than the theistic explanation, which does require a supernatural entity outside the material order. If some of these naturalistic explanations are also no less plausible than the theistic explanation, then, according to the principle of simplicity, they will be rationally preferable to the theistic explanation. Also, since naturalistic explanations (in the areas of physics, chemistry, biology, etc.) have been tremendously successful in the past, we can be reasonably confident that they will one day provide the true ultimate explanation for the existence of the universe and its laws. Therefore, given premises 1 and 2, we can logically conclude that appealing to physical factors alone is already sufficient to ultimately explain the universe, and that the postulation of God to explain the universe is simply redundant.

The above line of reasoning, however, is questionable. First, from the fact that naturalistic explanations have been tremendously successful in the past in various areas of science, it does not follow that naturalistic explanations will also be successful to *ultimately* explain the existence of the universe and its laws. Surely, naturalistic explanations have been tremendously successful in the past, but those are all non-ultimate explanations. When we provide ultimate explanations, we are addressing questions such as why the universe (physical reality) exists, why natural laws exist, why the universe has the laws it has, and whether these facts have further explanation or are they already the ultimate brute facts. There are big differences between non-ultimate explanations in various areas of science and ultimate explanations of the universe. Non-ultimate explanations in various areas of science deal with facts (e.g., the motion of planets) that can possibly be explained by appealing to natural laws. But ultimate explanations of the

universe deal with facts (e.g., the existence of natural laws) that cannot possibly be explained by natural laws. Those facts are such that either they have no further explanation or they can be further explained only by nonphysical factors, such as God. It remains to be seen whether naturalistic *ultimate* explanations will enjoy the same success in addressing the above questions.

Second, according to the above line of reasoning, if there are naturalistic ultimate explanations of the universe that do not require anything outside a completely formal, materialist description, then they will be simpler than the theistic explanation, which does require a supernatural entity outside the material order. However, there are good reasons for rejecting this assumption. Here are two reasons why the God hypothesis is simpler than the naturalistic ultimate explanations (or materialism).

Reason One: The *explanatory ultimate* posited by the God hypothesis—namely, God—is simpler than the *explanatory ultimate* posited by materialism—namely, the universe (matter-energy, space-time, and laws of nature). God is a very simple entity, a disembodied nonphysical Mind, who is not composed of parts at all, and who has zero limits in his essential attributes: knowledge, power, and goodness. In contrast, the universe is composed of parts related to each other in certain ways.

Theism is a very simple hypothesis. In explicating the concept of simplicity that is employed in scientific inquiry, Carroll said, “[The] simplicity of a model is judged by how much information is required to fully specify the system.”⁸ We can describe God in a very simple way as “the maximally perfect being.”⁹ From the concept of being maximally perfect, other essential properties of God follow: all-knowing, all-good, all-powerful. And it also follows that God necessarily depends on nothing else for his existence.

Here is Richard Swinburne’s explication of the concept of simplicity:

The simplicity of a theory, in my view, is a matter of postulating few (logically independent) entities, few properties of entities, few kinds of entities, few kinds of properties, properties more readily observable, few separate laws with few terms relating few variables, the simplest formulation of each law being mathematically simple.¹⁰

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Theism postulates only one entity, God, in providing an ultimate explanation of the existence of the universe and its laws; the entity is very simple—a disembodied nonphysical mind. And his essential properties can be unified in a very simple way—they are properties following from God's maximal perfection.¹¹

Reason Two: In explaining the existence and fine-tuning of the universe, the God hypothesis posits fewer *brute facts* than materialism. By the term "brute fact," I mean a fact which can possibly have an explanation, but which just happens to have no explanation. Under this sense of the term "brute fact," if God exists, then God's existence would not be a brute fact, since God's existence *necessarily* has no explanation. As a maximally perfect being, God is essentially uncaused and essentially eternal. In other words, *necessarily*, if God exists, then God must be uncaused and eternal. Therefore, it simply does not make sense to ask for an explanation/cause of God's existence.

On the other hand, it does make sense to ask for an explanation of the existence of the universe, because it is logically possible that theism provides the ultimate explanation for the universe—why it exists, why it has the laws it has, and why its laws are fine tuned to the existence of intelligent life. Under the God hypothesis, everything which *can possibly* have an explanation *does* have an explanation. But under materialism, many things (e.g., the existence of matter/energy, the existence of laws of nature, and the fact that physical reality possesses the laws it possesses) which *can possibly* have an explanation, just happen to have *no* explanation.

