

# The design argument

The different versions of the cosmological argument we discussed over the last few weeks were arguments for the existence of God based on extremely abstract and general features of the universe, such as the fact that some things come into existence, and that there are some contingent things.

The argument we'll be discussing today is not like this. The basic idea of the argument is that if we pay close attention to the details of the universe in which we live, we'll be able to see that that universe must have been created by an intelligent designer.

This **design argument**, or, as its sometimes called, the **teleological argument**, has probably been the most influential argument for the existence of God throughout most of history.

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The fifth way is taken from the governance of the world. We see that things which lack knowledge, such as natural bodies, act for an end, and this is evident from their acting always, or nearly always, in the same way, so as to obtain the best result. Hence it is plain that they achieve their end, not fortuitously, but designedly. Now whatever lacks knowledge cannot move towards an end, unless it be directed by some being endowed with knowledge and intelligence; as the arrow is directed by the archer. Therefore some intelligent being exists by whom all natural things are directed to their end; and this being we call God.

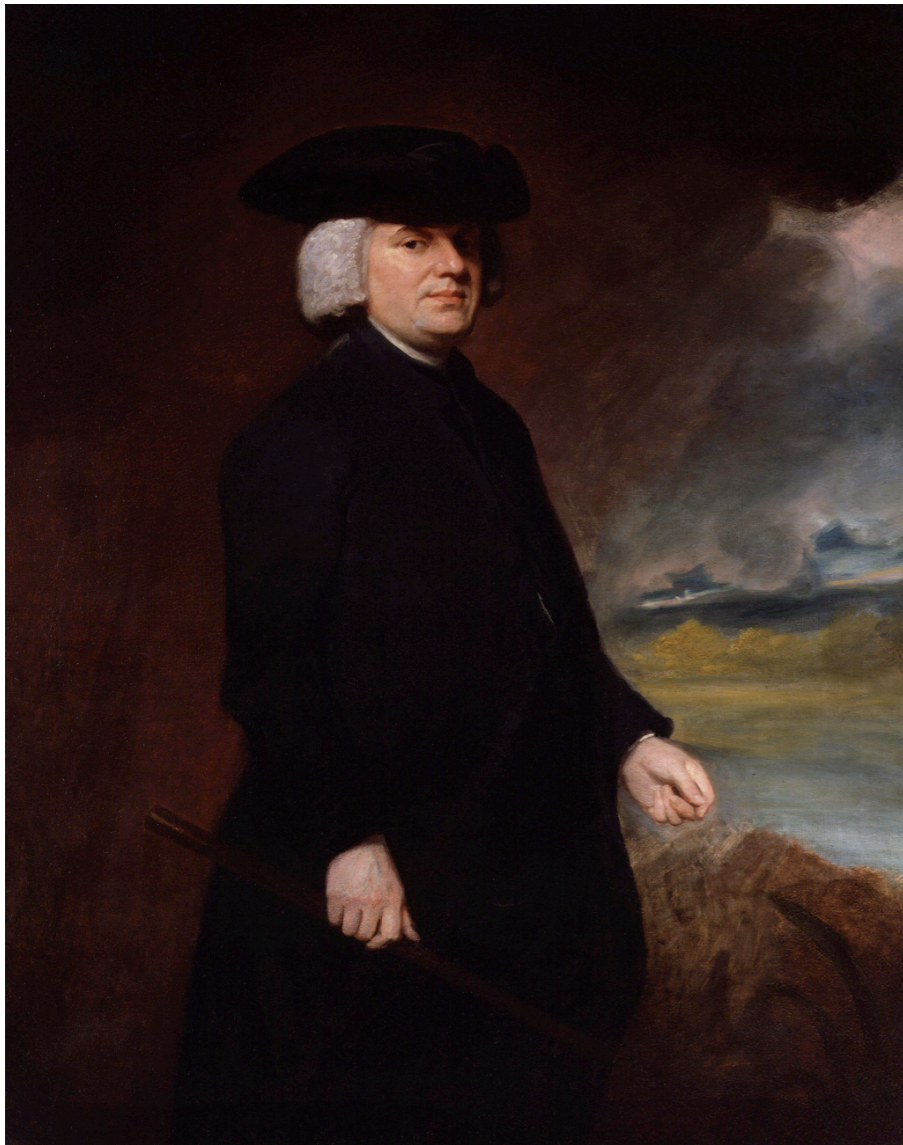
Aquinas is noting that things we observe in nature, like plants and animals, typically act in ways which are advantageous to themselves. Think, for example, of the way that many plants grow in the direction of light.

