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A Note on Design: What's Fine-Tuning Got to Do With It?

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1 INTRODUCTION

We have known for a long time that there is complex, intelligent life. More recently we have discovered that the physics of our universe is fine-tuned so as to allow for the existence of such life. Call these two observations *the Old Datum* and *the New Datum*, respectively. Our question here is: once we know the Old Datum, does the New Datum provide additional evidence for the design hypothesis? I will argue that it does not. Thus there is an important sense in which the much-touted fine-tuning of physics is irrelevant to debates about design.

2 THE ARGUMENT

Informally put, the version of the design argument that concerns us here runs as follows. Begin with the observation that certain parameters in the laws of physics and the initial conditions of our universe are fine-tuned so as to allow for the existence of intelligent life. Out of the range of values these parameters could have taken, only a small portion yield a universe with enough complexity to ground intelligent systems, and yet the actual values fall in that small range.[1] Now consider that such fine-tuning is to be expected if the universe was created by a designer of the sort typically postulated in western monotheistic traditions. Such a designer wants to create intelligent life, and can thus be expected to set the relevant values so as to allow for intelligent life. But if the universe was not created by such a designer, there is no reason to expect these values to be as we find them. Indeed, it seems much more probable that the actual values would fall outside of the small range necessary for intelligent life.[2]

1 See (Rees 1999) and (Collins 2003) for some recent discussion of examples of the phenomenon. The details won't detain us here.

2 These probabilistic claims can and have been challenged by other authors, but we will grant them here for the sake of argument. See (Narveson 2003) and (Colyvan et al. 2005) for some critical discussion.

So the fact that fine-tuning obtains favours the design hypothesis over its negation.

Some clarifications and caveats are in order. First, this *cosmological* version of the argument should be distinguished from *organismic* versions. The empirical findings here have to do with the laws of physics and the origins of the cosmos, not with the complex and subtle designs of the organic world. An organismic version of the argument can be run using biological findings instead, but the cosmological version is the target here. Second, the argument appeals to probabilistic considerations, not to explanatory considerations. The argument supposes that the probability of fine-tuning given a designer of the traditional sort is high, whereas the probability of fine-tuning given no such designer is low. No mention is made of the need to explain fine-tuning, nor do we assume any connections between the need for explanations and the confirmation or support of theories. One can run an explanation-based argument as well, but that is not the sort of argument under discussion. Third and finally, the argument assumes that we can assign probabilities to physical events given hypotheses about extra-physical beings like designers of universes. Hence the relevant probabilities cannot just be the chances physical theories assign to events, since probabilities *of* physical theories are under consideration. The relevant notion of probability must be something like a priori probabilities (Carnap 1950; Maher 1996), evidential probabilities (Williamson 2000), or degrees of belief (Jeffrey 1965; Howson and Urbach 1993). I will assume that some such interpretation of 'probability' is sensible, and that it makes the kinds of assignments usually assumed by proponents of the argument. The critique to follow applies no matter which conception of probability is favoured.

3 THE CRITIQUE

Now for a statement of the critique. Imagine that a designer of the traditional sort wants to create a universe containing intelligent life, and she is contemplating what sort of cosmology to use. What are her options? One option is to implement a cosmology like the actual one: she could choose laws whose parameters and initial conditions must be carefully set in order to allow for intelligent life, and set those conditions and parameters carefully. Another option is to choose laws whose conditions and parameters do not need such careful setting. She could choose laws that would generate intelligence no matter how the parameters and conditions were set, or laws that would generate intelligent life on most settings, and so on. Given only that her aim is to create intelligent life, is one of these options particularly preferable? It seems not. So there is no reason to expect her to choose a finely-tuned cosmology over one of the alternatives. Once we know that intelligent life exists, we know that some life-allowing cosmology must obtain, and a fine-tuned cosmology seems no more likely given a designer than given not. Learning that our physics allows for intelligent life via fine-tuning tells us no more about the existence of an intelligent designer than

the existence of intelligent life told us already.[3]

It might still be true that the existence of intelligent life does, by itself, support the existence of a designer. I don't mean to challenge that claim here. The point of this critique is just that, even if the Old Datum does support the design hypothesis, the New Datum adds nothing to the argument. So fine-tuning is not relevant to the debate about design.

