

**A NEW CRITIQUE OF
THEOLOGICAL INTERPRETATIONS
OF PHYSICAL COSMOLOGY**

Adolf Grünbaum
University of Pittsburgh

ABSTRACT

This paper is a sequel to my ‘Theological Misinterpretations of Current Physical Cosmology’ (*Foundations of Physics*, vol. 26, [1996] ; revised in *Philo*, vol.1, no.1, [1998]). There I argued that the Big Bang models of (classical) general relativity theory as well as the original 1948 versions of the steady state cosmology are each logically incompatible with the time-honored theological doctrine that perpetual divine creation (*‘creatio continuans’*) is required in each of these two theorized worlds. Furthermore, I challenged the perennial theological doctrine that there must be a divine creative cause (as distinct from a transformative one) for the very existence of the world, *a ratio essendi*. This doctrine is the theistic reply to the question ‘Why is there something, rather than just nothing?’

I begin my present paper by arguing against the response by the contemporary Oxford theist Richard Swinburne and by Leibniz to what is, in effect, my *counter*-question: ‘But why should there be just nothing, rather than something?’ Their response takes the form of claiming that the *a priori* probability of there being just nothing, vis-à-vis the existence of alternative states, is maximal, because the non-existence of the world is conceptually *the simplest*. On the basis of an analysis of the role of simplicity in scientific explanations, I show that this response is multiply flawed, and thus provides no basis for their three contentions that (i) if there is a world at all, then its ‘normal’, natural, spontaneous state is one of utter nothingness or total non-existence, so that (ii) the very existence of matter, energy and living beings constitutes a *deviation* from the allegedly ‘normal’, spontaneous state of ‘nothingness’, and (iii) that deviation must thus have a suitably potent (external) divine cause. Related defects turn out to vitiate the medieval Kalam Argument for the existence of God, as espoused by William Craig.

Next I argue against the contention by such theists as Richard Swinburne and Philip L. Quinn that (i) the specific content of the scientifically most fundamental laws of nature, including the constants they contain, requires *supra*-scientific explanation, and (ii) a satisfactory explanation is provided by the hypothesis that the God of theism *willed them* to be exactly what they are.

Furthermore, I contend that the theistic teleological gloss on the ‘Anthropic Principle’ is incoherent and explanatorily unavailing.

Finally, I offer an array of considerations against Swinburne’s attempt to show *via Bayes’s theorem*, that the existence of God is more probable than not.

1 Introduction

2 The Nonexistence of the Actual World as Its Purported ‘Natural’ State

2.1 Swinburne and Leibniz on the Normalcy of Nothingness

- 2.2 *Leibniz's and Swinburne's Simplicity Argument for the Normalcy of Nothingness*
 - 2.2a *Leibniz's Simplicity Argument*
 - 2.2b *Swinburne's Simplicity Argument*
- 2.3 *The Role of the Normalcy of Nothingness in the Medieval Arabic Kalam Argument*
- 3 *Critique of the 'Explanation' of the Most Fundamental Laws of Nature by Divine Creative Volition*
- 4 *The 'Anthropic Principle'*
 - 4.1 *The Scientific Status of the Anthropic Principle*
 - 4.2 *Critique of the Theistic Design Interpretation of the Weak Anthropic Principle*
- 5 *Critique of Swinburne's Bayesian Argument for the Existence of God*
 - 5.1 *The Incoherence of Swinburne's Apologia*
 - 5.2 *Swinburne's Bayesian Argument for the Existence of God*
 - 5.3 *The Problem of 'Old Evidence'*
- 6 *Conclusion*

1 Introduction

In Richard Gale's ([1991]) book *On the Nature and Existence of God*, he devotes a very penetrating chapter ([1991], chap.7) to a critique of cosmological arguments for the existence of God, after giving a generic characterization of all such arguments. As is well known, there are different species of such arguments. But Gale reaches the following negative verdict on the genus (p. 284):

My two arguments . . . constitute ontological disproofs of the existence of the very sort of being whose existence is asserted in the conclusion of every version of the cosmological argument, thereby showing that these arguments are radically defective. These ontological disproofs, however, do not pinpoint the defective spot in these arguments.

My initial aim in this paper is precisely to pinpoint the defects of the time-honored arguments for perpetual divine creation given by a succession of theists including Aquinas, Descartes, Leibniz, Locke, as well as by the present-day theists Richard Swinburne and Philip L. Quinn. One of these defects will also turn out to vitiate a pillar of the medieval Arabic Kalam argument for a creator (Craig [1979]).

2 The Nonexistence of the Actual World as Its Purported 'Natural' State

2.1 Swinburne and Leibniz on the Normalcy of Nothingness

In Richard Swinburne's extensive writings in defense of (Christian) theism, notably in his books ([1991], [1996]), he presents two versions of his argument for his fundamental thesis that 'the most natural state of affairs of the existing world and even of God is *not* to exist *at all!*' As he put it ([1996], p. 48) :

It is extraordinary that there should exist anything at all. Surely the most natural state of affairs is simply nothing: no universe, no God, nothing.

But there is something.

It will be expeditious to deal first with the more recent 1996 version of his case, and then with

Adolf Grünbaum

his earlier ([1979], [1991]) substantial articulation of Leibniz's argument from *a priori* simplicity.

Surprisingly, Swinburne deems the existence of something or other to be 'extraordinary', i.e., literally out of the ordinary. To the contrary, surely, the most pervasively ordinary feature of our experience is that we are immersed in an ambiance of existence. Swinburne's initial assertion here is, at least *prima facie*, a case of special pleading in the service of a prior philosophical agenda. Having made that outlandish claim, Swinburne builds on it, averring that 'surely the most natural state of affairs is simply nothing'. Hence he regards the question 'Why is there anything at all, rather than just nothing?' as paramount.

As we know, the Book of Genesis in the Old Testament starts with the assertion that, in the beginning, God created heaven and earth from scratch. And, as John Leslie ([1978], p. 185) pointed out, 'when modern Western philosophers have a tendency to ask it [i.e., the existential question above], possibly this is only because they are heirs to centuries of Judeo-Christian thought'. This conjecture derives added poignancy from Leslie's observation that 'To the general run of Greek thinkers the mere existence of a thing [or of the world] was nothing remarkable. Only their changing patterns provoked [causal] inquisitiveness'. And Leslie mentions Aristotle's views as countenancing the acceptance of 'reasonless existence'.

Yet there is a long history of sometimes emotion-laden, deep puzzlement, even on the part of atheists such as Heidegger, about the mere existence of our world (Edwards [1967]) . Thus, Wittgenstein ([1993], p. 41) acknowledged the powerful *psychological* reality of wondering at the very existence of the world. Yet logically, he rejected the question altogether as 'nonsense', because he 'cannot imagine its [the world's] not existing' (pp. 41-2), by which he may perhaps have meant not only our world, but more generally, as Rescher ([1984], p. 5) points out, some world or other. Wittgenstein could be convicted of a highly impoverished imagination, if he could not imagine the nonexistence of just our particular world.

Before turning to the logical aspects of the cosmic existential question, let me mention a psychological conjecture as to why not only theists, but also some atheists, find that question so pressing. For example, Heidegger ([1953], p. 1) deemed 'Why is there anything at all, rather than just nothing?' the most fundamental question of metaphysics. Yet he offered no indication of an answer to it, and he saw its source in our facing nothingness in our existential anxiety.

I gloss this psychological hypothesis as surmising that our deeply instilled fear of death has prompted us to wonder why we exist so precariously. And we may then have extrapolated this precariousness, more or less unconsciously, to the existence of the universe as a whole.

Psychological motivations aside, let me recast Swinburne's aforesaid statement 'The most natural state of affairs is simply nothing' to read instead 'The most natural state of the existing world is to *not* exist at all'. This reformulation avoids the hornet's nest inherent in the question as to the sheer intelligibility of utter nothingness qua purportedly *normal state* of our world.ⁱ

Yet the reformulation is still conceptually troublesome: How can *non*-existence at all be *coherently* a state, natural or otherwise, of the actual, existing world? Swinburne speaks vaguely

of ‘the most natural state of affairs’, leaving it unclear whether his ‘state of affairs’ pertains only to our actual world or also to any other logically possible world that might have existed instead. But it is clear that he has in mind *at least* our actual world, in which case the reformulation of his claim is incoherent and not helpful. The stronger claim pertaining to any alternative world as well was perhaps intended by Derek Parfit ([1998]), who wrote (p. 24): ‘. . . why is there a Universe at all? It might have been true that nothing ever existed: no living beings, no stars, no atoms, not even space or time. . . . No question is more sublime than why there is a Universe: why there is anything rather than nothing’.

No matter whether one is considering Swinburne’s original formulation, or Parfit’s ‘It might have been true that nothing existed’, it is surely epistemically appropriate to ask for the grounds on which Swinburne and Parfit respectively rests his assertion. Parfit does not tell us, whereas Swinburne does. Therefore, I shall scrutinize Swinburne’s argument for it, and also Leibniz’s.

I shall offer my own reasons for endorsing Henri Bergson’s injunction as follows: We should never assume that the ‘natural thing’ would be the existence of nothing. He rested this proscription on grounds radically different from mine, when he declared¹¹: ‘The presupposition that *de jure* there should be nothing, so that we must explain why *de facto* there is something, is pure illusion’. But Bergson’s reasons for charging illusoriness are conceptual and *a priori*, whereas mine will turn out to be empirical.

As we know, a long theistic tradition has it that this *de jure* presupposition is correct *and* that there must therefore be an explanatory cause *external* to the world for its very existence; furthermore, it is argued that this external cause is an omnipotent, omni-benevolent and omniscient personal God.

But, in outline, my challenge to this reasoning will be as follows: (i) In this context, the question ‘What is the *external* cause of the very existence of the universe?’ is avowedly predicated on the doctrine that, in Swinburne’s words, ‘Surely the most natural state of affairs is simply nothing’; (ii) Yet, as I shall argue in detail, just this doctrine is ill-founded, contrary to the arguments for it offered by Leibniz and Swinburne, and (iii) Therefore, the question calling for an external cause of the very existence of the world is a *non-starter*, i.e., it poses a *pseudo-problem*. By the same token, the answer that an omnipotent God is that cause will turn out to be ill-founded.

What are the appropriate grounds for gleaning what is indeed the natural, spontaneous, normal state of the world in the absence of an intervening external cause? In opposition to an *a priori* conceptual dictum of naturalness, I have previously argued from the history of science that changing evidence makes the verdict inevitably *empirical* rather than *a priori* (Grünbaum, [1996], [1998]). Here, a summary will have to suffice.

I welcome Swinburne’s use of the phrase ‘natural state of affairs’ ([1996], p. 48), which dovetails with the parlance I used, when I elaborated on the notion of ‘natural state’ by speaking of it as the ‘spontaneous, externally undisturbed, or normal’ state. In essence, Swinburne’s claim that ‘the most natural state of affairs is simply nothing’ had been enunciated by Aquinas,

Descartes, Leibniz, and a host of other theists. Hereafter, I shall designate this thesis as asserting ‘the spontaneity of nothingness’, or ‘SoN’ for brevity.

In my parlance, the terms ‘natural’, ‘spontaneous’, ‘normal’, and ‘externally unperturbed’ serve to characterize the historically dictated *theory-relative* behavior of physical and biological systems, when they are not subject to any *external* influences, agencies or forces. In earlier writings (Grünbaum [1954], [1989], [1990], [1996], [1998]) , I called attention to the *theory-relativity* of such naturalness or spontaneity by means of several examples from physics and biology.

Thus, I pointed out ([1996], [1998], sec. 3 and 4) that the altogether ‘natural’ behavior of suitable subsystems in the now defunct original Bondi & Gold Steady-State World is as follows: Without any interference by a physical influence external to the subsystem, let alone by an external matter-*creating* agency or God, matter pops into existence spontaneously in violation of Lavoisier's matter-conservation. This spontaneous popping into existence follows deductively from the conjunction of the theory’s postulated matter-*density*-conservation with the Hubble law of the expansion of the universe. For just that reason, I have insisted on the use of the *agency-free* term ‘matter-accretion’ to describe this process, and have warned against the use of the *agency-loaded* term ‘matter-creation’.

