

# Arguments from Design

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God, Faith and Infinity » Lecture 3

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# The Argument from Design

# Teleological Explanations

- › *Teleology* comes from the Greek *telos*, meaning ‘goal’ or ‘aim’. So a teleological explanation is one that cites **purposes**.
- › Purposes are one of Aristotle’s ‘four causes’ – four kinds of explanations, or answers to ‘why?’ questions.

And again, a thing may be a [reason] as the end. That is what something is for, as health be what a walk is for. On account of what does he walk? We answer ‘To keep fit’ and think that, in saying that, we have given the [reason]. (Aristotle 1984, 195<sup>a</sup>33-5)

- › Teleological explanations are often appropriate when thinking about **rational action**, because the behaviour to be explained is the result of an **intention** or **plan** that aims at some end goal.

# Teleological Arguments

- › In this lecture we turn to Kant's third category: **teleological** arguments.
- › These are arguments for the existence of God with this rough form:
  - (T<sub>1</sub>) There is some natural phenomenon X.
  - (T<sub>2</sub>) The best explanation of X is a teleological one, citing some agent and its plans.
  - (T<sub>I</sub>) So some agent exists and brought about X. (**Inference to the best explanation**, T<sub>1</sub>, T<sub>2</sub>)
  - (T<sub>3</sub>) But no finite/imperfect agent could have brought about X.
  - (T<sub>C</sub>) So an infinite/perfect agent (i.e., God) exists. (deduction, T<sub>I</sub>, T<sub>3</sub>)

# Inference to the Best Explanation

- › These arguments are at least **quasi-scientific** in two senses:
  1. They involve contingent empirical premises (e.g., at T1); and
  2. They involve **ampliative** inference (that goes beyond the premises), as in science, not pure logical deduction:

In making this inference one infers, from the fact that a certain hypothesis would explain the evidence, to the truth of that hypothesis. In general, there will be several hypotheses which might explain the evidence, so one must be able to reject all such alternative hypotheses before one is warranted in making the inference. Thus one infers, from the premise that a given hypothesis would provide a “better” explanation for the evidence than would any other hypothesis, to the conclusion that the given hypothesis is true.

There is, of course, a problem about how one is to judge that one hypothesis is sufficiently better than another hypothesis. Presumably such a judgment will be based on considerations such as which hypothesis is simpler, which is more plausible, which explains more, which is less *ad hoc*, and so forth. (Harman 1965: 89)

# (Organismic) Design Arguments as Teleological Arguments

- (D<sub>1</sub>) Natural organisms and their environment display a high degree of internal **complexity** and **suitability** to each other.
  - (D<sub>2</sub>) The best explanation for complexity is that those organisms were **designed**, and for suitability, that they and their environment were **designed for** each other.
  - (DI) A designer exists. (D<sub>1</sub>, D<sub>2</sub>, inference to the best explanation)
  - (D<sub>3</sub>) No finite organism could have designed things of such complexity – ‘we were altogether incapable of executing such a piece of workmanship ourselves, or of understanding in what manner it was performed’ (Paley 1802: 4).
  - (DC) The designer is an infinite being, i.e., God. (DI, D<sub>3</sub>)
- › Is the ‘God’ of this conclusion the same God we’ve been talking about? (Sober 2003: 34)

# Paley's Watch

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... it had lain there for ever.... 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.... Yet why should not this answer serve for the watch as well as for the stone? ... 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; ... the inference, we think, is inevitable, that the watch must have had a maker: that there must have existed, at some time and at some place or other, an artificer or artificers who formed it for the purpose which we find it actually to answer; who comprehended its construction, and designed its use. (Paley 1802: 1-3)

# Paley's Application to Atheism

- › But, says Paley, the atheist would have to **reject** this 'inevitable' conclusion.

every indication of contrivance, every manifestation of design, which existed in the watch, exists in the works of nature; with the difference ... that the contrivances of nature surpass the contrivances of art .... (Paley 1802: 19)

- ›› If the atheist doesn't conclude that God exists on the basis of the astounding design of the 'works of nature', then they ought not to conclude that a watchmaker exists on the basis of the pretty good design of the watch.

