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THE ARGUMENT FROM DESIGN

Graham Priest

1. *INTRODUCTION*

The argument from design for the existence of God has a long history. Its roots are in Greek philosophy. It occurs as one of Aquinas' five ways, and was much discussed in the Eighteenth Century. Its classic formulation occurred at the hands of the late Eighteenth Century clergyman and theologian, William Paley. Paley's version, depending as it did on the improbability of a complex organ such as the eye coming into existence all in one go (without divine intervention), was badly damaged by the theory of evolution. However, the argument from design has surfaced again recently in philosophy. Versions of it have been given by Swinburne[1] and Schlesinger[2] which avoid the problems created by the theory of evolution. In fact the two accounts are variants on a theme, a theme moreover, which has a good deal of *prima facie* plausibility. Despite this, I think the argument they present fails and the purpose of this paper is to explain why.

I shall start by explaining basically what the argument is. In section 3 I will consider Swinburne's treatment of it and in section 4 Schlesinger's. This will bring us to the crux of the argument, the question of prior probabilities, which I will discuss in section 5.

2. *RETRODUCTION TO INTELLIGENT CREATION*

A well-known kind of inference is illustrated by the following situation. One day as you are driving to work, the engine of your car stops. A glance at the petrol gauge shows that it reads empty. You conclude that you have run out of petrol. This kind of non-deductive inference is sometimes called 'an inference to the best explanation' though for reasons that will become clearer, I prefer to call it by the name 'retroduction'. Given a certain situation we infer the most likely state of affairs which would account for the situation. Thus an empty petrol tank would explain both the engine stopping and the fuel gauge showing empty. It is not the only possible explanation: a more or less simultaneous failure of the petrol gauge and the petrol pump would also explain the situation. But clearly the empty petrol tank is the most likely explanation.

We can give a precise account of this type of argument as follows. Suppose

[1] 'The Argument from Design', *Philosophy* XLIII 1968, pp. 199-212.
[2] *Religion and the Scientific Method,* Ch. 23, Reidel 1977.

that s is some situation and E is the set of possible explanations available to us. Then if $h \in E$, the inference from s to h is valid iff

$$(\forall h' \in E)\ (pr(h \mid s) \geq pr(h' \mid s))$$

where the probabilites in question may be evaluated with respect to some fixed background knowledge. Of course E may be time dependant and thus the validity of a retroductive argument may change as E expands. This is precisely, of course, what happened to Paley's argument. Intelligent creation may well have been the most likely explanation for the structure of complex anatomical features until the appearance of the theory of evolution.

We now have enough background to state the Swinburne/Schlesinger argument. The argument is a retroductive one. The premiss of the argument, which we will henceforth write as 'e', is essentially the existence of order and structure in the world, for example the order of things regularly obeying laws of nature. The conclusion, which we will henceforth denote by 'h', is the existence of an intelligent being responsible for the order. Now one can deny the soundness of an argument on two grounds. The first is to deny the truth of the premiss. In this case that would be to deny the existence of real order in the world (*in re*). This could be done on the grounds that what order there is, is a short term statistical phenomenon, or else that the order is really in the eye of the (Kantian) beholder. However, this is not the line I wish to pursue. For it seems to me that whatever the truth of the premiss, the argument can be faulted on the second ground — its validity.

3. *SWINBURNE'S VERSION*

At this point it is best to treat the two versions of the argument separately. Let us start with Swinburne's. Swinburne approaches the issue somewhat differently to the way I have approached it. However, his argument is, without doubt, the retroductive argument outlined above. As he says himself[3]

> The structure of any plausible argument from design can only be that the existence of a God responsible for the order in the world is a hypothesis well confirmed on the basis of the evidence, viz. that contained in the premiss [stating the existence of regularities], and better confirmed than any other hypothesis.

