The fine-tuning argument

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Abstract: A frequent objection to the fine-tuning argument has been that although certain necessary conditions for life were admittedly exceedingly improbable, still, the many possible alternative sets of conditions were all equally improbable, so that no special significance is to be attached to the realization of the conditions of life. Some authors, however, have rejected this objection as fallacious. The object of this paper is to state the objection to the fine-tuning argument in a more telling form than has been done hitherto, and to meet the charge of fallacy.

The common form of the argument stated

The common version of the fine-tuning argument turns on the point that a number of necessary conditions for life are exceedingly improbable. Critics have objected that all the other alternative sets of conditions were equally improbable, but this objection has been regarded by other authors as being fallacious, even obtuse.[1] In what follows I develop a more detailed version of the objection to the argument and aim to reply to the charge of fallacy. In order to achieve reasonable conciseness, I make no attempt to survey all that has now been written on the subject – a substantial monograph would be required for that. Rather, I present the common version of the argument, and discuss only those parts of the literature which seem to call for particular notice in relation to the criticism which I develop.

The argument under consideration goes as follows.[2] The several necessary conditions for life (e.g. that the gravitational constant should lie within a certain narrow interval, etc. etc.) have each a certain (very small) probability. A sequence of (intervals of) values of relevant constants can then be considered, each term in the sequence with its associated (very small) probability. Some expositions of the argument go on to envisage a *single* probability – the probability of the joint realization of values of constants lying within the several intervals – and this will be even smaller than the probabilities associated with the intervals for the several constants. For convenience I will speak of such a single probability, say, 1/k. 1/k is a very small probability indeed, and the fine-tuning argument holds that this fact – the extreme improbability of the realization of certain necessary conditions

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for life – demands explanation. It has seemed to many physicists and philosophers that chance can clearly be ruled out, and that other non-purposive explanations, such as the many-worlds hypothesis, are untenable.[3] The argument concludes that design must be invoked as the only acceptable explanation. The fine-tuning of the universe for life requires a fine-tuner.

We are dealing here with a probabilistic argument which is closely analogous to the traditional teleological argument, whether that is taken broadly, as referring to order of any kind (for example, the Newtonian view of the solar system as celestial clockwork), or narrowly, as referring to the appearance of design in living things. The teleological argument appealed directly to the vast improbability of order coming into existence by chance. In a quite parallel way the common fine-tuning argument claims that the realization of the very improbable conditions of life cannot be put down to chance (or to any other non-purposive cause) and that design must therefore be postulated.

In order to proceed we will need to consider what exactly the *alternatives* are. Consider the sequence described above. It is a sequence of real number intervals within which the actual values of the several constants fall, and is such that, for each constant, it is a necessary condition for life that that constant fall within that interval. Each of these intervals is supposed to have an associated (very small) probability. How are such probabilities to be understood? It is clear that it is the classical theory that is being applied, with its Principle of Indifference. The probability of a given interval is determined by first considering the total number of possible intervals equal to the given interval. (Presumably this will be the number of equal intervals within theoretically determined limits in each case, so that the number is finite. There may perhaps be objections to this, but the assumption is favourable to the fine-tuning argument.) Since there is no reason to expect any one of these equal intervals to have been realized rather than another, equal intervals (for each constant) are held to be equiprobable, by the Principle of Indifference. The probability of a given interval is then the ratio of the number of given cases (i.e. unity) to the total number of equiprobable cases. (I claim that this must be the underlying theory of probability because there is no other possibility suggested or even in sight.) Now it is clear that, for each constant, each of the equal intervals other than the actual one is an interval within which that constant might have fallen, but did not. Any sequence of intervals which arises by substituting a different equal interval for one or more of the actual intervals (call these 'derivative sequences') therefore constitutes a way in which the totality of the constants might have been realized, though in fact it was not. The probability of each such derivative sequence is 1/k as well, since the probability of each such sequence is the same function of equal probabilities. The *alternatives* we can then define to be the various derivative sequences of intervals, i.e. the equiprobable ways the constants might have been fixed, but were not.

It will be assumed here (for later application) that each alternative constitutes

necessary conditions for some subsequent possible state of the world. This seems to be implied in the usual statements of the argument, and ordinary expectations of symmetry suggest the same; if one set of conditions (the actual set) constitutes necessary conditions for some later state, then it is reasonable to expect that other equiprobable sets of conditions, had they occurred instead, would likewise have been necessary conditions for some later state or other. It should be noticed, however, that it is not being assumed that either the necessary conditions for life, or the alternatives, are to be regarded as necessary conditions for just *one* subsequent type of state. There seems no particular basis for such an assumption. The conditions addressed in the fine-tuning argument are necessary conditions for life, but they are also, it would seem, necessary conditions for some other type (or types) of state, like the present state of things in many respects, but devoid of life through the failure of further conditions to be realized; and the corresponding point holds for the alternatives.