# The 'Inevitable Conclusion'

- › Note that Paley's argument doesn't present on its face as a design argument in our sense, since he talks of the design conclusion being **inevitable** – i.e., the **only** explanation – rather than just the best explanation.
  - › It is not likely to strike us, even in the watch case, that design is the only explanation.
- › Even if we were convinced that the only way to explain a **device of brass and steel and glass** was that it is inevitably the product of design, it simply does not follow that that the only way to explain a **organism of muscle and sinew and bone** is that it is inevitably the product of design.
- › The markers we see in artefacts like the watch –
  1. unnatural materials;
  2. being out of keeping with their environment;
  3. meeting a familiar human desire– are just not present in organisms.

# Other Explanations

- › It is quite clear from his discussion that Paley doesn't really think the design conclusion is inevitable anyway. The objections he considers all seem to be attempts to show that other explanations are **inadequate**, not that they don't exist (Paley 1802: 4–8).
- › So he says that 'any man in his senses' would not think the watch came about by a chance 'combination of material forms' (Paley 1802: 6).
  - ›› But surely there is a scenario in which such a complex structure does come about **by chance** – if chance really did govern the natural order, it would seem to be a cosmic conspiracy if that particular structure was singled out as **not** able to be generated by chance.

# Manufacturing and Reproduction

- › The question Paley begins enquiring into is: 'how the watch happened to be in that place'. The answer, he thinks, is that it must involve a designer.
- › Note that it must fairly directly involve a designer – watches, we assume, are **manufactured**.
- › But organisms are not – if we consider what we might answer to the question, *how did this plant get here?*, we would naturally respond: *it grew there, from a seed produced ultimately by another plant*.
- › Paley wants to argue that this alternative **reproductive** answer nevertheless doesn't undermine the design hypothesis.

# Paley on reproducing watches

Though it be now [once we find the reproductive capability] no longer probable that the individual watch which our observer had found was made immediately by the hand of an artificer, yet does not this alteration in anyway affect the inference that an artificer had been originally employed and concerned in the production. The argument from design remains as it was. ... No one ... can rationally believe that the insensible, inanimate watch, from which the watch before us issued, was the proper cause of the mechanism we so much admire in it... (Paley 1802: 11-13)

- › Rather, he argues, a **reproductive capability** is yet more evidence of design – assuming it occurs in **something we already take to be designed**.

# **Criticisms of the Organismic Design Argument**

# Is the Inference Warranted?

- › Recall Harman: ‘there will be several hypotheses which might explain the evidence, so one must be able to reject all such alternative hypotheses before one is warranted in making the inference’.
- › The only alternative Paley explicitly considers is **mere possibility** (maybe **chance?**), and clearly the designer hypothesis is better than *that*:
  - Nor, fourthly, would any man in his senses think the existence of the watch ... accounted for, by being told that it was one out of possible combinations of material forms; that whatever he had found in the place where he found the watch, must have contained some internal configuration or other; and that this configuration might be the structure now exhibited, viz. of the works of a watch, as well as a different structure. (Paley 1802: 6)
- › But if we can come up with an **alternative hypothesis** which cannot be rejected in this way, we will be unwarranted in inferring the existence of a divine designer.

# Evolution

- › Paley suffers from a **failure of imagination** in coming up with alternative hypotheses.
- › For **evolution by natural selection** provides a process by which organismic complexity and suitability to the environment can emerge and increase over (a lot of) time, by the process of **adaptation**.
- › This involves **descent with modification**, under **selective pressure**:
  - › organisms can have offspring that differ in appearance and behaviour from them, and those differences will be preserved in any subsequent generations;
  - › Scarce resources will differentially favour some behaviours and appearances over others.
- › We need also the **auxiliary hypothesis** that there's been enough time for evolution to do its work – the target of 'young earth' creationists.

# The Power of the Evolutionary Explanation

- › Evolution blocks the inference to the best explanation argument for the designer, by providing a **better explanation** (at least, not a **worse** explanation).
  - › It is **more parsimonious**: we needn't invoke **special creation**, a specific divine act for each different species. Rather, we can get speciation **for free**.
  - › It is **more explanatory**: for we can not only explain the adaptedness of living things to their environments, but also some **maladaptations** (e.g., **deleterious mutations**, or cases where environmental change outpaces adaptability) and also **convergent evolution** (where similar environments involve distinct organisms occupying the same ecological niche – e.g., kangaroos and deer).
  - › It is **more general** – since we can make use of evolutionary reasoning in other circumstances as an alternative to design – e.g., evolutionary algorithms.