In the same vein, I emphasized that according to Galileo and to Newton's first law of motion, it is technically ‘*natural*’ that a *force-free* particle moves uniformly and rectilinearly, whereas Aristotle's physics asserted that a force is required as the external cause of a sublunar body's non-vertical uniform rectilinear motion. In short, Aristotle clashed with Galileo and Newton as to the ‘natural’, spontaneous, dynamically unperturbed behavior of a body, which Aristotle deemed to be one of rest at its proper place. Thus, Galileo and Newton *eliminated* a supposed external dynamical cause on *empirical* grounds, explaining that uniform motion can occur spontaneously without such a cause.

But, if so, then the Aristotelean demand for a causal explanation of any motion whatever by reference to an external perturbing force is predicated on a false underlying assumption. Clearly, the Aristoteleans then begged the question by tenaciously continuing to ask: ‘What net external force, pray tell, keeps a uniformly moving body going?’ Thus, scientific and philosophical questions can be anything but innocent by loading the dice with a *petitio principii*!

An example from biology yields the same lesson. It has been said that Louis Pasteur ‘disproved’ the ‘spontaneous’ generation of life from nonliving substances. Actually, he worked with sterilized materials over a cosmically minuscule time-interval, and showed that bacteria in an oxidizing atmosphere would not grow in these sterilized materials. From this he inferred that the natural, unperturbed behavior of *nonliving* substances *precludes* the spontaneous generation of living things. That was in 1862. But in 1938, A.I. Oparin in the then Soviet Union, and in 1952, H. Urey in the United States rehabilitated the hypothesis of the spontaneous generation of life to the following effect: Life on earth originated by spontaneous generation under favorable conditions prevailing sometime between 4.5 billion years ago and the time of the earliest fossil evidence 2.7 billion years ago. I have summarized this rehabilitation as follows ([1973], pp. 573-

74):

When the earth was first formed, it had a reducing atmosphere of methane, ammonia, water, and hydrogen. Only at a later stage did photochemical splitting of water issue in an oxidizing atmosphere of carbon dioxide, nitrogen and oxygen. The action of electric discharges or of ultra-violet light on a mixture of methane, ammonia, water, and hydrogen yields simple organic compounds such as amino acids and urea, as shown by work done since 1953 [footnote omitted]. The first living organism originated by a series of non-biological steps from simple organic compounds which reacted to form structures of ever greater complexity until producing a structure that qualifies as living.

Indeed, in a new book, Paul Davies ([1999]) has argued persuasively that progress in biology and astronomy is transforming the one-time mystery of the origin of life into a soluble problem. The clash between the inferences drawn by Pasteur, on the one hand, and by Oparin and Urey, on the other, provides a biological illustration of the theory-dependence of the 'natural', spontaneous behavior of a system, just as the theory-shifts from Aristotle to Galileo, and from matter-energy conservation to matter-accretion provide vivid illustrations from physics. And in each case, *empirical evidence* was required to justify the avowed naturalness.

As illustrated by the ill-conceived question put to Galileo by his Aristotelean critics, it is altogether misguided to ask for an external cause of the *deviations* of a system from the pattern that an empirically discredited theory tenaciously affirms to be the 'natural' one (Grünbaum [1973], pp. 406-07).

The proponents of SoN have not offered any empirical evidence for it. Yet the lesson of the history of science appears to be that just such evidence is required. However, some of the advocates of SoN have offered an *a priori* conceptual argument in its defense. I now turn to their defense.

2.2 Leibniz's and Swinburne's Simplicity Argument for the Normalcy of Nothingness

The imposition of *a priori* notions of naturalness is sometimes of-a-piece with the imposition of tenaciously held criteria of the mode of scientific explanation required for understanding the world. The demise of Laplacean determinism in physics, and its replacement by irreducibly stochastic, statistical models of micro-physical systems, is a poignant case of the empirical discreditation of a tenacious demand for the satisfaction of a previously held ideal of explanation: It emerges *a posteriori* that the universe just does not accommodate rigid prescriptions for explanatory causal understanding that are rendered invalid by a larger body of evidence.

Relatedly, the stochastic theory of radioactive decay in nuclear physics, for example, runs counter to Leibniz's demand for a 'sufficient reason' for all logically contingent states of affairs. Thus, since the existence of our actual world is logically contingent, he insisted that there must be a sufficient reason for its existence.

2.2a Leibniz's Simplicity Argument

I now cite this demand in context from Leibniz's ([1714]) essay, 'The Principles of Nature and of Grace Based on Reason':

7. Thus far we have spoken as simple *physicists*: now we must advance to *metaphysics*, making use of the great principle, little employed in general, which teaches that *nothing happens without a sufficient reason*; that is to say that nothing happens without it being possible for him who should *sufficiently understand* things, to give a reason sufficient to determine why it is so and not otherwise. This principle laid down, the first question which should rightly be asked will be, *why is there something rather than nothing?*

To justify this claim, he now resorts to an *a priori* argument from simplicity: For *nothing is simpler and easier than something*. Further, suppose that things must exist, we must be able to give a reason *why they must exist so* and not otherwise.

8. Now this sufficient reason for the existence of the universe cannot be found *in the series of contingent things . . .* (Wiener [1951], p. 525 ; most of the italics in original except for the one sentence 'nothing is simpler and easier than something').

Here Leibniz enunciated SoN, when he declared that 'nothing is simpler and easier than something'. Having thus assumed SoN by recourse to *a priori* simplicity, he is in a position to reason as follows about the different states of the worldⁱⁱⁱ:

. . . every subsequent state is somehow copied from the preceding one (although according to certain laws of change). No matter how far we may have gone back to earlier states, therefore, we will never discover in them a full reason why there should be a world at all, and why it would be such as it is. Even if we should imagine the world to be eternal, therefore, the reason for it would clearly have to be sought elsewhere . . .

As for Leibniz's claim that nothing is *simpler* and *easier* than something' (italics added), I ask: But why is this *conceptual* claim, if granted, mandatory for what is the ontologically spontaneous, externally undisturbed state of the *actual* world? Alas, Leibniz does not tell us here. Yet, as I argued in Section 2.1 above, according to our best scientific knowledge, spontaneity is relative to changing *empirically-based* scientific theories.

Furthermore, Philip Quinn has, in effect, issued an important demurrer (private communication): Let us suppose that the purported state of nothingness is conceptually non-elusive and the most simple. Then it would still not follow from this maximum conceptual simplicity that SoN is the simplest *hypothesis* within the set of all logically possible hypotheses, a set that we do not encompass intellectually. In short, conceptual simplicity does not necessarily bespeak theoretical simplicity, as Quinn has illustrated for this context by the following example.

Suppose the purpose of an hypothesis is to explain how the observed

universe is produced from a postulated initial state. Perhaps the hypothesis that postulates the most simple initial state will be forced to postulate a complex productive mechanism in order to achieve its explanatory purpose, while the same purpose can be achieved by a rival that postulates a slightly less simple initial state together with a vastly simpler productive mechanism. In such a case the hypothesis that postulates the most simple initial state will not be the hypothesis with the greatest overall simplicity.

The moral of this sketchy history is two-fold: (i) The character of just what behavior of the actual world and of its subsystems is ‘natural’ is an empirical *a posteriori* matter, rather than an issue that can be settled *a priori*, yet (ii) SoN has no *empirical* credentials at all, as acknowledged, in effect, by the purely conceptual arguments for it which have been offered by its recent defenders.

Given this empiricist moral, I must dissent from Leslie’s ([1998], p. 2) view that beliefs about the natural state of the universe are matters of ‘intuition’. Says he: ‘. . . intuitions about what should be viewed as a universe’s “natural state”—where this means something not calling for explanation by a divine person or any other external factor—can be defended or attacked only very controversially’. As I have argued, however, the naturalness or spontaneity of the states of physical and biological systems or of the cosmos is epistemologically a matter of empirical evidence and not of the conflict of personal intuitions regarding naturalness.

But the question could be and has been asked why this form of ‘scientism’ should be mandatory. Friedrich von Hayek (1952) and his acolytes have characterized scientism as a doctrine of explanatory scientific imperialism with utopian pretensions. Much more precisely, Richard Gale and Alexander Pruss ([in press]) defined scientism as implying that everything that *is* explained is explained by either science or some kind of explanation having strong affinities to actual scientific explanation. Thus, in their construal, scientism is not taken to assert that everything is explained by science *tout court*, but only that everything that is actually explained, is explained by science.

It is easy enough, as theists like Leibniz, Swinburne and Philip L. Quinn ([1993]) have done, to disavow scientism as just defined, although Swinburne insists ([1991]) that his version of theism is methodologically of-a-piece with various modes of scientific inference, such as the use of Bayes’s theorem to credibilify scientific hypotheses. And he then marshals that theorem to aver that God probably exists.

But such a theistic disavowal of scientism calls for a potent justification of the theistic explanatory alternative. The most prominent alternative that theists have proffered is modeled on volitional agency-explanations of human actions, as distinct from ordinary event-causation.

Yet in Section 3, I shall argue that a divine volitional explanation of the actual topmost or most fundamental laws of nature, of their constants, and of the pertinent boundary or initial conditions founders multiply.

2.2b Swinburne’s Simplicity Argument

Having gotten no help from Leibniz toward a cogent defense of SoN by reference to

simplicity, I turn to Swinburne's quite general argument from simplicity for which he claims multiple sanction from science ([1996]). And I note first that he claims probity for his appeal to simplicity by maintaining that it has 'the same structure' as the use of simplicity in scientific theorizing. In his words:

The structure of a cumulative case for theism was thus, I claimed [in *The Existence of God*], the same as the structure of a cumulative case for any unobservable entity, such as a quark or a neutrino. Our grounds for believing in its existence are that it is an entity of a simple kind with simple modes of behavior which leads us to expect the more complex phenomena which we find.^{iv}

Furthermore, having argued that an infinite capacity is simpler than any one finite capacity, Swinburne ([1991], chap. 5, [1996], chap. 3) contends that in a rank-ordering of graduated properties, God's omnipotence, omniscience and (presumably) omni-benevolence are the simplest. Hereafter, I shall refer to this triad as 'God's triplet of *omnis*'. He puts his case for the simplicity of this triplet as follows ([1991], p. 322):

The postulation of God . . . is the postulation of *one* entity of a simple kind, the simplest kind of person there could be, having no limits to his knowledge, power, and freedom.

Yet Swinburne ([1996], p. 48) had also told us that a natural state of nothingness *without God* is simpler than a world containing God. And furthermore, he deems the cardinal number zero of entities simpler than the number 1 for which he just claimed simplicity vis-à-vis a larger cardinal.

Occam's injunction, as symbolized by his razor, is to abstain from postulating entities beyond necessity. Mindful of this prescription, Swinburne ([1991], p. 84) characterizes the simplicity and complexity of hypotheses in terms of the *number* of entities, the sorts of entities, and the kinds of relations among entities that they postulate. But clearly, in scientific theorizing, the regulative ideal of Occam's razor is subject to the crucial proviso of heeding the total available evidence, including its complexity.

Thus, it now turns out that there were important episodes in the history of actual science, in which increasingly greater theoretical faithfulness to the facts required the *violation* of Swinburne's *a priori* criterion of simplicity with respect to the number of postulated entities. Thus, such numerical simplicity as can be achieved while explaining the phenomena is an empirical matter, and not subject to Swinburne's legislative *a priori conceptual* simplicity.

Ironically, this lesson is spelled by one of his own examples. In his view, the putative infinite speed of a particle is simpler than some finite value. Yet the velocity of light is known to be finite, and the special theory of relativity tells us that this finite velocity is an upper bound for the transmission of any causal influence. Other examples from actual science that violate Swinburne's mandate of conceptual simplicity abound. Let me enumerate some of them.