However, Carroll thinks that materialism is simpler:

[If] we are looking for simplicity of description, a view which only invokes formal structures and patterns would appear to be simpler than one in which God appeared in addition.¹²

My reply is this. In postulating God in our explanatory theory, what we are doing is not postulating God *in addition to* the postulation of structures and patterns *in the explanans* to explain the universe. Rather, God *alone* is postulated in the explanans to ultimately explain the universe, including its structures and patterns. In other words, the structures and patterns of the universe are parts of the explanandum, *not* parts of the explanans. God *alone* is the explanatory ultimate. And God is a very simple entity.

Let us look at some examples in science. According to Swinburne, as we postulate microscopic entities to explain the characteristics of macroscopic entities, we would not require microscopic entities to be like macroscopic entities, since our knowledge about the latter entities is not, in this case, part of the background knowledge, but data to be explained by the postulation of microscopic entities. The postulation of a microscopic realm (which is radically different from the macroscopic realm) to explain phenomena in the macroscopic realm does not render our subatomic theory to be a complicated theory. What matters to the simplicity of the theory is the simplicity of the models and mathematical formulae in the theory. Similarly, in explaining empirical data such as those about the human world, we need not require the postulated entity to be like human beings. What we require are, rather, simplicity and explanatory power of the postulation.¹³

Therefore, in the words of Don Page, "[It] might be that God is even simpler than the universe, so that one would get a simpler explanation starting with God than starting with just the universe."¹⁴

Thus, the reasoning from premises 1 and 2 to statement 3 in Carroll's first argument leaves the following *possibility* intact. On the one hand, the God hypothesis is no less plausible than the naturalistic ultimate explanations (although the latter may also be no less plausible than the former). And, on the other hand, the God hypothesis is simpler than those naturalistic explanations (although the former requires a supernatural entity outside the material order and the latter do not). In other words, even if premises 1 and 2 are true, it does not follow that appealing to physical factors alone is already sufficient to ultimately explain the universe, or that the postulation of God to explain the universe is simply redundant.

Since, in Carroll's first argument, statement 3 does not follow from premises 1 and 2, Carroll's first argument for his thesis C fails to be convincing.

Carroll's Second Argument and My Critical Evaluation of It

Carroll's second and later argument for his thesis C is built upon his earlier argument and is more sophisticated. It is as follows:

1. Science has been extremely successful at constructing theories which accurately model reality.
 2. In the various ways in which the God hypothesis might have been judged to be a helpful hypothesis, there are alternative explanations which are no less plausible than the God-hypothesis, and which do not require anything outside a completely formal, materialist description.
 4. The God hypothesis is not a viable explanation.
 5. Materialism is well confirmed by empirical evidence.
 6. There are no other considerations/data, which could lower the probability of the conclusion. (This is the requirement of total evidence.)
- ∴ C: By scientific standards, the materialist hypothesis should be accepted and the God hypothesis should be rejected.

Premises 4 and 5 are newly added premises. Premise 4 says that the God hypothesis is a deeply flawed hypothesis. Premise 5 says that materialism is a well-confirmed hypothesis. The conclusion of Carroll's second argument does follow from the premises. However, I shall argue, its premises 4 and 5 are dubious.

Premise 4 of Carroll's Argument

In support of premise 4, Carroll provides the following reasons:¹⁵

- 4.1 The God hypothesis postulates an external cause for the whole physical reality. However, the very concept of an external cause of the whole physical reality is nonsensical. Therefore the very meaningfulness of the God hypothesis is doubtful.
- 4.2 Either the God hypothesis is already significantly disconfirmed by empirical evidence, or it is empirically untestable and not well defined.
- 4.3 Asking for an external cause of the physical reality is unnecessary, because *the* right way to know reality is through laws of nature, and because there is no need for extra metaphysical baggage, such as the postulation of a transcendent cause. What we need to do,

rather, is to build complete and consistent physical models that fit with empirical data. This is the right way to know reality. We have no right to demand more than that.

In support of 4.1, Carroll argues in the following way. Asking for causes or explanations for phenomena *in* the universe is meaningful, since there are unbreakable laws of physics, and since there is an arrow of time stretching from the past to the future, and since the entropy was lower in the past and increases toward the future. Yet both of these features of the universe that allow us to speak meaningfully of the language of cause and effect are completely absent when we talk about the physical reality *as a whole*.¹⁶

However, Carroll's argument for his claim in 4.1, that the very concept of an external cause of the whole physical reality is nonsensical, is questionable. Yes, it is true that there are unbreakable laws of physics, that there is an arrow of time stretching from the past to the future, that the entropy was lower in the past and increases toward the future, and that these are sufficient conditions for the meaningfulness of the language of cause and effect. But why should we think that these are also *necessary* conditions of the meaningfulness of the language of cause and effect? It is clearly conceivable that physical space-time, matter-energy, and natural laws had a beginning and that they were created by God.

