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A user's guide to design arguments

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Abstract: **We argue that there is a tension between two types of design arguments: the fine-tuning argument (FTA) and the biological design argument (BDA). The tension arises because the strength of each argument is inversely proportional to the value of a certain currently unknown probability. Since the value of that probability is currently unknown, we investigate the properties of the FTA and BDA on different hypothetical values of this probability. If our central claim is correct this suggests three results: (1) It is not very plausible that a cumulative case for theism include both the FTA and the BDA (with one possible qualification); (2) Self-organization scenarios do not threaten theism but in fact provide the materials for a good FTA; (3) A plausible design argument of one sort or another (either FTA or BDA) will be available for a wide variety of values of the key probability.**

Introducing the problem

In general, arguments from design seek to infer the existence of God from some kind of order in the universe. There are two prominent forms of design argument. First, the cosmic fine-tuning argument (hereafter 'fine-tuning argument' or FTA) argues to the existence of God from facts pertaining to the initial conditions of the universe and its fundamental laws.[1] Second, the biological-design argument (BDA) argues to the existence of God from facts pertaining to the existence of complex organisms. These arguments can be stated in many forms, but for precision and comparability we will limit ourselves to a probabilistic formulation of these arguments. Our probabilistic formulation relies on three plausible and common claims about confirmation that we take for granted. First, the probability of a hypothesis H on a piece of evidence, i.e. P(H/E), is proportional to the prior probability of that hypothesis P(H). As the P(H) goes up so the P(H/E) goes up. Second, P(H/E) is also proportional to the P(E/H). Third,

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the P(H/E) is inversely proportional to the P(E). As the P(E) goes up, the P(H/E) goes down. These three properties of confirmation are consequences of Bayes' theorem. Our approach is thus consistent with Bayesianism, but doesn't require it. The points we make about the tension between the fine-tuning argument and the biological-design argument arise for any view of confirmation that shares these three properties.

The form of probability with which we will be primarily concerned in this paper is a form of conditional epistemic probability where P(A/B) is the probability a properly functioning rational agent attending to the evidence would have.[2] When we speak of prior probabilities we will be suppressing, for stylistic reasons, that prior probability is a relative notion, sometimes taking more into account, sometimes less, as we go about learning. Often the prior probability will be conditional only on tautological information. Further, we will be assessing this from the standpoint of an 'outsider', a view that does not assume the agent knows what we know but is appropriately epistemically innocent. Additionally, we find it plausible that a rational agent may have spotty priors. This marks a difference between our view of confirmation and standard Bayesianism. Standard Bayesianism implies, while our view does not, that each proposition has a prior probability.[3]

In rough outline, the fine-tuning argument proceeds as follows: the priori probability that the initial conditions of the universe and the values of the constants of the fundamental laws take their actual values is incredibly low.[4] Where 'C' specifies that the initial conditions of the universe and the values of the constants of the fundamental laws have such and such *actual* values, the claim is that the P(C) is incredibly low. But if theism were true it would be much more likely that C than if theism were false, i.e. $P(C/T) >> P(C/\sim T)$. So the fact that the initial conditions and the constants of the fundamental laws have such and such actual values provides evidence for theism.

The biological-design argument proceeds as follows (again in rough outline): it's incredibly unlikely that biologically complex organisms would exist somewhere or other in our universe. How unlikely? If we are to infer divine action from the existence of biologically complex organisms it must be nothing short of *miraculous*. This is 'statistical impossibility'. But note that if life is statistically impossible given the initial conditions of the universe, then there is very little sense to the notion that the universe is fine-tuned for life. True, there is *some* sense in which life is possible in such a universe, for God might specially create a micro-environment suitable for life. But *that's* true of *any* set of initial conditions.

Let 'B' specify that biologically complex organisms exist somewhere or other in the universe. If theism were true, it is much more likely that complex organisms would exist than otherwise – i.e. $P(B/T) >> P(B/\sim T)$, for God could guide the process of evolution along, intervening when necessary. So the existence of complex organisms provides evidence for theism.