(i) By Swinburne's normative criterion of numerical simplicity, the pre-Socratic Thales's monistic universal hydro-chemistry of the world's substances is about a hundredfold simpler

than the empirically discovered periodic table of the elements. And there are even two isotopes of Thales's water, one heavier than the other. Furthermore, in organic chemistry, isomerism is a complication. Moreover, the single frequency of monochromatic light is simple for Swinburne, but ubiquitous white light is composed of a whole range of spectral frequencies.

Yet again, suppose that fundamental physics were reduced to the well-known quadruplet of forces, then these four forces are numerically less simple than a single such force, not to speak of Swinburne's much simpler number zero of them. *Evidently, the world does not accommodate a priori conceptual decrees of simplicity!* Thus, it is unavailing for Swinburne to tell us ([1991], pp. 283-84): 'If there is to exist something, it seems impossible to *conceive* of anything simpler (and therefore *a priori* more probable) than the existence of God' (italics added).

Indeed, this claim boomerangs, as Keith Parsons ([1989], p. 84) has pointed out as follows:

A demon, for instance [especially Satan], is a single entity, it is a spiritual being and hence not composed of parts; it presumably exercises its power over persons and physical objects in some direct and simple way, and it is in all its deeds actuated by a single motivating drive—malevolence. Hence, explanation of a case of psychosis in terms of demon[ic] possession seems much simpler than any of the current psychological or neurological explanations. The simplicity and untestability (How could it ever be shown that demons *do not* cause psychoses?) of such hypotheses gives them great obscurantist potential.

It already emerges that empirical facts as to how much or little 'simplicity' there is in the world undermine Leibniz's and Swinburne's notion that the conceptual deliverances of epistemically *a priori* simplicity—even if they were coherent—can at all be mandatory for what is ontologically the case.

(ii) Among laws of nature, van der Waals's laws for gases are more complicated than the Boyle-Charles law for ideal gases. Again, in the Newtonian two-body system of the earth and the sun, Kepler's relatively simple laws of planetary motion are replaced by more complicated ones that take account of the sun's own acceleration. Third, Einstein's field equations are awesomely complicated, non-linear partial differential equations, and as such are enormously more complicated than the ordinary second order differential equation in Newton's law of universal gravitation. Remarkably, Swinburne himself mentions this greater complexity of Einstein's gravitational field equations, but his comment on it does not cohere with his demand for *a priori* simplicity. He says ([1991], p. 79) :

Newton's laws . . . are (probably) explained by Einstein's field equations of General Relativity [as special approximations under specified restrictive conditions]. In passing from Newton's laws to Einstein's there is I believe a considerable loss of [*a priori*] simplicity. . . . But there is some considerable gain in explanatory power.

Note, however, that the sacrifice of *a priori* simplicity for the sake of greater explanatory

power is dictated by *empirical* constraints. Thus, Swinburne seems to admit, in effect, that empirical facts override his *a priori* simplicity qua the governing heuristic criterion of theory-formation. In sum, epistemologically, all of the more complicated laws I have mentioned were of course prompted by empirical findings.

(iii) Simplicity enters into curve fitting to a finite number of data points. But just how? Glymour ([1980], pp. 77-9), in effect, answers this question tellingly as follows:

It is common practice in fitting curves to experimental data, in the absence of an established theory relating the quantities measured, to choose the 'simplest' curve that will fit the data. Thus linear relations are preferred to polynomial relations of higher degree, and exponential functions of measured quantities are preferred to exponential functions of algebraic combinations of measured quantities, and so on (p. 78). . . .

The trouble is that it is just very implausible that scientists typically have their prior degrees of belief distributed according to any plausible simplicity ordering, and still less plausible that they would be rational to do so. I can think of very few simple relations between experimentally determined quantities that have withstood continued investigation, and often simple relations are replaced by relations that are infinitely complex: consider the fate of Kepler's laws (p. 79).

I presume that Glymour's remark about Kepler's three laws does not pertain just to the complication arising from the two-body problem, which I already mentioned (under (ii)), but *a fortiori* to the *ten-body* problem of the Newtonian gravitational interaction of the sun with all of the nine planets. The solutions of these equations of motion are infinitely complex in the sense that they take the form of infinite series rather than featuring a much simpler closed, finite form. Besides, Richard Feynman has pointed out that this full planetary system is 'chaotic' in the technical sense of modern chaos theory: Very slight differences in the initial velocities or accelerations issue after a while in very large orbital differences.

In a perceptive critical review of Swinburne's *Is There a God* ([1996]), Quentin Smith ([1998]) examines his argument that theism is the simplest hypothesis, since God is infinite, while infinity and zero are the simplest notions employed by scientists. And Swinburne's reason for claiming that a state of nothing, *excluding* God, is the most natural state of the world is likewise that such a presumed state is conceptually the simplest.

Smith points out, however, that Swinburne equivocates on four different senses of 'infinity' which need to be distinguished. Briefly, Smith explains, these four senses are the following: (i) 'Infinite' refers to Georg Cantor's lowest transfinite cardinal number Aleph-zero; (ii) 'Infinite' refers to a speed, as in an instantaneous transmission of an effect, which is familiar from Newtonian gravitational interaction but is clearly different from the transfinite cardinal Aleph-zero; (iii) A third sense, different from the first two, pertains to the maximum degree of a graduated qualitative property. In this sense, God is infinite, because he is presumed to have the maximum degree of power, knowledge and goodness.

Parsons ([1989], chap. 2) and Michael Martin ([1990], pp. 110-18) had offered other objections to Swinburne's notion of simplicity.

Recall Swinburne's contention that 'If there is to exist something, it seems impossible to *conceive* of anything simpler (and therefore *a priori* more probable) than the existence of God' ([1991], pp. 283-84; italics added). Recall also that this claim does not heed Quinn's aforesaid *caveat* not to slide unsupportedly from being the simplest concept to being the simplest hypothesis. Then we can see that, for Swinburne, conceptual simplicity has *ontological* significance by being legislative for what does exist. Thus, for him, conceptual simplicity is not, at least in the first instance, a methodological, pragmatic, or inductive criterion.

Accordingly, Swinburne's writings do not, I believe, bear out the following suggestion as a counter to me: What he really had in mind was not a criterion of absolute simplicity based on concept-simplicity alone, but rather an injunction to 'always accept that theory which is the simplest one consistent with the data'. But this reading would turn Swinburne's thesis into a rather commonplace version of Occamite methodology. Thus construed, he would then be defending the hypothesis that God exists as the simplest explanation of the world's existence and content consistent with all known data. Admittedly—so the suggestion runs—this retort would not save Swinburne's espousal of SoN, but it might allow him to parry a number of my animadversions.

To this I say: I doubt that his philosophical framework could compatibly incorporate this suggestion. Besides, one basic part of that framework is the supposed divine volitional explanation of the existence of the world, and of its contents. But, as I shall argue in Section 3, that explanation fails on several counts.^v

Evidently, Swinburne presents us with a misdepiction of the use of simplicity criteria in actual science, although he claims continuity with actual scientific theory-construction for his conceptual standard of simplicity. Just as the lesson spelled out by scientific theoretical progress undermined his *a priori* conceptual avowal of SoN as a basis for external divine creation, so also his pseudo-Occamite argument for normative *a priori* simplicity fails. Thus, Swinburne's attempt to underwrite SoN by recourse to simplicity is abortive. But, in the absence of SoN, the logical contingency of the existence of the world does not jeopardize its existence one iota! Accordingly, the claim that a divine external cause is needed to prevent the world from lapsing into nothingness is baseless.

2.3 The Role of Normalcy of Nothingness in the Medieval Arabic Kalam Argument

To conclude my contention that the appeal to SoN wrought philosophical mischief in several of the major theistic cosmological arguments, let me consider the medieval Arabic *Kalam* argument for a creator, as articulated and championed by William Craig ([1979]).

We shall see that, contrary to Craig's assertion, the so-called Kalam version of the cosmological argument, which he defends, is likewise predicated, though only quite tacitly and insidiously, on the baseless SoN. The Kalam argument was put forward by such medieval Arab philosophers as al-Kindi and others (see Craig [1979]).

In Craig's 1994 'A Response to Grünbaum on Creation and Big Bang Cosmology' (Craig

[1994b], p. 247), he wrote:

. . . Grünbaum conflates three versions of the cosmological argument. The *Kalam* version, which I have defended, says nothing about a *causa/ratio essendi*. The Thomist version, as it comes to expression in Aquinas's *Tertia Via*, argues for a *causa essendi* on the basis of the real distinction between essence and existence in contingent things, *a distinction which disposes them to nothingness*. The Leibnizian version in no way presupposes a disposition toward nothingness in contingent things, but seeks a *ratio* for the existence of anything, even an eternal thing which has no disposition to nothingness, in a being which is metaphysically necessary. . . . Thus Grünbaum's demand for evidence of the spontaneity of nothingness is not in every case a relevant demand (italics added).

But I claim that I am not guilty of any conflation of the three versions of the cosmological argument for the existence of God. In the case of Aquinas, Craig acknowledges my demand for evidence supporting SoN as 'a relevant demand'. But since he gives no hint as to how this demand could be met, I presume that he has no response to my argument against SoN. As for Leibniz, I have documented above that, contrary to Craig, Leibniz's cosmological version does presuppose SoN, so that Craig's denial that it does so is just incorrect. Yet I allow that Leibniz's sundry publications may not be coherent on this issue.

As for Craig's endorsement of the *Kalam* version, I can now show that, *malgré lui*, it derives its spurious plausibility from a tacit, though subtle, appeal to SoN. In his attack on my views, which was replete with red herrings, Craig ([1992]) claimed that the old *Kalam* Cosmological Argument justifies a creationist theological interpretation of the big bang world. Specifically, in my paraphrase, he offers the following *Kalam* proposition to be metaphysically necessary ([1979], pp. 141-48, [1994a], [1994b]; Craig and Smith [1993], pp. 147, 156):

Anything that begins to exist but does not have a transformative cause *must have* a creative cause *ex nihilo*, rather than no cause at all.

Yet in the big bang universe, we have an unbounded interval of past time that is only metrically finite in years. This means that there is no first moment of time. Ordinally and topologically, the past-open time interval is isomorphic with a time that is metrically infinite in years. But Craig untutoredly declares an infinite past time to be logically impossible! And he speaks of the big bang universe as 'beginning to exist' by misdepicting the big bang singularity as a genuine first-moment of time (Grünbaum [1994], [1998], sec. 5A, pp. 25-6).

But why, I ask, does a big bang universe that 'begins to exist', in the special sense that there were no instants of time preceding all of the moments in the metrically finite unbounded past, require an external creative cause at all in the absence of a transformative cause? Is it not because Craig tacitly embraces SoN and uncritically assumes that the externally uncaused, natural state of the world is one of nothingness? What else makes it *psychologically compelling* to Craig and some others that an externally uncaused physical universe is 'metaphysically' impossible *tout court*? Would Craig's intuition of metaphysical necessity not dissipate, once its

tacit reliance on the baseless SoN, and its misextrapolation from cases of warranted external causation are made explicit?

SoN as a source of Craig's avowed 'metaphysical intuition that something cannot come out of absolutely nothing'—which is akin to the scholastic dictum '*ex nihilo nihil fit*'—seems also to be subtly present in his quasi-Leibnizian argument from the supposed potentiality of the universe to exist. That potentiality, Craig tells us, is causally but not temporally prior to the Big Bang. And he relies on it to buttress his stated metaphysical intuition as follows (Craig [1991]):

A pure potentiality cannot actualize itself. . . . On the theistic hypothesis, the potentiality of the universe's existence lay in the power of God to create it. On the atheistic hypothesis, there did not even exist the potentiality for the existence of the universe. But then it seems inconceivable that the universe should become actual if there did not exist any potentiality for its existence. It seems to me therefore that a little reflection leads us to the conclusion that the origin of the universe had a cause.