As Swinburne points out, we can provide an intentional explanation in terms of God's purposes and reasons for the existence of physical reality. (Intentional explanations, which are often used in social sciences, are one kind of proper explanations.) Even Carroll admits this point: "It is certainly conceivable that the ultimate explanation is to be found in God ..."¹⁷ If it is *conceivable* that the ultimate explanation of the physical reality is to be found in God, then the very concept of an *external* cause is meaningful. Hence Carroll's argument for his claim in 4.1 is not convincing.

Let's consider Carroll's second support of premise 4. Why should we accept it? Here is his reason for 4.2. If theism is empirically testable, then it is already significantly disconfirmed. Carroll thinks that the following empirical observations have significantly disconfirmed theism (if it is empirically testable at all):

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4.2.1 "In numerous ways, the world around us is more like what we would expect from a dys-teleological set of uncaring laws of nature than from a higher power with an interest in our welfare."¹⁸

4.2.2 "In a cosmological context, the most obvious example is the sheer vastness of the universe; it would hardly seem necessary to make so many galaxies just so that life could arise on a single planet around a single star."¹⁹ "The entropy didn't need to be nearly that low in order for life to come into existence. One way of thinking about this is to note that we certainly don't need a hundred billion other galaxies in the universe in order for life to arise here on earth; our single galaxy would have been fine, or for that matter a single solar system."²⁰ and

4.2.3 There are particles which are completely superfluous. "All the processes we observe in the everyday workings of the universe would go on in essentially the same way if those particles didn't exist. Why do the constituents of nature exhibit this pointless duplication, if the laws of nature were constructed with life in mind?"²¹

However, these apparent disconfirmations of theism can be rebutted. For the facts about evils, there are various theodicies and defenses which show that theism can be perfectly coherent with such facts. For the existence of those features in nature, which are apparently unnecessary to the existence of intelligent life, we can simply point out the possibilities missed by Carroll. Here are some of those possibilities. God might well have other purposes, besides the creation of intelligent life, in creating the universe. For example, the extremely sophisticated order of the cosmos can manifest to the intelligent creatures the handiworks and thus the reality of God, so that they can be led to seek God. Also in creating a vast universe, God might well intend for there to be abundant life and, accordingly, other life-affirming planets in different parts of the universe.²² So it is not surprising that God would choose to build a vast life-affirming universe, rather than just a small one. Hence, the empirical observations highlighted by Carroll (4.2.1, 4.2.2, 4.2.3) are not sufficient to lower the probability of theism.

In his recent book *The Big Picture*, Carroll elaborated on his problem of evil against theism:

[Imagine] a world that is very much like ours, except that evil does not exist. People in this world are much like us, and seem able to make their own choices, but they always end up choosing to do good rather than evil. In that world, the relevant data is the absence of evil. How would that be construed, as far as theism is concerned? It's hard to doubt that the absence of evil would be taken as very strong evidence in favor of the existence of God. If humanity simply evolved according to natural selection, without any divine guidance or interference, we would expect to inherit a wide variety of natural impulses—some for good, and some for not so good. The absence of evil in the world would be hard to explain under atheism, but relatively easy under theism, so it would count as evidence for the existence of God. But if that's true, the fact that we do experience evil is unambiguous evidence against the existence of God. If the likelihood of no evil is larger under theism, then the likelihood of evil is larger under atheism, so evil's existence increases our credence that atheism is correct.²³

Let p represent "probability"; E , the statement "Evils exist"; and T , the statement "God exists." Carroll's argument from evil, put in a formal way, is as follows:

6. $p(\sim E \mid T) > p(\sim E \mid \sim T)$
7. If $p(\sim E \mid T) > p(\sim E \mid \sim T)$, then $p(E \mid \sim T) > p(E \mid T)$ [This is a theorem in probability theory.]
- \therefore 8. $p(E \mid \sim T) > p(E \mid T)$ [Since 6 and 7]
- \therefore 9. $p(T \mid E) < p(T)$ [Since 8 and the likelihood principle]²⁴

Is this a good argument showing that the existence of evil provides some disconfirmation of the existence of God? I think not. I believe that premise 6 is questionable.