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Now that we have a rough outline of the two kinds of design argument we wish to consider, we draw out their commitment to a common probability and explain how the strength of each argument is inversely proportional to the value of that probability. The probability in question is P(B/C&∼P), the probability that biologically complex life exists somewhere or other given C and that there are no other B directed processes, ∼P (e.g. the process of divine intervention whereby God guides the process of evolution along.) The thing to notice is that this figure is currently unknown. Though there are plausible arguments to be made concerning its value, we are aware of no very convincing arguments for any definite value. We take it to be an epistemic possibility that it could be extremely small or nearly 1. Because of that, we will be considering, hypothetically, the relative strength of the FTA and the BDA on various value assignments. We suggest it is hard to see any range for that value for which it is very clear that the FTA and BDA could simultaneously provide much confirmation for theism.

To begin: notice two crucial claims in the above informal explanation; first, that P(C/T) >> P(C/∼T) and second that P(B/T) >> P(B/∼T). Why is the first claim true? The thought is that C achieves something of value, where that item of value is the kind of thing a good God would want to bring about. What is that item of value? The advocates of the FTA have offered different answers: it is life (John Leslie),[5] conscious, embodied life (Robin Collins),[6] or intelligent, moral beings of limited power (Richard Swinburne).[7] There are many targets fine-tuning could have and different theorists have taken different items for their data. We think it simplest to consider the argument from the fine-tuning of the universe for complex living organisms, our B above. Thus the reason the inequality holds – P(C/T) >> P(C/∼T) – is that B is valuable and C is a means to the end of B. It is because C is a means to B, and B is something a rational being like God would be expected to bring about, that the central FTA claim is true. The idea that C is a means to the end of B may be captured in probabilistic notation by probability raising, i.e. C raises the probability of B. To isolate the issue at hand we need to consider whether C raises the probability of B apart from some other process that results in B. For example, to consider whether C raises the probability of B we need to consider whether C absent divine intervention raises the probability of B. This is one reason why we focus on the probability of B on C & ∼P, where P is that there is some other B directed process. Thus the crucial probability is P(B/C&∼P).

Both the BDA and the FTA could be run from different data. For example Swinburne's FTA takes as its datum the existence of human bodies capable of supporting the mental life of rational moral agents. Since this entails the existence of complex living organisms, there is reason to believe that if our results follow for the present case they will apply to Swinburne's, as long as there is a very high probability that complex living organisms will evolve

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into intelligent moral beings of limited power, whether or not P. This is a plausible assumption, but we will not investigate it further. We believe the results of taking the data as we do may be generalized to most other contemporary versions of the arguments as well, though such a survey is beyond the scope of this paper.

We have just looked at the central claim of the FTA. We now consider the central claim of the BDA: $P(B/T) >> P(B/\sim T)$. The thought is that the universe is in general inhospitable to life (i.e. the universe is not a good means to life) and that God would intervene to bring about complex organisms if – as seems plausible – he wanted them to exist. That the universe is inhospitable to life is a necessary component to the BDA because if the $P(B/C\&\sim P)$ were high (or at least not so low), then, presumably, the $P(B/\sim T)$ would be not so low, in which case the claim that the $P(B/T) >> P(B/\sim T)$ would not hold and the argument would fail. The reason to think that the $P(B/T)$ is much greater than $P(B/\sim T)$ is again related to considerations about what is valuable. Since B expresses a state of affairs we can expect a rational being like God to value, we will not be very surprised if he brings it about. Otherwise, it is quite surprising.

So the strength of the FTA relies on the value of $P(B/C\&\sim P)$ being fairly high while the strength of the BDA relies on that same quantity being low. The point can be put thus: the strength of each argument is inversely proportional to the other. As the $P(B/C\&\sim P)$ goes up the FTA is strengthened and the BDA is weakened. As $P(B/C\&\sim P)$ goes down the FTA decreases in merit and the BDA gains favour. To drive home the point, consider the limit cases: $P(B/C\&\sim P) = 1$ and $P(B/C\&\sim P) = 0$. If the initial conditions of the universe made life a certainty, then the BDA would be a non-starter. There would be absolutely no need to look for an explanation of why life arose, although focus would naturally shift to the initial conditions themselves. On the other hand if the initial conditions statistically excluded life, then looking for an agent-based explanation of life would make sense (because it would be a miracle), whereas any talk of the universe being fine-tuned for life would not make the least sense.