Here Craig is telling us that an external cause is required to effect the realization of 'the [mere] potentiality of the universe's existence', and that if the latter potentiality did not exist, 'then it seems inconceivable that the universe should *become* actual' (italics added). But what reason is there in the temporally unbounded big bang model for claiming that the big bang universe ever '*became* actual'? The most immediate reason seems to be the ill-founded SoN, and the question-begging supposition that 'the potentiality of the universe's existence lay in the power of God to create it', a potentiality, which then required divine creation to be actualized.

Yet Craig insists that since the singularity of the big bang model avowedly had no earlier cause, it must have had a simultaneous one, because it is metaphysically impossible that it be uncaused or 'come out of absolutely nothing'. And he charges me with having overlooked this 'obvious alternative' of a simultaneous cause, claiming that the Big Bang singularity and its purported divine cause 'both occur coincidentally (in the literal sense of the word), that is, they both occur at t_0 ' (Craig [1994a], pp. 218, 222, fn. 1). But surely the *temporal* coincidence of events is not tantamount to *literal* coincidence. And, as is well-known to physical cosmologists, if t_0 is used as a label for the singularity, it does *not* designate a bona fide instant of physical time (Grünbaum [1998], pp. 25-6). Instead, the term 'the big bang' is short, in this instance, for the behavior of the universe during its unbounded early temporal past.

Now I must ask anew: What, other than the insidious SoN, could make *psychologically compelling* Craig's avowed 'metaphysical intuition that something cannot [spontaneously] come out of absolutely nothing' (Craig [1991])? I answer: Once we abandon his misleading language of 'coming *out of* nothing', we can describe the situation as follows: The big bang models feature a world whose past time is unbounded (open) but metrically finite in years. Absent the tacit presupposition of the baseless SoN, there is just no cogent reason for requiring an external creative cause for the existence of that world! We must be ever mindful to extirpate the baseless SoN from our cognitive (unconscious) awareness.

John Earman ([1995], p. 208), when presumably speaking of the Kalam argument, writes:

A seemingly more sophisticated but not essentially different response is that something cannot begin to exist without a cause so if there is no physical cause of the beginning to exist, there must be a metaphysical one. Here I am in complete agreement with Professor Grünbaum in that the standard big bang models . . . imply that for every time t there is a prior t' and that the state at t' is a cause (in the sense of causal determinism) of the state at t [fn. 7 omitted here]. Samuel Clarke, Leibniz and, in their wake, other philosophers have asked for an explanation of the existence of this *set* of states *as whole*, and indeed of the conjunction of all facts (Gale [1991]), over and above the explanation of each individual state t by some prior state or other t' . But why is it thought that the entire series of states requires an external cause, instead of being a fundamental, logically contingent brute fact? If the Clarkians envision divine volition as providing the explanation they demand (Quinn [1993]), then I argue, as below, that such a theological explanation fails multiply. Besides, Quentin Smith, in a perceptive paper 'Internal and External Causal Explanations of the Universe' ([1995]) , contended that contemporary discussions of the Clarke and Leibniz challenge 'are vitiated by an inadequate understanding of the relation between a cause external to a whole and the whole itself (in the broad sense of "whole" that includes sets, mereological sums, aggregates and organic unities)'. Smith argues that, regardless of what kind of whole the universe may be, it cannot be *externally* caused by the God of classical theism, who supposedly created it *ex nihilo*.

I conclude from the foregoing that Craig has failed to show cogently that the universe ever 'became actual' at the phantom time t_0 , let alone that the atheist, anti-creationist position is damaged by not countenancing a corresponding potentiality.

3 Critique of the 'Explanation' of the Most Fundamental Laws of Nature by Divine Creative Volition

Philip Quinn wrote ([1993], pp. 607-08):

. . . The conservation law for matter-energy is logically contingent. So if it is true, the question of why it holds rather than not doing so arises. If it is a fundamental law and only scientific explanation is allowed, the fact that matter-energy is conserved is an inexplicable brute fact. For all we know, the conservation law for matter-energy may turn out to be a derived law and so deducible from some deeper principle of symmetry or invariance. But if this is the case, the same question can be asked about this deeper principle because it too will be logically contingent. If it is fundamental and only scientific explanation is allowed, then the fact that it holds is scientifically inexplicable. Either the regress of explanation terminates in a most fundamental law or it does not. If there is a deepest law, it will be logically contingent, and so the fact that it holds rather than not doing so will be a brute fact. If the regress does not terminate, then for every law in the infinite hierarchy there is a deeper law from which it can be deduced.

Adolf Grünbaum

In this case, however, the whole hierarchy will be logically contingent, and so the question of why it holds rather than some other hierarchy will arise. So if only scientific explanation is allowed, the fact that this particular infinite hierarchy of contingent laws holds will be a brute inexplicable fact. Therefore, on the assumption that scientific laws are logically contingent and are explained by being deduced from other laws, there are bound to be inexplicable brute facts if only scientific explanation is allowed.

There are, then, genuine explanatory problems too big, so to speak, for science to solve. If the theistic doctrine of creation and conservation is true, these problems have solutions in terms of agent-causation. *The reason why there is a certain amount of matter-energy and not some other amount^{v1} or none at all is that God so wills it, and the explanation of why matter-energy is conserved is that God conserves it.* Obviously nothing I have said proves that the theistic solutions to these problems are correct. I have *not* shown that it is *not* an *inexplicable brute fact* that a certain amount of matter-energy exists and is conserved. For all I have said, the explanatory problems I have been discussing are insoluble. But an insoluble problem is not a pseudoproblem; it is a genuine problem that has no solution. So Grünbaum's claim that creation is a pseudoproblem for big bang cosmogonic models misses the mark (*italics added*).

In the same vein, Quinn ([1993], p. 606) cites Swinburne's book *The Existence of God* ([1979 ed.], pp. 123-25). Speaking of the laws of nature **L**, Swinburne declared:

L would explain why whatever energy there is remains the same; but what **L** does not explain is why there is just this amount of energy.

My response is twofold: (i) I contend that Quinn offers a non-sequitur in his conclusion 'So Grünbaum's claim that [the problem of] creation is a pseudoproblem for big bang cosmogonic models misses the mark', and (ii) The theistic volitional explanations for the existence and nomic structure of the world championed by Quinn and Swinburne are inherently defective.

(i) In Quinn's argument for his complaint that I had leveled an unsound charge of pseudo-problem, he conflates two different problems, only one of which I had indicted as a pseudo-issue. In a passage that he himself (Quinn [1993], p. 605) had adduced from Leibniz, that philosopher had lucidly stated the pertinent two distinct questions when he demanded 'a full reason why there should be a world at all, and why it should be such as it is'. Quinn reasoned fallaciously ([1993], p. 607) that if the latter question is a 'genuine explanatory problem' even when addressed to the most fundamental laws and facts of nature—as he claims—then so also the former question 'why is there is a world at all?' must be genuine. But in my complaint of pseudo-problem, I had targeted only the question: 'What is the *external cause* of the very existence of the universe?' It is *this* problem that is at issue when Quinn speaks of my dismissal

of ‘the problem of creation’.

I had rejected it as misbegotten, because it is avowedly or tacitly predicated on the SoN doctrine, a tenet that I have been at pains to discredit as ill-based. And I favor the use of the pejorative term ‘pseudo-problem’ to derogate a question that rests on an ill-founded or demonstrably false presupposition; yet in so doing, I definitely do not intend to hark back to early positivist indictments of ‘meaninglessness’.

Assuming that the most fundamental laws and facts of the world are logically contingent, one can clearly allow the question why they are what they are, as contrasted with logically possible alternatives to them, even as one rejects the different existential question ‘Why is there anything at all, rather than just nothing?’ Thus, when I indicted the latter as a pseudo-problem, I did not thereby disallow the former. Yet Quinn reasons illicitly that since the former question is genuine, my rejection of the latter ‘misses the mark’.

In the opening paragraph of his lengthy critique of my rejection of theological interpretations of physical cosmology, Quinn ([1993], p. 589) had declared that the aim of his critique is to refute my charge of pseudo-problem. I claim that he failed, when he conflated Leibniz’s two questions.

(ii) This brings me to the theological answer given by Swinburne and Quinn to their question why the nomological structure and content of the world are what they are.

To set the stage for my array of animadversions against their divine volitional answer, let me mention Richard Gale’s view ([1999]) that ‘. . . ultimate disagreements between philosophers are due to their rival sentiments of *rationality* as to what constitutes a rationally satisfying explanation of reality’. Two such rival views of rationality, Gale points out, are the scientific world view, on the one hand, and the man-centered one, which employs anthropomorphisms, on the other. Theistic advocates of ‘natural religion’ champion the anthropomorphic perspective of personhood in their proffered explanations of everything via divine creative volition, a standpoint rejected by Santayana, Bertrand Russell and a host of others.

Let me defer, for now, adjudicating the merits of these two competing world views, and first set forth some fundamental epistemological and methodological differences between them. These deep differences exist, despite Swinburne’s claim of solid methodological continuity between the two world views and their respective criteria of rationality. Says he ([1996], p. 2) : ‘The very same criteria which scientists use to reach their own theories lead us to move beyond those theories to a creator God who sustains everything in existence’. Moreover, he asserts theistic *pan-explainability*, declaring (*ibid.*): ‘. . . using those same [scientific] criteria, we find that the view that there is a God explains *everything* we observe, not just some narrow range of data. It explains the fact that there is a universe at all [via SoN], that scientific laws operate within it, . . .’ (*cf.* also his [1991], chap. 4 on ‘Complete Explanation ’).

Note, however, that Swinburne and others who offer divine volitional explanations would offer precisely such an explanation, if the facts of our world were radically different, or even if, in a putative world-ensemble of universes, each of them had its own laws, vastly different from

the respective laws in the others. Their schema of theistic volitional explanations relies on the model of Aristotle's practical syllogism (hereafter 'PS') for intentional action.

As we just saw, Swinburne maintains that the hypothesis of divine creation 'moves beyond' scientific explanations via the very same epistemological criteria. As against that contention, let me now set forth the substantial explanatory discrepancies between them.

Neither Swinburne nor Quinn spelled out the provision of a deductive theistic volitional explanation, which they claim for the hypothesis of divine creation. I now offer a reconstruction of essentially the deductive explanatory reasoning that, I believe, they had in mind. And I am glad to report that Quinn (private communication) authenticated my reconstruction, at least in regard to himself. It reads:

- Premise 1. God freely willed that the state of affairs described in the *explanandum* ought to materialize.
- Premise 2. Being omnipotent, he was able to cause the existence of the facts in the *explanandum* without the mediation of other causal processes.

Conclusion: Our world exists, and its contents exhibit its most fundamental laws.

It is to be understood that this reconstruction is only schematic, since the actual specifics of the most basic laws are not stated in the Conclusion.

But two basic considerations jeopardize the epistemic viability of this proffered volitional theological explanation:

(i) Epistemically, it will succeed *only if* the theist can produce cogent evidence, *independent of the explanandum*, for the very content of the volition that the proffered explanation imputes to the Deity; failing that, the deductive argument here is not viable epistemically; but where has the theist produced such independent evidence? Moreover, Premise 2 unwarrantedly assumes the availability of a successful cosmological argument for the existence of the God of theism.

(ii) Relatedly, the explanation is conspicuously *ex post facto*, because the content of the volition imputed to God is determined retrospectively, depending entirely on what the specifics of the most fundamental laws have turned out to be.

William James has beautifully encapsulated the *ex post facto* character of the relevant sort of theological explanation, in which God is Hegel's Absolute. Speaking of the facts of the world, James ([1975], p. 40) declared:

Be they what they may, the Absolute will father them. Like the sick lion in Esop's fable, all footprints lead into his den, but *nulla vestigia retrosum* [i.e., no trace leads back out of the den]. You cannot redescend into the world of particulars by the Absolute's aid, or deduce any necessary consequences of detail important for your life from your idea of his nature. But no such *ex post facto* deficiency is found in typical explanations in physics or biology such as (i) the Newtonian gravitational explanation of the orbit of the moon; (ii) the deductive-nomological explanations of optical phenomena furnished by Maxwell's equations, which govern the electromagnetic field, or in a statistical context; (iii) the genetic explanations of hereditary

phenotypic human family resemblances.