My reason to doubt premise 6 is this. According to theists, especially Christian theists, God created human beings as beings possessing libertarian free-will. So God cannot possibly *make* human beings to do good and refrain from evil without violating their libertarian free-will. Since God respects human free-will, God does not *make* human beings to choose good and refrain from evil. God allows human beings to make the decision to do either good or evil. Suppose that, possessing free-will, every human person has a certain probability, which is greater than 0 and less

than 1, to do good and refrain from evil (suppose the probability to be 9/10). Given that there are indefinitely many human persons, the probability that *every* person chooses only to do good is very near to zero. In other words, the probability that some people commit evil is near to 1. So $p(\sim E \setminus T)$ is nearly zero and premise 6 of Carroll's argument from evil is questionable. Therefore, Carroll's argument from evil against theism is not a good argument.

Carroll, however, rebuts the above lines of defense of theism against those criticisms in this way. The above lines of defense are merely using *ad hoc hypotheses* (e.g., the hypothesis that God created human beings as beings possessing libertarian freewill) to save theism from refutation. Such a move would make theism immune to empirical disconfirmations and thus make theism to be empirically untestable. If theism is not an empirically testable hypothesis, then by scientific standards, it is not a viable explanation.

There is an inevitable tension between any attempt to invoke God as a scientifically effective explanation of the workings of the universe, and the religious presumption that God is a kind of person, not just an abstract principle. God's personhood is characterized by an essential unpredictability and the freedom to make choices. These are not qualities that one looks for in a good scientific theory. On the contrary, successful theories are characterized by clear foundations and unambiguous consequences.²⁵

So Carroll's rebuttal is similar to this:

- I. God's personhood is characterized by an essential unpredictability and the freedom to make choices.
- II. Theism is saved by various *ad hoc* hypotheses from empirical refutations, whenever such refutations appear.
- ∴ III. Theism does not have predictive power. [Since I and II]
- ∴ IV. No empirical observations can possibly disconfirm theism (i.e., theism is not empirically disconfirmable). [Since III]
- ∴ V. Theism is not empirically testable. [Since IV]
- VI. A viable explanation of the workings of the universe must be empirically testable. (Since the requirements of scientific standards)

∴ VII. Theism is not a viable explanation of the workings of the universe. [Since V and VI]

Carroll's rebuttal is not cogent. I dispute his proposition I and, therefore, his propositions III and IV. Let me explain.

There is no reason to think that God's personhood is characterized by essential unpredictability. It is true that if God exists, God will have libertarian freedom to make choices. However, from this, it does not follow that God's personhood is characterized by essential unpredictability. Rather, God's personhood is characterized by the *essential* attributes of his nature, for example, essential goodness. God's behavior flows from the essential attributes of his nature, and it is impossible for God to act against his nature. This enables us to predict, though not with certainty, what God will do if he exists. For instance, if God exists, we would expect him to desire a good and deep relationship with us, for God is omnibenevolent. But we, human beings, are finite and unable to find God. So if God exists, he will take the initiative to approach us. In order for us to be able to identify his special revelation in the world of plurality of religions and worldviews, God might well perform miracles to testify to his revelation. So if theism is true, we would, to a certain degree, expect to find miracles in the world.

Let M be an observation of miraculous events, which are most easily explained by invoking God; let T be theism and N be naturalism. $p(\sim M \setminus N)$ is approximately 1, but $p(\sim M \setminus T)$ is significantly lower than 1. Therefore, by the likelihood principle, $\sim M$ would confirm N over T. Since N logically entails $\sim T$, and since $\sim M$ would confirm N over T, $\sim M$ would confirm $\sim T$. In other words, if, after a serious and diligent search for miraculous events in the world, we still fail to find any, then this would disconfirm theism.

Because of the above considerations, we can reasonably draw these conclusions:

1. If theism is true, we would expect, to a certain degree, to have observations of miraculous events—observations of God's miraculous work; in other words, theism has predictive power;

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2. Theism is, accordingly, empirically disconfirmable by empirical evidence; and
3. God's personality cannot be characterized by an *essential* unpredictability.

Even Carroll admits,

There are several possible ways in which [a theist worldview could be judged more compelling than a materialist one]. Most direct would be straightforward observation of miraculous events that would be most easily explained by invoking God.²⁶

If we can publicly *observe* such events, do these empirical observations not significantly confirm theism? And if theism is both confirmable and disconfirmable by empirical observations, it is empirically testable. So Carroll's argument for his conclusion VII, "Theism is not a viable explanation of the workings of the universe," fails.

Here I want to add one more remark. The degree of testability of *Christian* theism is even higher than that of bare theism. We can deduce definite and bold empirical predictions from Christian theism such that if our empirical evidence were to indicate that some of them are not borne out, then this would significantly disconfirm Christian theism. These predictions are (1) physical reality has a beginning; (2) Jesus of Nazareth has resurrected from the dead; and (3) human beings possess libertarian freewill.