The objection to the argument

I now proceed to a criticism of the argument. Consider all the cards from a well-shuffled pack being dealt out from left to right. (Call any result of this 'a hand'). Suppose that there is a conventional or standard ordering of suits used by card manufacturers and known to card players, and suppose, for the sake of argument, that it is Diamonds, Hearts, Clubs, Spades. On the classical theory the probability of the cards falling in numerical order in suits, Diamonds first, then Hearts, Clubs, and Spades (call this 'the perfect hand') is $1/52!$. This is a very small number indeed; $52!$ is about 8066×10^{64}. If one sits at a table and is dealt the perfect hand, one will no doubt think that this is *a put-up job*,[4] that it has been arranged somehow, by some prankster, that this should happen. However, one will not take the same view of the other 8066×10^{64} odd hands though, as is well known, they all have just the same (classical) probability as the perfect hand. (Quite possibly we would regard it is a put-up job if a hand proved to be *any* of the twenty-four ways of ordering the suits (with numerical order retained within them), even if D–H–C–S were strongly favoured by existing conventions and practices. However, the total number of such cases would still be so small relative to the huge number $52!$ that it is reasonable to speak as though there were just one case to consider. Moreover, this amounts to no more than a qualification to what is said; it will not prove to be of any help to the fine-tuning argument.) The situation is thus far analogous to that envisaged in the fine-tuning argument. The conditions for life are very improbable, and powerfully suggest, according to the proponents of the argument, a put-up job. Each of the hugely many alternatives is admittedly equally improbable, but these alternatives all lead to lifeless worlds and it would seem that they no more call for purposive explanation than do the many less than perfect hands.

Now, it appears to me, the question that matters here is this: why do we regard

this one arrangement of cards – the perfect hand – as *significant*, i.e. as betokening purpose, as the work of an intervening mind, but the other 8066×10^{64} odd arrangements as *not* significant, *not* betokening purpose, *not* the work of an intervening mind? The answer is surely a simple one; it is that this one arrangement (a) is the way that cards are packed by the manufacturer, (b) is the way that cards (and other sequentially numbered objects) are *naturally* thought of as due for arrangement, or liable to be arranged, and (c) is the way that (partially) reflects something even more fundamental, viz. the natural order of the integers, i.e. their order according to magnitude. These reasons – or reasons that are closely related to them, or variants on them – are surely the reasons why, if you were dealt the perfect hand, you would think that things had been arranged that way by a mind. That is the way minds go on with respect to arranging cards and similar objects to which conventional ordering practices apply. Now, the conditions for life are regarded as significant (in the same sense) by the fine-tuning argument. Why? Presumably because, in a parallel way, certain considerations mark these conditions off from the other (k–1) arrangements of conditions that are equally probable. What are those considerations? The question, that is, is the question of what it is that corresponds, in the case of life's necessary conditions, to (a), (b), and (c) in the case of the perfect hand. (a), (b), and (c) are, I am now assuming, *good* reasons for thinking that the perfect hand is significant, i.e. that it signifies the activity of mind; the question now being raised is the question what parallel or corresponding good reason there is, in the case of the necessary conditions of life, to view *them* as significant.

Various answers to this question are suggested in the literature. One stems from a consideration of *value*.[5] Life, especially of the human kind, is held to be something of supreme value. So (the argument runs) the realization of the remotely improbable conditions for this supremely valuable phenomenon should be regarded as signifying the activity of mind. But why? Presumably just because it is a question of *value*. But that reply only carries us back to the original type of difficulty; the problem now becomes that of saying why the realization of the necessary conditions for value, or for this value, should be regarded as significant, but the (counterfactual) realization of any of the equiprobable alternatives as not significant, and we are no further forward. The appeal to value also appears to require an objectivist account of value, since if value had a purely subjective character the realization of its necessary conditions would be merely the realization of certain conditions for human mentality, and there would cease to be anything distinctive about value to ground the argument. Objectivist accounts of value seem to me to be implausible, but clearly this cannot be defended here, and must stand as an unargued assumption. (The question of value will be reconsidered in the final section below.)

Another, quite different line of thought arises from the complex orderliness of life, so naturally and forcefully prompting the hypothesis of design. Advocates of

the fine-tuning argument are generally careful to separate the argument from the traditional teleological proof – which, they agree, foundered upon Darwinism – but I think it highly likely that some believe that purpose must still be postulated to account for the realization of the conditions of Evolution, even if Evolution itself fully accounts for all the appearances of design, presumably because Evolution, unlike all other natural processes, is a process producing such ordered complexity.[6] It is important therefore to recognize that once the traditional teleological argument is set aside then the ordered complexity of life can provide no handle for the fine-tuning argument. Someone who once concedes Evolution as an explanation of the apparent design has given up all the probative force traditionally attaching to the latter – there is no residue remaining to be inherited by the fine-tuning argument. The appearance of design has been explained by Darwinism (so, we are assuming, fine-tuners are conceding); even the intricate structure of eyes and brains, so overpoweringly suggestive of design, is in fact the product of causes with no mentality and no purpose of any kind (so – again – fine-tuners are conceding), namely random genetic variation and natural selection. There is *nothing* in the way of apparent design outstanding, *nothing* (in this domain) to constitute a reason for regarding the fine tuning as significant. What does now remain is an undesigned natural process whose necessary conditions (and, no doubt, actual beginning) are very improbable. But that merely returns us to the original question; what *further* considerations make these small probabilities significant of mind? I should emphasize that the argument just given does not require the acceptance of Evolution, but can be taken purely *ad hominem*. Thus even someone who thinks that it is incredible that eyes and brains should be produced by Evolution alone can still allow that *if* the evolutionary theory is conceded to be true, then it must be accepted that the order present in life is accounted for by that theory, leaving nothing over for the fine-tuning argument to appeal to. Thus a fine-tuner who accepts Evolution thereby deprives himself of that way of arguing that the improbable conditions of life are significant.