But according to familiar scientific evidential criteria which Swinburne tirelessly professes to employ—as in his appeal to Bayes’s theorem—his and Quinn’s deductive argument appear to be epistemologically frivolous by being altogether *ex post facto*. Nonetheless, Swinburne ([1991], p. 109), speaking of the explanandum *e*, is explicitly satisfied with such an *ex post facto* mode of explanation: ‘. . . clearly whatever *e* is, God being omnipotent, has the power to bring about *e*. He will do so, if he chooses to do so’. Yet since we obviously have no independent evidential access to God’s choices, Swinburne has to *infer* completely *ex post facto* whether God’s choices included *e* from whether or not *e* is actually the case.

In ordinary action-explanations on the model of Aristotle’s PS, we often, if not typically, do have independent evidence—or at least access to independent evidence—as to the content of the agent’s motives. That is to say, we have evidence for the imputed motives *other than* the action taken by the agent. And, absent such evidence, we reject the proffered action-explanation as viciously circular. Thus if I explain an unreasonable reprimand of an academic colleague by the department chairman as vindictive, I may do so on the basis of independent evidence that the chairman harbors aggressive feelings toward the colleague, because of the colleague’s repeated expressions of disrespect for the chairman. On the other hand, we reject imputations of motives for given actions as facile, when there is no independent evidence for the agent’s possession of the attributed motives.

In this sense, I claim that the attribution of the existence of the world to God’s willing that it exist is unacceptably *ex post facto*. Let me emphasize that, as I lodge it, the complaint that *ex post facto* explanations afford no independent empirical check on their premisses is *not* focused on their being non-predictive. Non-predictiveness is not tantamount to untestability, since a theory may be retrodictive without being predictive. For example, (neo)-Darwinian evolutionary theory is essentially unpredictable in regard to the long-term evolution of species, but it retrodicts numerous previously unknown past facts in the fossil record. Similarly, being an untreated syphilitic is not predictive of affliction with neurologically degenerative paresis. Yet, since only untreated syphilitics become paretics, being parietic testably *retrodicts* having been an untreated syphilitic. But an explanation that is neither retrodictive nor predictive and whose premisses have no corroboration by evidence independent of the given *explanandum*, is paradigmatically *ex post facto*.

There are further difficulties in the theistic explanation above: God’s omnipotence will now serve to show that Swinburne’s and Quinn’s deductive volitional explanation does not meet Leibniz’s aforesaid demand for a ‘full reason why’, if there is a world at all, ‘it should be such as it is’. Having harped on God’s omnipotence earlier, Swinburne develops it further ([1991], p. 295):

God, being omnipotent, cannot rely on causal processes outside his control to bring about effects, so his range of easy control must coincide with his range of direct control and *include all states of affairs which it is logically possible for him to bring about* (italics added).

Precisely because God is omnipotent, however, he could clearly have chosen any one of the logically possible sets of fundamental laws to achieve his presumed aims—goals that are outlined by Swinburne—rather than the actual laws. Yet, if so, then exactly that latitude shows that, if the stated epistemic defects are to be avoided, the theological explanatory scenario fails to satisfy Leibniz’s demand. Swinburne himself concedes that the theistic explanation is wanting: ‘It is compatible with too much. There are too many different possible worlds which a God might bring about’ ([1991], p. 289). Thus, God’s supposed choice to create the actual world is presumably a matter of brute fact.

How then does Swinburne justify that his theological explanation above improves upon a scientific system in which explanation is envisioned as departing from the most fundamental laws of nature, which are themselves taken to hold as a matter of brute fact? In the face of the epistemic flaws I have set forth, Swinburne’s and Quinn’s theological superstructure appears to be an explanatorily misguided step.

Furthermore, the details of the proposed theological explanation, employing the aforementioned modified version of the PS, is beset by difficulties of its own. Swinburne ([1991], p. 296) opines that ‘. . . although certain physical conditions of the brain need to occur if human agents are to have intentions which are efficacious, the human model suggests a simpler model in which such limitations are removed’. Leaving aside his hapless *a priori* simplicity, let me recall that he and Quinn rely on direct, unmediated divine volitional creation of the world *ex nihilo* (Swinburne [1991], p. 294 ; Quinn [1993], p. 602). Yet Quinn cautions us ([1993], p. 597): ‘I leave open the question of whether God and his volitions are timelessly eternal by not building into this locution [of direct bringing about] a variable ranging over times of occurrence of divine willings’. On the other hand, Swinburne ([1991], p. 8) dissociates himself from the notion of divine timeless eternity, and says: ‘I understand by God’s being eternal that he always has existed and always will exist’.

Like many others, I find it unintelligible to be told by Quinn that any mental state, especially a volitional one that creates *ex nihilo*, can be ‘timelessly eternal’. *A fortiori* it defies comprehension how such a timeless state can ‘bring about’ a state of existence at any one ordinary *worldly* time. The reply that this complex event happens in *metaphysical* time merely mystifies further an already conceptually elusive situation.

Thus, the best I can do to make the supposed creative process intelligible is to construe their direct divine causation as taking the following form: God is in the injunctive mental state ‘let there be the existing world’, including the Biblical ‘let there be light’. And this mental state instantaneously causes the world to exist.

But in all of our ordinary and scientific reasoning, it would be regarded as magical thinking, to suppose that any *mere thought* could bring about the actual existence of the thought-object, let alone out of nothing. Hence I can only welcome the assertion of the Jesuit theologian Michael Buckley ([1990], p. 314) that, as for divine volitional creation, ‘We really do not know how God “pulls it off ” ’ ([1990], p. 314). But then Buckley continues in an apologetic mode: ‘Catholicism has found no great scandal in this admitted ignorance’. While I accept this account of the attitude of the exponents of Catholic doctrine, I regard the admitted explanatory gaping lacuna as a ‘scandal’ of unintelligibility.

As a further cardinal methodological difference between scientific and creationist

reasoning, I now consider Quinn's attempt to reconcile the following two claims: (i) the theistic doctrine that divine perpetual creation (or re-creation) is causally necessary to prevent the universe from lapsing into nothing at any one moment, on the one hand, and (ii) the assertion of the scientific mass energy-conservation law, on the other. I had argued for their logical incompatibility ([1996], [1998]).

Yet in discussing this issue of logical compatibility, we must be mindful of the fact that the technical scientific concept of energy is highly *theory-relative* by depending on the energy-ontology of the particular pertinent scientific theory. And, furthermore, we must heed the *caveat* emphasized by John Leslie ([1996], p. 131) that the application of the energy concept to the entire universe is quite problematic in contemporary physical theory, notably in big bang and quantum cosmology, a caveat not honored by either Swinburne or Quinn.

How then does Quinn reason specifically that he can reconcile the supposed causal necessity of divine underwriting of the physical conservation law with its formulation in physics or chemistry textbooks, and in scientific encyclopedias? One such encyclopedia reads (Newman [1965]): 'The mass-energy content of an isolated system remains constant. The energy can be converted from one form to another, but can neither be created nor destroyed'. Note importantly that this statement asserts the impossibility of either the creation or annihilation of energy *tout court* as a law of nature. Furthermore, since the law declares the impossibility of the annihilation of energy, the energy *could not lapse into nothingness* anyway in the absence of God's supposed ontological support. Therefore, contrary to the long theistic tradition of perpetual creation espoused by Quinn, God is clearly *not* needed to *prevent* such supposed spontaneous annihilation by creative intervention. *This is a conclusion of cardinal importance* (Grünbaum [1996], p. 539, [1998], p. 29).

Quinn had laid the groundwork for his response, when he maintained that God is the only and the total cause of energy-conservation. Then he replied to my charge of incompatibility as follows ([1993], p. 603):

Grünbaum has argued that what I have said so far does not get to the heart of the matter. His key thesis, he says, is that the mere physical closure of a system is causally sufficient for the conservation of its matter-energy because the conservation of matter-energy is a matter of natural law. However, this thesis rests on an understanding of the conservation law that theists of the sort I have been discussing would reject. They would insist that the sum total of matter-energy in a physically closed system remains constant from moment to moment only if God acts to conserve it from moment to moment. Because they hold that divine conserving activity is causally necessary for the conservation of matter-energy even in physically closed systems, such theists would deny that the mere physical closure of a system is causally sufficient for the conservation of its matter-energy. So they would take the true conservation law to contain an implicit *ceteris paribus* clause about God's will. When spelled out in full

Adolf Grünbaum

detail, the law is to be understood as implying that if a system is physically closed, then the sum total of matter-energy in it remains constant if and only if God wills to conserve that sum total of matter-energy.

It is important to realize that it does not lie within the competence of empirical science to determine whether Grünbaum's understanding of the conservation law is rationally preferable to the theistic understanding I have sketched. The empirical methods of science could not succeed in showing that divine activity does not conserve the matter-energy in physically closed systems.

I have several critical comments on this passage (*cf.* also Grünbaum [1996], [1998]). And I use the term 'energy-conservation' as short for mass-energy conservation.

(i) Recall that the doctrine that perpetual divine creation is causally necessary for physical energy-conservation is tacitly predicated on SoN, which I have shown to be baseless.

(ii) Quinn, though not Swinburne, told us that physical energy conservation is only an epiphenomenon, presumably in the sense of Malebranche's occasionalism.^{vii} And he rests that thesis on the purported causal exclusivity and totality of God's conservationist role. Thus, he lays down the proviso that the physical conservation law holds 'if and only if God wills to conserve that sum total of matter-energy'. This contention, however, makes that physical law totally irrelevant, both causally and *explanatorily*, to physical energy conservation.

(iii) Oddly, Quinn peremptorily shifts the probative burden of evidence from his own shoulders to mine. In lieu of himself giving *positive* evidence for his theistic proviso, which he ought to have done—over and above telling us that his theistic confrères avow it—he illegitimately calls on me to *refute* it. But surely it is not incumbent on me to disprove such a wholly untestable proviso, any more than Quinn is required to confute a *rival* proviso asserting that only Satan's intervention preserves the total energy with the help of poltergeists who refrain from making noises!

(iv) Having thus improperly shifted the burden of proof from himself to me, Quinn concludes that 'it does not lie within the competence of empirical science to determine whether Grünbaum's understanding of the conservation law is rationally preferable to the theistic understanding. . . '. But since Quinn did not justify his proviso by evidence, on what grounds, I ask, does *he* feel rationally entitled to espouse it?

(v) Last, but by no means least, I argue that Quinn's imposition of his proviso, *in epistemic effect*, turns the physical conservation law into an empty tautology. The proviso amounts to the claim of *creatio continuans* that the physical conservation law is true only if God does not make it false by 'suspending' it. And this claim, in turn, is tantamount to the following conjunction: (a) The *tautology* that the law is true only if it is not false, and (b) The law will cease to hold if God 'suspends' it at some time.

Yet plainly, we have no independent evidential access to whether and when God decides to discontinue his supposed ontological support for the physical law, so that God's 'suspension'

in (b) is epistemically otiose. Evidentially, God's 'suspension' amounts to the empirical falsity of the law. Thus, epistemologically, Quinn's avowal reduces to the *tautological* averral that the conservation law holds except when it doesn't, which is the empirically empty logical truth that the law is either true or false!

What physicist, I ask, would *nowadays* countenance such an epistemic trivialization of the law, be he/she religious or not? And, since the physical law asserts *tout court* that energy can neither be created nor destroyed, why should everyone else *not* regard Quinn's imposition of the theistic proviso on the physical law as a mere *ad hoc* rescuing maneuver needed to meet my charge of incompatibility?

