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Religion, Science, and Explanation

Abstract

A recent legal ruling in the United States regarding 'intelligent design' (ID) argued that ID is not science because it invokes a supernatural agent. It therefore cannot be taught in public schools. But the important philosophical question is not whether ID invokes a supernatural agent; it is whether it meets the standards we expect of any explanation in the sciences. More generally, could any proposed theistic explanation – one that invokes the deity of classical theism – meet those standards? Could it be *both* scientific *and* religious? The present paper sets out the factors to be taken into account when answering this question.

1 The Question

In December 2005, a United States district court handed down a judgement regarding the teaching of 'intelligent design' (ID) in American schools. The case centred on the actions of the Dover (Pennsylvania) Area School Board, which had decreed that students in biology classes were to be told about ID, as an alternative to the theory of evolution by natural selection. A group of parents had taken a case against the board, arguing that ID is a religious rather than a scientific view, so that its introduction into the classroom breached the constitutional separation of church and state. In his decision, Judge Jones agreed with the plaintiffs, arguing that ID fails to qualify as scientific on a number of grounds. One of these has to do with the methodological naturalism of the sciences. 'ID,' he wrote, 'violates the centuries-old ground rules of science by invoking and permitting supernatural causation.'[1]

What are we to make of this argument? It is true, as a matter of historical fact, that the modern sciences eschew reference to supernatural agents.[2] Reference to divine action disappeared from scientific literature sometime in the

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[1] John E. Jones, Memorandum Opinion: Kitzmiller et al. vs Dover Area School District,' 64. US District Court for the Middle District of Pennsylvania, 20 December 2005.

[2] The natural-supernatural distinction is a difficult one, but I understand a supernatural explanation to be one that refers to an agent who is not part of the natural world but who can interact causally with it; see Paul R. Draper, "God, Science, and Naturalism" in: William J. Wainwright (ed.) *The Oxford Handbook of Philosophy of Religion* (New York: Oxford University Press, 2005), 277–78.

mid-nineteenth century.[3] Charles Darwin's work seems to have been something of a watershed in this respect, representing the triumph of a naturalistic research programme.[4] But even before that date, scientists (or 'natural philosophers') recognised a distinction between natural and supernatural explanations, and restricted themselves (for the most part) to natural explanations.[5] Interestingly, this is true even of theological occasionalists, such as Nicolas Malebranche (1638–1715), who denied the existence of natural (or 'secondary') causes.[6]

So there is no doubting the factual basis of the judge's decision. The modern sciences do exclude talk of divine agency. Even where scientists are unable to find any natural explanation of some phenomenon, they will assume that one exists. But of course the religious opponents of Darwin do not dispute this fact; indeed, they are among the first to highlight it. What they argue is that the naturalism of the sciences is an *a priori*, dogmatic commitment, based on nothing more than atheistic prejudice. If scientists were not already committed to this godless doctrine, they allege, they would recognize that there exist religious explanations of natural phenomena that are both plausible and compelling.[7] So it is not surprising if Darwin's opponents are unimpressed by such legal rulings. They do not disagree that the modern sciences *are* naturalistic; their question is whether they *should* be.

On the face of it, this seems a legitimate question. A central aim of the scientific enterprise is that of explanation.[8] Scientists aim to embrace the best available explanation of whatever phenomenon they are studying: let's say, for the moment, that which is the simplest, most fully corroborated, and most informative. But what if the best available explanation happened to posit a supernatural agent? To reject that explanation, on this ground alone, would seem to run counter to the very *raison d'être* of the scientific enterprise. Would it be reasonable to reject the best available explanation and be satisfied with a less satisfactory explanation, simply because the latter does not invoke a divine agent? It is hard to see how such a choice could avoid the accusation of mere anti-religious prejudice.

It follows that the important question is not, 'Does a proposed explanation appeal to a supernatural agent?' The important question is, 'Is the proposed explanation a good one?' If it is a good one, we should be ready (in principle) to embrace it, no matter what the historical ground-rules of modern science may

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[3] Ronald L. Numbers, 'Science without God: Natural Laws and Christian Beliefs' in: David C. Lindberg and Ronald L. Numbers (eds.), *When Science and Christianity Meet* (Chicago: University of Chicago Press, 2003), 272.

[4] Neal C. Gillespie, *Charles Darwin and the Problem of Creation* (Chicago: Chicago University Press, 1979), 115.

[5] Edward Grant, 'God and Natural Philosophy: The Late Middle Ages and Sir Isaac Newton,' *Early Science and Medicine* 5 (2000): 279–98.

[6] Nicholas Malebranche, *The Search After Truth* Cambridge Texts in the History of Philosophy (Cambridge: Cambridge University Press, 1997), 662.

[7] Phillip E. Johnson, *Reason in the Balance: The Case Against Naturalism in Science, Law, and Education* (Downers Grove, IL: InterVarsity, 1995), 105.

[8] Carl G. Hempel, *Aspects of Scientific Explanation* (New York: The Free Press., 1965), 245.

demand.[9] But this invites a further question, one that is less commonly asked. Could an explanation invoking a supernatural agent *be* a good one? Could it ever meet the standards we expect of explanations in the sciences? More precisely, could a proposed *theistic* explanation – one that invokes the God of classical theism – ever meet these standards? If it could not, then the naturalism of the sciences would be justified. In the pages that follow, I do not attempt to answer that question, which is too large a task for a single essay. I merely outline the factors we should take into account when offering an answer.