This point about inverse proportionality doesn't imply that the arguments are logically inconsistent, for there may be some values for $P(B/C\&\sim P)$ in which both arguments contribute something to the case for theism.[8] To reiterate, our aim in the paper is to investigate the properties of the FTA and BDA, given differing values for $P(B/C\&\sim P)$. We assume that it is currently unknown whether $P(B/C\&\sim P)$ is high or low. What we find interesting is that if the value should turn out to be high then the FTA could be very strong, though the BDA thereby fails. If, however, the value should turn out to be low then the BDA could be very strong and the FTA falters. Moreover, if the value is modest then perhaps both arguments fail. There are several interesting consequences if this relationship holds between the two arguments. One is that whether or not data from the empirical sciences provide material for an argument for theism doesn't depend

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on naturalistic evolution. If some Kauffman-style self-organization scenario is true,[9] then while the advocates of the BDA may suffer loss the overall dialectic favours theism, for in that case there could be a great FTA.

Another interesting consequence of the argument is that the prospects of a two-tiered 'cumulative-case' design argument including both the FTA and the BDA are threatened. A two-tiered design argument will work only if a modest value of P(B/C&~P) is true and makes somewhat successful both arguments which we find unlikely. However, and third, one or the other of the arguments could well be successful as long as the value of P(B/C&~P) is not in a moderate range. Since current models differ primarily over which extreme the value is near, if either side is correct the grounds for one or the other of the FTA or BDA will exist.

We end this section by observing that a prominent advocate of the FTA seems committed to the claim that P(B/C&~P) is relatively high. Richard Swinburne, in *The Existence of God* (revised edition) writes:

> [God] has the power and abundant reason for putting in such a universe intelligent organisms. [I]f all evidence is that the occurrence of boundary conditions and laws such as to permit *and make probable* the evolution of intelligent organisms are *a priori* very unlikely, then that is evidence that God brought them about, and thereby indirectly brought about the existence of intelligent organisms. *He made an intelligent-organism-producing* universe.[10]

This passage suggests that Swinburne thinks the P(B/C&~P) is high. In the most recent edition of *The Existence of God* Swinburne attests:

> [T]here will be an argument from the existence of human (and animal) bodies to the existence of God of any great strength, via the route of 'fine-tuning', only if it follows that a fine-tuned universe will (not merely possibly but with significant probability) lead to embodied humans and animals.[11]

Finally, in a recent response to Jordan Howard Sobel regarding charges of inefficiency involved in standard fine-tuning scenarios,[12] Swinburne has said that, based on his understanding of the current scientific evidence, 'it is very improbable indeed' that the universe would produce no life. He attests, 'The amount of chance in the process is very small.'[13]

These passages bears out our contention that a strong FTA requires a value for P(B/C&~P) that implies the BDA is weak. We do not contend that the FTA is strong or weak. Our point is that there is a tension between the two arguments that has not been commented upon in the literature.[14]

Simplicity and the explanatory power of theism

In the literature on inference to the best explanation the term 'explanatory power' can cover a wide variety of explanatory virtues such as fit with background

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evidence, comprehensiveness, etc. The notion we use is that of Swinburne. Swinburne's general notion of explanatory power is making probable. In the case of personal explanation, predictive power is teleological. Agents have aims and resources which allow one to predict to some degree what they are likely to do. In the case of God, He is omnipotent, omniscient, and perfectly free and thus will always do the best action or kind of action where there is one, and a satisfactorily good action where there is not. Thus, theism predicts states of affairs to the extent that they are intrinsically good or the best means to some intrinsic good. Though plausible arguments can be made to support it,[15] we shall assume that B is such an intrinsic good.