(vi) Let us recall the challenge I issued to the intelligibility of the process of instantaneous divine creation; and also the cognate admission by the Jesuit Michael Buckley that 'We really do not know how God "pulls it off" '. Then one further moral of the epistemic demise of Quinn's proviso is that, contrary to his and Swinburne's contention, their version of divine volitional explanation provides no epistemically viable account of why the physical energy conservation law holds, let alone of why the magnitude of the total energy is what it is, presumably to within a choice of units and of a zero of energy.

As for the putative divine 'suspension' of one or more of the laws of nature, Swinburne ([1989], chap. 8) has offered criteria (p. 79) for a divine miracle *qua bona fide* 'Violation of a Law of Nature'. But elsewhere (Grünbaum [forthcoming]), I shall give major counter-examples to his criteria for a violation of one or more true laws of nature, as distinct from what are believed to be the laws at any given stage of scientific theory.

In regard to Swinburne's argument from religious experience ([1991], chap.13) of a transcendent God endowed with the triad of 'omnis', I confine myself to just deeming it impossible that the human cognitive apparatus could ever experience such a God. How, for example, can a human being possibly receive cognizance of an omnipotent transcendent being via perceptual or non-perceptual direct religious experience? Surely this is a matter of dare-devil *inference* rather than of direct human experience. Hence I consider the reports of such alleged transcendent experiences to be fundamental epistemic misinterpretations of them, whatever else they might deliver.^{viii}

I have provided an only occasionally evaluative account of some of the fundamental differences between the scientific and the anthropomorphic world views sketched above by Richard Gale. Note that theism relies on the anthropomorphism of attributing personhood to God, and it is *anthropocentric* as well, by holding that God chose a world in which human beings would play an important role. Let me now provide my promised appraisal of the rivalry between these competing world views.

Gale has expressed the following view concerning that rivalry: 'That a belief results from wish fulfillment and lacks evidential support is not alone a reason for charging it with being irrational. For our belief that our senses and memories are in general reliable results from wish fulfillment and has no non-circular evidential support, but is not irrational for that reason' (private communication).

To this, I respond in several ways:

1. It is both unreasonable and utopian to demand of an epistemic system that it provide an *internal* justification of its fundamental epistemic points of departure, if such there be. As Gale surely knows, such foundationalism has been ably challenged. In any case, just as every *non-a priori* explanatory system has to start from some unexplained explainers, so also any epistemic system must, in effect, contain some internally unjustified precepts as to what is to count as evidence. No epistemic system can completely pick itself up by its own bootstraps.

2. I see no grounds for Gale's claim that our epistemic dependence on sensory experience and memories is, in the first instance, wish-driven. Instead, such epistemic dependence is precisely the mechanism of our very existence and biological survival. And within our ordinary and scientific epistemic systems, both our sensory perceptions and memories are relentlessly *self-correcting*. By the same token, they tell us that wishful thinking more often than not leads to painful frustration and disappointment or even disaster, especially in some psychoses. Thus Freud observed: 'Experience teaches us that the world is not a nursery' (*Standard Edition*, vol. 22, p. 168). For just such reasons, Donald Davidson ([1982], p. 298) characterized wishful thinking as 'a model for the simplest kind of irrationality'.

3. The issue of rationality posed by Quinn à propos his theistic proviso, and surely also by Swinburne's invocation of scientific evidence in his reliance on Bayes's theorem, is set within a framework that completely bypasses Gale's demand for an epistemic system's self-justification: The appeal to self-correcting sensory experience, including memory, is *common ground* between these theists and myself in our debate on rational preferability. Therefore, I believe that, this commonality and my other foregoing responses to Gale as well as to Quinn spell the following moral: I am fully entitled to conclude, contra Quinn, that my standard scientific construal of the conservation law, without his epistemic trivialization of it by his theistic proviso, is rationally preferable to Quinn's.

Finally, the theistic explanatory scenario for our world is abortive, because it is ethically incoherent: As Hume has emphasized, no omni-benevolent and omnipotent God would ever create a world with so overwhelmingly much gratuitous and uncompensated natural evil such as cancer, evil that is not due to human decisions and actions. In particular, evil comprises both moral and natural evil. Thus, even if God could be exonerated from moral evil via the so-called 'Free Will Defense', the strong challenge to God's omni-benevolence from natural evil remains. This egregious difficulty is attested by wide agreement, even among theists, that no extant theodicy has succeeded in neutralizing it.

True enough, Swinburne ([1991], chap.11 and p. 284, [1996], chap.6, [1998]) offered his own theodicy. But Quentin Smith ([1991], pp. 165-68, [1992], [1997], pp. 137-57) has discredited his earlier efforts, while Gale ([forthcoming]) undermined Swinburne's ([1998]). For my part, I claim that Swinburne sees the world through rose-colored glasses, preparatory to enlisting this glowing view of the world in the service of his theistic agenda. Thus, he opined ([1991], p. 284):

The world contains much evil, but the evil is not endless and it is either

evil brought about by men, or evil of a kind which is necessary if men are to have knowledge of the evil consequences of possible actions (without that knowledge being given in ways which will curtail their freedom), and which provides the other benefits described in chap.11.

But this apologetic scenario does not meet the more inclusive challenge that David Hume issued through the interlocutor Philo in his *Dialogues Concerning Natural Religion*. As we shall see in Section 5, Swinburne uses Bayes's Theorem from the probability calculus to claim that the existence of God is more probable than not. Yet Swinburne makes no mention of Salmon's telling 1978 paper 'Religion and Science: A New Look at Hume's *Dialogues*'. In that article, Salmon endorsed Philo's stance as part of casting Hume's [Philo's] case into Bayesian form. A year later, Salmon ([1979]) further articulated his pro-Humean stance.

4 The 'Anthropic Principle'

4.1 The Scientific Status of the Anthropic Principle

The so-called 'Weak Anthropic Principle' (WAP) has been construed in a number of naturalistic, non-theological ways, whose nub is the following: *Given* the currently postulated laws of nature, very sensitive physical conditions, going back to the earliest stages of a big bang universe, are *causally necessary* for the cosmic evolution and existence of carbon-based humanoid life. And these very delicate initial or boundary conditions are *a priori* exceedingly improbable, where the *a priori* probabilities are presumably defined on the set of all logically possible values of the pertinent physical conditions, which include the physical constants in the above laws of nature. Various authors speak of these sensitive initial conditions as being 'fine tuned' for life. But John Leslie, an exponent of the Design-interpretation of the 'fine tuning', issued the disclaimer '... talk of "fine tuning" does not presuppose that a divine Fine Tuner, or Neoplatonism's more abstract God, must be responsible' ([1990], p. 3).

Yet the Roman Catholic theist Ernan McMullin rightly cautions ([1993], p. 602): '*Fine tuning* has something of the ambiguity of the term *creation*; if it be understood as an action, then the existence of a "fine tuner" seems to follow. Perhaps a more neutral term would be better'. Indeed, for just that reason, I suggest the use of the term 'bio-critical values' in lieu of the locution 'fine tunings'.

In an admirably thorough and cogent article, John Earman ([1987]) gave the following account and appraisal of WAP, but without any evaluation (p. 314) of a teleological construal of it in a theistic argument from Design (pp. 314-15):

The litany of the many ways the universe is fine tuned for life falls into two parts. First, for example, a tiny change in the strong nuclear force would mean the absence of complex chemical elements needed for life. . . . Second, for example, a change in the energy density at Planck time by an amount as small as 1 in 10^{-5} as compared with the critical density (corresponding to a flat universe) would mean either that the universe would have been closed and would have recollapsed millions of years ago or else that it would have been open with a presently negligible energy

**A New Critique of Theological Interpretations
of Physical Cosmology**

Adolf Grünbaum

density. The second category does not call for an attitude of agog wonder-at-it-all. Rather, it points to a potential defect, in the form of a lack of robustness of explanation, of the standard hot big bang scenario, a defect which the new inflationary scenario promises to overcome by showing how exponential expansion in the early universe can turn fairly arbitrary initial conditions into the presently observed state. . . . Nor is it evident that puzzlement is the appropriate reaction to the first category. A mild form of satire may be the appropriate antidote. Imagine, if you will, the wonderment of a species of mud worms who discover that if the constant of thermometric conductivity of mud were different by a small percentage they would not be able to survive.

Even if puzzlement as to the fine tuning of constants is appropriate, it does not follow that we must look for enlightenment either to Design or to worlds-within-worlds. . . .

CONCLUSION

Insofar as the various anthropic principles are directed at the evidentiary evaluation of cosmological theories they are usually interpretable in terms of wholly sensible ideas, but the ideas embody nothing new, being corollaries of any adequate account of confirmation. And insofar as anthropic principles are directed at promoting Man or Consciousness to a starring role in the functioning of the universe, they fail; for either the promotion turns out to be an empty tease or else it rests on woolly and ill-founded speculations.

To give pause to a teleological construal of WAP, it is well to remember that the universe is not particularly hospitable to humans. To emphasize this restricted hospitality, T. Schick ([1998], p. 98) quotes the renowned attorney Clarence Darrow as follows:

. . . Admitting that the earth is a fit place for life, and certainly every place in the universe where life exists is fitted for life, then what sort of life was this planet designed to support? There are some millions of different species of animals on this earth, and one-half of these are insects. In numbers, and perhaps in other ways, man is in a great minority. If the land of the earth was made for life, it seems as if it was intended for insect life, which can exist anywhere. If no other available place can be found they can live by the million on man, and inside of him. They generally succeed in destroying his life, and if they have a chance, wind up by eating his body.

In a very fine 1997 paper on ‘The Lessons of the Anthropic Principle’, John Worrall wrote :

It is notoriously easy to play the coincidence game. Coincidences - ‘massively improbable’ events can be created at will—especially if you

A New Critique of Theological Interpretations of Physical Cosmology

Adolf Grünbaum

are happy not to think too sharply about what you treat as the random variables underlying the probabilities (p. 11).

. . . Even in cases where probability talk is justified, it's just plain silly to say that some event has such a low probability of happening that it 'cannot have happened by chance'—chance is what governs both high and low probability events: low probability events tend to occur less often.

But if the best of all possible worlds would be one in which this perceived intolerable coincidence had been explained scientifically—that is, shown to be the deductive consequence of a further deeper theory that had independently testable empirical consequences that turned out to be correct, then surely the worst of all possible worlds is the one in which, by insisting that some feature of the universe cannot just be accepted as 'brute fact', we cover up our inability to achieve any deeper, testable description in some sort of pseudo-explanation—appealing without any independent warrant to alleged a priori considerations or to designers, creators and the rest (p. 13).

4.2 Critique of the Theistic Design Interpretation of the Weak Anthropic Principle

In his *Dialogues on Natural Religion*, David Hume famously warned against sliding from an ordered universe to one featuring theistic Design. In this subsection, I shall examine critically the theistic Design interpretation of WAP, with which Earman did not deal and which Worrall dismissed.

Recall (from Section 3) that divine omnipotence has the defect of failing to explain the explanandum by allowing too much. So also, I shall now argue, Swinburne and Leslie undermine their teleological construal of WAP by invoking the omnipotent God's Design to explain the *a priori* very improbable bio-critical values ('fine tuning'). It is crucial to note that, as a point of departure of their theistic argument, both Swinburne and McMullin take the laws of nature as given and fixed, no less than philosophical naturalists do. Thus, Swinburne wrote ([1991], p. 306): '. . . given the actual laws of nature or laws at all similar thereto, boundary conditions will have to lie within a narrow range of the present conditions if intelligent life is to evolve. . . .' Elsewhere, Swinburne ([1990], p. 160) had made the same claim. Moreover, he averred ([1991], p. 312): '. . . the peculiar values of the constants of laws and variables of initial conditions are substantial evidence for the existence of God, *which alone can give a plausible explanation of why they are as they are*' (italics added). And divine action supposedly does so by teleologically transforming the *a priori* very low probability of the bio-critical conditions into probable ones.