Clearly, as Aquinas says, plants don't do this because they **know** where the light is; as he says, they "lack knowledge." But then how do they manage this? What does explain the fact that plants grow in the direction of light, if not knowledge?

Aquinas' answer to this question is that they must be "directed to their end" - i.e., designed to be such as to grow toward the light - by something which does have knowledge of their ends. And what could this "something" be other than God?

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Later writers filled this gap in Aquinas’ argument, by providing reasons to think that the end-directed behavior of living things shows that the universe must have been designed.

Perhaps the fullest development of this argument was provided by William Paley, an 18th century English philosopher and theologian, in his book *Natural Theology*.

This book is filled with careful and detailed discussions of various facets of the natural world, each of which Paley employs in his argument for the existence of an intelligent designer of the universe.

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I know no better method of introducing so large a subject, than that of comparing a single thing with a single thing; an eye, for example, with a telescope.\* As far as the examination of the instrument goes, there is precisely the same proof that the eye was made for vision, as there is that the telescope was made for assisting it. They are made upon the same principles; both being adjusted to the laws by which the transmission and refraction of rays of light are regulated. I speak not of the origin of the laws themselves; but, such laws being fixed,\* the construction, in both cases, is adapted to them. For instance; these laws require, in order to produce the same effect, that the rays of light, in passing from water into the eye, should be refracted by a more convex surface, than when it passes out of air into the eye. Accordingly we find, that the eye of a fish, in that part of it called the crystalline lense, is much rounder than the eye of terrestrial animals. What plainer manifestation of design can there be than this difference? What could a mathematical instrument-maker have done more, to shew his knowledge of his principle, his application of that knowledge, his suiting of his means to his end; I will not say to display the compass or excellency of his skill and art, for in these all comparison is indecorous, but to testify counsel, choice, consideration, purpose?

Here, as in many other places throughout the book, Paley is comparing an aspect of the natural world - in this case, the construction of the eye - and an artefact -- in this case, a telescope.

The resemblance between the two is that both the parts of the eye and the parts of the telescope are set up perfectly for a certain purpose: in this case, the production of an accurate image of physical objects on the basis of the light reflected off of those objects.

Further, Paley emphasizes, in either case very small changes to the parts of the instrument, or the way that they are combined, would make the instrument wholly unable to serve its purpose.



IN crossing a heath, suppose I pitched my foot against a *stone*, and were asked how the stone came to be there, I might possibly answer, that, for any thing I knew to the contrary, it had lain there for ever: nor would it perhaps be very easy to shew the absurdity of this answer. But suppose I had found a *watch*\* upon the ground, and it should be enquired how the watch happened to be in that place, I should hardly think of the answer which I had before given, that, for any thing I knew, the watch might have always been there. Yet why should not this answer serve for the watch, as well as for the stone? Why is it not as admissible in the second case, as in the first? For this reason, and for no other, viz. that, when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose, e.g. that they are so formed and adjusted as to produce motion, and that motion so regulated as to point out the hour of the day; that, if the several parts had been differently shaped from what they are, of a different size from what they are, or placed after any other manner, or in any other order, than that in which they are placed, either no motion at all would have been carried on in the machine, or none which would have answered the use, that is now served by it.

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This thought leads Paley to a famous thought-experiment.

Suppose that one found some object which is like an eye or telescope in this way, like a watch, and we didn't know where this watch could have come from.

Would we, in this case, believe that the watch must have been designed by some intelligent watchmaker or other, or would we think that, for example, the watch simply came to be by chance?

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Would we, in this case, believe that the watch must have been designed by some intelligent watchmaker or other, or would we think that, for example, the watch simply came to be by chance?

The answer, Paley thinks, is clear: we would conclude that it must have been designed by an intelligent watchmaker. The opposite view seems ridiculous.