2 Objections to Theistic Explanations

There are many who suggest that proposed theistic explanations are wholly unsatisfactory, that they can never meet the standards of the sciences. Let's examine some of the reasons they offer, which fall into at least two categories. Take, for instance, an article on ID by Matthew Brauer, Barbara Forrest, and Steven Gey. In the course of defending the exclusion of ID from the school science curriculum, on the grounds that it is religious rather than scientific, they offer a defence of what they call the 'methodological naturalism' (MN) of the sciences. In fact, they offer (apparently without realising it) two quite different defences.

The first is based on a claim that the naturalism of the sciences is a defeasible position, justified by nothing other than its explanatory success. Naturalism, they write, is

> science's universal procedural protocol requiring natural explanations for natural phenomena. ... This protocol is not arbitrary, and contrary to ID proponents' accusations, requires no a priori metaphysical commitments. The only commitment is to an empirical methodology, which scientists use with good reason: it works. Natural explanations are scientifically successful; supernatural ones are not. The commitment to MN is thus pragmatic and provisional, not ideological.[10]

This objection to proposed 'supernatural explanations' seems to be that they have been falsified by empirical evidence, or at least shown to be less successful than their natural alternatives. I shall describe this as a *de facto* objection to proposed theistic explanations. But our three authors immediately introduce another reason.

> If a better methodology were devised, science would adopt it and adjust the definition of science to reflect its use, but humans have no recognized cognitive faculties for knowing the supernatural. Consequently, despite other ways in which people claim to know things (intuition, revelation, etc.),

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[9] Theodore Schick, 'Methodological Naturalism vs. Methodological Realism,' *Philo: The Journal of the Society of Humanist Philosophers* 3 (2000), 31.

[10] Matthew J. Brauer, Barbara Forrest, and Steven G. Gey, 'Is it Science Yet? Intelligent Design Creationism and the Constitution,' *Washington University Law Quarterly* 83 (2005), 48.

naturalistic methodology is the only intersubjective, public way of knowing nature.[11]

It is difficult to know what to make of this second objection, which is a kind of *in principle* objection, although of a different kind from that I shall explore in a moment. What is wrong with proposed theistic explanations, it suggests, is not that they have been superseded, in the same way that Ptolemaic astronomy has been superseded by Copernican astronomy. What is wrong with proposed theistic explanations is that they are not intersubjectively testable, being based on something like intuition or an alleged divine revelation. And intersubjective testability is a classic feature of the modern sciences.[12]

There is, of course, a problem here. If proposed religious explanations are not testable, it is hard to see how they could be falsified or superseded.[13] So the second objection does not seem to be consistent with the first. It is also a weak objection, for it fails to distinguish between the context of discovery and the context of justification.[14] The mathematician Srinivasa Ramanujan apparently believed that he received formulas from the goddess of Namakkal while asleep.[15] Needless to say, this claim was not taken seriously by his fellow mathematicians. But his results were taken seriously, because he could back them up with proofs. So the important question is not, 'Where did this idea come from?' It is, 'Can it be defended? Can it function as the *explanans* of a successful explanation?' But let me leave this second point aside, for what I want to argue here is that Brauer, Forrest, and Gey's second objection is different in kind from their first. It suggests not merely that natural explanations are more successful, but that supernatural explanations are inherently flawed. They could never meet the standards we expect of an explanation in the sciences.

It would be useful to have a clear distinction between these two kinds of objection, which I shall call *de facto* and *in principle* objections. Can I produce one? Yes, but it will involve setting out a particular view of what it means to offer an explanation. While I believe this view is defensible, it is not the only possible one. But it's still worth doing. If I sketch my understanding of what it means to offer an explanation, it will not only clarify the distinction between *de facto* and *in principle* objections. It will also throw light on other aspects of proposed theistic explanations and will enable me to address the question of whether such explanations could be *both* scientific *and* religious.

3 Potential and Actual Explanations

Let me begin by making a distinction between *potential* and *actual* explanations. This distinction is not uncommon in the literature; we find it, for

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[11] *Ibid.*, 48–49.

[12] Karl. R. Popper, *The Logic of Scientific Discovery* Routledge Classics (London: Routledge, 2002), 22.

[13] Elliot Sober, 'The Design Argument,' in: Neil A. Manson (ed.), *God and Design: The Teleological Argument and Modern Science* (London: Routledge, 2003), 42.

[14] Hans Reichenbach, *Experience and Prediction: An Analysis of the Foundations and the Structure of Knowledge* (Chicago: University of Chicago Press, 1938), 6–7.

[15] G.H. Hardy, 'The Indian Mathematician Ramanujan,' *The American Mathematical Monthly* 44 (1937), 139.

instance, in the work of Peter Lipton.[16] But I would like to develop it by using C. S. Peirce's schema illustrating what he calls 'abduction.'[17] According to Peirce, the typical form of an abductive argument is as follows.

(1) The surprising fact, C, is observed.
(2) But if A were true, C would be a matter of course.
(3) Hence, there is reason to suspect that A is true.[18]

It may not be clear what the *A* and *C* refer to here, so let's replace *C* with *E* (for *explanandum*: the fact to be explained) and *A* with *H* (for 'hypothesis': the proposed *explanans*). Peirce's schema would now read as follows.

(1) The surprising fact, E, is observed.
(2) But if H were true, E would be a matter of course.
(3) Hence, there is reason to suspect that H is true.

