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A simple argument against design

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Abstract: **This paper presents a simple argument against life being the product of design. The argument rests on three points. (1) We can conceive of the debate in terms of likelihoods, in the technical sense – how probable the design hypothesis renders our evidence, versus how probable the competing Darwinian hypothesis renders that evidence. (2) God, as traditionally conceived, had many more options by which to bring about life as we observe it than were available to natural selection. That is, the relevant parameters were, in many cases, far more constrained under natural selection. (3) Utterly mundane features of the world, like that the earth is very old, are actually powerful evidence that the world was not designed, since that outcome was optional on the design hypothesis but nearly inevitable on natural selection.**

There is a simple but neglected argument from likelihoods for thinking that life on earth was not designed.[1] By 'likelihood', I mean the probability of observing some evidence given some hypothesis, in symbols P(E|H), not the posterior probability of the hypothesis given some evidence, P(H|E). The argument arises from three points that are related to some evidence, E, that we observe, and the hypothesis, H1, that life developed purely by Darwinian natural selection, and the rival hypothesis, H2, that life is the product of design.

Point 1 We can conceive of the debate about design in terms of likelihoods: what we care about is the relationship of P(E|H1) to P(E|H2).

Point 2 God, as traditionally conceived, had many more options by which to bring about life as we observe it than were available to natural selection. That is, the relevant parameters were, in many cases, far more constrained under natural selection.

Point 3 In light of Points 1 and 2, utterly mundane features of the world, like that the earth is old, are actually powerful evidence that the

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world was not designed, since that outcome was *optional* on H2 but nearly *inevitable* on H1.

Perhaps none of these points is individually impressive. But together they seem to generate an important challenge to the view that life was designed (or that evolution was somehow guided by design). Moreover, the argument doesn't need to rely on strong assumptions other arguments must make, for instance appeals to vestigial organs or alleged examples of imperfect design. It does assume that we can form reasonable beliefs about P(E|H1) and P(E|H2), of course, and in the following section I address doubts on that score.

The argument

If other things are equal, we should prefer theories that tend to make our observations more likely. Other things being equal, confronted with two sushi restaurants in Lima, we should prefer the theory that sushi is popular in Peru, rather than that it's unpopular but that we stumbled on the only two sushi restaurants in the whole country. The first theory renders our observation perfectly natural and expected; the second would render it extraordinary and unlikely. To put it another way, we should assume that we are average in how we are placed with respect to the evidence, and avoid theories requiring that we are extraordinary. This means that the mere fact that, of two theories, the one would have been compatible with many observations besides those we make, while the other could *only* have produced what we see, counts in favour of the second theory. Alternatively, we can put this more formally in terms of support evidence lends a hypothesis: E supports H1 over H2 to the extent that $P(E|H1) > P(E|H2)$.[2]

The associated inferences don't always come naturally to people. Suppose the killer was seen fleeing in a blue car. Only two men could have done the killing, A or B. The mere fact that A has a blue car (and could have used it, and no other car), while B has a blue and a red car (and could have used either and no other) is fairly potent evidence for A's guilt, though in my experience this doesn't always move people. 'But the evidence is perfectly *compatible* with B being the killer', they sometimes protest. They're wrong not to be moved, though, and adding more and more coloured cars to B's garage makes that obvious.[3] Or, more schematically, imagine a game of chance: there's a blue deck with blue cards and a mixed deck that contains half blue and half red cards. The dealer has drawn a card from one of the decks and your task is to guess which. Suppose, for argument's sake, that you are unwilling to assign a prior probability to the card's having been drawn from one or the other deck, which rules out a Bayesian approach. Even so, if the card turns up blue, you should obviously go with the blue deck on grounds of likelihood alone.