But, Paley thinks, this is exactly the view into which an atheist is forced. After all, we see in the world around us many examples of things, like the eyes of animals, which show the marks of design. This is relevantly just like finding a bunch of watches without knowing where they came from: we have found a whole *world* of well-designed creatures rather than just a single watch; so if it was reasonable to conclude that a watch must have been designed by an intelligent watchmaker, it is that much more reasonable to conclude that the natural world we find around us must have been designed by an intelligent creator.

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Here is one way to make Paley's line of reasoning explicit; as above, let's say that an object has the "marks of design" if its parts are finely-tuned to its purpose.

### Paley's design argument

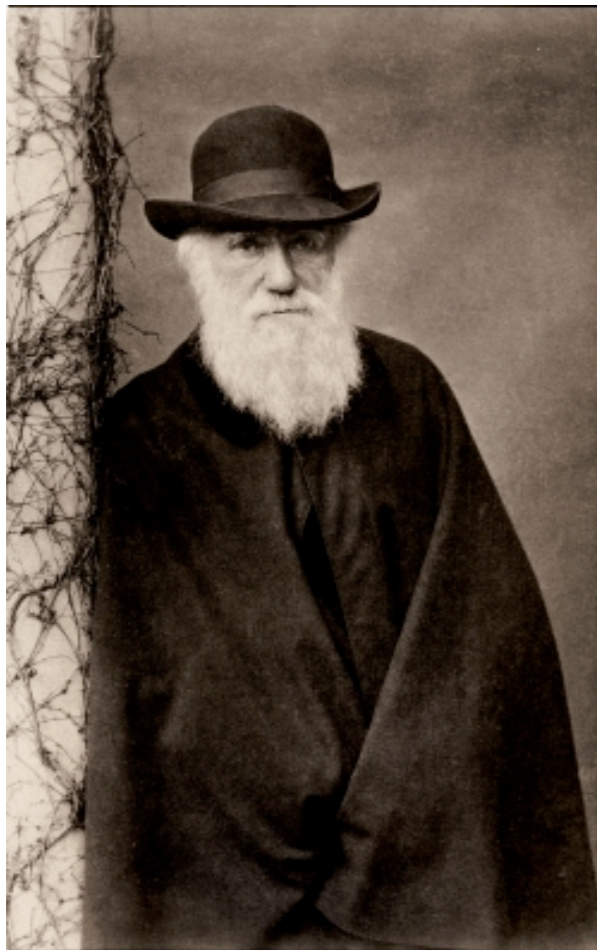
1. Many things in nature, like eyes, show the marks of design.
  2. These things must either have been created by an intelligent designer or produced by random natural processes.
  3. Random natural processes never, or almost never, produce things with the marks of design.
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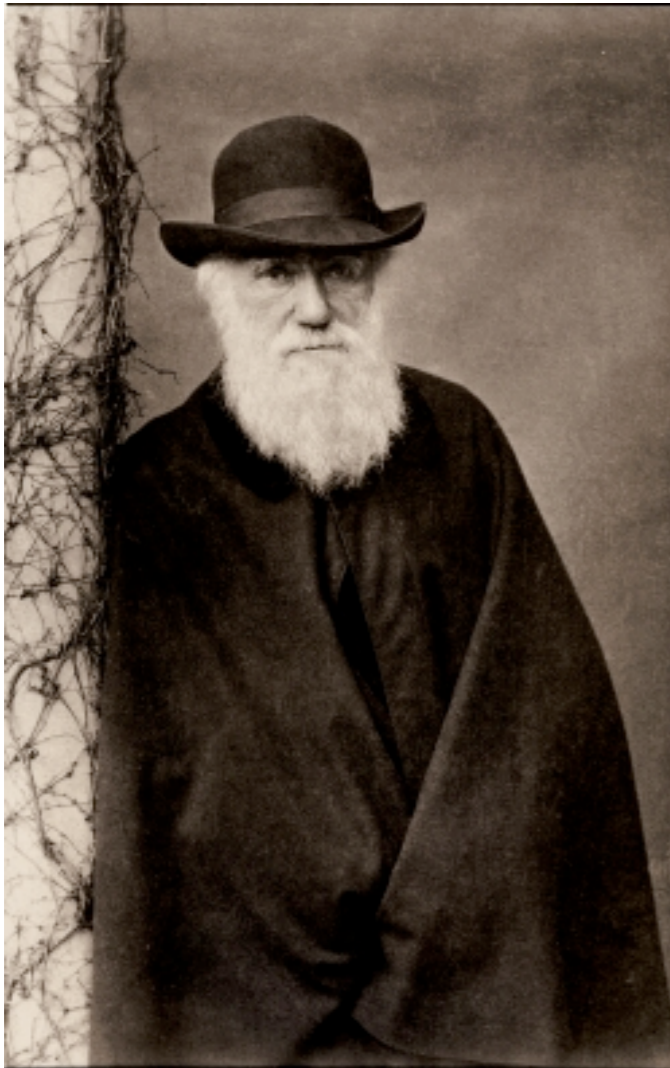
This argument for God's existence, however, faces an important challenge of which Paley could not have been aware.