I shall define a potential explanation of *E* as any proposition or set of propositions, *H*, that satisfies the second premise of this schema. In other words, a potential explanation is one which, if it were true, would make the *explanandum* what we would expect to observe. What does it mean to say that we would 'expect to observe' something? That's a question to which I shall return shortly, when I discuss intentional explanations (see Section 5). It is tempting to say that an actual (as opposed to potential) explanation is one that has a further feature, namely that it *is* true. But since philosophers wonder if we can ever have adequate reason to affirm that a scientific theory is true,[19] it might be better to spell out this definition in terms of acceptance (treating a proposition as though it *were* true). On this view, we should regard hypothesis *H* as the actual explanation of *E* if two conditions are fulfilled: *H* must be a potential explanation of *E* and we must have adequate reason to accept *H*.

What would be an adequate reason to accept *H*? I shall be assuming that *H*'s being the best available potential explanation of *E* would constitute an adequate reason to accept it. In other words, I shall be assuming the legitimacy of what philosophers call 'inference to the best explanation' (IBE). I am happy to concede that the best available explanation of any fact may be false.[20] But the legitimacy of IBE does not depend on the (clearly implausible) claim that the best available explanation of any fact is true (or even probably true). It depends on the more

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[16] Peter Lipton, *Inference to the Best Explanation Philosophical Issues in Science* (London: Routledge, 1991), 59–60.

[17] In fact Peirce offered a number of analyses of what he also called 'hypothesis' or 'retroduction,' but this is the form upon which he finally settled. See Ilkka Niiniluoto, 'Truth-seeking by Abduction,' in: Friedrich Stadler (ed.), *Induction and Deduction in the Sciences*; Vienna Circle Institute Yearbook 11 (Dordrecht: Kluwer, 2003), 57–64.

[18] Charles Sanders Peirce, *Collected Papers of Charles Sanders Peirce* vol. v: *Pragmatism and Pragmaticism* (Cambridge, MA: Harvard University Press, 1934), 117.

[19] Karl R. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* (London: Routledge and Kegan Paul, 1963), 226.

[20] Bas C. van Fraassen, *Laws and Symmetry* (Oxford: OU P, 1989), 143.

plausible claim that we ought to accept the best available explanation of any fact, provided that explanation is a satisfactory one. If, in the light of further evidence, we discover we were wrong, that does not make our original act of acceptance any less appropriate.

Note the qualification here. I have said that we ought to accept the best available explanation, provided it is a satisfactory one. I introduce this qualification because we may wish to have a bottom line. The best available explanation may be so awful, so lacking in explanatory virtues, that we should not accept it, even if we have nothing better. In these circumstances, the most rational course of action would be to withhold acceptance while we see if we can find a more satisfactory alternative. But with this qualification, IBE does seem a defensible policy. In any case, I shall be assuming its legitimacy in what follows.

4 De Facto and In Principle Objections

I can now spell out more clearly my distinction between *de facto* and *in principle* objections. Someone offering a *de facto* objection accepts that a proposed theistic explanation is a potential explanation of the relevant state of affairs. If it were true, it would render its *explanandum* what we would expect to observe, 'a matter of course.' But she will maintain that we do not have sufficient reason to accept it, perhaps because we have a natural explanation that we judge to be preferable. By way of contrast, someone offering an *in principle* objection argues that even if this account of divine action were true, it would fail to explain. It would not make the *explanandum* what we would expect to observe, 'a matter of course.' Since the account in question is not even a potential explanation, the question of whether it is the best potential explanation cannot arise.

To avoid confusion, it is important to specify the scope of such objections. Are they being leveled at *particular* proposed theistic explanations? If so, it may be that the proposed explanations in question could be improved, so as to escape the objection. Or is the objector arguing that *all* proposed theistic explanations suffer from this weakness, and that no amendment could save them? If the latter claim were true, the whole project of theistic explanation would turn out to be radically flawed.

An example may help to make the difference clear. Let's say that someone offers theistic hypothesis *H* as an explanation of some event *E*. (*E* might be, for instance, Indian Ocean tsunami of 26 December 2004.) In this instance, *H* is a very simple hypothesis: it states that '*E* occurred because God willed it.' On my definition, *H* would count as a potential explanation of *E*. I say this because we can formulate an argument that takes us, with impeccable logic, from *H* to *E*. Here it is.

(1) H: God wills E.
(2) If God wills E, then E.
(3) Therefore E.

Note that given the truth of theism, premise (2) would be uncontroversial: it is inconceivable that God should will something and that it should fail to come about. It follows that if *H* were true, *E would* be 'a matter of course.' It is precisely what we would expect. This means that *H* is a potential explanation of *E*. Yet it seems an unsatisfactory explanation.[21] Why? It may be a potential explanation, it may (as a matter of fact) even be true, but the reason it does not merit our acceptance is that it lacks empirical content. As Karl Popper pointed out, the empirical content of a theory is measured by the number of possible states of affairs it excludes.[22] If it excludes no possible states of affairs, then it is neither testable nor informative.[23] But it may be that this particular hypothesis could be improved: it could be given some empirical content. We could improve it by positing not merely a divine action, but also a particular divine intention.

Here's an example. After the Indian Ocean tsunami of 2004, the chief Sephardic rabbi of Israel suggested that God had brought about this disaster in order to punish those who disobeyed his commandments.[24] Let's call this 'improved' theistic hypothesis *H**.[25] The point I am making here is that our *de facto* objection regarding empirical content may be limited in its scope. It may apply to proposed theistic explanation *H*, but not to proposed theistic explanation *H**. This would be the case if *H** did have empirical content, if it did allow us to predict what would and would not follow if it were true. (For this purpose, *H** may need to be coupled with some other assumptions – 'auxiliary hypotheses,' if you will – but such couplings are common in the sciences.)