He then continues

> I shall begin by showing that there can be no possible explanation for the operation of natural laws other than the activity of a god...

and this he does as follows. According to Swinburne given any piece of order or lawlike behaviour in the world, we may be able to explain it in terms of a more fundamental law. (Thus the regular behaviour of gasses is explained by the laws

[3] *Op. cit.*, p. 203

of statistical thermodynamics, etc.) However, we may ask for an explanation of the explaining laws and so on. At some point we come to fundamental laws not susceptible to further explanation in this way. As Swinburne puts it[4]

> Almost all regularities of succession are due to the normal operation of scientific laws. But to say this is simply to say that these regularities are instances of more general regularities. The operation of the most fundamental regularities clearly cannot be given a normal scientific explanation.

There is a surprising lacuna here in what is otherwise a tightly argued paper. The assumption that there are fundamental regularities, that the chain of explanations cannot be continued indefinitely, is made without further comment. This is particularly surprising since of course this is the crucial point on which Aquinas' versions of the cosmological argument comes to grief: no reason has ever been offered why there should be any fundamental laws of nature in this sense. This a serious flaw in Swinburne's argument. As we shall see, he is going to claim that the explanation for the fundamental laws of nature (if there is one) must be given in terms of an intelligent agent. If there are no fundamental laws the position obviously collapses. However, Swinburne's argument can be repaired here. We may suppose that what is in question is to account for the fundamental laws, if there are any, and if not, to account for the whole infinite sequence of laws, each explaining the former. (This is of course Leibniz' strategy in his version of the cosmological argument.[5]) With this understanding let us continue. Swinburne argues that the only kind of explanation other than scientific covering law explanation is explanation in terms of the action of a rational agent. He then continues[6]

> . . . If the operation [of the most fundamental regularities] is to receive an explanation, and not merely to be left as a brute fact, the explanation must therefore by given in terms of the rational choice of a free agent.

Swinburne appears to be on firm ground here. Since he has ruled out all other possible explanations by construction, only one is left. If this is the case, the argument *must* be valid. If $E = \{h\}$, then h must be the most probable hypothesis! However, appearances are deceptive, and Swinburne has in fact glossed over an important point in the phrase 'their operation is to receive an explanation and not be left as a brute fact'. The point is that being a 'brute fact', as Swinburne puts it, can be an explanation of sorts. The precise sense of 'explanation' in which it can be considered an explanation, is irrelevant. The important fact is that the 'brute fact' hypothesis can be the perfectly validly drawn conclusion of a retroductive inference. (This is why I prefer to call this form of inference 'retroductive' rather than the possibly misleading 'inference to the best explanation'.)

[4] *Op. cit.*, p. 204

[5] See his essay 'On the Ultimate Origin of Things' in e.g. *Leibniz' Philosophical Writings* ed. G. H. Parkinson.

[6] *Op. cit.*, p. 204.

If this is not clear, consider the following case. At breakfast one morning my wife and I happen to discuss an old friend whom I have not seen or heard from in years and who is, as far as I know, living on the other side of the world. After breakfast I take the bus to work. Normally I walk, but the previous weekend I had hurt my knee playing baseball. On the bus, whom should I meet but the old friend, who appears to be as surprised at our meeting as I am. Now what retroductive conclusion is to be drawn in this case? Clearly it is possible that the whole situation has been engineered by someone — my wife for example. However, this would seem a somewhat implausible conclusion. Much more likely is that this is just a coincidence, a 'brute fact' in Swinburne's terminology. There is no 'deeper' explanation: that's just the way things happened. Thus the 'brute fact' hypothesis (that's just the way things are — there is no deeper explanation) is a possible conclusion of a retroductive inference and, as in this case, may even be the validly drawn conclusion.

Thus there is an hypothesis alternative to intelligent creation, which can be drawn from the existence of regularities — the 'that's just the way it is' hypothesis. Actually statisticians have a much nicer name for this kind of hypothesis. They call it the *null hypothesis* — the hypothesis that nothing particularly significant is going on. Thus there are at least two possible conclusions for the argument at hand, h and the null hypothesis which we will henceforth write as 'ϕ'. By downgrading and writing off the null hypothesis summarily, Swinburne makes it appear that his is the only hypothesis, which therefore wins by default. However, we now see that there are two hypotheses and the argument hinges on which of these is the more probable given the evidence, i.e. which of $pr(h \mid e)$ and $pr(\phi \mid e)$ is greater. For the time being we will leave things there and pick up Schlesinger's version of the argument.

