A Cosmological Argument

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July 11, 2013

- Let the Big Fact be something like this:
  - The conjunction of the laws of nature, constants and initial conditions
  - The conjunction of all contingent truths
- Explanation: The Big Fact has an explanation.
- Best explanation: The best explanation of the Big Fact is creation by a perfect being.
- So, probably, there is a perfect being.

The Principle of Sufficient Reason

- Why are there extremely few cubical galaxies (as compared to elliptical, spiral or irregular)?
- Suppose that (contrary to fact) after thorough search we could find no explanation.
- We would not conclude that there is no explanation, in the way that after searching a drawer for a sock one might conclude that the sock isn't there.
- Rather, we would think there is an explanation we haven't found.

Formulation

PSR

If p is a contingent truth, then there is an explanation for p.

- Why restrict to contingent truths?
  - We don't understand mathematical explanation well enough.
  - Plausible that $\langle 0 = 0 \rangle$ is a contingent truth with no explanation.
  - Maybe necessary truths are explained by the fact that they are necessary, so we can drop the restriction?
- Leibniz famously has: "*sufficient* explanation"
  - Does this mean: *logically sufficient*?
  - If so, PSR is false. (We'll see later.)
  - Also, Leibniz insists that it is *contingent* that this world is as it is, and yet he seems to want to explain what this world is like in terms of the divine nature.
  - *I* say: *sufficient to explain*, not *sufficient to entail*. Substantive, not exegetical claim.

Pro PSR: Intuition

- PSR seems self-evidently true to many.
  - E.g., take Einstein on God and dice.
  - Einstein not only wanted explanations, but non-stochastic ones.
- What of those to whom it doesn't so seem?
- Different understanding of "explains" or "contingent"? Like color-blindness?
- But in any case, claims of self-evidence are unhelpful for discussion with someone to whom it seems false.

Pro PSR: Don't give up too quickly!

- If we don't accept PSR, we will have no reason to persevere in searching for explanations.
- Compare: If we don't accept metaphysical naturalism (MN), we will give up too quickly and settle for easy supernaturalistic explanations.
- Both are pragmatic arguments. Do they give reason to think PSR or MN *is true*?
- Alternative to PSR and MN: *Typically* there are explanations and *typically* they are natural.
  - Worry: Is there any way to measure the typicality?

Pro PSR: Bootstrap from typicality of explicability

- Typically, contingent truths have explanations. Why? Simplest explanation: PSR is necessarily true.
- Seems circular. If PSR is false, why expect an explanation?
- Even if there are occasional unexplained events, don't want vast coincidences, and if PSR were false, that typically contingent truths have explanations would be a vast coincidence.
- Alternative explanation: Conservation laws.
  - Cartwright-style laws grounded in causal powers probably couldn't prevent unexplained events.
  - In any case, is there a reason why there aren't causeless unexplained violations of the laws?
- As long as there is any chance that something could happen for no cause at all, given the infinity (beyond cardinality!) of possible events, we would expect that chance to be often realized, contrary to observation.

Pro PSR: Probability, I

- Observe infinitely many independent events of some type. Limiting frequency of subtype A is $1/3$. Infer a probability of $1/3$ of A.
- **Standard justification:** by the Strong Law of Large Numbers (SLLN) almost surely the limiting frequency of independent outcomes equals the probability of the outcome.
- **Catch:** application of SLLN needs that the outcome is *measurable* with respect to underlying probability measure.
- **Tempting thought:** if A is nonmeasurable, then we wouldn't expect a limiting frequency, but a mess.
- **Theorem:** if A is nonmeasurable, then event of there being a limiting frequency is "maximally nonmeasurable". (arXiv:1208.3187)
- *Nothing* probabilistically useful can be said about it. Can't say it is unlikely for there to be a limiting frequency.
- Hypothesis that A is measurable cannot be confirmed empirically.

Pro PSR: Probability, II

- To do science, we need to posit that physical events are probabilistically measurable (or measurable in some analogous way), even though we cannot confirm this empirically.
- Relevant probability measure is the objective physical probabilities.
- So we need to posit that all physical events are governed by objective physical probabilities (or something analogous).
- Events governed by objective physical probabilities have at least *stochastic* explanations. And plausibly something analogous would be similar in this respect.
- So PSR is true for all physical events.
- It seems *ad hoc* not to extend to general case.