Because of the above considerations, Carroll fails to show either that theism is already significantly disconfirmed by empirical evidence, or that theism is empirically untestable. In other words, he fails to show that his proposition 4.2, that either the God hypothesis is already significantly disconfirmed by empirical evidence, or it is empirically untestable and not well defined, is true.

Let's examine Carroll's proposition 4.3. This seems to be the argument presented:

- A. The *only* right way to know reality is through laws of nature.
 - B. There is no need for extra metaphysical baggage, such as the postulation of a transcendent cause.
- ∴ D. Asking for an external cause of the physical reality is unnecessary. [Since A and B]
- ∴ 4. Theism is not a viable explanation. [Since D]

Is this a good argument? I doubt it. First, premise A is questionable. Yes, a right way to know some aspects of reality is through laws of nature, but why should we think that this is the *only* way to know reality? Indeed, much of our knowledge of daily life does not come from knowledge of laws of nature. For example, I know that Tom is feeling pain now. How do I know it? Do I know it through appealing to a law of nature? No, I know it through observing Tom's pain behavior, as well as the circumstances in which his behavior occurs. Ancient people had little scientific knowledge, but they could still know when a person was in pain. Here is another example: I know that I feel uncomfortable now. How do I know it? Do I know it through any laws of nature? No, I know it through feeling it directly.

Carroll said, "What we need to do, rather, is to build complete and consistent physical models that fit with empirical data. This is *the* right way to know reality. We have no right to demand more than that."²⁷ But why should we believe that *all* aspects of reality can be grasped in this way? How does Carroll know that reality has no nonnatural aspects, which cannot be grasped by physical models? Carroll's premise A has begged the question against theism.

Premise B is also questionable. Why should we believe it? As stated in my assessment of Carroll's first argument, theism has many merits—for example, simplicity and explanatory power—and deserves our serious consideration. The *ultimate explanation* provided by theism starts with God, and this may well be simpler than the ultimate explanation provided by materialism, which starts with the universe. Theism also posits fewer brute facts than materialism. So why should we think that theism is "an unnecessary extra metaphysical baggage" and not the best *ultimate explanation* of reality? Because of these considerations, I doubt premise B.

Since premises A and B are questionable, I do not think that Carroll's argument 4.3 can cogently support his premise 4, "Theism is not a viable explanation."

Carroll provides three arguments, 4.1, 4.2, 4.3, to support his premise 4. However, all of them fail. Therefore, Carroll fails to show that theism is not a viable explanation.

Premise 5 of Carroll's Argument

Premise 5 of Carroll's second argument for his main thesis C says that materialism is well confirmed by empirical evidence. Is this premise true? Why should we believe it? Let me quote in full Carroll's empirical evidence used to confirm materialism and disconfirm theism:

I've claimed that over and over again the universe we would expect matches the predictions of naturalism not theism. So the amount of tuning, if you thought that the physical parameters of our universe were tuned in order to allow life to exist, you would expect enough tuning but not too much. Under naturalism, a physical mechanism could far over-tune by an incredibly large number that has nothing to do with the existence of life, and that is exactly what we observe. For example, the entropy of the early universe is much, much, much, much lower than it needs to be to allow for life. You would expect under theism that the particles and parameters of particle physics would be enough to allow life to exist and have some structure that was designed for some reason, whereas under naturalism you'd expect them to be kind of random and a mess ... You would expect, under theism, for life to play a special role in the universe. Under naturalism, you would expect life to be very insignificant. I hope I don't need to tell you that life is very insignificant as far as the universe is concerned.

... What you should be doing over and over again is comparing the predictions or expectations under theism to [those] under naturalism and you find that over and over again naturalism wins. I'm going to zoom through these ...

- If theism were really true, there's no reason for God to be hard to find. He should be perfectly obvious, whereas in naturalism you might expect people to believe in God but the evidence to be thin on the ground.
- Under theism you'd expect that religious beliefs should be universal. There's no reason for God to give special messages to this or that primitive tribe thousands of years ago. Why not give it to anyone? Whereas under naturalism, you'd expect different religious beliefs inconsistent with each other to grow up under different local conditions.
- Under theism you'd expect religious doctrines to last a long time in a stable way.

Under naturalism you'd expect them to adapt to social conditions.