Let me offer just one such prediction. Since, as Abraham argued on a similar occasion (Gen 18:25), a just God would not destroy the innocent with the guilty, *H** would seem to entail that the only people who died in the tsunami were those who were guilty of disobeying God's commandments. If this is not what we find, it would count as evidence against hypothesis *H**. So our *de facto* objection to *H* – that it lacks empirical content – may turn out to be an objection of narrow scope, in the sense that *H* could be reformulated so as to avoid it.

What about an objection of broad scope, which would apply to all proposed theistic explanations? Well, here's one. A number of philosophers, both theist and atheist, have argued for some form of 'sceptical theism.' They have suggested that even if we posit a particular divine intention, we cannot predict how God

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[21] Philip Kitcher, 'Explanatory Unification,' *Philosophy of Science* 48 (1981), 528.

[22] Popper, *Logic of Scientific Discovery*, 96.

[23] Luciano Floridi, *Information: A Very Short Introduction* (Oxford: OUP, 2010), 54. The same may be true, incidentally, of the central claim made by advocates of ID. Since they are reluctant (for political reasons) to appear to be advocating a religious position, they fail to specify who their posited designer is supposed to be or what he is supposed to have done. Their central claim boils down to the idea that 'an unknown intelligent designer did something, somewhere, somehow,' for some unspecified reason in order to produce the specified complexity of living beings (Alan Gishlick, Nick Matze, and Wesley R. Elsberry, 'Meyer's Hopeless Monster,' http://pandasthumb.org/archives/2004/08/meyers-hopeless-1.html, 2008). This, too, lacks empirical content.

[24] Shlomo Amar, 'G–d is Angry,' published in the online Israeli media network Arutz Sheva, (http://www.israelnationalnews.com/news.php3?id=74503, December 31, 2004).

[25] One might argue that it is not an improved hypothesis from a moral point of view, attributing attitudes to God that we might regard as abhorrent. But it is an improved hypothesis in the sense of having some discernible empirical content: there are states of affairs (as I shall argue immediately) that would falsify it.

would act in order to bring about what he intends. This may be because of the mysterious character of the posited divine agent,[26] or it may be because of the limits of our own cognitive powers.[27] What would follow if this were true? It would certainly follow that we could not test such explanations, since we could not predict what we would or would not observe, if they were true. Since testability is at least a *desideratum* of any proposed explanation, we would have good reason not to accept a hypothesis of this kind.

But the consequences of sceptical theism are still more serious. If we cannot say how God would implement a posited divine intention, then talk of such intentions would lack all explanatory force. Not only could we not deduce testable consequences from our hypothesis; we could not deduce a description of the *explanandum*, either.[28] We could not say that if theistic hypothesis H were true, then E is what we would expect. So sceptical theism would give rise to an *in principle* objection of the broadest possible scope. It would apply to all proposed theistic explanations, which would turn out to be mere pseudo-explanations. The claim, for instance, that 'God raised Jesus from the dead'" would not count as an explanation of why his body was no longer in the tomb. One hopes that those theists whose embrace such scepticism – in order to lessen the force of the evidential argument from evil[29] – are aware of its implications.

5 Intentional Explanations

I have talked about attributing events to divine agency and of positing particular divine intentions. As this language suggests, proposed theistic explanations are a species of intentional explanation. What form do such explanations take?

There are, broadly speaking, two ways of answering this question, corresponding to two different views of explanation. The first is what I shall call the 'deductivist' approach, which has Carl Hempel as its chief intellectual ancestor.[30] On this view, to say that H explains E is to say that there exists a sound deductive argument taking us from a description of H to a description of E. The second approach appeals to some form of confirmation theory, perhaps Bayesian in inspiration. It argues that to say that H explains E is to say that H renders E more likely than it would be otherwise. More precisely, it argues that $\Pr(E|H) > \Pr(E|{\sim}H)$. The best-known advocate of the latter, 'probabilistic,' approach to explanation, in the context of theism, is Richard Swinburne.

I cannot here discuss the strengths and weaknesses of each of these two views. All I can do is to suggest is that the best reconstructions of intentional explanations rely on some form of practical syllogism and are, to this extent,

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[26] Sober, 'Design Argument,' 38.

[27] Peter van Inwagen, 'Modal Epistemology,' *Philosophical Studies* 92 (1998), 70.

[28] This might appear to entail a 'deductivist' view of explanation, and so it does. But I shall argue for the appropriateness of this view in a moment.

[29] Stephen J. Wykstra, 'The Humean Obstacle to Evidential Arguments from Suffering: On Avoiding the Evils of "Appearance."' in: Marilyn McCord Adams and Robert Merrihew Adams (eds.), *The Problem of Evil* (Oxford: OUP, 1990), 138–60.

[30] Hempel, Aspects of Scientific Explanation, 338.

deductivist.[31] So one need not accept the strong claim that *all* explanations can be reduced to deductive arguments to accept the weaker claim that *intentional* explanations are best reconstructed as deductive arguments.

Just what form would such an argument take? Here's an attempt to offer a schema for intentional explanation.

(1) There exists a rational agent A with intended goal G.