Leslie's way of answering the question what it is that corresponds to (a), (b), and (c) in the case of the cards involves another line of thought altogether from the preceding two (i.e. value and complex order). What he argues in chapter 5 of *Universes* is that ' a chief reason for thinking that something stands in special need of explanation is that we actually glimpse some tidy way in which it might be explained'.[7] Yet this principle appears quite implausible. The presence of water on the ground (or bread in my cupboard) need not be regarded as something that stands in special need of explanation, yet one can no doubt easily glimpse exceedingly tidy explanations, namely that it has rained (or that I have been to the shop). If the particular examples do not appeal, the reader is invited to supply others; but we assuredly need to acknowledge the existence of some circumstances which do not call for special explanation despite the fact that one can see some tidy way of explaining them. Leslie suggests that a feedback loop holds,

'connecting a tidy explanation with the need for a thing to be explained' – seeing some causal agency apparently at work 'suggests both an explanation and the need for one'.[8] This may of course be so in some cases, but the point certainly does not hold generally, as the cases above make clear. It is hard then to see that Leslie's principle about explanation serves any better than considerations about value or order to fill the lacuna in the fine-tuning argument.

In his accounts of the fine-tuning argument Davies often connects the fine tuning, not so much with life in general as specifically with *mind*. On this approach what is 'fishy' (in Davies's word) is that the very improbable conditions for mind have been realized, a fact which suggests to him that the universe is friendly to mind.[9] Our question here is, then, whether there is something about mind which would signify the presence of purpose in a way corresponding to (a), (b), and (c) in the case of the perfect hand. Now Davies appears to accord no recognition at all to the intensive discussion, since the papers by Place and Smart in the fifties, of the possibility of a materialist interpretation of mind. If this interpretation proved to be possible (and it is now quite commonly accepted as so by philosophers of mind) then considerations about minds are (in brief) considerations about brains, and we are dealing only with a special case of the appearance of design in life. The points in the last paragraph but one about fine tuning and Evolution then apply, and the case of mind provides nothing distinctive to signify the operation of extra-human purpose, and thus does nothing to close the lacuna in the fine-tuning argument. But if, on the other hand, we were to assume – most implausibly – the inevitability of some form of dualism, this twist to the fine-tuning argument would collapse for a different reason. The reason is that, whether or not the existence of immaterial minds would in itself be significant, there would now be no title to claim any fine tuning. Let us now assume for the purposes of the argument that psycho-physical dualism is true in some form or other; on that assumption we cease to be able to assert the fundamental thesis of this version of the fine-tuning argument, namely that the necessary conditions of mind are very improbable. We cease to be able to assert this simply because it is no longer a question of cosmology. Nobody has any idea what the necessary conditions for the existence and operation of mind – *understood in accordance with dualism* – would be. Locally, indeed, things are so arranged that a mind is connected with the physical world by being joined with a brain – even Descartes did not deny *that* – but there is nothing in dualism to say that this is a necessary condition of either the existence or operation of mind. Dualists in fact have commonly supposed otherwise. If one is to be serious about dualism, then, one needs to recognize that if it is true then the world has a dimension that lies right outside the domain of physics, and this simply stymies the fine-tuning argument when given this dualist form. So, whether we take a materialist or a dualist view of mind, Davies's twist to the fine-tuning argument, referred to at the start of this paragraph, is powerless to advance it.