- Under theism you'd expect the moral teachings of religion to be transcendent, progressive, sexism is wrong, slavery is wrong. Under naturalism you'd expect they reflect, once again, local mores, sometimes good rules, sometimes not so good.
- You'd expect the sacred texts under theism to give us interesting information. Tell us about the germ theory of disease. Tell us to wash our hands before we have dinner. Under naturalism you'd expect the sacred texts to be a mishmash—some really good parts, some poetic parts, and some boring parts and mythological parts.
- Under theism you'd expect biological forms to be designed; under naturalism they would derive from twists and turns of evolutionary history.
- Under theism, minds should be independent of bodies. Under naturalism, your personality should change if you're injured, tired, or you haven't had your cup of coffee yet.
- Under theism you'd expect that maybe you can explain the problem of evil—God wants us to have free will. But there shouldn't be random suffering in the universe. Life should be essentially just.
- At the end of the day with theism you basically expect the universe to be perfect. Under naturalism it should be a kind of mess—this is very strong empirical evidence.²⁸

In response, I think the above empirical observations do *not* significantly disconfirm theism. We have no reason to think that if God exists, God would not overtune the universe, or God would not allow sufferings to occur in the world in the ways we observe, or God would manifest God's existence clearly and irresistibly before all human beings, or God would create human beings in such a way that their minds are independent of their bodies, and so on. There are already a lot of good discussions of these points in the literature. To show that the above empirical observations significantly disconfirm theism, Carroll needs to forcefully rebut these theistic defenses.²⁹

But do the above empirical observations *significantly* confirm materialism? In order to determine whether

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materialism is well confirmed by empirical evidence, we need to consider this question:

- (a) If theism is true, would it equally lead us to expect the above empirical observations as materialism would? (If yes, then the above empirical observations would not be able to *significantly* confirm materialism. This is what we call the "Surprise Principle" in confirmation theory.)

To question (a), my answer is this. Many theists, such as Richard Swinburne and John Hick, have argued that the majority of the aforementioned empirical phenomena are expected if theism is true.³⁰ For example, according to these theists, if God exists, we would expect that there would be a significant degree of divine hiddenness (e.g., that God would not appear in the sky to be seen by all human beings) for the sake of human freedom. God wants human beings to freely seek God, rather than being forced in fear to believe God. And God would allow sufferings to occur on human beings, because sufferings can have soul-making functions. And so on. In other words, we have reason to think that theism leads us to expect the majority of the aforementioned empirical observations, but which are taken by Carroll as confirming materialism. Hence, Carroll's claim that these empirical observations significantly confirm materialism is doubtful.

Because of these considerations, Carroll's claim—that is, premise 5 in his second argument—that materialism is well confirmed by empirical evidence, is doubtful.

Since some of the major premises, premises 4 and 5, in his second argument for thesis C are questionable, Carroll's second argument for naturalism and against theism fails to be convincing.

Conclusion

After a critical and careful examination of Carroll's two arguments for naturalism and against theism, my final conclusion is that both of them are not good arguments. The earlier argument fails because there is a step of inference in the argument, which is logically incorrect—its statement 3 does not follow from its statements 1 and 2; the later argument fails because some of its major premises—premises 4 and 5—are questionable.

Appendix

Initial Brief Comments on Carroll's Criticisms of the Kalam Cosmological Argument and the Fine-Tuning Argument

This is the kalam cosmological argument (The Craig-Carroll Debate):

First premise: If the universe (physical reality) began to exist, then there was a transcendent cause that brought the universe into existence.

Second premise: The universe began to exist.

Conclusion: There was a transcendent cause that brought the universe into existence.

Carroll's criticism challenges the second premise:

Since there are cosmological models (e.g., the Hartle-Hawking no-boundary proposal and other eternal-universe models) which avoid a boundary for the universe, and since these cosmological models deserve serious consideration, we do not have good reason to believe that the universe has a boundary (beginning).

However, Carroll's criticism is not sufficient to undermine the second premise of the kalam argument, since there is no good evidence yet to support the cosmological models mentioned by Carroll, and since the second premise is supported by not only scientific arguments, but also by powerful metaphysical arguments (e.g., the Hilbert-Hotel argument).³¹ The cosmological models mentioned by Carroll simply cannot threaten the metaphysical arguments.

With respect to the fine-tuning argument, Carroll has put forward four criticisms. To Carroll's criticism (i), Jeffrey Koperski has provided a reply:

[Some] fine-tuning examples allow for no inhabitable universe whatsoever outside of the life-permitting range ... A slight change in the cosmological constant would produce either a Big Crunch singularity or a universe devoid of atoms. Either way, life—any sort of life—would be physically impossible. In short, the appeal to other possible types of life ignores that a universe with any discernible structure depends on fine-tuning.³²

To Carroll's criticism (ii), I have provided a detailed reply in the article that precedes this appendix.