(2) A has beliefs B_1, B_2, ... B_n relating to the attainment of G.

(3) If B_1, B_2, ... B_n were true, E would be the best way of achieving G.

(4) Rational agents always choose what they believe to be the best way of achieving their goals.

(5) Therefore A will do E.

Premises (1) and (4) of this schema make reference to a key factor in intentional explanations, namely the rationality principle. The role this principle plays in intentional explanations has been highlighted by Dan Dennett's discussion of the 'intentional stance,' but it had already played a major role in the work of Donald Davidson, where it took the form of the 'principle of charity.'[32] This rationality principle is best thought of as a presumption of rationality, akin to the legal presumption of innocence. We begin by presuming that the being whose behaviour we are trying to explain is acting rationally. We presume, in other words, that she is choosing what would be the best way of achieving her goals, given a particular set of beliefs. That presumption is defeasible. It may be, for instance, that she is not acting rationally at all, but in thrall to some force that overwhelms her power of rational reflection. But in that case we shall be simply unable to offer an intentional explanation of her behaviour. Some other kind of explanation will be required.

We are now in a position to begin answering the question I posed at the beginning. In what circumstances, if any, would a proposed theist explanations be a successful explanation, one that is worthy of our acceptance? Could such a proposed explanation ever meet the standards of the sciences?[33] We can now break this down into two questions. The first is: Under what circumstances, if any, would a proposed theistic explanation count as a *potential* explanation of some fact? The second is: Under what circumstances, if any, would a potential theistic explanation count the *actual* explanation, that is to say, one we ought to accept?

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[31] Robert Audi, *Practical Reasoning The Problems of Philosophy: Their Past and Present* (London: Routledge, 1989), 99; Georg Henrick von Wright, *Explanation and Understanding* International Library of Philosophy and Scientific Method (London: Routledge and Kegan Paul, 1971), 96. G.F. Schueler, *Reasons and Purposes: Human Rationality and the Teleological Explanation of Action* (Oxford: Clarendon Press, 2003), 71–72 has criticised the use of the practical syllogism to represent intentional explanations, but he apparently understands this in a narrow sense. He himself represents intentional explanations as deductive arguments (ibid., 69–70, 123–24).

[32] Daniel C. Dennett, *The Intentional Stance* A Bradford Book (Cambridge, MA: MIT Press, 1987), 49; Donald Davidson, *Essays on Actions and Events (*Oxford: Clarendon Press, 1980), 237.

[33] In common with many philosophers within the analytic tradition, I regard these two questions as synonymous, since I believe that the sciences offer paradigmatic cases of successful explanation.

5.1 Theism as a Potential Explanation

The first question should now be relatively easy to answer. If proposed theistic explanations are intentional explanations and if intentional explanations can be reconstructed using some form of practical syllogism, then we can understand the form of a proposed theistic explanation. Such an explanation would 'work' (if it works at all) by positing the existence of a divine agent having particular beliefs and desires. It would explain the *explanandum* by seeing it as the most rational way for such an agent to achieve his posited goal.

There is one fact that complicates this apparently simple scheme. It is the fact that many of the *explananda* the theist wishes to explain will already have natural explanations. (We already have a natural explanation of tsunamis, which I am assuming the theist does not contest.) In these circumstances, the theist will have to face the charge of explanatory redundancy, a problem of which even Thomas Aquinas (ca. 1225–74) seems to have been aware.[34] It is true that there are other circumstances in which we may offer two explanations of the same fact, one intentional and one non-intentional. We can explain the movement of my arm by reference to nerves and muscles or by reference to what I am intending to achieve, and both explanations may be true.[35] In this sense, a proposed theistic explanation may *complement* rather than *exclude* a natural explanation of the same fact. But the theist still needs to show that there is something about the *explanandum* that requires us to posit a divine agent. In the case of a fact that already has a natural explanation, this is no easy task.

So it is understandable that most theists, when arguing for the existence of God,[36] begin with facts which (in their opinion) have no natural explanation. These may be facts which (as a matter of fact) lack a natural explanation, or they may be facts which could never have a natural explanation. (Swinburne's example of a fact of the second kind is the very existence of the universe and of its laws.[37]) If one could establish the existence of the God of classical theism on these grounds, then one could extend the process of theistic intentional explanation to all facts, whether naturally-explicable or not, since the God whose existence you would have demonstrated is the cause (at least in the sense of primary cause) of all that occurs.

We have seen that at the heart of an intentional explanation is a rationality principle. What does this entail, in the context of theistic explanation? It means that God would not have chosen event *E* as a way of bringing about goal *G* if there existed a better means of bringing about that goal, let's say *E**. This imposes an important constraint on proposed theistic explanations. If one can show that

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[34] See Aquinas's *Summa theologiae* 1a, qu. 2. art. 3, obj. 2.

[35] Richard Swinburne, *The Existence of God* (2nd ed. Oxford: OUP, 2004), 46.

[36] In an earlier discussion of these issues in the pages of this journal, Wilko van Holten has argued for a distinction between the question of explanatory power and that of rational justification (Wilko van Holten, 'Theism and Inference to the Best Explanation,' *Ars disputandi* 2 ([2002]). If theism were the best available explanation of a wide range of phenomena, he argues, it would not necessarily follow that belief in God was rationally justified, in some objective sense. This may be true. But explanatory power of this kind would surely constitute *evidence in favour* of theism.

[37] Swinburne, *The Existence of God*, 75, 140–43, 160.