Swinburne's version of the fine-tuning argument,[10] which is considered

separately below, also involves a reference to mind, and it is convenient to take account of this aspect of it here. Swinburne is an unabashed and sophisticated dualist, and in other writings has argued from the premise of a Cartesian form of dualism to theism as the only, or best, explanation of such a state of affairs.[11] But in his account of the fine-tuning argument he sets that line of argument aside. What he does do is to take as his 'datum that there exist bodies which are suitable vehicles for the embodiment of conscious beings',[12] where 'conscious beings' is to be understood in a Cartesian sense. He goes on to argue that complex brains and large stable bodies with sense organs are required for such embodiment, and then proceeds to discuss the improbability of the fine tuning necessary for the existence of such organs and organisms.[13] But here, as before, we find that a consideration of mind does not provide a distinctive twist to the fine-tuning argument capable of supplying the required point that the improbability of the necessary conditions of life is significant. (I should note that it is not necessarily Swinburne's intention to supply just this; but we are considering his discussion as possibly casting light on the matter.) As was noted in relation to Davies in the previous paragraph, the fine tuning that cosmology informs us about is fine tuning for brains, sense organs, etc., not for Cartesian minds. No-one could plausibly claim to have information about the probability of the necessary conditions for the existence and operation of Cartesian *res cogitantes*, so the data about fine tuning simply do not apply. It could not even be claimed, as Swinburne does claim, that the fine tuning at any rate pertains to *embodiment*, i.e. that the necessary conditions of brains and sense organs are also necessary conditions of the embodiment of Cartesian minds. The reason is that Swinburne's datum is stated to be the existence of bodies 'which are suitable vehicles for the embodiment of conscious beings'; but there is nothing in that datum to say that the existence of brains and sense organs is a necessary condition for embodiment, since Swinburne, like Descartes and Locke when they address the same point, holds that all psycho-physical connections, as far as any science of ours can go, are arbitrary divine fiats.[14] Thus no particular physical mechanisms could be regarded as necessary conditions even for embodiment – other quite different ones would have done just as well so far as our science can ever tell us. (For this reason, indeed, Swinburne's purported deduction of a need for brain, sense organs etc. for the purposes of embodiment is inconsistent with his Cartesian-Lockean view of the arbitrariness of the psycho-physical connections; this constitutes an objection to his Bayesian argument as a whole, and will be referred to again in the final section below.)

Elsewhere, too, Swinburne says things that may suggest to the reader that certain physical events are necessary conditions at least of embodiment. Thus, he says in *Is There a God?* that, 'at some stage of animal evolution, an animal brain became so complex that that *caused* the existence of a soul connected to it …; and, as evolution moves on, similar complexity *causes* similar souls' (my emphases).[15] But against this is his endorsement of Creationism in *The Evolution of the Soul*:

'The human soul is not something which develops naturally from the genetic material, but is something created on each occasion by God … and linked to the developing embryo'.[16] However, these points need not detain us; the important fact for our purposes is that just as nothing can be claimed on the authority of cosmology (or any other science) about the necessary conditions of the existence of dualist mind, so, we now see, nothing can be claimed even about the necessary conditions of its embodiment. We thus reach an impasse similar to that we reached with Davies. Even if there were something significant about the existence of immaterial mind (supposing there to be such a thing for the sake of the argument), this does not remedy things for the fine-tuning argument, since the fine-tuning considerations themselves cease to apply to immaterial mind (and even to its embodiment).

In this section I began with what Leslie calls 'the standard bridge hand objection', though in a more interesting form. I then modified it in a way that brings further, separate factors into account, and proceeded to argue that with this modification a rather more telling form of the standard objection becomes available.[17]

A reply to the above objection

But there is a point that might be made now to undercut the whole foregoing line of argument. In his discussion of the fine-tuning argument Smart draws attention to the objector who, noting that the physical constants must have some values, then observes that those values might just as well be those that were actually realized ('Why not the actual values?'). Smart replies to this objector in the following way:

> **There seems to be a fallacy here. Given a particular unfortunate sequence [unfortunate for life, that is], this would require explanation, no less than a particular fortunate one. What would not require explanation would be that there was some unfortunate sequence or other. This does not need explanation because the set of unfortunate sequences is hugely greater than the set of fortunate ones.[18]**

Smart's point, applied to what was argued in the preceding section, would be that the account given there of the case of life (and also of the case of the perfect hand) is misconceived. The necessary conditions of life, it might be said, are significant of mind or purpose simply because they are so improbable by comparison with the alternatives taken together. All the other equally probable sequences of values are alike in being conditions for a lifeless universe, so the proper comparison is not between the very improbable conditions for life and one particular equi-probable alternative or another, but between the very improbable conditions for life and the overwhelming probability of conditions for a lifeless universe. That always was the fine-tuning argument, it might be said. No reason for regarding the

conditions for life as significant need be sought beyond their extreme (comparative) improbability. It is a lifeless world whose conditions are overwhelmingly probable. The fact demanding explanation is that *it* has not eventuated, and the explanation must be some purposive fine tuning.

There is no doubt an important point being made here, and one that a critic of the fine-tuning argument must come to terms with, on pain of being rendered unable to account for probabilistic arguments of a common type. If there is some basis for contrasting one particular event with all the alternative outcomes, taken together, and if the probability of that particular event is very small by comparison with the probability of the alternatives taken together, then a need for explanation will certainly be felt. The perfect hand, it might be said, is a case in point. Here one particular orderly state should be opposed to the enormous totality of other, disorderly ones – the rest of all the possible hands, taken collectively. *Orderliness* can happen only one way, but *disorderliness* can happen in some 8066×10^{64} different ways.[19] Similarly, the argument would run, the conditions for life can happen only one way, but lifelessness can happen in $(k–1)$ different ways, and $(k–1)$ is agreed to be an enormous number. Can the critic of the fine-tuning argument really resist this line of reply?