# Theistic Evolution: Response and Reply

- › One can imagine Paley responding as follows:

*If evolution is to explain complexity and environmental suitability, then we must have the preconditions for descent with modification - we must start with reproductive capability and heritability. But these are complex processes already - how could they just arise from nothing, without the input of a designer?*

- › You can't **evolve evolution itself**. This is the hypothesis of **theistic evolution**, that evolution is real but set in motion by God.
- › But we have some evidence that RNA molecules can (i) replicate themselves, and (ii) could have formed spontaneously given the 'goldilocks chemistry' of the early earth (Marshall 2011).

# Criticisms of Inference to the Best Explanation

- › Some criticisms of the design argument focus on IBE in general (van Fraassen 1989: ch. 6).
  - ›› Such criticisms have a lot of **collateral damage** – they undermine acceptance of the evolutionary hypothesis too.
- › One avenue of criticism of ampliative inference comes from David Hume, who argues that IBE can't provide **rational justification**:

I say then, that, even after we have experience of the operations of cause and effect, our conclusions from that experience are *not* founded on reasoning, or any process of the understanding. (Hume 1777: §4.16).
- › Why not? IBE only justifies belief if we assume that **best explanations are more likely to be true**.
- › But this assumption can be established **only by use of IBE**, which 'must be evidently going in a circle, and taking that for granted, which is the very point in question' (Hume 1777: §4.19).

# The Likelihood Approach

# Probability and Evidence

- › Ampliative arguments aren't deductively valid, so many mutually inconsistent hypotheses are compatible with the premises.
- › IBE aims to select one of these as the best, **qualitatively different** to the others, which gives us justification to neglect them.
- › Another approach is **quantitative**: to measure **how much support** these premises give to each of the hypotheses under consideration.
- › The standard tool here is **probability**, which is used in a couple of different approaches to understanding and measuring how some premises support, or **confirm**, various hypotheses.
- › The basic notion is **conditional probability**, the probability of  $A$  given  $B$ :

$$\Pr(A | B) \stackrel{\text{def}}{=} \frac{\Pr(A \wedge B)}{\Pr(B)}, \text{ when } \Pr(B) > 0.$$

- › What is probability  $\Pr$  (Eagle 2011; Friederich 2021: §2)? There are lots of different ideas, but the two main camps are that it represents **objective chance** or **subjective confidence**.

# Probability Refresher

- › A **probability** is a **function**: it assigns to every proposition drawn from some topical field  $\Omega$  a number in accordance with these rules: for any  $A$  and  $B$  in  $\Omega$ ,
  1.  $\Pr(\Omega) = 1$  – the probability that one of the possible propositions concerning our topic is true is 1;
  2.  $\Pr(A) \geq 0$  – no probability is less than 0;
  3.  $\Pr(A \vee B) = (\Pr(A) + \Pr(B)) - \Pr(A \wedge B)$  – the probability of either  $A$  or  $B$  is the sum of their individual probabilities, without double-counting their possible overlap.
- › Probability is thus – mathematically speaking – a **normed measure**. All this means is that it measures the **volume** of a proposition in some logical space; and that it is a **proportion** rather than an absolute size.

# An Alternative Logical Structure for Paley's Argument

The best version of the design argument, in my opinion, uses an inferential idea that probabilists call the *likelihood principle* (LP). This can be illustrated by way of Paley's (1802) example of the watch on the heath. Paley describes an observation that he claims discriminates between two hypotheses:

- (W) O1: the watch has features  $G_1, \dots, G_n$ .
- W1: the watch was created by an intelligent designer.
- W2: the watch was produced by a mindless chance process.

Paley's idea is that O1 would be unsurprising if W1 were true, but would be very surprising if W2 were true. This is supposed to show that O1 favours W1 over W2; O1 supports W1 more than it supports W2. (Sober 2003: 26)

# The Likelihood Principle

Surprise is a matter of degree; it can be captured by the concept of conditional probability. The probability of observation ( $O$ ) given hypothesis ( $H$ ) -  $\Pr(O | H)$  - represents how unsurprising  $O$  would be if  $H$  were true. LP says that comparing such conditional probabilities is the way to decide what the direction is in which the evidence points:

(LP) Observation  $O$  supports hypothesis  $H_1$  more than it supports hypothesis  $H_2$  if and only if  $\Pr(O | H_1) > \Pr(O | H_2)$ . (Sober 2003: 26-27)