This challenge came not from a philosopher finding a flaw in Paley's argument, but rather from Darwin's development of the theory of evolution. This theory provides very strong reason to doubt premise 3 of Paley's argument.

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Consider, for example, Darwin's discussion of the eye:

It is scarcely possible to avoid comparing the eye with a telescope. We know that this instrument has been perfected by the long-continued efforts of the highest human intellects; and we naturally infer that the eye has been formed by a somewhat analogous process. But may not this inference be presumptuous? Have we any right to assume that the Creator works by intellectual powers like those of man? If we must compare the eye to an optical instrument, we ought in imagination to take a thick layer of transparent tissue, with spaces filled with fluid, and with a nerve sensitive to light beneath, and then suppose every part of this layer to be continually changing slowly in density, so as to separate into layers of different densities and thicknesses, placed at different distances from each other, and with the surfaces of each layer slowly changing in form. Further we must suppose that there is a power, represented by natural selection or the survival of the fittest, always intently watching each slight alteration in the transparent layers; and carefully preserving each which, under varied circumstances, in any way or in any degree, tends to produce a distincter image. We must suppose each new state of the instrument to be multiplied by the million; each to be preserved until a better one is produced, and then the old ones to be all destroyed. In living bodies, variation will cause the slight alterations, generation will multiply them almost infinitely, and natural selection will pick out with unerring skill each improvement. Let this process go on for millions of years; and during each year on millions of individuals of many kinds; and may we not believe that a living optical instrument might thus be formed as superior to one of glass, as the works of the Creator are to those of man?

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Darwin's theory shows how random natural processes could, over time, produce things with the marks of design. This theory seems to destroy Paley's argument, as Darwin himself noted in his autobiography:

“The old argument of design in nature, as given by Paley, which formerly seemed to me so conclusive, fails, now that the law of natural selection had been discovered. We can no longer argue that, for instance, the beautiful hinge of a bivalve shell must have been made by an intelligent being, like the hinge of a door by man. There seems to be no more design in the variability of organic beings and in the action of natural selection, than in the course which the wind blows. Everything in nature is the result of fixed laws.”

Often very bold claims are made on behalf of the theory of evolution; sometimes it is even claimed that the theory shows that God does not exist. It is hard to see why this should be so. But it does seem that the theory undermines one historically important argument for the existence of God.

