Metaphysics // Fall 2024

Handout 5

Fine-tuning: White

Preliminaries. The fact of fine-tuning is *prima facie* surprising. But we don't introduce a fine-tuning designer. How to account for this remarkable fact? By introducing the hypothesis of multiple universes (M). So we have: 261

(5-1) Fine-tuning facts are evidence of M.

Fallacies. White wishes to distinguish the status of the claim that *some* universe is life-permitting from the claim that *this* (*our*) universe α is life-permitting. This relates to the question of the nature of our evidence. We have: 262

$$\begin{aligned} \{T_1, T_1, \ldots, T_n\} &: \text{ set of fundamental constants} \\ E = T_1\alpha &: \alpha \text{ is life-permitting} \\ E' = \exists x T_1 x &: \text{ some universe is life-permitting} \end{aligned}$$

White shows that the following equations hold:

$$\begin{aligned} \mathrm{P}\left(E' \mid M\right) &= \mathrm{P}\left(E' \mid {\sim}M\right) \\ \mathrm{P}(E) &= 1/n. \end{aligned}$$

That is, the probability of our universe is life-permitting does not depend on the number of universes.

The fallacy is essentially the same as the ' inverse gambler's fallacy '. If we see the dice landing double six, this is no evidence for concluding that they have been rolled many times before to yield such a remarkable result. The reason is that the rolls of the dice are stochastically independent. 263

The situation is analogous to the hypothesis M. We observe just one universe—ours—with remarkable feature T_1. This doesn't give us a reason to believe that there are multiple universes spread out ' out there ' or in time, as in Wheeler's model. As White says, we have only witnessed a single Big Bang that produced our universe. 265

Surprise and confirmation. The hypothesis M reduces (or eliminates) surprise we are apt to attribute to the fact of fine-tuning. Hence, we might argue with Leslie that this show the correctness of M. Or to put it another way, the fact that the surprisingness of T_1 confirms M.

Sometimes this indeed is the case. If a monkey types, ' I want a banana ', the design hypothesis ' There was a human intervention ' makes the fact of typing this sentence both not surprising and not improbable. And by P1, the hypothesis is confirmed if the event is rendered more probable on the assumption of the hypothesis. 270

But in other cases, this is not so. Suppose that you are shot. Suppose also that you assume that the shot was random. Then you are somewhat surprised that *you* were hit. Suppose that you learn that, in fact, you were part of a large crowd. Then it is not surprising that you were shot. However, it is still improbable, for the shot is *still* random. 272

As White notes, the connection between surprise and confirmation is also due to the explanatory power of the hypothesis. When the hypothesis reduces the surprisingness of E, it also explains why E occurred. However, in the crowd shooting case, it seems wrong to say, ' I was shot, because there were many people around me. ' So this is another reason for not thinking that, although M reduces surprise, it is not confirmed by the E. fn17

Lessons for fine-tuning. Given that there is a single universe α, E is surprising. The design hypothesis reduces the surprise. 273

Supposing now that M is true, the design hypothesis does not raise the probability of E: for why would the designer make exactly α life-permitting? Thus, supposing that we knew somehow that M is true, then some universe would be likely life permitting: that is, $\mathrm{P}\left(E' \mid M\right)$ would be high. But this would not affect $\mathrm{P}(E \mid M)$, and the fact that α is life-permitting may still be due to chance. Hence M is not supported by E. 274

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