Clearly, Swinburne operates with the assumption that the laws of nature are *given* as fixed. And he does so twice: (i) in his initial inductive inference of divine teleology from the bio-critical values, whose critical role is predicated on a given set of laws, and (ii) in the theistic teleological explanation of why these values 'are as they are'. And my challenge will be that this explanation does not cohere with divine omnipotence, which negates the fixity of the laws.

Relatedly, though far more cautiously than Swinburne, McMullin wrote ([1993], p. 603):

According to the Biblical Account of creation, God chose a world in which human beings would play an important role, and would thus have been committed to whatever else was necessary in order for this sort of universe to come about. If fine tuning was needed this would present no problem to the Creator.

Although McMullin is careful to speak of fine tuning conditionally, bear in mind that the pertinent fine tuning would be needed *only* in the context of the *givenness* of the actual laws of nature.

The logical structure of Swinburne's explanation of the existence of the bio-critical values can be schematized essentially as follows: The premisses are (i) the laws of nature are given, (ii) God wants to create human life, and (iii) under the constraints of the given laws, 'fine tuning' is necessary for the existence of human life. And the conclusion is that God selected the bio-critical values in his creation, and therefore they materialized.

But this explanation founders on the shoals of divine omnipotence, just as did the theistic volitional explanation of the ultimate laws of nature (*cf.* Section 3). As noted earlier, Swinburne's account of omnipotence included the following creative nomological latitude ([1991], p. 295): 'God, being omnipotent . . . his range of easy control must . . . include all states of affairs [including laws] which it is *logically possible* for him to bring about' (italics added). Yet this conclusion undermines the theistic teleological explanation of the bio-critical values, a philosophical account that was predicated on the *contrary* assumption that God confronts fixed, rather than disposable laws of nature. Instead, God can achieve any desired outcome by any laws of his choosing. This result demonstrates the logical incoherence of the theistic anthropic account. Moreover, divine omnipotence makes the causal necessity of the bio-critical values *irrelevant* to the divine teleological scenario: In the context of suitably different natural laws, relating their corresponding variables to the existence of humanoid life, the *a priori* very low probability of the standard bio-critical values is no longer an issue at all, since the critical role of these values is relative to a specified fixed set of laws and is not played by them *per se*.

Again, as in the case of the theistic explanation of the laws of nature by divine volition (Section 3), the doctrine of divine omnipotence has boomeranged!

In the teleological scenario, God is held to be omnibenevolent. But, given his omnipotence, his choice to let human and animal life evolve via Darwinian evolution clashes head-on with his omni-benevolence. How could the God of these two omnis possibly choose the mindless, unbelievably cruel and wasteful Darwinian process—Tennyson's 'nature red in tooth and claw'—as his way of bringing intelligent life onto the earth? After all, an untold number of far more benevolent mechanisms were available to him, even including the Biblical Garden of Eden arrangement of Adam and Eve. Besides, as Leslie ([1996], p. 81) has reported, 'There have been certainly five and maybe well over a dozen mass extinctions in Earth's biological history'. The Darwinian mechanism befits a cruel monster.

In an argument quite different from mine, Quentin Smith has contended ([1994], p. 372) that (i) there is a huge range of values of the constants of nature and initial conditions which do *not* issue in intelligent life but which are also *a priori* overwhelmingly improbable, and (ii) Swinburne's claim ([1990], p. 154) that the bio-critical values specially cry out for explanation is unjustified.

It turns out that the so-called ‘anthropic’ coincidences, which are purely physical, are *coextensive* with those that are critical for the formation and primordial existence of stars and galaxies: As Earman remarked ([1987], p. 309), ‘the selection function [of initial/boundary conditions]’ is served just as well by the existence of stars and planetary systems supporting a carbon-based chemistry but no life forms’.^{ix} Thus, since the ‘fine tunings’ are not distinctively anthropic after all, we must beware that the so-called ‘Weak Anthropic Principle’ (WAP) not be allowed to give the misleading impression that the ‘fine tunings’ are *anthropically* unique, qua being necessary for *our* existence. In this sense, the label ‘Anthropic Principle’ is pseudonymous.

5 Critique of Swinburne’s Bayesian Argument for the Existence of God

5.1 The Incoherence of Swinburne’s Apologia

Quinn ([1993], p. 622) has given a concise summary of Swinburne’s Bayesian argument for the existence of God:

He [Swinburne] argues that the hypothesis of theism is more probable given the existence over time of a complex physical universe than it is on tautological evidence alone, and he further contends that this argument is part of a cumulative case for theism whose ultimate conclusion is that ‘on our total evidence theism is more probable than not’ ([1979], p. 291).

But Swinburne hedged his Bayesian plaidoyer, declaring ([1991], chap.13, p. 244): ‘Certainly one would not expect too evident and public a manifestation [of the existence of God], If God’s existence, justice and intentions became items of evident common knowledge, then man’s freedom to choose [belief or disbelief] would in effect be vastly curtailed’. In short, in Swinburne’s view, the requirements of human freedom of choice allegedly require God to play a kind of hide-and-seek game with us.

Richard Gale ([1994], p. 39) clarified this feature of Swinburne’s view as follows: ‘While Swinburne’s overall aim is to establish that the [Bayesian] probability that God exists is greater than one-half, he does not want the probability to be too high, for he fears that this would necessitate belief in God on the part of whoever accepts the argument, thereby negating the acceptor’s freedom to choose not to believe’.

Yet, assuming this clarification of Swinburne’s argument here, the argument is flatly incoherent: He appeals to the need for free choice of belief to justify God’s *not* giving us evidence for a high probability of his existence, on the grounds that a high probability would *cause* us to believe in God willy-nilly! But why, oh why, would a high probability *necessitate* our belief at all, *if* we have free choice to believe or not in the first place when we are confronted with evidence, however strong? In the process of saving our freedom to believe, Swinburne inconsistently assumes the causal determination of our beliefs (*cf.* Grünbaum [1972], sec. II, B and C on the role of causality in belief-formation).

Gale (*op. cit.*, p. 40) cites Swinburne as having asserted that ‘S believes that *p* if and only if he believes that *p* is more probable than any alternative’, where the alternative is usually not-*p*. But Gale rightly disputes that claim: He gives examples from Tertullian to Kierkegaard, and from his own life, to the following effect (*ibid.*): ‘It certainly is possible for someone to believe a

proposition while believing that it is improbable, even highly improbable’.

In sum, Swinburne’s apologia for God’s evidential coyness is deeply incoherent. A cognate appeal to God’s elusiveness has been made by the old apologetic doctrine of *deus absconditus*, such as Martin Buber’s thesis of ‘the eclipse of God’ (Grünbaum [1995], pp. 211-12; cf. also J.L. Schellenberg [1993]). The characterization of God as self-concealing is found repeatedly in the Old Testament, and was also espoused by Martin Luther, for instance.

5.2 Swinburne’s Bayesian Argument for the Existence of God

Swinburne takes it for granted that Bayes’s theorem, which is derived from the formal (Kolmogorovian) probability axioms, is applicable to the probability of *hypotheses*, and can thus serve as a paradigm for probabilifying scientific and theological hypotheses. This kind of use of Bayes’s theorem has been challenged and even rejected, if only because of the well-known problems besetting the determination of *non*-subjective values of the so-called ‘prior probability’ of the hypothesis at issue, as will be clear below. Yet Swinburne ([1990], p. 155) asserts exaggeratedly that ‘Bayes’s Theorem . . . is a crucial principle at work for assessing hypotheses in science, history and all other areas of inquiry’.

But if we do use Bayes’s theorem to probabilify hypotheses, we must be mindful of a crucial distinction made by Hempel, yet unfortunately not heeded by Swinburne. W.C. Salmon ([forthcoming]) has lucidly articulated it as follows:

. . . Bayes’s theorem belongs to the context of confirmation, not to the context of explanation. . . . This is a crucial point. Many years ago, Hempel made a clear distinction between two kinds of why-questions, namely, *explanation-seeking* why questions and *confirmation-seeking* why-questions. Explanations-seeking why-questions solicit answers to questions about why something occurred, or why something is the case. Confirmation-seeking why-questions solicit answers to questions about why *we believe* that something occurred or something is the case. The characterization of nondemonstrative inference as inference to the best explanation serves to muddy the waters—not to clarify them—by fostering confusion between these two types of why-questions. Precisely this confusion is involved in the use of the ‘cosmological anthropic principle’ as an explanatory principle (here Salmon cites his book [1998]).

Swinburne likewise muddies the waters. He tries to use Bayes’s theorem both to probabilify (i.e., to increase the confirmation of) the existence of God, on the one hand, and, on the other, to show that theism offers the best explanation of the known facts, assuming that God exists. And his account of the notation he uses in his statement of the theorem reveals his failure to heed the Hempel-Salmon distinction.

Thus, Swinburne tells us the following ([1991], pp. 64-5, p. 289): *h* represents the hypothesis to be probabilified incrementally; ‘*k* is our general background knowledge of what there is in the world and how it works’ (p. 64); ‘*e* is our *phenomena to be explained* and other relevant observational evidence’ (*ibid.*, italics added); $p(h/e \cdot k)$ is ‘the [posterior] probability of a

hypothesis h on empirical evidence e and background knowledge k ' (p. 281); $p(h/k)$ is the prior probability of h on k ; $p(e/h \cdot k)$ is the 'likelihood' of e on the conjunction of h and k ; and $p(e/k)$ is the 'expectedness' of e on k . But note importantly that Swinburne speaks of e both as the *explanandum* and as the 'relevant observational evidence', thereby rolling them into one, and running afoul of Salmon's *caveat* that 'Bayes's theorem belongs to the context of confirmation, not to the context of explanation'.

In this notation, the short form of Bayes's theorem asserts:

$$p(h/e \cdot k) = \frac{p(h/k) \times p(e/h \cdot k)}{p(e/k)}$$

Here the terminology is as follows:

- $p(h/e \cdot k)$ =Def. The 'posterior' probability of h on $e \cdot k$.
- $p(h/k)$ =Def. The 'prior' probability of h on k .
- $p(e/h \cdot k)$ =Def. The 'likelihood' of e on $h \cdot k$.
- $p(e/k)$ =Def. The 'expectedness' of e on k .

It is vital to distinguish the *absolute* confirmation of h from its *incremental* confirmation (Salmon [1975], p. 6). The former obtains iff the probability of h is fairly close to 1; the latter, also called 'relevant confirmation', is defined by the condition that the posterior probability of h be greater than its prior probability.

Upon dividing both sides of Bayes's theorem by the prior probability $p(h/k)$, it is evident that h is incrementally confirmed by e , iff $p(e/h \cdot k) > p(e/k)$, i.e., iff the likelihood exceeds the expectedness.

It is vital to be clear on what Swinburne takes to be the hypothesis h in his Bayesian plaidoyer for the existence of the God of theism. He tells us explicitly: 'Now let h be our hypothesis—"God exists" ([1991], p. 16). . . . Our concern is with the effect of various pieces of evidence on the proposition in which we are interested—"God exists"' ([1991], p. 18). And then he argued for the following conclusion ([1991], p. 291) : 'On our total evidence theism is more probable than not'. Yet to reach this conclusion, he proceeds as follows: '. . . to start without any factual background knowledge (and to feed all factual knowledge gradually into the evidence of observation), and so to judge the prior probability of theism solely by *a priori* considerations, namely, in effect, simplicity' ([1991], p. 294 , p. 63n). However, in Section 2.1, I have already contended that the conceptual deliverances of *a priori* simplicity, even if they were coherent, cannot be at all mandatory for what is probably actually the case.

Above, I also advanced considerations that undermine Swinburne's theodicy. And I now add that the weakness of such a theodicy is shown further by the content of the Roman Catholic Exorcist Rite. It brings in Satan as a counterweight to God in order to reconcile divine omnibenevolence with such natural evils as death, declaring that Satan 'hast brought death into the world' ('Exorcism', *Encyclopedia Britannica* [1929]). As Salmon ([1978] and *private communication*) interprets Hume's argument in the *Dialogues*, in the face of all the evil in the world, and of the hypothesis of an omnipotent omnibenevolent God, the likelihood of the evidence in the numerator of Bayes's theorem is less than the expectedness in the denominator. It

then follows immediately from the theorem that the ratio of the posterior to the prior is less than one; that is, the total evidence *disconfirms* the existence of God.