This critique is easy to confuse with the infamous anthropic objection, but it is importantly different. The anthropic objection says that our very existence as intelligent observers makes the observation of fine-tuning equiprobable whether we suppose a designer or not. Given that we exist, the universe must be such as to allow for intelligent life, whether there is a designer or not. So our discovery of fine-tuning is 'inevitable', providing no information about the existence of a designer. (Sober 2004, 2009)

One difference between the current critique and the anthropic objection is that the current critique does not assume the truth of any anthropic principles. Another difference: the current critique does not hold that our observations about the existence of intelligent life or fine-tuning were in any way 'inevitable'. Indeed, it acknowledges that we could have found that our universe is not finely tuned; we might have found instead that the laws of our universe are such that they would generate complexity no matter how the cosmological parameters were set. Rather than saying that anthropic considerations neutralize the informativeness of fine-tuning data by making it inevitable, the current critique says that our old empirical knowledge that intelligent life exists neutralizes the informativeness of fine-tuning data by making it equiprobable whether a designer exists or not.

Another way to see the difference is to note that the current critique still stands even if the anthropic objection fails. To illustrate, suppose the anthropic objection fails on the following grounds: even if our observation that there are intelligent observers was 'inevitable', our observation that there are intelligent observers grounded in complex physical systems was not inevitable. Even if I was born knowing that I am an existing, intelligent observer, I might have found that I was a cartesian soul with no physical basis, inhabiting a physically simple universe. In fact we have found that we are not like that — we are physically realized intelligences in a complex universe — but this might be seen as informative news even once we take anthropic

3 The reader may find it surprising that this point has been overlooked in the literature. Indeed, a similar point may drive Monton's (2006) critique, though Monton frames his attack in doubly proprietary terms. He argues that the design argument must be framed in subjective Bayesian terms, and he views his critique as essentially tied to the problem of old evidence, and to the particular solution to that problem he favors. I intend the current critique to be neutral on the relevant conception of probability, and to be free from any commitments about the subjective Bayesian's problems with old evidence.

considerations on board. (Weisberg 2005) So suppose for the sake of illustration that the anthropic objection fails on these grounds: the existence of intelligent observers was inevitable, but the existence of physically-based, complex intelligences was not inevitable. The current critique would still be with us: even if our discovery of complex and intelligent life was substantive and informative with respect to the design hypothesis, the additional modern discovery of fine-tuning is not. Once we know that our physics allows for complex and intelligent life (as we have for thousands of years), the more specific discovery that it allows such life via fine-tuning is not indicative of design. Some life-allowing physics had to be in place, and the supposition that our physics was chosen by a designer does not predict a fine-tuned implementation any more than the supposition of random chance does.

4 A FORMAL PRESENTATION

The critique can be made more precise by applying it to a formal presentation of the design argument much discussed in recent literature, Sober's (2004) likelihood formulation. According to the likelihood version, the design hypothesis has a higher likelihood than its negation, so it is supported by the evidence. 'Likelihood' has its technical meaning here: the likelihood of H relative to E is the probability of E given H, $p(E|H)$. The form of the argument is then:

(1) $p(N|D) > p(N|\neg D)$.

(2) The Likelihood Principle: if $p(E|H) > p(E|\neg H)$ then E supports H over $\neg H$.

(3) So N supports D over $\neg D$.

Here N is the New Datum that the cosmos is fine-tuned for the existence of intelligent life, and D is the design hypothesis. The thrust of the objection is that we have known the Old Datum for some time and, once the Old Datum is given, D no longer predicts the New Datum any more strongly than $\neg D$ predicts it. So the objection is that the appropriate likelihoods to compare, once we know the Old Datum, O, are $p(N|D \wedge O)$ and $p(N|\neg D \wedge O)$. The design argument then becomes:

(1) $p(N|D \wedge O) > p(N|\neg D \wedge O)$.

(2) The Likelihood Principle.

(3) So N supports D over $\neg D$ (given O).

But, the critique continues, the first premise here is false! Given the Old Datum that intelligent life exists and hence must be allowed for in the physics, why would fine-tuning be any more probable if there were a designer than if there weren't?