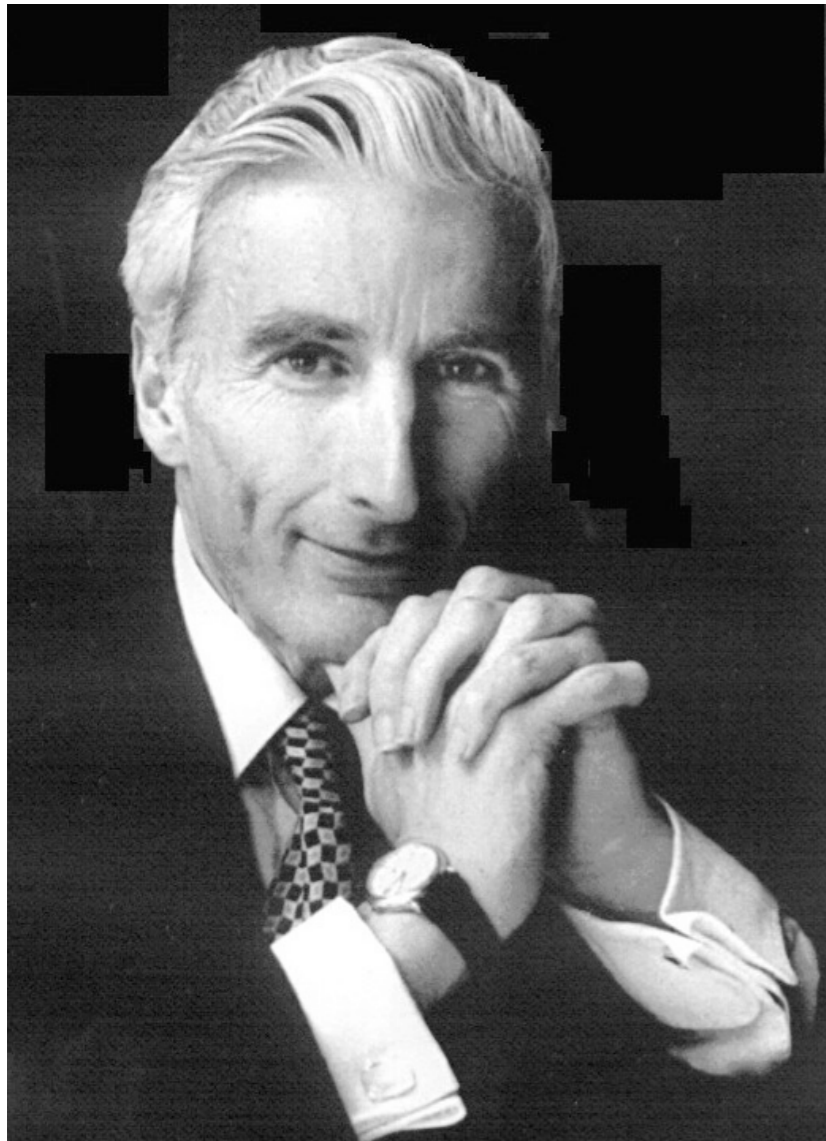
The theory of evolution does not, however, destroy every version of the design argument, since not all versions of the design argument are based on the explanation of the features of living things.

One might think of Darwin's reply to Paley as posing a challenge to the defender of the design argument: which aspects of the universe are not explained by the theory of evolution by natural selection, and yet are such that they are better explained by God than by chance?



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Contemporary physics suggests an answer to this question, which is illustrated by today's short excerpt from the book *Just Six Numbers*, by Martin Rees, a well-known astrophysicist and cosmologist.



Rees describes six constants which figure in the fundamental laws of nature, and to a large extent shape the nature of the universe. Here is one of them:

The cosmos is so vast because there is one crucially important huge number  $\mathcal{N}$  in nature, equal to 1,000,000,000,000,000,000,000,000,000,000. This number measures the strength of the electrical forces that hold atoms together, divided by the force of gravity between them. If  $\mathcal{N}$  had a few less zeros, only a short-lived miniature universe could exist: no creatures could grow larger than insects, and there would be no time for biological evolution.

And here's what Rees says about the six numbers:

These six numbers constitute a 'recipe' for a universe. Moreover, the outcome is sensitive to their values: if any one of them were to be 'untuned', there would be no stars and no life. Is this tuning just a brute fact, a coincidence?

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These remarks can be turned into an argument for the existence of God. (Though, as we'll see, it is not an argument that Rees himself accepts.) To see how this argument works, we will have to think a bit about what sorts of evidence can confirm a theory.

Consider the following two theories:

T1: It rained last night.

T2: It did not rain last night.

Suppose that I am considering these two theories this morning as I walk out of my front door, and, as I walk out the door, I come across a bit of evidence which might help me decide which of T1 and T2 are true:

E: My sidewalk is wet.

Does E count in favor of T1 or T2? Why?

One natural answer is that E counts in favor of T1 because of the following fact: **if T1 is true, then E is quite likely to be true, whereas if T2 is true, E is quite unlikely to be true.**

This suggests the following *principle of confirmation*:

Evidence E favors T1 over T2 if E would be more likely to be true if T1 is true than if T2 is true.