A counter to the above reply

I think that it is resistible. First, recall that each equiprobable sequence of intervals of values of constants has been assumed to constitute necessary conditions for some subsequent state (or states) of the world (first section, final paragraph). If that is so, the subsequent state(s) associated with any one of these sequences of intervals will be distinct from the subsequent state(s) associated with any other. For if conditions Ci and Cj for states Si and Sj differ, and these conditions are respectively necessary conditions for Si and Sj, then Si and Sj must differ. (Suppose that Si occurs and that $Si = Sj$. Ci holds, since Si occurs. Then Cj does not hold, since Ci and Cj are mutually exclusive. So Cj does not hold, but Sj does, so Cj is not necessary for Sj, contrary to the assumption.) It follows that there are very many distinct possible states alternative to life. (This is perhaps not likely to be denied, but it *is* likely to be obscured by the practice – now under discussion – of lumping together all the alternative sets of necessary conditions for lifeless worlds. That it matters will be argued in a moment.) Consider one of these, and call it ‘Strife’. (I capitalize the word to make clear that it should be taken as a proper name for this particular type of state, and for the duration of this point I also write ‘Life’ to make the parallel. Note that ‘Strife’ and ‘Life’ merely denote certain states, and do not refer to any kind of explanatory or organizing principle.) Strife is (i.e. would have been, had it occurred) a particular form of nasty lifeless chaos and its necessary conditions are very improbable. Its necessary conditions in fact have just the same probability as the necessary conditions of Life, since Strife is

being supposed to be a state with necessary conditions which are alternative to Life's conditions and are therefore equiprobable with Life's (first section). The forms that non-Strife could take (including Life as one among others) are very numerous, in fact there are just as many as non-Life can take. Now consider the values of constants unfortunate for Strife. Here we can simply transfer Smart's point noted in the third section ('A reply to the above objection') to the case of Strife. Suppose Strife had occurred, not Life. In that event the proper comparison on Smart's account would not be between the very improbable conditions for Strife and one or another of the equally improbable sets of conditions for non-Strife, but between the very improbable conditions for Strife and the totality of alternative conditions for non-Strife – all the non-Strife – permitting sets of conditions taken together. That is, if Strife had occurred (rather than Life) then the realization of conditions for non-Strife would have been the overwhelmingly probable case, just as, things being as they are, the realization of some conditions (or other) for non-Life is the overwhelmingly probable case.

With this background we can now state a reply to Smart's suggestion of a fallacy. Life is what occurred, Strife did not. But pursue the above thought-experiment, a universe permitting and producing Strife. Imagine yourself now as a disembodied intelligence, not dependent on the evolving physical universe of the thought-experiment, but looking on with interest, and applying the same epistemic standards as now. Will you argue that this universe must have been fine tuned for Strife? You *should*, if you endorse the interpretation of the fine-tuning argument that started this part of the discussion (third section, first paragraph), since on this interpretation it is the sheer improbability of the conditions for Life by comparison with the probability of the conditions for non-Life that is the sole basis for the inference to a fine-tuner. Hence, in the thought-experiment, we would likewise require to infer to a fine-tuner, since the case of Strife in the world of the thought-experiment exactly parallels that of Life in the world as it is, in the only respect that now matters, viz. in respect of improbability by comparison with all the other possibilities taken collectively. Finally, however, to complete the point, it is plain that we will *not* draw such an inference. The mere improbability of the conditions of Strife in relation to those of non-Strife would be no reason whatever to postulate a fine-tuner, and I will now assume that in the thought-experiment no-one would be inclined to make that postulation. The case of the cards works out in a similar way. If the improbability of one particular hand by comparison with the probability of all the other alternatives taken together was by itself a correct explanation (or justification) of our belief that the perfect hand was a put-up job, then any hand whatever ought to attract the same belief, since it is on all fours with the perfect hand in what is being declared to be the only relevant respect.

It is clear by now that the version of the fine-tuning argument formulated in the first paragraph of the third section ('A reply …') is untenable; if *that* is how the argument is to be taken then Strife would have to be regarded as no less significant

of purpose than Life, and any arbitrary hand of cards as no less significant than the perfect hand. The trouble is that the probabilistic argument, when it is given the more explicit formulation of the third section, second paragraph, carried a condition that has been obscured. The formulation there said that *if* there is some basis for contrasting the particular improbable event with all the alternatives, taken together, then explanation will be called for. But the stated condition needs to be met if we are to proceed – there does need to exist that basis for contrasting the particular event with all its alternatives. Moreover, not any old basis will do. There is a basis for contrasting the perfect hand with all other hands that consists in the fact that the perfect hand is one particular permutation of the cards which can readily be distinguished from every other, but in that sense there is equally a basis for contrasting (in turn) *each* of the imperfect hands with all the other hands. (The present discussion does not offer to say what sort of basis *will* do; the onus for that is not especially upon the critic of the fine-tuning argument.) Hence we are thrown back again on to the considerations of the second section above ('The objection to the argument'). There it was held that certain properties (those labelled (a), (b), (c)) constitute the reason for regarding the perfect hand as significant; and one now sees that it is just those properties that also constitute the required basis for contrasting the case of the perfect hand with all the alternative hands, taken together. In the second section it was also held that corresponding considerations are apparently lacking when it comes to the case of Life; it was argued that the various candidates that might be proposed for regarding Life (or its conditions) as significant will not withstand scrutiny. This thesis applies again now; if there is no basis available for contrasting the case of Life with all the alternatives taken together, then we have no reason (of the sort now under discussion) to hold that Life requires explanation in a way that Strife would not. In a word, for the fine-tuning argument to benefit from the point made by Smart some further consideration must be brought in *ab extra* to distinguish the case of Life from that of Strife. Fine-tuners, it seems to me, have not succeeded in doing this.