Pro PSR: Evolution

- Consider:
  - All my colleagues whose pet I know have a dog.
  - And there are many colleagues whose pet I know.
  - So, every colleague has a dog.
- No! All we are justified in inferring is that every colleague *who has a pet* has a dog.
- We have very good empirical reason to think every present organism has an evolutionary explanation. What is it?
  - All the present organisms we know the explanation for have evolutionary explanations.
  - And there are many present organisms we know the explanation for.
- This only justifies inferring that every present organism *that has an explanation* has an evolutionary one.
- We need PSR to conclude that every present organism has an evolutionary explanation.

Against PSR: Quantum Mechanics

- Electron in spin state $(3/5)|\text{up}\rangle + (4/5)|\text{down}\rangle$ is sent through a spin measurement device which measured its spin as up. What explains this result?
- That the electron was measured as spin up is explained by the fact that the electron was in a quantum state which had an $|\text{up}\rangle$ component with normalized modulus-square of coefficient at least $|3/5|^2 = 9/25$.
- If had measured spin down, this would have instead been explained by the fact that the electron was in a quantum state which had an $|\text{down}\rangle$ component with normalized modulus-square of coefficient at least $|4/5|^2 = 16/25$.
- These explanations might even be contrastive in one sense.

Contrastive explanation (sort of)

E contrastively explains why p rather than q iff E explains why p and E would not explain why q were q rather than p true.

Against PSR: Van Inwagen's argument, I

- BCCF = conjunction of all contingent truths.
- Suppose p explains BCCF.
- p is contingent or necessary.
  - If p is contingent, it is a conjunct in BCCF, and hence self-explanatory. But contingent self-explanation is absurd.
  - If p is necessary, then it cannot explain BCCF. For no necessary truth can explain a contingent one.
- I'll grant that no contingent truth can explain itself.

Against PSR: Van Inwagen's argument, II

- Why think necessary p can't explain contingent q?
- Well, p would still be true even if q were false.
- This is only a problem if one accepts

Entail

If p explains q, then p entails q.

- But Entail is false.
  - All good scientific explanations ever given violate Entail.
  - We saw this in the quantum case.
  - Why did the dog not bark? Because none of the causes of barking were present. But if PSR is false, then that none of the causes of barking were present does not entail that the dog did not bark. So the opponent of PSR cannot say hold to Entail.

Against PSR: Van Inwagen's argument, III

- But what could explain BCCF?
- **Suggestion:** there is a necessary all-powerful being B such that B necessarily values goods $G_{i_1}, G_{i_2}, \ldots$ and BCCF necessarily includes goods $G_{i_1}, G_{i_2}, \ldots$. **Abbreviate:** $V(B, \text{BCCF}, \{G_{i_k}\})$.
- But what if an alternate world described by BCCF$'$ were actualized?
- Then the explanation would be $V(B, \text{BCCF}', \{G_{j_k}\})$ where $\{G_{i_k}\} \neq \{G_{j_k}\}$.
- PSR doesn't require contrastive explanations.
- But this suggestion is contrastive in the above counterfactual sense. For were BCCF$'$ true in place of BCCF, $V(B, \text{BCCF}, \{G_{i_k}\})$ would be true but wouldn't explain BCCF$'$.
- This extends to show how free choices could be explained.

Back to the argument

- Recall:
  - EXPLANATION: The Big Fact has an explanation.
  - BEST EXPLANATION: The best explanation of the Big Fact is creation by a perfect being.
  - So, probably, there is a perfect being.
- If PSR is true, then so is EXPLANATION.
- If PSR is false, then some replacement for PSR is true. Maybe:
  - If we can come up with a reasonable candidate for an explanation of a contingent truth p, then probably p has an explanation.
  - If a contingent truth p could have an explanation, then p has an explanation.
  - We should assume a truth has an explanation until it's shown otherwise.
- Each of these replacements can be used in place of EXPLANATION, though the argument is weakened.