Again, the critique is easily confused with the anthropic objection. As applied to the likelihood argument, the anthropic objection takes a very similar form: we find some prior knowledge — the anthropic principle — that makes the likelihoods of D and of $\neg D$ the same. But despite having a similar structure, the content of this objection is different. Here the prior knowledge that renders the evidence equiprobable whether given D or given $\neg D$ is not the anthropic principle, it is our old empirical knowledge that intelligent life exists. Moreover, the current critique does not hold that the likelihoods of D and $\neg D$ are 1 once O is taken into account as background knowledge, only that the likelihoods are the same.

5 OBJECTIONS

I will briefly consider three objections that I have encountered in response to this critique.

First Objection. The designer does have reason to prefer a fine-tuned implementation of intelligent life. The designer wants to leave some evidence of her great abilities in the design of the cosmos so that we can know about her greatness.[4]

Reply. Even supposing that we take a special interest in arguing for a designer with revelatory aims, fine-tuning evidence would be better regarded as evidence of the designer's revelatory aims given that she exists at all, than as evidence of a designer *tout cort*. But suppose we set this concern aside. Why would a designer with revelatory aims choose to reveal her excellence through fine-tuning of conditions and parameters, rather than by creating laws so exquisitely designed that they need no fine-tuning? Is it any less excellent or impressive to create laws that generate complexity no matter how the values are set?

Second Objection. Your critique supposes that the designer had a choice about what kind of cosmology to implement. You said that she could have chosen laws that need fine-tuning but she could also have chosen laws that don't need fine-tuning. But (maybe) there are no possible alternatives to a fine-tuned cosmology. Maybe the only laws that can generate the kind of complexity intelligent life requires are laws that must be fine-tuned.

Reply. One would have to show, of course, that every possible life-allowing cosmology requires fine-tuning, and no one has done this. As long as it remains an epistemic possibility that there are life-allowing cosmologies that do not require fine-tuning, the proponent of the design argument has no grounds for saying that a de-

4 One might even suggest that a designer would have reasons to choose a fine-tuned cosmology that have nothing to do with revealing her existence or greatness. Leibniz seems to have held that God, being perfect, had to choose a cosmology that strikes the best balance between simplicity of natural law and richness of phenomena (Leibniz 1989: *Discourse on Metaphysics §6*). In a similar vein, one might suggest that God's perfection would oblige him to choose laws that require fine-tuning.

signer would have to choose a fine-tuned cosmology to create intelligent life. But even if we did show that there are no such possible cosmologies, the upshot would just be that we could have known about fine-tuning thousands of years ago, by deducing it from the existence of complex, intelligent life. In that case, the critique would still stand: our empirical discovery of fine-tuning would tell us nothing more about the design hypothesis than our observation of intelligent life did. In terms of likelihoods, we would still have $p(N|D \wedge O) = p(N|\neg D \wedge O)$, because both likelihoods would equal 1 in virtue of O entailing N.

Third Objection. Fine-tuning does support the design hypothesis, it's just that the support is masked by our old evidence about the existence of intelligent life. Had we discovered fine-tuning before we knew about the existence of intelligent life (an admittedly odd hypothetical scenario), our discovery of fine-tuning would have increased the probability of design. Moreover, our subsequent discovery that intelligent life exists would have increased it still more.

Reply. It may well be that, had we discovered fine-tuning first, it would have increased the probability of the design hypothesis, and that the subsequent discovery of intelligent life would have increaseed it still more. But that does no harm to this critique, which holds that fine-tuning is only relevant to design insofar as it speaks to the existence of intelligent life. In the counterfactual scenario where we discover fine-tuning first, it is only by increasing the probability of intelligent life that fine-tuning increases the probability of design. After all, if we had first discovered that the laws of physics are such as to need no fine-tuning in order to generate complex life, this would have provided the same quality and strength of evidence for the design hypothesis as the discovery of fine-tuning would. Another way to see the point: had we learned about fine-tuning first, and then learned that intelligent life in fact does *not* exist (per impossibile, according to some), fine-tuning's support for design would have been undercut.[5]

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