The Bayesian argument and its relevance

The common fine-tuning argument considered up to this point has the following (approximate) form: certain conditions for life have been uncovered by cosmologists which are so improbable (in the naive version), or so improbable compared with all the other equiprobable cases taken together (in Smart's recension of the naive version), that a theistic explanation is called for because either (1) it alone, or (2) it best, accounts for the discovery. The discussion above has aimed at criticism of this form of argument. But there is another form of the fine-tuning argument to consider, namely the form which depends on a use of Bayes' Theorem. This rather more complex form of argument may well be thought to be, not only immune to the criticism of the previous sections, but also able to suggest an

answer to it, thus serving in addition to rescue the common form of the argument. Bayesian versions of the fine-tuning argument are well known from the writings of Schlesinger and Swinburne.[20] I will focus here upon the version given by Swinburne in his paper 'Argument from the fine-tuning of the universe'.

Swinburne begins as follows:

> **Why is intelligent life in special need of explanation? Why is there anything more to be explained if a Universe contains intelligent life than if it does not? Because, intelligent life is something which a creator God would have the power and abundant reason for bringing about, and so a phenomenon which, if he exists, would be quite likely to occur. If it is also ... something not in the least likely to occur except as a result of God's agency, then its occurrence is evidence for God's existence. This ... is the structure of all worthwhile arguments for the existence of God; and indeed ... all inductive arguments for anything at all.[21]**

The argument depends on Bayes' Theorem, in the form:

$$\frac{P(h/e\&k) = P(e/h\&k) \times P(h/k)}{P(e/k)}$$

where h is the hypothesis (here, that there is a deity with such and such (traditional) attributes), k is the background knowledge, i.e. our knowledge apart from h, and e is the evidence under notice (the existence of intelligent life). Swinburne holds that $P(e/h\&k)$ – the probability of e given h and k – is quite large, and that $P(e/k)$ is very small, so that $P(h/e\&k) > P(h/k)$, i.e. e raises the probability of h beyond its value on k alone (and, indeed, raises it considerably). He claims further, not only that $P(h/e\&k)$ is much greater than $P(h/k)$ (something that could be true even though both were nugatory) but also that $P(h/e\&k)$ is 'substantial'.[22] How are these various points argued? First, $P(e/h\&k)$ is held to be large because consciousness is something of very great value, hence something one has good reason to expect a deity with traditional attributes would be likely to create. (A number of further axiological assumptions enter Swinburne's argument at this point, but we need not pursue them here.)[23] $P(e/k)$, on the other hand, is very small for the reasons already identified in the first section above. $P(h/k)$ – the probability of traditional theism apart from the evidence of fine tuning – is held to be non-nugatory on general grounds of plausibility or simplicity.

Restrictions of space prevent detailed discussion of the differences between the Bayesian argument and the common form of the argument, but some things are clear enough. Thus the common form says nothing at all about $P(h/k)$, and nothing very expressly about $P(e/h\&k)$, though no doubt it does say something about $P(e/k)$. Bayes' Theorem, on the other hand, says nothing about the conditions under which something calls for (special) explanation, though the claim that life (or mind, or value) does so is a regular feature of the common form of argument. Swinburne does indeed claim in the quoted passage that a need for special explanation is created by Bayesian considerations alone, but his argument on the

point is surely inconclusive. The facts (1) that a certain hypothesis explains and renders likely some circumstance, and (2) that the circumstance is unlikely without the truth of the hypothesis, may well constitute confirming evidence for the hypothesis, but do not imply that the circumstance is in special need of explanation. The presence of bread in my cupboard (to revert to a case cited earlier) is a paradigm of a circumstance which does *not* call for special explanation, yet it is something which is explained and rendered likely by my economic activity at the supermarket and would be most unlikely to occur without that activity. It appears then that Swinburne is *not* giving a successful argument from Bayes' Theorem for thinking that 'intelligent life [is] in special need of explanation' or that there is something 'more to be explained if a Universe contains intelligent life than if it does not'. To establish such things as these evidently requires something further.