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Now consider the piece of evidence, E, that *the earth is very old*.[4] If life developed by natural selection, then E was all but inevitable. According to natural selection, there isn't any obvious way for advanced life-forms like human beings to develop but over fairly long time-scales, which makes it all but inevitable that we should discover the earth to be very old. This was, in fact, a source of concern among early Darwinians and geologists like Kelvin, when it was still unclear exactly how old the earth was. By contrast, an old earth is merely optional on the design hypothesis. After all, so far as we know, there was nothing to stop God from creating even advanced life right away (or utilizing some other fast-acting process, if not direct creation). This, too, is demonstrated by the beliefs of proponents of the hypothesis prior to our evidence about the age of the earth – many theists were (and a few, alas, still are) young-earth creationists, indicating that a young earth is, to say the least, an option on the design hypothesis. But this puts us in the same position as when evaluating A/B's crime: other things being equal, we should favour H1 simply because it makes our observation more likely than H2, since H2 has E merely as one of two options (dividing somewhat artificially between an 'old' and a 'young' earth). Thus, this reasoning supports the inequality $P(E|H1) > P(E|H2)$.[5,6]

It is crucial to note that this argument is distinct from the usual appeals to vestigial or imperfectly designed organs.[7] The core of the simple argument is that God had more options available to Him than did natural selection, so to speak. This is different from claiming that some feature is bad design or useless. The latter claims rely on two assumptions that the simple argument needn't make: first, that organs like the vermiform appendix really are vestigial, and second, that God wouldn't be likely to create vestigial or imperfect-appearing organs. The first assumption is tricky, since it's hard to be certain what role organs may play at various times in the life-cycle of an animal – witness contemporary challenges from within biology to the tradition of dismissing the appendix as vestigial.[8] The second assumption is also dubious, since it isn't clear that God would need to create the best. The beauty of the simple argument is that it dispenses with such strong assumptions and instead makes the much weaker assumption that as far as our evidence goes, God had several equally viable options open to Him.

Since I am only making a point about evidence, other things being equal, let me be explicit about what is supposed to be established by this sort of argument. All it shows is that evidence like an old earth is evidence against life coming to be by design: $P(E|H1) > P(E|H2)$. This is not supposed to be an all-things-considered argument against design; that would depend on other information, like one's priors, which I am not addressing here. It would also depend on whether there's evidence that cuts the other way: evidence that is improbable on H1 but probable on H2, or that could have come out any which way on H1 but which is inevitable on H2. I think it's fair to say that there aren't any uncontroversial examples of such evidence parallel to an old earth, but some people would certainly want to

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talk more about fine tuning or about alleged instances of irreducible complexity or the Cambrian explosion, despite a large literature contesting such claims.[9] The main point is just that mundane facts like the age of the earth constitute powerful evidence against design, not that such evidence is conclusive.

The simple argument can be extended in various ways, since it is not just the age of the earth that matters. Another example of mundane but relevant evidence might be homologous organs and body structures, such as the skeletal architecture of mammals, in light of the Darwinian theory of speciation. Or, again, the ordering of simpler life forms followed sequentially by more complex ones (to the degree geological displacement permits). Some of these weren't, perhaps, quite inevitable on H1, but still seem far more probable on H1 than H2, since they are simply optional on H2.

The objection

This completes my rough sketch of the simple argument. No doubt various details could be filled in further, but I want instead to concentrate on the central objection. That objection, oddly enough, was originally made to some versions of the argument *from* design, as well as to the argument from evil. In either case, the worry is that the argument is implicitly helping itself to assumptions about God for which there isn't any justification.[10]

The argument from design, in some formulations, revolves around the idea that intelligent design has a high likelihood in relation to evidence like Paley's eye, i.e. P (human eye with features F1 … Fn|intelligent design)≫P(human eye with features F1 … Fn|naturalism). But given that God was going to design life on earth, why suppose that God would want to create the human eye with the particular features it has? For example, what evidence is there that God would be likely to design an eye that was very fragile and limited in its performance?[11] This, the critic says, amounts to an unwarranted confidence in what God's intentions would be. Similarly, in the argument from evil, it is usually assumed that a perfect God wouldn't have wanted to permit the observed amount of evil in the world. At the very least, the probability of His having such a desire must be set low. But this, too, makes an assumption about the mind of God for which we lack any real evidence, as the standard theodicies attempt to make clear.