4. *SCHLESINGER'S VERSION*

Schlesinger's approach is somewhat different from Swinburne's, though the idea is basically the same. For the empirical evidence, or thing to be explained, Schlesinger takes the existence of a universe whose 'laws of nature . . . and . . . initial conditions are such that complex and precarious systems like humans can come into existence and survive',[7] where moreover, humans are sentient beings capable of religious and moral sentiments. In this way Schlesinger avoids the problems about the existence of fundamental laws which beset Swinburne's account. Schlesinger is also aware that there are two possible retroductive inferences that can be drawn from this situation, the theistic hypothesis and the null hypothesis. Schlesinger however, argues that the theistic hypothesis is preferable.

> It is clear that from [the theistic hypothesis alone] one can derive that there is a universe and that this universe is such that the conditions prevailing in it allow the existence of some sort of creature similar to man...
> Given, however, [the null hypothesis] instead..., that the physical universe

[7] *Op. cit.*, p. 182.

> and its laws are what they are, not as a result of a transcendent being who willed them into existence, then it is by no means the case that the existent universe had to be just the way it is. . . It follows therefore that . . . the very fact that the actual universe is the way it is confirms h as compared to ϕ. The reason is because $pr(e \mid h) > pr(e \mid \phi)$.[8]

Now with the exception of one minor error this is correct. The existence of an omnipotent being with an interest in creating the kind of world we live in by no means entails the existence of this kind of world. Interest is not *logically* sufficient for performance. However, Schlesinger's main point still seems reasonable, that

$$pr(e \mid h) > pr(e \mid \phi) \qquad (\alpha)$$

What follows from this concerning which of h or ϕ is the better conclusion to draw in this context? The answer is 'As yet, nothing'. For what is in question is the posterior probabilities of h and ϕ, $pr(h \mid e)$ and $pr(\phi \mid e)$. As we saw in section two, the important issue is whether

$$pr(h \mid e) > pr(\phi \mid e) \qquad (\beta)$$

and (α) is no guarantee of this. By a well-known theorem of probability theory[9]

$$pr(h \mid e) = \frac{pr(e \mid h).pr(h)}{pr(e)} \qquad (\gamma)$$

and similarly

$$pr(\phi \mid e) = \frac{pr(e \mid \phi).pr(\phi)}{pr(e)} \qquad (\delta)$$

Hence $pr(h \mid e) > pr(\phi \mid e)$ if and only if

$$pr(e \mid h).pr(h) > pr(e \mid \phi).pr(\phi) \qquad (\epsilon)$$

and without information about $pr(h)$ and $pr(\phi)$ we cannot determine whether this is true, even given (α).

In case it is not clear that the evidence may be more probable on one hypothesis than another and yet the latter hypothesis may be more probable than the former given the evidence, consider the following example. Someone chooses a number between 1 and 10 at random. Let h_1 be the hypothesis '1 is chosen', h_2 the hypothesis 'A number $\geqslant 2$ is chosen' and a the evidence 'An odd number is chosen'. Then

$$pr(h_1) = 1/10, pr(a \mid h_1) = 1 \text{ and } pr(h_1 \mid a) = 1/5$$

but

$$pr(h_2) = 9/10, pr(a \mid h_2) = 4/9 \text{ and } pr(h_2 \mid a) = 4/5.$$

Thus although the evidence is more probable given h_1 than h_2, h_2 is still the better bet even given the evidence. This is essentially because the prior probability of h_2, $pr(h_2)$ is so much higher than the prior probability of h_1, $pr(h_1)$.

[8] *Op. cit.*, pp. 183-184. I have changed Schlesinger's notation to bring it into line with the rest of this essay.

[9] See, e.g. Swinburne's book, *Introduction to Confirmation Theory*, Methuen 1972, p. 42.