To Carroll's criticism (iii), Robin Collins responds:

[Hypothesizing such a fundamental law] merely moves the epistemic improbability of the fine-tuning of the laws and constants up one level, to that of the postulated fundamental law itself. Even if such a law existed, it would still be a huge coincidence that the fundamental law implied just those lower-level laws and values of the constants of physics that are life-permitting, instead of some other laws or values.³³

To Carroll's criticism (iv), my reply is that the multiverse hypothesis is unable to explain the fine-tuning phenomena in our universe. Yes, if a multiverse exists, then it will not be surprising that there is a universe whose laws are fine tuned to the existence of intelligent life. However, even if a multiverse exists, the probability of fine-tuning in *our* universe (*this* universe) would not thereby be increased at all. It would still be extremely improbable and very surprising that *this* universe is fine tuned to the existence of intelligent life. To suppose that the postulation of a multiverse is sufficient to explain the fine-tuning phenomena in our universe is to commit the Inverse Gambler's Fallacy.³⁴ Accordingly, it is doubtful that the multiverse hypothesis can threaten the fine-tuning design argument. *

Acknowledgment

Here I would like to give thanks to Lydia McGrew, Andrew Loke, and the anonymous reviewers of the journal for their very useful comments on my paper.

Notes

¹I think in Carroll's language, the words "naturalism" and "materialism" are interchangeable. By "naturalism," Carroll means this:

The broader ontology typically associated with atheism is naturalism—there is only one world, the natural world, exhibiting patterns we call the "laws of nature," and which is discoverable by the methods of science and empirical investigation. There is no separate realm of the supernatural, spiritual, or divine; nor is there any cosmic teleology or transcendent purpose inherent in the nature of the universe or human life. "Life" and "consciousness" do not denote essences distinct from matter; they are ways of talking about phenomena that emerge from the extraordinarily complex systems. (Sean Carroll, *The Big Picture: On the Origins of Life, Meaning, and the Universe Itself* [New York: Dutton, 2016], 11)

In a word, naturalism in Carroll's sense is the doctrine that physical reality is *all* there is.

²Sean M. Carroll, "Why (Almost All) Cosmologists Are Atheists," accessed June 16, 2017, <https://preposterousuniverse.com/wp-content/uploads/nd-paper.pdf>. This article was prepared for "God and Physical Cosmology: Russian-Anglo American Conference on Cosmology and Theology," Notre Dame, January/February 2003, and was published in *Faith and Philosophy* 22, no. 5 (2005): 622–35.

³Sean Carroll's later works: "Does the Universe Need God?" in *The Blackwell Companion to Science and Christianity*, ed. J. B. Stump and Alan G. Padgett (Malden, MA: Wiley-Blackwell, 2012), chap. 17; "Post-Debate Reflections," accessed June 16, 2017, <http://www.preposterousuniverse.com/blog/2014/02/24/post-debate-reflections/>; *The Big Picture*; and video debate, William Lane Craig vs. Sean Carroll, "God and Cosmology: The Existence of God in Light of Contemporary Cosmology," New Orleans Baptist Theological Seminary, New Orleans, LA, March 2014, accessed June 16, 2017, <https://www>

[reasonablefaith.org/videos/debates/craig-vs.-carroll-new-orleans/](https://www.reasonablefaith.org/videos/debates/craig-vs.-carroll-new-orleans/); transcript, <https://www.reasonablefaith.org/media/debates/god-and-cosmology-the-existence-of-god-in-light-of-contemporary-cosmol/>.

⁴Carroll, "Does the Universe Need God?," 189.

⁵Carroll, "Why (Almost All) Cosmologists Are Atheists," 12.

⁶Ibid.

⁷Carroll, "Does the Universe Need God?," 191; and Richard Swinburne, *The Existence of God*, 2nd ed. (Oxford, UK: Clarendon Press, 2004), 53.

⁸Carroll, "Why (Almost All) Cosmologists Are Atheists," 7.

⁹For an explication of the concept of a maximally perfect being, as well as a defense of its coherence, see Thomas V. Morris, *Our Idea of God: An Introduction to Philosophical Theology* (Downers Grove, IL: InterVarsity Press, 1991), see especially chap. 2; and Charles Taliaferro and Chad Meister, *Contemporary Philosophical Theology* (New York: Routledge, 2016), chap. 5.

¹⁰Swinburne, *The Existence of God*, 2nd ed., 54.