The objection to the simple argument is just the same: like the arguments from design and from evil, the simple argument must make assumptions about God for which there isn't any independent support. In particular, it assumes that P(E|H2) isn't very high, but what evidence do we have to support such an estimate, or even just the claim that it's less than 1? Earlier, I spoke of God having more options than natural selection, of certain parameters being less constrained. But what evidence is there for thinking that those options were equally likely to be executed? Suppose that *if* God were to create life on earth, then He would

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inevitably choose some time-delayed method (and utilize homologous structures, and create life forms in order of complexity, etc.). That supposition wrecks the simple argument, and yet we lack any real evidence that the supposition is false.[12]

Clearly this type of objection is powerful – so powerful that both the argument from design and the argument from evil (at least on some readings) struggle to meet it. But on reflection, I am inclined to think that the simple argument differs from the arguments from design and evil in certain key respects, and that the objection thus ultimately fails to apply.

To begin with, we should worry about some of the warm-up exercises from earlier. The way that an actual juror would respond to the murder case, one hopes, is by accepting that A's being the killer has a higher likelihood than B's being the killer, so far as the evidence of the blue getaway car goes. If we ham things up a bit, that is even more obvious. Let's suppose A drives a blue car, while B drives blue and red; that A owns one pair of shoes for which prints were found at the scene, while B owns those shoes along with several other kinds; that A always smokes Marlboro cigarettes, of which stubs were at the scene, while B smokes several different brands; and so on, and so on. Ask yourself: would you release a defendant on to the streets on the basis of rejecting the assumption that A's committing the crime has a higher likelihood, if that assumption together with the other facts would warrant conviction?

But that assumption now faces the above objection: 'What independent evidence do you have for fixing the probability of B choosing to drive his blue versus his red car, given that he was going to drive over to kill his victim? (And similarly for the other evidence.) For all you know, he is far more likely to drive the blue car to a killing, since red reminds him of his true love. In certain factual scenarios, the probability of B driving blue and A driving blue are just the same. Since you lack independent evidence for this probability you must ignore the fact that B had more options available to him and let A walk. In fact, even in the hammed-up scenario with multiples lines of evidence, you still lack specific evidence of what the probabilities in question were, and so must withhold judgement.'

I find this objection incredible, and yet it is the same objection we are considering against the simple argument. It might be said that we know a lot about human car-owners, and that this background knowledge is crucial. The reason that we are unsympathetic to far-out possibilities like the red car reminds the killer of his true love (or that he was more likely to smoke Marlboros, etc.) is that, relative to our background knowledge, such things are atypical. By contrast, we have absolutely nothing to go on when it comes to God's reasons for delaying or not delaying the creation of life on earth. But this response strikes me as unpersuasive. How, after all, does our background knowledge really help us with B? It's not as if we have specific evidence about any of the sorts of things that might make him more or less likely to drive his blue car or smoke Marlboros. We don't know anything about him personally, and the probative value of general

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frequency distributions here – how often two-car owners drive each, say – is effectively nil. Nevertheless, it would be crazy to pretend we aren't getting useful evidence in the form of the car, the shoes, and the cigarette stubs.

Moreover, we can go back to the game of chance outlined earlier and adapt it to prevent us from drawing on background knowledge. To bring things closer to the target case, let's imagine it works like this: Deck A has ninety blue cards and ten red. Deck B was once used to help me with my statistics research. I can remember using some specific method to determine the ratio of blue to red cards, but I can't remember what it was. I pick a card from one of the decks and present it to you. The card turns up blue. Which deck should you guess that it came from? Or, in the hammed-up version, I have Box A and Box B, each of which contains three decks, A1–A3 and B1–B3. A1 contains ninety blue cards and ten red; A2 contains ninety green cards and ten yellow; A3 contains ninety pink cards and ten gold. The B-decks contain cards with the same colours, but mixed in a ratio determined by a specific but forgotten method that was unrelated to our game. You are presented three cards from the same box, and your task is to guess which box they're from. They turn up blue, green, and pink. As before, the objection applies: there is no specific evidence to rule out B-decks with all blue, green and pink cards. Nevertheless, betting on Box A seems the better bet if your money is on the line.