A less artificial example is provided by the old friend story of the previous section. The meeting of the old friend is much more likely on the hypothesis that someone is trying to arrange it than on the null hypothesis. Yet even given the meeting, the tampering hypothesis is still less probable than the coincidental hypothesis.

Thus, we have seen that the facts Schlesinger points to do not show that h is a better bet than the null hypothesis. What does he say about this? He says

> A word must be said about the point that Theism is confirmed by the facts that the universe contains human beings and that human nature is the way it is. This amounts to no more than that the credibility of Theism, relative to its rivals, is higher than it would be in the absence of those facts. But does it follow that we have to accept Theism as the most credible hypothesis?
>
> The question of the degree of confirmation, provided by a given piece of evidence and the question of how much confirmation is needed to render a hypothesis more credible than its rivals, is a complicated one. However, it may [be] stated that in general a hypothesis which receives more confirmation than its rivals is more credible than its rivals. This implies that if h has received confirmation, no matter of what degree, while none of its rivals have received any confirmation at all, this suffices to render h more confirmed than any of its rivals and therefore more credible than its rivals.[10]

In short Schlesinger thinks that the most confirmed theory is the most acceptable. There is a sense in which this is true and a sense in which it is false. There is an ambiguity in the notion of confirmation which has caused much confusion in studies of inductive logic.[11] 'a confirms h_1 more than h_2' can mean both

(1) a raises the probability of h_1 more than h_2

and (2) h_1 is more probable given a than h_2 is. Let us call these confirmation$_1$ and confirmation$_2$ respectively.

Schlesinger has indeed shown that h is better confirmed$_1$ by e than ϕ is. For provided $pr(e) \neq 0$), (α) entails

$$pr(e \mid h)/pr(e) > pr(e \mid \phi)/pr(e)$$

which by (γ) and (δ) give us that

$$pr(h \mid e)/pr(h) > pr(\phi \mid e)/pr(\phi)$$

(provided $pr(h) \neq 0$ and $pr(\phi) \neq 0$), i.e. h's probability is raised more by e than ϕ's is. However as we have already seen, this does not show that h's posterior probability is greater than ϕ's, i.e. it does not follow that h is better confirmed$_2$ than ϕ. And this is of course the crucial point, which of h and ϕ is more likely given the evidence.

Schlesinger seems to have confused the two notions of confirmation. Because he uses the same word for confirmation$_1$ and confirmation$_2$, he takes confirmation$_1$ to be (trivially) sufficient for confirmation$_2$. It is not.

[10] *Op. cit.*, p. 199.

[11] See, I. Lakatos 'Changes in the Problem of Inductive Logic' in his *Collected Papers*, Vol. 2.

5. *Prior Probabilities*

We now come to the central issue of both versions of the argument. Given that (α) is true, i.e. that

$$\mathrm{pr}(e \mid h) > \mathrm{pr}(e \mid \phi) \qquad (\alpha)$$

what reason is there to suppose that (β) is, i.e. that

$$\mathrm{pr}(h \mid e) > \mathrm{pr}(\phi \mid e)? \qquad (\beta)$$

We know that (β) is true if and only if

$$\mathrm{pr}(e \mid h).\mathrm{pr}(h) > \mathrm{pr}(e \mid \phi).\mathrm{pr}(\phi) \qquad (\epsilon)$$

Hence given (α) we need to know something about the prior probabilities of h and ϕ, pr(h) and pr(ϕ). How are these to be determined? This depends upon what sense of probability is being invoked here — a problem to which neither Swinburne nor Schlesinger addresses himself. In fact there are only two senses of probability that are *prima facie* candidates for use here, frequential probability and inductive probability.[12] I will discuss each of these in turn and argue that on either interpretation, the argument is a failure.