# The Likelihood Design Argument (LDA)

- (D<sub>1</sub>) Natural organisms and their environment display a high degree of internal complexity and suitability to each other.
- (L<sub>2</sub>) The probability of (D<sub>1</sub>) given that natural organisms were designed exceeds the probability of (D<sub>1</sub>) given that natural organisms obtained their features by 'mindless chance'.
- (L<sub>1</sub>) The evidence supports, or favours, the hypothesis that a designer exists over the rival hypothesis of mindless chance. (D<sub>1</sub>, L<sub>2</sub>, LP)
- (D<sub>3</sub>) No finite organism could have designed things of such complexity – 'we were altogether incapable of executing such a piece of workmanship ourselves, or of understanding in what manner it was performed' (Paley 1802: 4).
- (LC) The evidence supports the hypothesis of perfect designer, i.e., God, over the rival hypothesis of chance (L<sub>1</sub>, D<sub>3</sub>)

# Likelihoods and Probabilities

- › The conclusion of the Likelihood Design Argument (LDA) is very different than the original version: it is **comparative**, rather than absolute.
- › This is because **likelihoods** (conditional probabilities of observations given hypotheses) do not settle the probability of hypotheses given the evidence.
  - › For that you also need the **prior probabilities of the hypotheses**:

$$\Pr(H_1 | O) > \Pr(H_2 | O) \text{ iff } \Pr(O | H_1) \underbrace{\Pr(H_1)}_{\text{prior}} > \Pr(O | H_2) \underbrace{\Pr(H_2)}_{\text{prior}}.$$

This explains why the likelihood version of the design argument does not show Design is more probable than Chance. ... I see no way to understand the idea that the two hypothesis have *objective* prior probabilities. Since I would like to restrict the design argument ... to matters that are objective, I will not represent it as an argument concerning which hypothesis is more probable. (Sober 2003: 27-28)

# Natural Selection Revisited

- › Sober makes the point that the comparative version of the argument only succeeds if we make the **right comparisons** – and Paley does not:

Paley addressed the alternative of uniform chance, not the alternative of natural selection.... Showing that Design is more likely than Chance leaves it open that some third, mindless, process might still have a higher likelihood than Design. This is not a defect in the design argument, so long as the conclusion of that argument is not overstated. (Sober 2003: 30-31)

- › But the weakened conclusion is – for us, with the live hypotheses we have available – next to **useless**.
  - ›› So the likelihood of the observed sex ratios given that the chance of a female birth is 0.5 is very low (Sober 2003: 30). But the likelihood of the observed sex ratio, given that parents want to maximise the number of grandchildren, is very high (Hamilton 1967).
- › Design doesn't come out better in the comparisons we actually want to make.

# Are We Likely Given Design?

- › Set aside those other hypotheses. The crucial premise in the argument Sober actually gives us is (L2), that what we observe is **more likely** given Design than it is given mere Chance.
- › Defenders of design often justify (L2) by arguing that what we observe is very **unlikely** given mere Chance.
- › But that is only **half the job**: they need also to argue that ‘Pr(O | Design) is higher’ (Sober 2003: 36).
- › But the kind of Designer who might have designed us is to us **incomprehensible**. So how do we have any idea what God’s intentions are, such that **the features we observe are made probable by his plan**?
- › As Anselm puts it,

[My understanding] does not grasp it; and the eye of my soul cannot bear to gaze at length upon it ... [and] is dazzled by its splendor, overcome by its vastness, overwhelmed by its immensity, confounded by its capacity. (Anselm 1078: §16)

# The Mysterious Designer

We are invited ... to imagine a designer who is radically different from the human craftsmen [sic] we know about. But if this designer is so different, why are we so sure that he would build the vertebrate eye in the form in which we find it? (Sober 2003: 36-37)

Our judgments about what counts as a sign of intelligent design must be based on empirical information about what designers often do and what they rarely do. As of now, these judgments are based on our knowledge of *human* intelligence. The more our hypotheses about intelligent designers depart from the human case, the more in the dark we are as to what the ground rules are for inferring intelligent design. ... The upshot of this point for Paley's design argument is this: *Design arguments for the existence of human (and human-like) watchmakers are often unproblematic; it is design arguments for the existence of God that leave us at sea.* (Sober 2003: 38-39)

# Fine-Tuning

# Theistic Responses to Design Arguments

- › The organismic design argument invokes God to explain a fairly **localised and specific** fact: the existence of creatures with a certain body plan here on Earth.
- › Evolutionary theory threatens to displace God from this particular explanatory role.
- › Some theists deny the evolutionary explanation, or some facts on which it rests – e.g., **young earth creationists** deny that the Earth is old enough for the evolutionary explanation to be viable.
- › Others will agree that evolution explains the local fact, but argue that the more ‘global’ or abstract fact of evolution itself stands in need of explanation.
- › Or perhaps the feature standing in need of explanation is even more global than that.