It is God's intention to bring about B combined with the fact that – ex hypothesi – C is a good means to B without any further intervention, which explains why God would bring it about that C. Without this component T has no explanatory power with respect to C, and thus C would not be evidence for T as the FTA advocate alleges. The reason that C's being a good means to the end of B makes C likely is that B is an intrinsically valuable state of affairs, and God is the sort of agent – possessing perfect knowledge, power, and freedom – who could be expected to bring about a state of affairs to the extent that it represents a valuable kind of state of affairs. Put the other way round, to the extent that a state of affairs is a token of a type of intrinsically good state of affairs it is the kind of thing we can expect God to bring about.[16]

This point is worth dwelling on for a moment. If theism is going to be more than marginally confirmed, it must score high in explanatory power and simplicity. Since there are an infinite number of hypotheses which entail the data in this case, simplicity is of the utmost importance. Like all *explananda* in science, the existence of the world and its features faces an underdetermination problem. Consider the following hypotheses: 345 demigods created the world just as it is; one being with a very large physical body created the world just as it is; an advanced culture from another spatiotemporal continuum created the world just as it is; the world was created by the last member of a backwardly infinite series of ever-more-complex demigods; the world has always existed in a series of expansions and contractions. All these hypotheses entail the existence of the world we observe, yet they are not all on a par epistemically. How should we choose among these competing hypotheses? Among the different criteria for selection, simplicity plays a central role.

The virtue of monotheism is that it posits one entity of a familiar type –personal agent – with one property – intentional power[17] – held in the simplest way – without limit.[18] Such a being would know the good and desire it to be actualized and nothing could prevent such a being from bringing it about. Thus, to the extent that a state of affairs is sufficiently good, we have some reason to expect God to bring it about.[19,20]

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The crucial probability – P(B/C&∼P)

The P(B/C&∼P) is either extremely low, very high, or somewhere in between. If the value is high the FTA will be well positioned but the BDA will be a non-starter. If the value is very low the BDA will have the basis for success but the FTA will fair poorly. If the value falls somewhere else in the 'moderate' range then the FTA and BDA advocates have some work to do in order to show how these arguments can confirm theism. For all we know there may be a 'sweet spot' for the P(B/C&∼P) on which both the FTA & BDA turn out to be quite good, but there are various obstacles to defending the existence of such a range.

Scenario 1: the P(B/C&∼P) is low

Consequences for the FTA: If the P(B/C&∼P) is low then the supposition that a good God desires to bring about B should not lead one to think that P(C/T) >> P(C/∼T). Why? In the FTA the original thought is that P(C/T) >> P(C/∼T). The reason for this is that the P(B/C&∼P) is fairly high and a good God has a desire to bring about B. You then learn that the P(B/C&∼P) is not fairly high. In this case, your rationale for the original thought is undercut. You should, at least, suspend judgment on the claim that P(C/T) >> P(C/∼T).

Consequences for the BDA: Even though the FTA gets weaker when P(B/C&∼P) gets lower, the BDA gets stronger at lower values, for where the P(B/C&∼P) is very low and yet B obtains, some explanation for the occurrence of B is called for. If it's low enough,[21] then it's reasonable to think that P(T/B) > P(T), so T is confirmed by B. So it's reasonable the BDA will be on good ground where the P(B/C&∼P) is low.

An objection: It might be objected by the apologist who wishes to hold on to both the FTA and the BDA that God might find it more valuable to first create a world which allowed for, but probabilistically precluded, life and then add life in as a 'fingerprint'. To this we have three replies. First, either the FTA or the BDA by themselves would count as such a 'fingerprint'. Secondly, it would take independent argument that this was a better state of affairs than single-stage creation as the strong FTA advocate alleges; it is not enough to merely assert that it is. Finally, notice that all the work in such a two-state approach is being done by the BDA data, the 'fine-tuning' data simply serve as a backdrop to make biological design stand out. Thus this approach is not a reply to our criticisms but rather a capitulation and a choice of the BDA over the FTA.

Scenario 2: the P(B/C&∼P) is high[22]

Consequences for the BDA: As we explained above, in the limit case in which the P(B/C&∼P) = 1, the BDA is a non-starter. As long as the P(B/C&∼P) is at least .5 the BDA will not get off the ground. As we move away from the limit case the BDA incrementally gains strength, but as long as the P(B/C&∼P) is not incredibly low there seems little warrant for inferring divine intervention.

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Consequences for the FTA: The FTA, however, may well succeed. Since the fact that P(B/C&∼P) is very high, the supposition that a good God would bring it about supports the central contention that P(C/T) >> P(C/∼T). This is especially true in which the P(C) is extremely low. So, while the BDA fails for high values of P(B/C&∼P), the FTA is on firm ground.