Let us start with frequential probabilities. To determine the frequential probability that a is B we must determine a suitable reference class A of which a is a member. The probability that a is B is then the number of As that are B divided by the number of As. (More sophisticated mathematics needs to be used if the class A is infinite.) How to choose the reference class is, of course, a problem. Normally we are faced with an embarrassment of riches: the problem is to determine which of the numerous candidates is best. However in this case we are faced with the opposite problem: there are too few. If there were a large finite number of universes some of which were the product of intelligent creation and some of which were not, we could determine the prior probability that this universe is the product of intelligent creation by dividing the number of created universes by the number of universes. However, there is, by definition only one totality of everything that exists, one universe. Thus the prior frequential probability that the universe is created is trivially either 0 or 1. Moreover, under these conditions, the argument is valid only if pr(h)=1 and obviously this cannot be assumed without begging the question.

It might be thought that in assessing the frequential probability of h we should take as reference class not the class of actual universes but the class of logically possible universes. Thus the prior probability of h is the number of logically possible universes which are the product of intelligent creation divided by the number of logically possible universes. However, this approach will not deliver us a prior probability at all; for the number of logically possible universes

[12] See, for example R. Carnap 'Statistical and Inductive Probability', The Galois Institute of Mathematics and Art 1955. Reprinted in *Readings in the Philosophy of Science* ed. B. Brody, Prentice Hall 1970. A third interpretation of probability, the propensity theory, seems to have no application in this context. See Swinburne's *Introduction to Confirmation Theory*, p. 22. Inductive probabilities are sometimes called 'epistemic'. See, e.g. B. Skyrms, *Choice and Chance*, 2nd edn. Dickenson 1975.

is surely infinite and therefore simple ratio techniques fail us. Probabilities are sometimes calculated over infinite domains using limit techniques. However, this can be done only when the domain has a suitable ordering of order type ω (the same as that of the positive intigers). The set of logically possible universes has cardinality greater than ω and has no natural ordering in any case. Hence this approach fails. Thus if frequential prior probabilities are used, the argument is not successful.

Let us then examine the possibility that the prior probabilities concerned are inductive. Here the chance of success looks greater.[13] In this camp we need to distinguish between subjectivists and non-subjectivists.

Subjectivists take epistemic probabilities to be rational degrees of belief where 'rational' is equivalent to 'conforming to the axioms of probability theory'. Now if these are the sort of probabilities to be invoked in the argument, it fares very badly. For the only constraint put on subjective probabilities, viz. satisfaction of the axioms of probability theory, is much too weak to yield a determinate validity to the argument. For example, some assignments of subjective probabilities make (ϵ) true (e.g. $pr(h)=1$, $pr(\phi)=0$) and some make it false (e.g. $pr(h)=0$, $pr(\phi)=1$). Thus there is no determinate answer to the question of which hypothesis, h or ϕ, is the valid conclusion. The argument must therefore be considered a failure.

Let us turn finally to non-subjectivists. Merely satisfying the axioms of probability theory is too weak a constraint to yield unique prior probabilities. So the problem that non-subjectivists face is how to put more constraints on prior probability assignments. This is a notoriously difficult problem.[14] However there are, as far as I am aware, only two principles which set constraints on inductive prior probabilities sufficient to give a determinate answer to the question of the validity of the argument at hand. The first of these is the principle that all universal propositions of unlimited scope have zero probability and hence that all existential ones have unit probability.[15] If this were correct then h would have probability 1, ϕ probability 0, and the argument would be valid. However the principle is hardly a satisfactory one and is not now widely held. Swinburne himself argues against, and rejects the principle.[16]

Moreover, it cannot be applied in the case of retroductive inferences without producing absurdity. For if it were correct then virtually any proposition would be a better bet for the conclusion of a retroductive inference than the null hypothesis. (Since this would have prior *and* posterior probability zero.) The absurdity of this is easily seen by considering the example of retroductive

[13] In fact, few people have thought that frequential probabilities can be used in this context. See for example Carnap, *op. cit.* Reichenbach is an exception. See his 'The Logical Foundations of the Concept of Probability' in *Readings in Philosophical Analysis,* eds. H. Feigl and W. Sellars, Appleton-Century-Crofts 1949.

[14] See, for example Carnap's discussion in 'The Aim of Inductive Logic' in *Logic, Methodology and the Philosophy of Science,* eds. E. Nagel, P. Suppes and A. Tarski, Stanford U.P. 1962.