# Design of the World System

- › Many theists have argued that the **system of the world** - the laws of nature that permitted the complexity and structure we see around us – was designed.
- › This hypothesis is a refuge for contemporary proponents of theistic evolution: we do away with individual design and special creation in favour of a single primordial act of design, the setting up of the **laws of nature** in such a way that the formation of stars and planets, the origin of life, and its subsequent evolution, are all **expected** outcomes.
- › For, it is said, our universe is **fine-tuned** for life:
  - according to many physicists, the fact that the universe is able to support life depends delicately on various of its fundamental characteristics, notably on the form of the laws of nature, on the values of some constants of nature, and on aspects of the universe's conditions in its very early stages. (Friederich 2021)

# Fine-Tuning and Design

Assuming there is just the one universe, the fact that it is life-permitting is surprising. For this otherwise extremely improbable outcome of the big bang is more probable on the assumption that there is a cosmic designer, who might adjust the physical parameters to allow for the evolution of life. So the fine-tuning facts challenge us to question whether the big bang was merely an accident. (White 2000: 273)

- › The argument seems to be: the probability that life evolves given a designer is higher than the probability that life evolves given no designer. So, that life has evolved is evidence for a designer, because it makes design more probable.

# Uncertainty About Process

- › Not every **low-probability outcome needs explaining**.
- › If I toss a coin 1000 times, the outcome will have a very low probability. But there is no need to offer any further explanation as to why that outcome happened: the chance setup guarantees that some low-probability outcome will occur.
- › In the case of fine-tuning, however, we don't know the prior chance setup; if God had a role, there is no chance involved. So one of the things we're trying to figure out is **what process** generated the outcome.
- › Compare: suppose I toss a coin 1000 times and it lands heads every time.
  - › This is a possible outcome for a fair coin, and if I **knew** the coin was fair, no further explanation would be required.
  - › But if I am initially **unsure** whether the coin is fair or rigged, this should persuade me that the coin is rigged.
- › The proponent of fine-tuning wants to say: if you are unsure of the process that led to the creation of the universe, the existence of life is like tossing 1000 consecutive heads – it is evidence that **the universe is rigged**, i.e., set up by God to favour a particular outcome.

# The Bayesian Approach

- › Here, again, explicit appeals to IBE are replaced by probabilistic reasoning to the effect that fine-tuning **confirms** or **is evidence for** the existence of a designer.
- › The conclusion also seems to be **comparative**: that fine-tuning is better evidence for a designer than for the rival hypothesis that it was an ‘accident’.
- › We could analyse this using the likelihood framework, but the probabilistic conception of support White has in mind is this:

**Bayesian Confirmation**  $E$  confirms  $H$ , given background knowledge  $K$ , iff

$$\Pr_K(H | E) > \Pr_K(H) \text{ (White 2000: 261)}$$

- › This has the consequence that  $E$  confirms  $H$  just in case  $H$  gives  $E$  a higher **posterior probability** than it has if  $H$  is false – that if  $H$  would lead us to **expect**  $E$ , then  $E$  confirms  $H$ .
- › Note this is an absolute notion of confirmation, not merely comparative.

# What is Improbable About Fine-Tuning?

- › In what sense is fine-tuning ‘extremely improbable’?
- › It seems that it can't be **physical probability**, or **chance** – for that is just probability given the laws of nature, and they will tend to assign other ‘tunings’ – **alternative laws** – no chance whatsoever.
  - › It's not like there was some chance process after the big bang, like drawing from a big bag of universes, which lead to our universe being selected.
  - › While Sober wants to approach design using likelihoods because they are more ‘objective’, is there a non-trivial objective probability here?
- › So most think it will be a kind of **epistemic** probability, or **credence** – one which should reflect the fact that since there are lots of ways the universe could have been different and in which life would not have evolved, we should be **surprised** that we are in one of the few universes where life can evolve.
  - › We should not have **rationally expected** to be in such a narrow region of the space of possibilities.