A worry: Let us address one worry here. Does the fact of quantum indeterminacy provide an argument that the P(B/C&∼P) is low or inscrutable and therefore that it can't be high? We are philosophers and not theoretical physicists, so what we say here should be taken with more than a few grains of salt. A well-known result of quantum mechanics is that the velocity and position of a particle (an electron, for example) cannot be simultaneously predicted. This implies that, given knowledge of the initial state of a physical system, one cannot determine with complete accuracy the future evolution of the system. One can only say that there is a certain probability that the system will be in such and such state in the future. Some have taken this result to indicate that there is an underlying indeterminacy in nature. If this inference is correct then the indeterminacy in nature undermines the limit case in which P(B/C&∼P) = 1.[23]

To what extent would indeterminacy undermine a fairly high probability to P(B/C&∼P)? We don't know. But there are several issues that need to be answered in order for indeterminacy to undermine a significant value of P(B/C&∼P). First, the value of P(B/C&∼P) need be only high enough to block the BDA and still make the data more likely than relevant competing hypotheses. So, indeterminacy needs to provide a reason for the P(B/C&∼P) being very low indeed. Second, even if P(B/C&∼P) is low for certain sub-regions of space, it may be that P(B/C&∼P) is not too low for the entirety of space. Third, it needs to be shown how indeterminacy on the quantum level significantly undermines the development of large scale features of the universe. Perhaps indeterminacy on the quantum level can have this affect at or before Planck time. But after Planck time it's not clear that the quantum indeterminacy can have this affect. An objection from quantum indeterminacy would have to show that a universe could not be fine-tuned so as to make life significantly probable. We are aware of no such arguments. In the end we think it best to consider how the values work under the assumption of considerable determinism and then generalize from that if necessary.

Scenario 3: the P(B/C&∼P) is modest

Suppose the P(B/C&∼P) is below .5 but still above the extremely low range. Is it possible for there to be a range in which P(B/C&∼P) takes a value that allows for a BDA *and* a FTA? In this case we conjecture that it's very puzzling that God would bring about C for the means of producing B when C is inefficient for that goal. Rational beings typically perform actions which are as likely to produce their desired effects as is consistent with their ability and other aims. In other

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words, there is a very low prior that God would produce conditions that make the desired ends significantly improbable. This would naturally have to be weighed against any confirmation which would accrue to theism through such an argument, and the net result could be marginal. Thus, the FTA is threatened. Moreover, the threat to the FTA increases the lower the value of P(B/C&∼P) drops. But as the P(B/C&∼P) drops the promise of a BDA increases. So the advocate of both a BDA and FTA has to look for some 'sweet-spot' in which the P(B/C&∼P) is lower than .5 but high enough to not make too implausible the idea that God brings about C for the goal of producing B. We think that apart from introducing other divine goals and arguing that they follow from the simple conception of theism this project is bleak. A rational agent not lacking in knowledge or power will choose the most effective means to his goals. Thus God will choose the most effective means to the goal of B. Hence the P(B/C&∼P) will be greater than .5, indeed surely close to 1.[24] So the prospects for a 'sweet-spot' are dim indeed.

One way of defending the idea that the prior probability of God bringing about initial conditions and laws which leave significant chance of not producing biologically complex life is to suggest that God has other purposes for creating in a multi-stage fashion.[25] The die-hard advocate of a cumulative case involving both a FTA and a BDA can argue that the multi-stage approach is somehow more valuable than the single-act creation. We note several problems with this response. First, some other goals must be given. It's not enough just to advert to 'other' reasons merely as conjecture. This would be an argument from ignorance. The way explanatory arguments for theism work is to posit a person with unlimited knowledge and power who is willing and able to bring about states of affairs which are, at a minimum and on balance, good. Then, to the extent that the obtaining states of affairs are on balance good and that they are quite inexplicable apart from personal explanation, it is reasonable to infer that God brought them about to realize the good they contain. So the foe of a stacked universe (i.e. a universe in which the initial conditions and laws make life almost certain) would need to argue that creation in many acts realizes a greater good than creation by a single act.

Further, positing more complex goals has the potential to hurt the resulting arguments. Suppose God wanted to display His power[26] and this means that God would first create a world and then create life. Now here's the problem: if that's the case why didn't God create a universe that does not permit life at all and then suddenly change the nature of the universe so that it both permitted life and contained life.