[15] This was epoused by Karl Popper (see his *Logic of Scientific Discovery,* Appendix *vii) and, at one time, Rudolph Carnap (see his *Logical Foundations of Probability,* Appendix to 2nd edition).

[16] *Introduction to Confirmation Theory,* Ch. 5.

inference given in section three concerning the meeting of an old friend. For if this principle were right the hypothesis that Jimmy Carter (or Jack the Ripper or Aristotle) engineered the whole situation would be a better conclusion than that it was a coincidence. Whilst the C.I.A. are known for fixing a large number of situations, their interests are unlikely to have stretched this far.

The second principle which would settle the issue is the principle of indifference (which I suggest, without any hard evidence, to be the line Schlesinger would adopt). According to the principle of indifference, given n exclusive and exhaustive possibilities concerning which we have no relevant information, each has the probability 1/n. Unfortunately, the principle of indifference is a very shaky principle. Not only does it rest on dubious philosophical grounds, but moreover, equally plausible applications of it lead to well-known paradoxes.[17] However, leaving these aside, it is not difficult to see that the principle cannot be applied satisfactorily in this case. We cannot argue that since we have two hypotheses they must, by the principle of indifference, both have probability 1/2. First, it is not at all clear that these hypotheses are exhaustive. Hume's hypothesis[18] according to which the universe is an organism allows the possibility that the order in the universe may be explained in functional terms.[19] Secondly, and more importantly, it is hopelessly naive to argue from the fact that there are two hypotheses that they must each have probability 1/2. Let h_1 be the hypothesis that the universe is exactly as it is and h_2 the hypothesis that it is different; then bearing in mind that there are an infinite number of logically possible universes, it is quite clear that the probability of h_1 must be infinitesimal compared to that of h_2. Without some theoretical back-up, calling evens odds on h and ϕ is totally vacuous. Neither principle can therefore be applied in a satisfactory way.

We have now considered all the possible ways in which the prior probabilities may be determined, and in none of these cases does the argument work.

6. *Conclusion*

The weakest conclusion one can draw from the above considerations is that the argument is, as it stands, unsuccessful. Without plausible considerations which determine prior probabilities it is incomplete. However in virtue of the apparent impossibility of obtaining such considerations a stronger conclusion seems warranted, viz. that the hypotheses are intrinsically such that prior probabilities are impossible to determine and hence that no retroductive argument from design can work. Hume[20] came close to the point when he argued that the universe was so (?) unique that no inductive argument from design can work. Hume's argument is not quite right since, as Swinburne points out[21]

[17] See, for example, William Kneale's *Probability and Induction*, pp. 147-150.

[18] *Dialogues Concerning Natural Religion*, Part VII.

[19] Swinburne actually considers this possibility ('Argument from Design', p. 210) but rejects it on the grounds that only regularities of copresence can be explained functionally whilst laws of nature are regularities of succession. However this is just plain false. For example, the behaviour of a thermostat, which is a regularity of succession, can be explained functionally.

[20] *Op. cit.*, Part II.

[21] 'Argument from Design', p. 208.

retroductive arguments can be made to work for unique objects or events. Cosmological theories are obvious examples. However in these cases, we can adopt a subjectivist account of prior probabilities. For since cosmological hypotheses have empirical consequences, new evidence will continue to turn up. Moreover, it is well-known that in this sort of situation, posterior subjective probabilities tend to the same number, whatever prior assignations are made.[22] Thus convergence would show the objective validity of a retroductive argument to a cosmological conclusion. By contrast, h and ϕ are metaphysical in Popper's sense — they have no test implications. Thus, for them we cannot base a judgement on the convergence produced by accumulating evidence. Hence it may be the uniqueness of the universe which prevents us from using prior frequential probabilities, but it is the metaphysical nature of the hypotheses that prevents us using subjective prior probabilities. However although Hume's diagnosis was not quite right, his conclusion was right enough: the nature of the hypotheses involved in the argument from design ensures that it is just not on.

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[22] See, for example, *Studies in Subjective Probability,* eds. A. E. Kyburg and H. E. Smokler, p. 13.