I will assume then that we are dealing with two different forms of argument. However, the possibility still exists that Swinburne's argument contains some further point that will serve to redeem the common form from the criticism of earlier sections. In considering this question one can deduce possible lines of thought from 'Argument from the fine-tuning', but in his more recent discussion in *Is There a God?* Swinburne makes an explicit statement which may seem to resolve the matter at once:

> **True, every draw [or hand of cards], every arrangement of matter, is equally improbable a priori – that is, if chance alone dictates what is drawn. But if a person is arranging things, he has reason to produce some arrangements rather than others ([e.g. the perfect hand] …, a world fine tuned to produce animals and humans). And if we find such arrangements, that is reason for supposing that a person is doing the arranging.**[24]

Here Swinburne may seem to answer at a stroke the objection to the common form of the argument developed in earlier sections. The answer is that the deity of traditional theism would have a reason to create the world (and thus its necessary conditions) because that world (*qua* conscious) is *good*. This, it might be said, is what distinguishes the improbability of the conditions of life from the improbability of any of the alternatives, and this is what corresponds to (a), (b), and (c) in the case of the perfect hand. The improbable conditions of life are significant in that they are also conditions for something of great value. Thus, despite the differences between the common form of the argument and Swinburne's Bayesian form, the latter might seem to rescue the former from the earlier objection.

The common form of the fine-tuning argument, however, is not helped by this. The question of value was already considered in the second section ('The objection to the argument'), and two points were made. One was that introducing the question of value is not by itself sufficient, since it merely raises the further question why the realization of conditions for a world embodying value should be judged significant. It will not do to reply to this that it should be judged significant for just the reason that Swinburne gives, namely that it is what a (traditional) deity

is likely to produce. The existence of a theistic hypothesis which renders a circumstance likely no more makes that circumstance significant (in the sense of the common form of the argument) than it puts it in need of special explanation. If it were otherwise *any* circumstance (e.g. the existence of this stone) would be significant, since there is *some* theistic hypothesis on which it is likely. The Bayesian argument, it could be said, is an argument *to* the significance of the conditions of value, not *from* it, so citing the point that P(e/h&k) is large (even unity) does not establish the significance of those conditions; only the success of the Bayesian argument as a whole can do *that*, and that is a very different matter, which we are at present suspending judgement on. The other earlier point was the (unargued) rejection of objectivist views about value; if one takes that stand-point then the supposed value of consciousness has anyway a purely subjective character and its existence can therefore imply nothing about the character of the world beyond human psychology. Swinburne's own argument, it seems, commits him to some form of objectivism about value. Consider his claim that P(e/h&k) – the probability of the world being as we find it, given a deity who values things the world contains and is able to produce them – is quite high. Now admittedly this could hold regardless of the question of objectivity. The con-jectured deity need only be supposed to set a great value on intelligent life and the point about P(e/h&k) will stand, even if all value depended solely on that deity's will, as in, say, the voluntarist ethical theory of Ockham. However, despite that, the familiar epistemological difficulty for divine command theories would apply to rule out such a theory for Swinburne. If goodness is created by the divine will then knowledge of the divine will is necessary for us to know of the presence of goodness. Thus Swinburne would require knowledge of the divine will in order to know that his axiological premises are true. Yet the existence and character of the divine will is among the things in question, and cannot be assumed by his argument. That Swinburne is well-disposed towards objectivism is not indeed a secret,[25] but what is being argued here is that his Bayesian fine-tuning argument *commits* him to an objectivist view. (An unargued, but very plausible assumption here is that the only serious alternatives (for the theist) are objectivism and a divine command theory.) Thus for Swinburne's version of the fine-tuning argument, no less than for the common version, a good deal depends on the view we take of the objectivity of value.

Finally there is the question of the cogency of Swinburne's Bayesian argument, regardless now of its relation to the common form of the argument, and apart from the question of value just discussed. This, however, is not a question that can be properly discussed in a few paragraphs, and I hope to give a full account of it in a subsequent paper. Here I merely remind the reader that a serious objection to the argument has already been made in passing. It is the point noted in the second section, that Swinburne's purported deduction of a need for brains and sense organs from the assumption of embodiment – an important step in the argument

as he sets it out – is inconsistent with his view of the psycho-physical correlations. (According to his deduction brains are required for embodiment; according to his view of the correlations any old stick or stone would serve as well as a brain so far as our science can ever tell us.)

I should note in conclusion that it has not been asserted in this paper that the great improbability of the necessary conditions of life is *not* significant, nor has it been asserted that those conditions do *not* call for explanation of any kind or in any sense. Both these things are theses much stronger than the thesis which it has been my aim to argue. As to the first point, it may yet prove to be the case that there *is* some reason to think that the improbability is significant – I do not think it would be possible to prove otherwise. What *has* been claimed is rather that, when the reasons which have been (or might foreseeably be) advanced are considered, they do not withstand criticism. As to the second point it would be simply bizarre to hold that those improbable conditions for life call for no explanation of any sort or in any sense. Physics no doubt aspires to explain the occurrence of those conditions, and presumably the desiderated Theory of Everything would be called on to do so. What *has* been claimed is rather that the reasons that have been (or might foreseeably be) advanced to think that the conditions call specifically for *purposive* explanation do not withstand criticism.