So where does the objection go wrong as it applies to these cases? The answer, I believe, involves mistaking what we're entitled to assume about probabilities. In criticizing the arguments from design and evil, it was reasonable for the objector to demand evidence for the strong assumptions that God would be *very* likely to design a human eye of type T, or that God would be *very* likely not to want the observed amount of evil. Why should we think such things were *very* likely? What's objectionable here is not so much the lack of specific evidence, as the reliance on strong assumptions without sufficient evidence. Wide departures from shoulder-shrugging equipoise require substantial evidence. But a reasonable juror in our criminal case makes the inverse assumption: he assumes that there *isn't* any special reason to think B *would* be very likely to drive his blue car, wear a specific pair of shoes, and smoke Marlboros rather than his other brands. Similarly in the card case. Notice that the juror needn't assume that B is particularly *unlikely* to drive the blue car, or that the probability has some specific value; he's just assuming that there isn't any reason to think that value is particularly high (which, in conjunction with the inevitability of a blue getaway car if A were the killer, is enough for a likelihoods argument to work).

The reasoning here also needn't make the strong claim that in the absence of evidence we should just assume a probability of .5 (though it's unclear what might motivate any specific alternative). We can instead make the weaker claim that we should proceed on the assumption that the probabilities don't lie in some extreme range unless there's some evidence to support that view. That principle counts against the arguments from design and evil, but in favour of suspecting A.

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And if we don't accept something in the neighbourhood of that principle, or if we insist on suspending judgement and refusing to form any view at all, we seem stuck with letting A off the hook. We would be letting him off the hook, that is, just because B *might* have had a very high conditional probability of driving his blue car, smoking Marlboros, and wearing a certain pair of shoes, even though there's no reason at all to think that is the case. From our perspective that would be a fantastical coincidence – an amazing congruence between the conditional probabilities applying to A and B.

The same thought applies to the simple argument. It runs on the assumption that the probabilities don't lie in some extreme range, that there isn't any special reason to think God would be *very* likely to delay creating life allowing for an old earth, to utilize homologous structures, etc. It assumes that we should set aside the possibility of what would be, from our perspective, a fairly bizarre coincidence whereby it turned out that God was very likely to create life in just the way natural selection says, across several independent parameters, even though there's not the slightest evidence for this, and even though theists thinking about these matters independently before the evidence came in predicted just the opposite.

I concede that the objection raises tricky issues, and earlier I emphasized that the simple argument is just one piece of evidence among others. As a theist I don't particularly welcome its existence. But it does look like evidence that life on earth wasn't ushered onto the stage 'by hand'.[13]

Notes

1. It isn't discussed in major philosophical anthologies like Neil Manson (ed.) *God and Design* (New York NY: Routledge, 2003); or in compendia like Michael Martin *Atheism: A Philosophical Justification* (Philadelphia PA: Temple University Press, 1990); Richard Swinburne *The Existence of God* (Oxford: Oxford University Press, 2004); or in monographs like William Dembski *The Design Inference* (Cambridge: Cambridge University Press, 1998); Elliott Sober *Evidence and Evolution* (Cambridge: Cambridge University Press, 2008); or in popular digests like Jerry Coyne *Why Evolution is True* (New York NY: Viking, 2009); Richard Dawkins *The Greatest Show on Earth* (New York NY: Free Press 2009); or in official public summaries like the National Academy of Science *Science, Evolution and Creationism* (Washington DC: National Academies Press, 2008).
2. Ian Hacking *The Logic of Statistical Inference* (Cambridge: Cambridge University Press, 1965), 55ff.; John Leslie *The End of the World* (London: Routledge, 1996), ch. 5; Darren Bradley & Branden Fitelson 'Monty Hall, doomsday, and confirmation', *Analysis*, **63** (2003), 23–31; Sober *Evidence*, ch.1.
3. Making stronger Bayesian assumptions, and assuming no other evidence is relevant, a simple calculation shows we should move from a prior probability on A's guilt of .5 – sheer uncertainty – to a relatively confident .67 with just the one extra car at B's disposal. Add a third and it's .75. Of course, I'm trying to avoid the stronger Bayesian assumptions throughout the paper; I mention this just to convey a sense of the significance of such evidence.
4. It isn't important to define 'old' as long we mean something like 'at least tens of millions of years', i.e. a period that is within the minimum natural selection might be thought to have taken, and that is still far greater than what God might have chosen.
5. It isn't important to attach precise values to either of these probabilities. We needn't assume P(E|H1) is 1 rather than, say, .9; and we needn't assume P(E|H2) is exactly .5, though it isn't clear what evidence would support a higher figure.