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Using the language of probability, this can be put as follows. To talk about the likelihood of an event happening is to talk about its **probability**, which can be represented as a number between 0 and 1.

We can also talk about **conditional probability**, which is the likelihood of something to happen in the condition that something else happens. When we want to talk about the likelihood of X happening if Y happens, we talk about **the probability of X given Y**.

In these terms, we can state the principle of confirmation as follows:

### **The principle of confirmation**

E is evidence for T1 over T2 if the probability of E given T1 > the probability of E given T2.

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This principle suggests the following further claim: if E is *extremely* likely to be true if T1 is true, and *extremely* likely to be false if T2 is true, then if E is true, this is very strong evidence that T1 rather than T2 is true.

Now consider the following piece of evidence which we seem to possess:

LIFE: The universe is such as to permit life to exist.

And now consider the following two theories about the universe:

CREATION: The universe was designed by a creator who wanted life to exist.

CHANCE: The basic physical constants of the universe are due to chance, rather than intelligent design.

The probability of E given T1 -- the chance of E being true if T1 is true -- is extremely high. This is not really debatable.

One of the apparent consequences of the work of Rees and others is that the probability of E given T2 -- the chance of E being true if T2 is true -- is extremely low.

If this is correct, then it follows from what we have said so far that E -- the fact that the universe is life-supporting -- is extremely strong evidence that T1, rather than T2, is true.

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If this is correct, then it follows from what we have said so far that LIFE is extremely strong evidence that CREATION, rather than CHANCE, is the correct theory.

This is often called the **fine-tuning argument** for God's existence. It may be put as follows:

### The fine-tuning argument

1. The probability of LIFE given CREATION is extremely high.
2. The probability of LIFE given CHANCE is extremely low.
3. The principle of confirmation.

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C. LIFE is evidence for CREATION over CHANCE.

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These six numbers constitute a 'recipe' for a universe. Moreover, the outcome is sensitive to their values: if any one of them were to be 'untuned', there would be no stars and no life. Is this tuning just a brute fact, a coincidence? Or is it the providence of a benign Creator? I take the view that it is neither. An infinity of other universes may well exist where the numbers are different. Most would be stillborn or sterile. We could only have emerged (and therefore we naturally now find ourselves) in a universe with the 'right' combination.

Here Rees contemplates the possibility that our universe, with its laws of nature, is only one of many, many universes.

Let's suppose that this is true - that our universe is only one among many in the multiverse. Would this cast doubt on any of the premises of the fine-tuning argument?

So if we have good reason to believe in the multiverse, this has the makings of a good objection to the fine-tuning argument. But do we have good reason to believe in the multiverse?



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So if we have good reason to believe in the multiverse, this has the makings of a good objection to the fine-tuning argument. But do we have good reason to believe in the multiverse?

One might think that LIFE provides us with extremely strong evidence for the existence of the multiverse. After all, isn't the probability that a universe is life-permitting **given the existence of the multiverse** higher than if not? If so, the principle of confirmation itself seems to count strongly in favor of the multiverse.

But this argument is not convincing. Consider the following analogy:

I am sitting in my office, and I pick up 12 dice and decide to roll them. I roll all sixes. Amazed, I think to myself: there must be lots of people rolling dice in Malloy Hall right now. After all, what are the odds that someone rolls 12 sixes in Malloy in the case where there is just one person rolling dice?

Something is odd here; my rolling 12 sixes is certainly surprising, but it is not evidence for the existence of many rollers. Why not?

The explanation of what's going on here shows that we have to be careful in thinking about what, exactly, our evidence is. In particular, we need to keep the following two pieces of evidence separate:

Evidence 1: I rolled 12 sixes.

Evidence 2: Someone in Malloy Hall rolled 12 sixes.

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Evidence 1: I rolled 12 sixes.

Evidence 2: Someone in Malloy Hall rolled 12 sixes.

If my evidence is #2, **then** it looks like I have some evidence for the existence of many rollers. But in the above case my evidence is #1; and the existence of many rollers would **not** make it more likely that **I** would roll 12 sixes.