# Is there any explanation needed?

- › Of course, in some sense this is not surprising **at all**. We already knew we were in a universe in which life evolved – we are alive!
- › I certainly would not have expected to find myself in a universe where life **didn't** evolve. So all of my confidence should **already** have reposed in those hypotheses according to which the laws of nature permitted life to evolve.
  - › One way of representing this is that the background information  $K$  should include 'We exist, and if we exist the constants must be right' (Sober 2003: 42).
  - › And if we ensure this, then the probability of fine-tuning will be trivial given **any** hypothesis, because if  $\Pr_K(\text{Fine-Tuning}) = 1$  then  $\Pr_K(\text{Fine-Tuning} \mid B) = 1$ , for any  $B$ .
- › This illustrates the **weak anthropic principle**:
  - what we can expect to observe must be restricted by the conditions necessary for our presence as observers. (Carter 1974: 291)
- › This trivialises the likelihoods, and thus guarantees no confirmation – on both the Bayesian and likelihoodist approaches.

# Ur-Probabilities

- › To make sense of the idea that there is still something to be surprised at here, proponents of the argument have opted to interpret  $Pr$  as an **ur-probability** (Monton 2006: §4):
  - ▮ rational credences of some counterfactual epistemic agent who is unaware that the constants are right for life (Friederich 2021: §3.3).
- › What is in need of explanation, on this view, is that a life-permitting universe exists, given that ‘reason alone’ would not lead us to rationally expect that outcome.
- › This isn’t quite the approach of objective likelihoodist, but they too need some kind of probability given background knowledge which doesn’t trivialise the fine-tuning evidence.
  - » This may even provide some grounds to favour the likelihood approach.
  - » Barnes (2020: 1223) argues that ur-probabilities are not needed; but it is totally unclear where the probability function he prefers comes from.

# Is Fine-Tuning a Brute Fact?

- › Even using the ur-probability approach, does the low rational prior probability that the universe is life-permitting need an explanation?
- › Sometimes things ‘just happen’ – maybe it is **brute fact** that the universe is fine-tuned, not explained by a chance mechanism or by divine intervention, because not needing explanation at all.

brute facts would presumably include the ultimate laws of physics, the fact that the universe contains a particular amount of matter or energy rather than some other amount, or the fact that the universe exists at all. These facts are ontologically brute just in case there is no underlying reason for their existence—they are simply the fundamental facts about reality from which all other facts in some sense derive. It suffices to simply stretch our imagination to conceive of a possible world consisting almost entirely of brute facts—imagine a universe that consisted of nothing but brightly colored explosions which each occurred for no reason whatsoever. (Barnes 1994: 62)

# Ur-Probabilities and Your Probabilities

- › If confirmation is about how **your** posterior credence reflects **your** evidence, why should you care about some hypothetical ur-agent with **different** credences and different evidence?
- › All this shows is that **someone** might find the evidence of fine-tuning boosts their confidence in a designer; it does not show that **you** should have your confidence so boosted.

I already knew that our universe was special, in the sense that there are many possible universes similar to ours in certain ways and yet not life-permitting. I already knew that, if God existed, God would have to choose to actualize our life-permitting universe from among a sea of similar non-life-permitting universes. I already knew that, if God did not exist, there's a sense in which we are lucky that the universe is life-permitting.... The fine-tuning evidence doesn't change any of that, and hence the fine-tuning evidence doesn't change my probability for the existence of God. (Monton 2006: 421)

- ›› See also Weisberg (2010: 433–34).

# Two Arguments from Fine-Tuning for Design

- (FTD<sub>1</sub>) 'A designer might prefer to bring about a universe which is inhabitable by other intelligent organisms, rather than a homogeneous cosmic soup' (White 2000: 270)
- (FTD<sub>2</sub>) So the probability that life evolves in our universe given a designer is relatively high. (FTD<sub>1</sub>)
- (FTD<sub>3</sub>) The chance occurrence of 'a single life-permitting universe is extremely improbable' (from fine-tuning (White 2000: 262; see also Barnes 2020).)
- (FTD<sub>4</sub>) So the probability that life evolves in our universe, given a designer, is higher than the probability that life evolves in our universe, given homogenous cosmic soup. (FTD<sub>2</sub>, FTD<sub>3</sub>)
- (FTDC-L) So: that life has evolved in our universe supports a designer more than it supports cosmic soup. (FTD<sub>4</sub>, LP)
- (FTDC-B) So: that life has evolved in our universe is evidence for a designer. (FTD<sub>4</sub>, Bayes)