Perhaps, to anticipate another line of thought, God wanted to put a distinctive seal on human life by specially creating it. Still, this could be done by means of connecting human souls with bodies suitably evolved in a universe where the probability of B given the initial conditions and laws was adequately high. Finally,

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it might be thought more beautiful to paint a world in multiple strokes. But why is this more beautiful than the classical elegance of pre-planned harmony. Consider an example from pyrotechnics. The beautiful multi-stage explosions of the best fireworks are the result of building the rocket right and then just lighting the fuse. The beautiful and dynamic result comes from planning and precision engineering. In short, it is hard for us to imagine a consideration offered on behalf of two-stage creation which couldn't be just as well achieved with a single creation.[27]

In the end, though, we are content to note that the apologist that wants to hold to both the FTA and BDA is committed to a moderate value of P(B/C&∼P). In this section we argued that there are some issues to work out to get a decent a priori argument that the P(B/C&∼P) does fall within that range. We think, though, wisdom lays in waiting to see how the science works out, for on very many assignments to P(B/C&∼P) a plausible theistic design argument can be formulated.

Concluding observations

We have argued that the strengths of FTA and the BDA are inversely proportional to each other. If the value of P(B/C&∼P) is high then the BDA will be a non-starter but the FTA may very well succeed. If, however, the P(B/C&∼P) is very low the FTA seems a non-starter but the BDA seems well positioned. If the P(B/C&∼P) is modest then there's the possibility of a 'sweet-spot' in which both arguments confirm theism. We've suggested, though, reasons to doubt a 'sweet-spot' in which case a modest value leaves both arguments in a worse state. There is good news and bad news here for the theistic apologist.

The bad news first: it follows from these observations that a cumulative case for theism cannot plausibly include both arguments without a sophisticated response to the problem we have raised. The strength of the arguments depends on currently unknown information and, whatever is learned, both arguments will not contribute a great deal to the case for theism.

However, there are two items of good news for the theistic apologist. First, not only do self-organization scenarios not undermine the design argument for theism, they maximize the strength of the FTA by raising P(B/C&∼P) very high, thus making C an excellent means to B, which we have reason to believe God would bring about, but is quite unlikely otherwise. Second, if the value of P(B/C&∼P) is anything but moderate then either one or the other of the BDA or FTA will have a good starting point. Prevailing models tend to be extreme in their consequences for the development of life with traditional views seeing life as extremely unlikely if the universe is left to itself and more recent views seeing life as nearly inevitable. If either of these views is correct then the theistic apologist can at least get started.[28]

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Notes

1. Most versions presented in the literature assume an initial singularity (see for example, Swinburne (2004), 189). However, a reviewer for this journal pointed out the possibility of such an argument apart from that assumption. There are various ways to modify the argument to make it plausible without this assumption, but for simplicity we shall consider the argument on the assumption of an initial singularity.
2. For an exposition of a similar view see Plantinga (1993), ch. 9.
3. This feature of our view escapes the normalizibility problem pressed by McGrew, McGrew, and Vestrup (2001). For further development of this view see Bradley Monton (2006).
4. Since our goal is to assess the *relation* of the FTA to the BDA we will not consider objections to the arguments such as whether there is any plausible way to fix this prior. For an objection of this sort see Cory Juhl (2006).
5. See Leslie (1989), 2.
6. Collins (1999).
7. Swinburne (2004), ch. 6. Since Swinburne is a substance dualist, his argument is technically an argument from human bodies, bodies capable of supporting the mental life of intelligent moral agents like humans.
8. However, note that any version of the BDA will require $P(B/C\&\sim P)$ to be extremely low and any version of the FTA will need $P(B/C\&\sim P)$ to be fairly high. Holding context fixed, it is plausible that any precisification of 'fairly high' is strictly inconsistent with 'extremely low'.
9. See Kauffman (1993) and (1995).
10. Swinburne (1991), 303.
11. Swinburne (2004), 189.
12. See Sobel (2004), 287.
13. Swinburne (2006), 234.
14. The one exception to this is Richard Swinburne whose post-2005 reprinting of the second edition of *The Existence of God* includes a note on 189 about the tension. This note, though, was added in response to an earlier draft of our paper.