Some options

- Recall:
  - EXPLANATION: The Big Fact has an explanation.
  - BEST EXPLANATION: The best explanation of the Big Fact is creation by a perfect being.
  - So, probably, there is a perfect being.
- Here the fact of fine-tuning comes in. The better explanations of the Big Fact will also explain fine-tuning.
- Some options:
  - Regress
  - Necessary nice laws
  - Multiverse
  - Supernatural options:
    - Optimalism
    - Non-theistic supernatural options
    - Creation by perfect being

Option: Regress

Hume, *Dialogues Concerning Natural Religion*

Did I show you the particular causes of each individual in a collection of twenty particles of matter, I should think it very unreasonable, should you afterwards ask me, what was the cause of the whole twenty. That is sufficiently explained in explaining the cause of the parts.

- Can explain one part of Big Fact by another, *ad infinitum*.
- But infinite regresses leave unanswered the question of why the whole regress is as it is.
- Each step in the regress just shifts the bump in the carpet.
- Let S be the set of states of the universe at all times $t > t_1$, where t_1 is five minutes ago. Each member of S is explained by another member. But S is not self-explanatory.

Option: Necessary nice laws

- Necessarily, the laws are nice—they are finetuned so that they are likely to result in observers.
- We do not have a plausible candidate for such nice laws.
- And even if we did, it would not be plausible that these laws are *necessary*—that other laws are metaphysically impossible.

Option: Multiverse

- Neat explanation of fine-tuning of constants and initial conditions.
- No explanation of the existence of the multiverse and the fundamental constraints, if any, on it.
- But can add that it is *necessary* that such a multiverse exist.
- Three kinds of multiverses:
  - Physics: inflation, string, etc.
  - Metaphysics: Lewis, Tegmark
  - Supernaturalism: Leslie, Rescher, Turner, Kraay
- Another subdivision: Finite versus infinite.
- All the metaphysics and supernaturalism ones are infinite. Some of the physics ones are finite.
- Implausible that it be necessary that there be a finite multiverse (fine-tuning of laws, implausibility of a finite set of options).
- Infinite ones face in-principle insoluble measure problem. (Later, I promise!)

Option: Optimalism

- Two varieties:
  - Theistically-based: Leibniz, Turner, Kraay
  - Principle-based: Leslie, Rescher
- Only the principle-based ones are *fundamentally* optimalistic.
- Objection 1: Does this look like the best world?
- Objection 2: No total ordering of values. Simplicity and diversity. Mercy and justice. Elegance of laws and lack of suffering. Being a physicist and being a musician.
- In any case, principle-based optimalism may entail theism (Rescher).

The theory

- Should try to maximize the simplicity of the *unexplained* hypotheses of a theory. (Dougherty)
- Theism has very simple hypothesis: There is a perfect being. No free parameters.
- A perfect being exists of necessity—it is the ground of all being. The PSR does not require an explanation of a necessary being. Maybe there is an ontological explanation, though.
- A perfect being knows what possible worlds are more valuable and in what way, and acts on the values, to the extent that the values are morally and rationally compelling.
- The value of intelligent observers is highly morally and rationally compelling. So is the value of simple and elegant laws of nature. But these are not the only values, and there is more than one way to realize them, so necessitarianism does not follow.
- We get a *very fundamental and elegant* explanation at the expense of its being low on detail and predictivity on its own (get more detail and predictivity in revealed religions). Compare evolution in the time of Darwin.

Two quick objections too quickly answered

- We don't have anything like a complete axiomatization of the perfect being so it is not on par with hypotheses like multiverse ones.
  - Sure we do: x is a perfect being if for every property P that is a perfection, x has P.
  - Of course, we have nothing like a complete axiomatization of a perfection.
  - And likewise, we cannot have anything like a complete axiomatization of any theory of physics. Say, a theory supposes a Hilbert space. But Hilbert spaces live in some universe of sets. And there is not, and cannot be (Gödel), a complete consistent axiomatization of a universe of sets.
- Evil.
  - Theodicy
  - Recalcitrant cases present an anomaly, but should expect anomalies in any wideranging theory (Dougherty and Pruss)

Option: Non-theistic supernaturalism

- Polytheism and finite-god theories have many free parameters.
- Pantheism does not explain the universe.
- Panentheism is either an orthodox or a heterodox theism, anyway.

Conclusions

- Explanation: The Big Fact has an explanation.
- Best explanation: The best explanation of the Big Fact is creation by a perfect being.
- So, probably, there is a perfect being.