God could have chosen a better means of bringing about *G*, then the proposed theistic explanation would be disqualified. And since God is assumed to be omnipotent, what he could have chosen has no limits, other than those of logic.[38] So if we can conceive of a better means without falling into self-contradiction, then we may assume that God could have brought it about.

Admittedly, it is not easy to spell out what 'better' might mean in this context. Some of the criteria by which we judge one human action to be better than another are clearly not applicable to God. As Laura Garcia notes, 'God has no need to minimize the amount of time or effort or expense and he is not subject to time constraints, natural laws, etc.'[39] But, *pace* Garcia, there are other criteria that are applicable to God. The most obvious of these stem from the fact that God is believed to be morally perfect, or 'omnibenevolent.' Given two ways of bringing about his posited goal, we may assume, *ceteris paribus*, that God would chose the path that entails less creaturely suffering.

This opens potential theistic explanations to the kind of suboptimality arguments made famous by Stephen Jay Gould's essay on 'the panda's thumb.'[40] But of course suboptimality arguments are nothing new. Evidential arguments from evil can be regarded as a species of suboptimality argument, appealing to the idea that God could have created a world that entails less suffering. David Hume countered arguments from design by referring to 'the inaccurate workmanship of all the springs and principles of the great machinery of nature.'[41] And Charles Darwin argued that the existence of 'rudimentary, atrophied, or aborted organs' had no explanation at all on the theory of special creation.[42]

Incidentally, a suboptimality argument does not need to rely on the assumption that there is a best possible world, an idea that some have argued is incoherent. For there may be no single scale of values against which various possible worlds may be ranked,[43] or there may be no upper limit to the qualities by which we judge one world to be better than another.[44] But the atheist need not be bothered by this objection. She need not rely on the assumption that there is a *best* possible world; all she need show is that there could exist a *better* one. More precisely, all she need show is that there is a better way in which God could have brought about his posited goal, in some sense of the word 'better' that is applicable to God. If she can do this, she can show that the theistic hypothesis in question is not even a potential explanation of the fact to be explained.

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[38] I am assuming the traditional view that even God could not create something that involved a contradiction (see, for example, Aquinas, *Summa theologiae* 1a, qu. 25, art. 4).

[39] Laura Garcia, 'Divine Freedom and Creation,' *The Philosophical Quarterly* 42 (1992), 212.

[40] Stephen Jay Gould, *The Panda's Thumb: More Reflections on Natural History* (New York: W.W. Norton, 1980), 20–21.

[41] Graham Oppy, 'Hume and the Argument for Biological Design,' *Biology and Philosophy* 11 (1996), 522; see, for instance, David Hume, 'Dialogues Concerning Natural Religion,' in: *Principal Writings on Religion* edited by J.C.A. Gaskin; Oxford World's Classics (Oxford: OUP, 193), 111.

[42] Charles Darwin, *The Origin of Species by Means of Natural Selection* Pelican Classics (Harmondsworth, UK: Penguin, 1968), 432.

[43] Thomas V. Morris, 'Perfection and Creation,' in: Eleonore Stump (ed.), *Reasoned Faith: Essays in Philosophical Theology in Honor of Norman Kretzmann* (Ithaca, NY: Cornell University Press, 1993), 236.

[44] Garcia, 'Divine Freedom and Creation,' 200.

5.2 Theism as the Best Explanation

Let's say that a proposed theistic explanation can survive this challenge. Let's suppose it can plausibly be offered as a *potential* explanation of the fact in question. What follows? Nothing at all, for theist must still produce reasons why we should regard it as the *actual* explanation. Given the legitimacy of IBE, one way of doing this would be to show that it is the best available potential explanation, given a certain minimum standard. But this, too, raises difficult issues. Just what do I mean when I speak of 'the best' explanation?

Before I try to address that question, let me attend briefly to another. What if the proposed theistic explanation were the *only* potential explanation on offer, perhaps because the *explanandum* has no natural explanation? Would the theistic hypothesis win by default? Not necessarily. As I suggested earlier, we may wish to have a 'bottom line' here, some standard of explanatory adequacy below which we will not allow potential explanations to fall. So the reasoning behind IBE can be set out as an expanded version of Peirce's schema for abduction.

(1) The surprising fact, E, is observed.
(2) H would be a satisfactory explanation of E.
(3) No available competing hypothesis would explain E as well as H does.
(4) We ought to accept the best available satisfactory potential explanation of any fact.
(5) Therefore, we ought to accept H.[45]

Once again, if the proposed theistic explanation is not a satisfactory one, the appropriate response would be to withhold acceptance, while we seek something better. But this merely raises the initial question with new force. What do I mean by 'satisfactory' in this context? What are our criteria of explanatory adequacy?

My initial suggestion is that whatever criteria we choose are best thought of as *desiderata* rather than necessary conditions. Moreover, these *desiderata* will not all be accorded equal weight.[46] We may, for instance, choose to accept a theory of great explanatory power (one that is well corroborated), even if it lacks some other virtues. It would be convenient if there were an algorithm that would ensure a correct choice among competing hypotheses. Unfortunately, it seems that no such algorithm exists. Theory choice is a matter of judgement: there are occasions when equally rational investigators, faced with the same evidence, may arrive at different conclusions.[47] So what are the criteria against which we can assess a proposed theistic explanation?