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15. See Swinburne (2004), 118–119.
16. For a subtle discussion of matters pertaining to the explanatory power of theism, see Swinburne (2004), 112–123.
17. Swinburne (1994) considers a single property – 'pure limitless intentional power' from which it is plausible that all God's other properties follow (see especially 150ff). Most theorists take God to have three core properties: knowledge, power, and goodness (see Wierenga (1989), 1, and Hoffman and Rosenkrantz (2002), 15). Swinburne thinks God's goodness follows from His perfect freedom and omniscience (Swinburne (1994), 151). We personally think that perfect freedom is itself derivable from omnipotence and omniscience, but on any traditional account bare theism is a very simple hypothesis. Attributing to God any intention that does not follow solely from the intrinsic goodness of the act requires going beyond simple bare theism to attributing *particular* intentions to God which we see as drastically lowering the prior probability of theism, given the vast array of intentions God might have.
18. For more on this see Swinburne (2004), ch. 5.
19. Since there is no such thing as a best possible world, the question of whether God would necessarily have to create it is moot. Since the rational action in cases of infinitely expanding utility is to satisfice, there is no way to predict in advance *precisely* how good an event God will bring about; but the better a state of affairs, the less surprising it would be that God brought it about.
20. For a more complete treatment of this topic, see Swinburne (2004), ch. 6.
21. How low? Again, since we are inferring nothing less than a miracle, it seems that it must be a statistical impossibility.
22. How high? Not very far from 1. Suppose we are examining possible universes (conceived of as non-maximal possible situations of approximately physical universe-sized chucks), and the one we are looking at is such that P(B/C&∼P) is .75. You ask 'Do you think this is a God-designed universe? I'd probably say, 'I doubt it, God would surely give himself better odds than 3:1. I can't think of any reason why he'd leave a 1 in 4 chance of failure given that he's omnipotent and omniscient.' We consider this again below. God may play dice, but He's surely a better gambler than that.
23. It also undermines the other limit case, but that isn't our concern here.
24. Probably as close to 1 as consistent with human freedom. Swinburne (2006), 234, touches on this point.
25. Richards (2002) suggests no less than a dozen different reasons ranging from the mundane to the bizarre (see 109–110). Almost all the ones worth taking seriously are perfectly consistent with P(B/C&∼P) being very high, as Van Till points out in his reply. See Van Till (2002), 113–118. Richards suggests the following: (1) interactiveness; (2) constituent design; (3) 'artifactuality'; (4) heaven-revealing; (5) God-as-novelist with Himself as character; (6) empirical marks of God's activity; (7) making a world more like a violin needing to be played than a watch; (8) a world open to God's direct influence; (9) 'God-bathed'; (10) God-as-hobbyist; (11) God-as-gardener; (12) God-as-'nose-thumber'-at-naturalists. Some of these we don't understand, most are achievable via fine-tuning, and those that we both understand and are inconsistent with a finely-tuned world are not defended as being more valuable that the goods achieved via fine-tuning. Such goods include a kind of diachronic beauty achievable only in a drawn-out, pre-planned process. Consider the cross-temporal beauty of a pyrotechnic display. Though it takes place over an interval of time – and don't we always wish it was longer? – all that happens is the result of the way it was planned from the beginning and, ideally, one could simply light the initial fuse and then step back and watch the show. The story of cosmic evolution which science depicts has some of these good-making properties and is one reason why God might choose this method of creation. Additionally, God plausibly has reason to remain somewhat hidden, even though He leaves sufficient clues for those who look for them. For an argument to this effect see Poston and Dougherty (2007).
26. Incidentally we think it's a pretty awesome display of power and knowledge to create a universe that has it all written in from the start.
27. At this point we are not addressing the concern that God may intervene in the world as a result of the activity of moral beings, perhaps to right a great wrong or to answer prayer.
28. We are grateful to the participants of Prosblogion, a weblog for the philosophy of religion for comments on an early version of this paper and the participants at the 2005 Eastern Meeting of the Society of Christian Philosophers. We wish to thank Robin Collins and Timothy McGrew for helpful comments as well. Finally, we have a special debt of gratitude to Richard Swinburne, whose extensive comments on the penultimate version of this paper led to significant improvements.

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