Notes

1. Thus J. J. C. Smart *Our Place in the Universe* (Oxford: Blackwell, 1989), 177; P. van Inwagen *Metaphysics* (Boulder CO: Westview, 1993), 134–135. The former speaks of a fallacy, the latter uses the word 'obtuse'.
2. This form of the argument, or minor variants on it, can be found in Paul Davies *The Mind of God* (London: Penguin, 1993), ch. 8, and *idem God and the New Physics* (London: Dent, 1983), 186–189; J. Leslie *Universe* (London: Routledge, 1989), ch. 1 (and *passim*); Freeman Dyson *Disturbing the Universe* (New York NY: Harper and Row, 1979), ch. 23; J. J. Haldane in J. J. C. Smart and J. J. Haldane *Atheism and Theism* (Oxford: Blackwell, 1996), 121–129; Philip L. Quinn and Charles Taliaferro (eds) *A Companion to Philosophy of Religion* (Oxford: Blackwell, 1997), 422–423. Smart *Our Place in the Universe*, ch. 7, and Smart and Haldane *Atheism and Theism*, 16–28, present and gives some defence of the argument, but without endorsing it; Van Inwagen *Metaphysics*, chs 7–8 likewise. A great deal of relevant discussion is scattered through J. Leslie (ed.) *Physical Cosmology and Philosophy* (New York NY: Macmillan, 1990). Further recent discussion is in Theodore Drange 'The fine-tuning argument revisited', *Philo*, **3** (2000), 38–49.
3. For the many-worlds hypothesis see Leslie *Universe*, chs 1, 4. Nothing in the present paper turns on this question, and it will not be discussed. The same applies to questions about anthropic principles and selection effects.
4. This apt if racy term is especially appropriate since it was also used by Hoyle to describe the fine tuning. The passage is referred to in Davies *The Mind of God*, 199.
5. *Ibid.*, 214.
6. This thought appears in many discussions, though generally not very explicitly, e.g. van Inwagen *Metaphysics*, 131. Leslie *Universe*, 117–120, advances the idea in an unusually explicit way, but then draws back from it. His wording, however, suggests a residual attachment to the thought that the realization of Evolution's conditions is significant because of the nature of Evolution's output.
7. Leslie *Universe*, 121. A very similar line of thought is in van Inwagen *Metaphysics*, 135–136.
8. Leslie *Universe*, 121.

9. Davies *The Mind of God*, 213, 232. The word 'fishy' is on 204–205. A similar emphasis on mind is in Haldane's discussion in Smart and Haldane *Atheism and Theism*, 128–129; it is in fact quite common in the literature.

10. Richard Swinburne 'Argument from the fine-tuning of the universe', in Leslie *Physical Cosmology*, 154–173. A shortened version of this paper is given as an appendix to Richard Swinburne *The Existence of God* (Oxford: Clarendon Press, rev. edn 1991). A simplified version is given in *idem Is There a God*? (Oxford: Oxford University Press, 1996), ch.4.

11. *Idem Existence of God*, ch. 9; *idem Is There a God?*, ch. 5.

12. *Idem*, 'Argument from fine-tuning', 157.

13. *Ibid.*, 158–161.

14. *Ibid.*, 157; *idem Existence of God*, 172–173; *idem Is There a God?*, 90, 93–94; *idem The Evolution of the Soul* (Oxford: Clarendon Press, 1986), 198–199.

15. *Idem Is There a God?*, 79, point repeated on 89.

16. *Idem Evolution of the Soul*, 199. Also *idem Is There a God?*, 94. R. M. Adams *The Virtue of Faith and Other Essays in Philosophical Theology* (Oxford: Oxford University Press, 1987), 243–262, discusses the question of the psycho-physical correlations in its relation to theism. Though Adams is not addressing the point under discussion here, his essay gives a good sense of the issues involved (and includes textual references for Descartes and Locke). See too Mark Wynn *God and Goodness* (London: Routledge, 1999), 37–46.

17. The quoted phrase is from Leslie *Physical Cosmology*, 20. The recognition that an *argument* is required if one is to regard an improbable event as also significant is not of course new; it can be seen, e.g., in Leslie *Universes*, ch. 5, and Drange 'The fine-tuning argument', 43–45. It seems to me, however, that these authors (and others) have failed to follow the point up in an adequate manner.

18. Smart *Our Place in the Universe*, 177.

19. Such a line of thought can also be seen in Haldane's discussion in Smart and Haldane *Atheism and Theism*, 124–125.

20. George N. Schlesinger *Metaphysics: Methods and Problems* (Oxford: Blackwell, 1983), ch. 3; *idem New Perspectives on Old-time Religion* (Oxford: Clarendon Press, 1988), ch. 5. For Swinburne's version of the argument see note 10 above. Wynn *God and Goodness*, 55–60, also discusses the argument from a Bayesian point of view.

21. Swinburne 'Argument from fine-tuning', 154–155.

22. *Ibid.*, 164.

23. *Ibid.*, 155–157.

24. *Idem Is There a God?*, 67.

25. See *Idem Existence of God*, 97–98, and the further references there. The relevance of value to natural theology is discussed at length in Wynn *God and Goodness*.