Let me offer some, which seem relatively uncontroversial. A theory may be worthy of our acceptance first and foremost if it is well corroborated, having

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[45] This is modelled on, but is not identical with, the schema given by Alan Musgrave: see his *Essays on Realism and Rationalism* Series in the Philosophy of Karl R. Popper and Critical Rationalism 12 (Amsterdam: Rodopi, 1999), 285.

[46] William G. Lycan, 'Explanation and Epistemology,' in: Paul K. Moser (ed.) *The Oxford Handbook of Epistemology* (Oxford: OUP, 2002), 416

[47] Musgrave, *Essays on Realism and Rationalism*, 250n.

survived a range of independent tests. Ideally, it will posit mechanisms that are at least analogous to those with which we are already familiar, and it will form part of a previously successful research tradition. It will also be simple, in a sense I shall spell out in a moment. It will be ontologically economical, in the sense of not positing new kinds of entities if these are not required. (This is merely a version of Ockham's razor, but reworded in terms of what we might call ontological-type economy.) In addition to this, the most acceptable explanation will be informative, in the sense of allowing us to specify, with some degree of precision, just what it does and does not predict. (Peter Lipton refers to this last feature as the 'loveliness' of a theory.[48]) While these are by no means the only criteria that might be chosen, they at least give us something to work with.

What makes such criteria the appropriate criteria for theory choice? I have, at present, no adequate answer to this question. All I can say is that such explanatory virtues are widely accepted, among both philosophers and working scientists. Perhaps they can have no adequate philosophical defence. As a number of philosophers have pointed out, we cannot defend any fundamental principle of rationality except, perhaps, by invoking that same principle, in a frankly circular fashion.[49] If we look at instances of theory-choice that we judge, intuitively, to be rational, we discover that these are the kinds of principles they employ.[50] We might be able to produce an evolutionary explanation of why we employ such principles, but this is different from a philosophical defence.[51]

In the debate about proposed theistic explanations, one may wish to take issue with one or more of these criteria. The list could be expanded or reduced. But in the dispute between theists and atheists, they are relatively uncontroversial. In particular, those theists who appeal to IBE – such as Michael Banner, Philip Clayton, Stephen Meyer, and Arthur Peacocke[52] – produce lists of explanatory virtues which at least overlap my own. Even Richard Swinburne, who does not appeal to IBE, argues that the theistic hypothesis is a theory of great simplicity and scope, and that this raises its prior probability.[53]

There is one exception to this rule. Swinburne admits that we normally favour theories which are consistent with what we already know about the world (our background knowledge).[54] But he argues that this criterion need not be taken into account when assessing the theistic hypothesis. Why not? It is because theism 'purports to explain everything logically contingent (apart from itself).'[55]

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[48] Lipton, *Inference to the Best Explanation*, 118.

[49] See, for instance, Lawrence Bonjour, *The Structure of Empirical Knowledge* (Cambridge, MA: Harvard University Press, 1985), 195; Alan Musgrave, *Essays on Realism and Rationalism*, 329–31; and Noah Lemos, 'Epistemic Circularity Again,' *Philosophical Issues* 14 (2004), 261–62.

[50] William G. Lycan, *Judgement and Justification* Cambridge Studies in Philosophy (Cambridge: CUP, 1998), 155, 158.

[51] *Ibid.*, 158–59.

[52] Michael C. Banner, *The Justification of Science and the Rationality of Religious Belief* Oxford Philosophical Monographs (Oxford: Clarendon Press, 1990), 125–53; Philip Clayton, 'Inference to the Best Explanation,' *Zygon* 32 (1997), 385; Stephen C. Meyer, 'The Return of the God Hypothesis,' *Journal of Interdisciplinary Studies* 11 (1999), 27; Arthur Peacocke, *Paths from Science Towards God: The End of All Our Exploring* (Oxford: Oneworld, 2001), 32–36.

[53] Swinburne, *The Existence of God*, 109.

[54] *Ibid.*, 53.

[55] *Ibid.*, 66.

So there is nothing left, other than logic, to act as background knowledge. What does this mean, in practice? Well, one might argue, for instance, that theism is rendered less plausible by the fact that the personal agent of which the theist speaks is very different from any other personal agent with which we are familiar. (He has, for instance, no body.) But Swinburne argues that in the case of theism (and in the case of theism alone) such disanalogies are of no significance.

This seems simply wrong. Swinburne's argument is based on the idea that 'the theist argues from all the phenomena of experience, not from a small range of them.'[56] Now it is true that proposed theistic explanations could, in principle, cover all phenomena. If God exists and if he is (*ex hypothesi*) the cause of all that occurs, presumably he has some reason for acting as he does and the theist could (in principle) identify this reason. If we take *p* to represent any true proposition about the world, then the existence of God could explain not merely $p_1, p_2, ... p_n$, taken disjunctively. It could also explain the conjunction of all these propositions.

The problem is that no particular theistic explanation could have so broad a scope. Even if it made sense to speak of 'explaining everything,' we could never know the vast, conjunctive proposition that would describe everything. Nor, in practice, does the theist try to explain 'everything we know' about the world. All the theist can do is to offer an explanation of some particular fact or relatively restricted set of facts. (Even an explanation of the existence of the universe is not, in itself, an explanation of every fact about the universe.) So it is always possible to distinguish between those facts that the theist claims to be explaining and those facts that his proposed explanation takes for granted. It is the latter that constitute the relevant background knowledge against which the theistic hypothesis may legitimately be judged.