Now think about the fine-tuning argument and the multiverse. Just as in the dice case, we have to be careful to distinguish the following two pieces of evidence:

Evidence 1: This particular universe is life supporting.

Evidence 2: Some universe or other is life-supporting.

Which piece of evidence do we have? What does this show about the argument that LIFE is evidence for the existence of the multiverse?

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Which piece of evidence do we have? What does this show about the argument that LIFE is evidence for the existence of the multiverse?

One might defend the above argument for the multiverse as follows:

Yes, it is true that we have piece of evidence #1 - we know that our universe is life-supporting. But we **also** have piece of evidence #2 - after all, if our universe is life supporting, it follows that **some** universe is. So if evidence #2 supports the multiverse, it looks like we have good evidence for the multiverse after all.

However, there is something odd about setting aside evidence that some particular thing is F and reasoning from the weaker claim that something or other is F. Consider the following use of this sort of reasoning, which is due to Roger White:

I wake up in the morning feeling hung over. Since I know that I am hung over, I know that someone in my house is hung over. If my house-mate drank too much last night, then this raises the probability that someone in my house will be hung over this morning; hence my being hung over provides evidence that my house-mate drank too much last night.

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To sum up our discussion of the multiverse so far: it does seem that if we have good reason to believe in the multiverse, then this is a problem for the fine-tuning argument. But so far we have not seen how we might argue for the existence of the multiverse; the idea that we can argue for this on the basis of LIFE runs into a number of problems.

Can you think of any other evidence that one might give for the multiverse?

There is one other line of objection to the fine-tuning argument worth considering.



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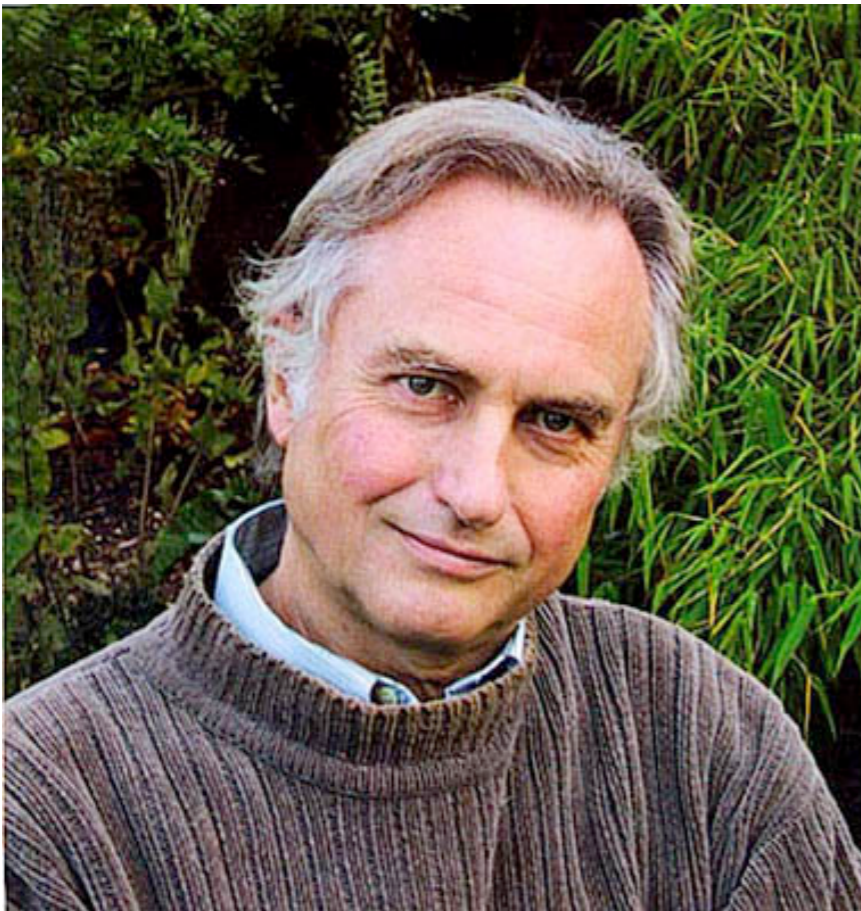
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This objection has been defended by, among others, Richard Dawkins in his book *The God Delusion*.