# Old Worries Return

- › Just as with Paley's argument, there is a cloud hanging over FTD<sub>1/2</sub>. Why should we think that the kind of thing powerful enough to create a universe, and weird enough to exist before it came into existence, **would have any inclination to populate it with things like us?**
  - › Even if fine-tuning is designed, maybe we're a **by-product** of some other divinely-desired feature of the laws, one which our laws share with laws in many universes not containing life.
  - › Return to evolution: if it produces organisms, it almost certainly produces adapted organisms; that is consistent with the chance that it produced us, in particular, being very low, and indeed the chance of life at all being very low.
- › The claim at FTD<sub>3</sub> cannot, as is familiar, be read as a claim about our actual background knowledge.
  - › Since we know we exist, and that the constants must be fine-tuned, the probability right now that the constants are right in our universe must be 1, not 'extremely improbable'. (Sober 2003: 42)

# Is the Bayesian Argument Valid?

- › Moreover, the Bayesian conclusion FTDC-B **does not follow**. Fine-tuning only confirms design if the conditional probability of fine-tuning given design is higher than the prior.
  - › The prior ur-probability is the expectation of its conditional probabilities under various hypotheses.
  - › If we have many hypotheses – especially any that make fine-tuning probable (such as a hypothesis of ‘cosmic evolution’, parallel to the evolutionary hypothesis of organismic design) – the argument is invalid.
  - › It could be that the prior probability of life is higher than ‘relatively high’ if there are enough rival hypotheses that would make life probable if they were true.
- › However, if we are considering only these two hypotheses (chance or design), it **does** follow from (FTD<sub>4</sub>) that fine-tuning confirms the hypothesis of design.

# The Multiverse

# Resisting Design By Postulating the Multiverse

- › Many wish to **resist** the argument from fine-tuning for design, while accepting the claim FTD<sub>3</sub> that 'a single life-permitting universe is extremely improbable'.
- › So, they say, rather than conclude something improbable has happened as a **freak occurrence**, or conclude that there is a designer, why not conclude instead that there is not **merely** a single universe.
- › Rather, **there are many universes** (perhaps in a larger pluriverse) – and the probability that life evolves given lots of universes may be relatively high.
- › The multiverse argument doesn't **block** the likelihoodist design inference – it says that there is another non-theological hypothesis also supported by the fine-tuning data (i.e., giving it high likelihood).
  - › So fine-tuning really supports the **disjunction** *designer or multiverse*, and our theoretical preferences (prejudices?) may then inform which disjunct we regard as more probable overall.

# The Argument from Fine-Tuning for the Multiverse

- (FTM<sub>1</sub>) 'if we suppose there are or have been very many universes, it is to be expected that eventually a life-permitting one will show up' (White 2000: 262)
- (FTM<sub>2</sub>) So the probability that life evolves, given that there are lots of universes, is relatively high. (FTM<sub>1</sub>)
- (FTD<sub>3</sub>) 'a single life-permitting universe is extremely improbable' (White 2000: 262) (from fine-tuning)
- (FTM<sub>4</sub>) So the probability that life evolves, given that there are many universes, is higher than the probability that life evolves in our universe in the absence of other universes. (FTM<sub>2</sub>, FTD<sub>3</sub>)
- (FTMD-L) So that life has evolved supports the multiverse more than it supports cosmic soup. (FTM<sub>4</sub>, LP)
- (FTMD-B) So that life has evolved is evidence for the multiverse. (FTM<sub>4</sub>, Bayes)

# The Total Evidence Requirement

- › This argument is valid, I think. It is indeed more probable that life has evolved somewhere if there are lots of attempts – lots of other universes.
- › But there is a potential problem. The evidence we have isn't just that life has evolved **somewhere** – it is that life has evolved **here**.
- › Our evidence is thus **strictly logically stronger** than the claim *life evolves*.
- › And it is our **total evidence** that matters for support (White 2000: 264; Sober 2003: 35).
  - ›› If we neglect our total evidence, we can erroneously take hypotheses to be confirmed based on misleading parts of our evidence: this is **cherry-picking data**.
- › So we need to ask ourselves: if we replace 'life has evolved' with 'life has evolved **here**' throughout the above argument, does it still go through? In particular, does this revised claim follow from FTM<sub>1</sub>?
  - (FTM<sub>2</sub>\*) So the probability that life evolves here, given that there are lots of universes, is relatively high.