Worth discussing, too, is the criterion of simplicity. Swinburne adopts a broadly metaphysical conception of simplicity.[57] The simplicity of a theory, he writes, is a matter of its postulating few (logically independent) entities, few properties of entities, few kinds of entities, few kinds of properties, properties more readily observable, few separate laws with few terms relating few variables, the simplest formulation of each law being mathematically simple.[58]

It is a moot point whether the theistic hypothesis is simple in this sense.[59] Is God really, as Swinburne argues, 'the simplest kind of person there could be'?[60] In any case, it is hard to see how one could count the number of entities or principles employed by competing theories without making arbitrary choices.

For this reason, I prefer the broadly Popperian definition of simplicity found in the work of Paul Thagard. Thagard argues that simplicity has to do with the number of auxiliary hypotheses that a theory requires in order to cover the *explanandum*. The fewer the auxiliary hypotheses, the simpler the theory. So Thagard does not argue that one theory should be preferred to another simply

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[56] *Ibid.*, 71.
[57] Robert Prevost, 'Swinburne, Mackie and Bayes's Theorem,' *International Journal for Philosophy of Religion* 17 (1985), 181.
[58] Swinburne, *The Existence of God*, 53.
[59] J.L. Mackie, *The Miracle of Theism* (Oxford: Clarendon Press, 1982), 100
[60] Swinburne, *The Existence of God*, 97.

because it posits the existence of fewer entities. In fact, he argues that we may prefer a theory that posits more entities than its competitors if it has greater explanatory power or, in Thagard's terms, if it contributes to consilience.[61] The important fact – that which makes a theory simple in Thagard's sense – is that it contributes towards consilience 'without making a host of assumptions with narrow application.'[62]

6 Further In Principle Objections

I have already mentioned one *in principle* objection to proposed theistic explanations, which arises from the position known as 'sceptical theism' (see Section 4). There may, however, be other in principle objections of similar scope. One candidate would be David Hume's argument, recently defended by John Beaudoin,[63] that we should never ascribe to a case 'any qualities, but what are exactly sufficient to produce the effect.'[64] At least at first sight, this seems to rule out positing an infinite cause to explain a finite effect.

While we associate this view with Hume, a very similar argument is to be found in Aquinas. 'If it were to be demonstrated that God exists,' he writes,

> this could only be from his effects But his effects are not proportionate to him, since he is infinite and his effects are finite, and there is no proportion between the finite and the infinite. Since, therefore, a cause cannot be demonstrated from an effect that is not proportionate to it, it seems that the existence of God cannot be demonstrated.[65]

There may be ways in which the theist can evade this objection. Richard Swinburne, as we have seen, tries to argue that an infinite deity is a 'simpler' hypothesis than a finite deity. Aquinas admits the force of the objection, but claims that we can know of the existence of a divine cause, even if we do not know what that cause is like. But the believer could also appeal to divine revelation. Let's say, for example, that the *explanandum* is a set of sacred writings, such as the Bible or the Qur'an. If the theist could argue that the best available explanation of the existence and character of these scriptures is that they were produced by God, then the scriptures could tell us things about God that go beyond the facts required to explain their existence. One of these might be that God is a being who is infinite in knowledge and power.

7 Conclusion

Such arguments may be good or bad, but they illustrate the difficulty of finding an objection that would immediately disqualify any proposed theistic

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[61] Paul R. Thagard, 'The Best Explanation: Criteria for Theory Choice,' in: Peter Lipton (ed.), *Theory, Evidence and Explanation* International Research Library of Philosophy (Aldershot: Dartmouth, 1995), 186.

[62] *Ibid.*, 184.

[63] John Beaudoin, 'On Some Criticisms of Hume's Principle of Proportioning Cause to Effect,' *Philo: The Journal of the Society of Humanist Philosophers* 2 (1999): 26–40.

[64] David Hume, *Hume's Enquiries* edited by L. A. Selby-Bigg (2nd ed. Oxford: Clarendon Press, 1902), 136.

[65] Aquinas, *Summa theologiae* 1a, qu. 2. art. 2, obj. 3.

explanation. In the absence of a decisive in principle objection – one that would apply to any possible proposed theistic explanation – the atheist must approach proposed theistic explanations on a case-by-case basis.[66] Many proposed theistic explanations are surely vulnerable to suboptimality objections; those that pass this first hurdle will often fall below a minimum standard of explanatory adequacy. But we cannot exclude, *a priori*, the possibility that a proposed theistic explanation might merit our acceptance. If it did, then it could be described as *both* scientific *and* religious.

If the arguments for 'intelligent design' (ID) were to be convincing, they would fall into this category. They could not be dismissed, as Judge Jones dismissed them (see Section 1), merely on the grounds that they invoke a divine agent. If ID were the best available explanation of a wide range of phenomena, this would mean the overthrow of the taken-for-granted naturalism of the modern sciences. In fact, however, the arguments in favour of ID are far from convincing, when measured against the kind of standards that we expect of any explanation in the sciences. But I shall not argue for this conclusion here.[67] My aim here has been merely to spell out the standards against which any proposed theistic explanation might be assessed.

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[66] For fuller arguments in support of this conclusion, see my monograph *Theism and Explanation* (Routledge Studies in the Philosophy of Religion [New York: Routledge, 2009]), as well as my article, 'In Defense of Naturalism,' *International Journal for Philosophy of Religion* 70 (2011), 3–25.

[67] See my essay 'What *is* Wrong with Intelligent Design?' *International Journal for Philosophy of Religion* 61 (2007), 69–81.