The theist says that God, when setting up the universe, tuned the fundamental constants of the universe so that each one lay in its Goldilocks zone for the production of life. It is as though God had six knobs that he could twiddle, and he carefully tuned each knob to its Goldilocks value.

Biologists, with their raised consciousness of the power of natural selection to explain the rise of improbable things, are unlikely to be satisfied with any theory that evades the problem of improbability altogether. And the theistic response to the riddle of improbability is an evasion of stupendous proportions. It is more than a restatement of the problem, it is a grotesque amplification of it. Let's turn, then, to the anthropic alternative. The anthropic answer, in its most general form, is that we could only be discussing the question in the kind of universe that was capable of producing us. Our existence therefore determines that the fundamental constants of physics had to be in their respective Goldilocks zones.



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There is one other line of objection to the fine-tuning argument worth considering.

Dawkins' main point seems to be expressed toward the end of this passage.

What he calls the “anthropic alternative” to explaining the universe involves the claim that our existence presupposes that the universe is life-supporting, so that, were the universe not life-supporting, we would not be around to discuss it.

He says, further, that our existence therefore **determines** the nature of the fundamental constants of physics.

Dawkins is not making the (ridiculous) claim that we someone set the fundamental physical constants of the universe. Rather, he is saying:

**If we exist, then the fundamental physical constants had to have been such as to permit life.**

The theist says that God, when setting up the universe, tuned the fundamental constants of the universe so that each one lay in its Goldilocks zone for the production of life. It is as though God had six knobs that he could twiddle, and he carefully tuned each knob to its Goldilocks value.

Biologists, with their raised consciousness of the power of natural selection to explain the rise of improbable things, are unlikely to be satisfied with any theory that evades the problem of improbability altogether. And the theistic response to the riddle of improbability is an evasion of stupendous proportions. It is more than a restatement of the problem, it is a grotesque amplification of it. Let's turn, then, to the anthropic alternative. The anthropic answer, in its most general form, is that we could only be discussing the question in the kind of universe that was capable of producing us. Our existence therefore determines that the fundamental constants of physics had to be in their respective Goldilocks zones.

## The fine-tuning argument

1. The probability of LIFE given CREATION is extremely high.
2. The probability of LIFE given CHANCE is extremely low.
3. The principle of confirmation.

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C. LIFE is evidence for CREATION over CHANCE.

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## The principle of confirmation

E is evidence for T1 over T2 if the probability of E given T1 > the probability of E given T2.

This claim is, of course, true. (If it were not correct, then the fine-tuning argument would make no sense.) But it is not easy to see how it could be relevant to the fine-tuning argument.

Dawkins is not proposing a third alternative to CREATION and CHANCE; and he does not seem to be giving an objection to any of the premises of the fine-tuning argument.

Let's suppose that both the multiverse and the anthropic objection to the fine-tuning argument fail. It is worth emphasizing that we would still not have a **proof** of the existence of God. We would have an argument that facts about the fundamental physical constants provides evidence for the theory that God exists as against the theory that God does not exist.

Because of the kind of argument it is, the argument does not, strictly speaking, show that the existence of God is even probable. What it shows, if successful, is that **whatever probability you assigned to the existence of God before encountering these facts about the fine-tuning of the universe, you should raise your probability assignment significantly.**

An analogy here might help. Suppose you observe that I begin class every day at 2:01. Now consider the theory that an alien controls my brain and that this alien desires very strongly that this particular class should begin every day at 2:01. How likely is it that class would begin every day at 2:01 if this theory is true? Does this mean that you should think that this theory is likely to be true?

What this kind of case shows is that an observation might count in favor of a certain theory, but that, because the theory was antecedently so improbable, the theory remains quite improbable, even given the observation. Some atheists might take this attitude to the fine-tuning argument: that it significantly raises the probability that God exists, but that theism is still quite improbable, all things considered. They might think this because they think that there are good arguments against the existence of God.

But despite these limitations, if the objections we discussed to this argument can be overcome, it seems plausible that the fine-tuning argument might accomplish one aim that one might have for arguments for the existence of God: it might make it rational for someone who did not previously believe that God exists to form that belief.