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6. As before, we can illustrate the point in more robust Bayesian fashion. Suppose our prior probability on H1 is .5. (This isn't to make Laplacian indifference assumptions; we're just illustrating what would happen in a particular case, say with someone unmoved by other available evidence.) P(E|H1) = .9, say; let P(E|H2) = .5. For argument's sake, make the crude assumption that H1 and H2 are exhaustive, waiving life being seeded by aliens, wildly heterodox naturalistic theories, etc. Bayes' theorem says: $P(H1|E) = P(H1)P(E|H1)/P(H1)P(E|H1) + P(H2)P(E|H2)$. And all this works out to.64, meaning that the simple point about the age of the earth should move our undecided individual to being reasonably confident that life is not the product of design, given these admittedly fraught assumptions, which the likelihood argument eschews.
7. See, e.g., Coyne *Why Evolution*, ch. 3.
8. On this assumption, see R. Bollingera, A. Barbasa, E. Busha *et al.* 'Biofilms in the large bowel suggest an apparent function of the human vermiform appendix', *Journal of Theoretical Biology*, **249** (2007), 826–831. On the second assumption, see Robert Adams 'Must God create the best?', *Philosophical Review*, **81** (1972), 317–332.
9. For more on these issues, see John Leslie *Universes* (London: Routledge, 1989), ch. 2; Michael Behe *Darwin's Black Box* (New York NY: Free Press, 2006); Renyi Liu & Howard Ochman, 'Stepwise formation of the bacterial flagellar system', *PNAS*, **104** (2007), 7116–7121; S. J. Gould *Wonderful Life* (New York NY: W.W. Norton, 1990).
10. See, for instance, Neil Manson 'The ''Why design?'' question', in Y. Nagasawa & E. Wielenberg (eds) *New Waves in Philosophy of Religion* (New York NY: Palgrave MacMillan, 2008), and Alvin Plantinga 'Epistemic probability and evil', in Daniel Howard-Snyder (ed.) *The Evidential Argument from Evil* (Bloomington IN: Indiana University Press, 1996).
11. See Sober *Evidence*, sec. 2.12, for more detail on this point, including the issue of whether our evidence should be considered to be just *the fact that humans have eyes*, or *the fact that humans have eyes with specific features F1…Fn.*
12. I ignore the separate objection that anything God does has a probability of 1, because His actions are in some sense necessary. We could just as much object to attaching probabilities to the actions of criminal defendants, since they lie in the past. Presumably in these sorts of cases what we have in mind is evidential probability: we're interested in how likely it was that we'd observe an old earth, given that God designed life, *in light of our evidence.*
13. 'Sitting calmly on a ship in fair weather is not a metaphor for having faith; but when the ship has sprung a leak, then enthusiastically to keep the ship afloat by pumping and not to seek the harbor – that is the metaphor for having faith'; Søren Kierkegaard *Concluding Unscientific Postscript*, Howard & Edna Hong (trans.) (Princeton NJ: Princeton University Press, 1992), 225fn.

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