# The Inverse Gambler's Fallacy

- › Suppose we are rolling five dice simultaneously.
  - › If we suppose there are or have been very many rolls with five dice, it is to be expected that eventually a roll of five simultaneous 4s will come up – YAHTZEE! (Analogue of FTM<sub>1</sub>)
  - › So, the probability that **this roll** will have 5 simultaneous 4s, given that there are lots of rolls, is high. (Analogue of FTM<sub>2</sub>\*)
- › This is obviously **fallacious**: the probability that **some roll or other** will be five 4s may be high, but individual rolls are i.i.d. trials.
  - › The dice have no memory or sense of the other rolls, so each individual roll has the same chance of five 4s, namely, 1 in 7776 – not high.
  - › So the likelihood that this roll has five 4s given that there are many rolls is the same as the likelihood given that there are few. (Sober 2003: 35)

# The Fallacy Applies to the Multiverse Argument

- › The analogy holds with the multiverse argument, since our evidence

is just the claim that [our world  $\alpha$  is fine-tuned], and the probability of this is just  $\frac{1}{n}$ , regardless of how many other universes there are, since  $\alpha$ 's initial conditions and constants are selected randomly from a set of  $n$  equally probable alternatives, a selection which is independent of the existence of other universes. The events which give rise to universes are not causally related in such a way that the outcome of one renders the outcome of another more or less probable. They are like independent rolls of a die. (White 2000: 262-63).

- › If so, the likelihood of actual fine-tuning is **indifferent** to one universe or many.

# Disanalogy with Design Argument

- › If we want to explain why this unlikely event happened, we need to cite something about **this very roll** – e.g., that it was rigged by a ‘dice-igner’.
  - ›› Say what you like about other rolls, they won’t explain away the low probability event that happened on this roll.
- › By contrast, the designer in the argument from fine-tuning for design is a **local cause** which raises the probability of life in our universe, not just raising the probability of life in some universe or other.

# The Spoiler Role for the Multiverse

on the assumption that our universe is just one of very many, the existence of a designer does not raise the probability that our universe should be life-permitting. For while we might suppose that a designer would create some intelligent life somewhere, there is little reason to suppose it would be *here* rather than in one of the many other universes. It is only on the assumption that there are no other options that we should expect a designer to fine-tune *this* universe for life. Given the existence of many universes, it is already probable that some universe will be fine-tuned; the Design hypothesis does not add to the probability that any particular universe will be fine-tuned. So the Multiple Universe hypothesis screens off the probabilistic link between the Design hypothesis and the fine-tuning data. Hence if we happened to know, on independent grounds, that there are many universes, the fine-tuning facts would give us little reason to question whether the big bang was an accident, and hence our knowledge of the existence of many universes would render the fine-tuning of our universe unsurprising. (White 2000: 273-74)

# Final Evaluation

- › So fine-tuning doesn't support the multiverse; we're back to the fine-tuning argument for design.
- › That is: **if**
  1. we can find the right ur-probability function that avoids the observation selection effects; and
  2. it's a probability function that makes it likely that a designer would design us/this; and
  3. we're sure that the space of hypotheses is such that that no other explanation for fine-tuning is available (e.g., we don't have 'cosmic evolution' of the constants over time); and
  4. we're not already sure we live in a multiverse; thenwe can **accept** the conclusion of the Fine-Tuning Argument.
- › **But that's a lot of conditions!**

# Brute Facts Revisited

- › And remember: the conclusion of the Bayesian version of the fine-tuning argument is just that fine-tuning **confirms** design,  $\Pr(\text{design} \mid \text{fine-tuning}) > \Pr(\text{design})$ .
- › **It doesn't say that design is probable** ( $\Pr(\text{design}) > 1/2$ ).
- › That depends on the priors assigned to the various hypotheses.
- › The hypothesis that fine-tuning is just a brute fact, not in need of explanation, is not confirmed by the evidence of fine-tuning; but that doesn't matter if we are antecedently confident there is nothing here to be explained.
  - › Some presentations of the fine-tuning argument obscure this. Barnes concludes that 'the existence of a life-permitting universe strongly favours theism over naturalism' (2020: 1225); but here 'strongly favours' just reflects the likelihoods, not the absolute probabilities. The theistic hypothesis that God exists can be both 'strongly favoured' and remain absolutely improbable.
- › In this sense, the fine-tuning argument, though often presented as an attempt to persuade, might be better understood as a plausible argument to bolster the existing commitments of the theist.

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