¹¹Indeed Sean Carroll's conception of simplicity is very similar to that of Richard Swinburne. See Carroll, "Why (Almost All) Cosmologists Are Atheists"; and "Does the Universe Need God?," 191–92; and Swinburne, *The Existence of God*, 2nd ed., 53–61. Both of them attempt to apply the principles of the methodology of science (one of which is the principle of simplicity) to the critical evaluation of ultimate explanations of reality. Swinburne said clearly,

All that I have been concerned to show here is the crucial influence of the criterion of simplicity within science. If we are to adopt in our investigations into religion the criteria of rational inquiry that are used in science and ordinary life, we must use this criterion here. (*The Existence of God*, 2nd ed., 60)

¹²Carroll, "Why (Almost All) Cosmologists Are Atheists," 7.

¹³Swinburne, *The Existence of God*, 2nd ed., 145–46.

¹⁴Guest post, Don Page on God and Cosmology," posted by Sean Carroll on March 20, 2015, Don Page, "Open Letter to Sean Carroll and William Lane Craig," <http://www.preposterousuniverse.com/blog/2015/03/20/guest-post-don-page-on-god-and-cosmology/>.

¹⁵Craig vs. Carroll Debate, "God and Cosmology."

¹⁶Ibid.

¹⁷Carroll, "Does the Universe Need God?," 193.

¹⁸Ibid., 196.

¹⁹Carroll, "Why (Almost All) Cosmologists Are Atheists," 12.

²⁰Carroll, "Does the Universe Need God?," 192.

²¹Carroll, "Why (Almost All) Cosmologists Are Atheists," 12.

²²I am indebted to the anonymous reviewer for this possibility.

²³Carroll, *The Big Picture*, 147.

²⁴Robin Collins has provided a clear explanation of the likelihood principle:

[It] is a general principle of reasoning which tells us when some observation counts as evidence in favor of one hypothesis over another. *Simply put, the principle says that whenever we are considering two competing hypotheses, an observation counts as evidence in favor of the hypothesis under which the observation has the highest probability (or is the least improbable).* (Or, put slightly differently, the principle says that whenever we are considering two competing hypotheses, H_1 and H_2 , an observation, O , counts as evidence in favor of H_1 over H_2 if O is more

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probable under H_1 than it is under H_2 .) Moreover, the degree to which the evidence counts in favor of one hypothesis over another is proportional to the degree to which the observation is more probable under the one hypothesis than the other. (Collins, "The Fine-Tuning Design Argument," accessed June 16, 2017, <http://home.messiah.edu/~7Ercollins/Fine-tuning/FINETLAY.HTM>)

²⁵Carroll, "Does the Universe Need God?," 195.

²⁶Carroll, "Why (Almost All) Cosmologists Are Atheists," 7.

²⁷Craig vs. Carroll Debate, "God and Cosmology," italics mine.

²⁸Ibid.

²⁹For a good summary of theistic responses to the problem of evil and the problem of divine hiddenness, see Michael J. Murray and Michael Rea, *An Introduction to the Philosophy of Religion* (Cambridge, UK: Cambridge University Press, 2008), chap. 6. For a good explication of a Christian/biblical conception of the mind-body relation, see John W. Cooper, *Body, Soul and Life Everlasting: Biblical Anthropology and the Monism-Dualism Debate* (Grand Rapids, MI: Eerdmans, 1989).

³⁰See, for example, Swinburne, *Is There a God?*, rev. ed. (Oxford, UK: Oxford University Press, 2010), chap. 6; John Hick, *Evil and the God of Love*, 2nd ed. (New York: Harper and Row, 1977).

³¹William Lane Craig and James D. Sinclair, "The Kalam Cosmological Argument," in *The Blackwell Companion to Natural Theology*, ed. William Lane Craig and J. P. Moreland (West Sussex, UK: Wiley-Blackwell, 2012), 103–25.

³²Jeffrey Koperski, *The Physics of Theism: God, Physics, and the Philosophy of Science* (Malden, MA: Wiley Blackwell, 2015), 85.

³³Robin Collins, "The Teleological Argument: An Explanation of the Fine-Tuning of the Universe," in *The Blackwell Companion to Natural Theology*, ed. Lane Craig and Moreland, 274–75.

³⁴Klaas Landsman, "The Fine-Tuning Argument: Exploring the Improbability of Our Existence," in *The Challenge of Chance: A Multidisciplinary Approach from Science and the Humanities*, ed. Klaas Landsman and Ellen van Wolde (Switzerland: SpringerNature, 2016), 122–24.

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