Yet, even disregarding this devastating consequence, Swinburne's proposed additive agglomeration of posterior probabilities, starting with tautological evidence k , has a burden of proof that he did not address: The avoidance of some highly counter-intuitive results of Carnap's, which bedevil incremental confirmation. Salmon ([1975], pp. 14-6) has clearly summarized an array of them. One of them threatens Swinburne's assumption of additivity of probabilities: Two separate items of evidence e_1 and e_2 can each provide positive incremental confirmation for a given h , while their conjunction $e_1 \cdot e_2$ incrementally *disconfirms* h ! As Salmon has shown ([1975]), the Carnapian anomalies arise *whenever there is probabilistic dependence* among the various pieces of evidence. Swinburne has the burden of showing that he can choose his successive pieces of evidence so as to avoid such dependence. The depth of that problem becomes clear below.

Again, even leaving both of these great hurdles aside, there is a yet further major difficulty that Swinburne likewise does not address, let alone overcome. And the latter alone would suffice to undermine his agglomeration argument.

5.3 The Problem of 'Old Evidence'

Old evidence is constituted by facts already known. But, if a hypothesis (e.g., Darwinian evolutionary theory) *retrodicts* past events that were not previously known, then evidence of the occurrence of these events does count as new evidence, no less than successfully predicted events. More generally, as Salmon has put it so well (private communication), Bayes's theorem is a device for updating the appraisal of a hypothesis on the basis of new or previously unavailable, or unconsidered evidence.

Now, Swinburne tells us regarding his agglomerative program of adding posterior probabilities that 'any division of evidence between e and k will be a somewhat arbitrary one. Normally, it is convenient to call the latest piece of observational evidence e and the rest k ; but sometimes it is convenient to let e be all observational evidence and let k be mere tautological evidence' ([1991], p. 65). Yet in the case of old evidence as defined, i.e., facts already known, how can Swinburne *avoid* conceding that the expectedness in the denominator is equal to 1, and argue effectively that it is less than 1? The circumvention of an expectedness equal to 1 is crucial, if there is to be incremental confirmation of h : As noted in Section 5.2, the condition for such confirmation is that the likelihood in the numerator exceed the expectedness in the denominator. But since no probability value can exceed the value 1, this condition for incremental confirmation cannot be met if the expectedness equals 1.

What then does Swinburne need to accomplish in order to avoid this untoward result? He absolutely must be able to *split off* a given piece of old evidence e from what remains from the old background knowledge k , such that k does not still entail e .

Deborah Mayo ([1996], p. 334 and fn. 10 there) reports that several authors have insisted that probability assignments should have been relativized to current knowledge *minus* e . Or, as urged by Paul Horwich, that although the expectedness of old evidence is actually 1, a 'Bayesian

should assess how much e would alter our degree of belief assignment to h relative to “our epistemic state prior to the discovery” of e , when its probability was not yet 1' (Mayo [1996], p. 334 and fn. 10 there). If such splitting off could succeed, then the expectedness would no longer be *prima facie* 1. Philip Quinn has emphasized a *caveat* for me (private correspondence): Unless we allow such splitting off of e , Bayes's theorem cannot be useful in the confirmation of a hypothesis by known facts. Hence the question now becomes: Can the required splitting off of e succeed? Let me give my own reasons for a negative answer by means of two concrete illustrations.

As we saw, Swinburne offers the existence of laws of nature as evidence e supporting the existence of God. And he also adduces that hypothesized existence, in turn, as the sole explanation of natural lawfulness, an explanatory claim in which he is joined by Quinn ([1993], pp. 607-08). But, assuming that the laws e have been split off, consider the complement-subset of the already known background knowledge, which supposedly now *excludes* the laws of nature. Surely, that complement-class will still include a vast array of practical knowledge by means of which we are able to control our environment and survive at all. Yet just that practical knowledge *inextricably involves the laws of nature*. Thus, when we go ice-sledding on a (partially) frozen lake, we count on the lawful anomalous expansion of water, as we do when we expect ice-cubes to float upon being dropped into water at room temperature. Other examples in point are legion. For instance, our technological knowledge of the use of color filters depends essentially on our cognizance of the lawful spectral decomposition of white light. It emerges that the attempt to split-off the laws of nature, as required by Swinburne's program fails. Philip Quinn likewise did not spell out how he would achieve the splitting off he advocated.

Marek Druzdzel (private communication) has retorted to these objections that, if they were sound, a jury of Bayesians could never convict a murderer who is caught with a smoking gun on the basis of that old evidence. To this, Salmon (private communication) has offered the cogent rejoinder that, in this juridical context, the jury is duty-bound to start with the presumption of innocence, and that it seems unfeasible to factor this normative legal point into a *de facto* prior probability. Thus, this high-profile crime example does not gainsay my claim that Swinburne's handling of old evidence fails.

Quite generally, in the chapter of Earman's ([1992], chap. 5) entitled ‘The Problem of Old Evidence’, he drew the following conclusion regarding the status of old evidence (p. 135): ‘. . . the Bayesian account of confirmation retains a black eye. . . .’

I conclude that Swinburne and other Bayesians have failed to solve the problem of old evidence. Even more importantly, as we saw, Swinburne's avowed program ([1991], p. 291) to probabilify the existence of God cumulatively as exceeding one-half has likewise been unsuccessful: He has failed to establish that the posterior probability of the existence of God exceeds one-half. *A fortiori* he has failed to show, in turn, that the hypothesis of the existence of God can serve as a warranted premiss to provide explanations.

6 Conclusion

None of the cross-section of diverse theists, past and present, whose arguments I have

considered have presented cogent evidence for the existence of their God.

Acknowledgments

I am greatly indebted for very helpful discussions, over and above my citations of their work, to my colleagues and friends (in alphabetical order) Richard Gale, Allen Janis, John Leslie, Philip Quinn, Wesley Salmon, and Quentin Smith. I likewise benefited from the comments of an anonymous referee. And I owe my colleague and friend Gerald Massey the reference to Schellenberg's book [1993].

Adolf Grünbaum
University of Pittsburgh
2510 Cathedral of Learning
Pittsburgh, PA 15260-6125
E-mail address: grunbaum+@pitt.edu
Office Fax: (412)648-1068
Home Fax: (412)371-6692

References

- Buckley, M. [1990]: 'Religion and Science: Paul Davies and John Paul II', *Theological Studies*, **51**, pp. 310-24.
- Carnap, R. [1931]: 'Überwindung der Metaphysik durch Logische Analyse der Sprache', in H. Schleichert (ed.), 1975, *Logischer Empirismus—der Wiener Kreis. Ausgewählte Texte mit einer Einleitung*, Munich: W. Fink, pp. 149-71.
- 'Conservation of Mass-Energy' [1965]: in J. Newman (ed.), *International Encyclopedia of Science*, vol. 1, Edinburgh: Thomas Nelson, pp. 276-77.
- Craig, W. [1979]: *The Kalam Cosmological Argument*, New York: Harper & Row.
- Craig, W. [1991]: 'Pseudo-Dilemma?' Letter-to-the-Editor, *Nature*, **354** [December 5], p. 347.
- Craig, W. [1992]: 'The Origin and Creation of the Universe: A Reply to Adolf Grünbaum', *The British Journal for the Philosophy of Science*, **43**, pp. 233-40.
- Craig, W. [1993]: 'The Theistic Cosmological Argument', in W. Craig and Q. Smith, *Theism, Atheism, and Big Bang Cosmology*, Oxford: Clarendon Press.
- Craig, W. [1994a]: 'Creation and Big Bang Cosmology', *Philosophia Naturalis*, **31**(2), pp. 217-24.
- Craig, W. [1994b]: 'A Response to Grünbaum on Creation and Big Bang Cosmology', *Philosophia Naturalis*, **31**(2), p. 247.
- Davidson, D. [1982]: 'Paradoxes of Irrationality', in R. Wollheim and J. Hopkins (eds.), *Philosophical Essays on Freud*, New York: Cambridge University Press.
- Davies, P. [1999]: *The Fifth Miracle: The Search for the Origin and Meaning of Life*, New York: Simon and Schuster.
- Earman, J. [1987]: 'The SAP Also Rises: A Critical Examination of the Anthropic Principle', *American Philosophical Quarterly*, **24**(4), pp. 307-17.
- Earman, J. [1992]: 'The Problem of Old Evidence', in *Bayes or Bust?*, Cambridge, MA: MIT Press, chap. 5.
- Earman, J. [1993]: 'The Cosmic Censorship Hypothesis', in J. Earman et al. (eds.), *Philosophical Problems of the Internal and External Worlds: Essays on the Philosophy of Adolf Grünbaum*, Pittsburgh and Konstanz: University of Pittsburgh Press and University of Konstanz Press, chap. 3, pp. 45-82.
- Earman, J. [1995]: *Bangs, Crunches, Whimpers, and Shrieks: Singularities and Acausalities in Relativistic Spacetimes*, New York: Oxford University Press.
- Edwards, P. [1967]: 'Why', in P. Edwards (ed.), *The Encyclopedia of Philosophy*, vol. 8, New York: The Macmillan Company and Free Press, pp. 296-302.
- 'Exorcism' [1929]: in *Encyclopedia Britannica*, vol. 8, 14th ed., pp. 972-73.
- Gale, R. [1991]: *On the Nature and Existence of God*, New York: Cambridge University Press.
- Gale, R. [1994]: 'Swinburne's Argument from Religious Experience', in A. Padgett (ed.), *Reason and the Christian Religion, Essays in Honor of Richard Swinburne*, Oxford: Oxford University Press, chap. 3.

- Gale, R. [1999]: 'Santayana's Bifurcationist Theory of Time', *Bulletin of the Santayana Society*, **16** [Fall].
- Gale, R. [forthcoming]: 'Review of *Providence and the Problem of Evil* by Richard Swinburne', *Religious Studies*.
- Gale, R. and Pruss, A. [in press]: 'A New Cosmological Argument', *Religious Studies*.
- Glymour, C. [1980]: *Theory and Evidence*, Princeton, NJ: Princeton University Press.
- Grünbaum, A. [1954]: 'Science and Ideology', *Scientific Monthly*, **79**(1) [July], pp. 13-9.
- Grünbaum, A. [1972]: 'Free Will and Laws of Human Behavior', in H. Feigl, W. Sellars and K. Lehrer (eds.), *New Readings in Philosophical Analysis*. Appleton-Century-Crofts, pt. VIII, chap. 62, pp. 605-27.
- Grünbaum, A. [1973]: *Philosophical Problems of Space and Time*, Dordrecht, The Netherlands: D. Reidel Publishing Co.
- Grünbaum, A. [1990]: 'The Pseudo-Problem of Creation in Physical Cosmology', in J. Leslie (ed.), *Physical Cosmology and Philosophy*, Philosophical Issues Series, New York: Macmillan Publishing Co., pp. 92-112. This is a reprint of the article in [1989] *Philosophy of Science*, **56**(3), pp. 373-94.
- Grünbaum, A. [1994]: 'Some Comments on William Craig's "Creation and Big Bang Cosmology"', *Philosophia Naturalis*, **31**(2), pp. 225-36.
- Grünbaum, A. [1995]: 'The Poverty of Theistic Morality', in K. Gavroglu, J. Stachel and M.W. Wartofsky (eds.), *Science, Mind and Art: Essays on Science and the Humanistic Understanding in Art, Epistemology, Religion and Ethics, in Honor of Robert S. Cohen*. Boston Studies in the Philosophy of Science, vol. 165, Dordrecht, The Netherlands: Kluwer Academic Publishers, pp. 203-42.
- Grünbaum, A. [1996]: 'Theological Misinterpretations of Current Physical Cosmology', *Foundations of Physics*, **26**(4) [April], pp. 523-43.
- Grünbaum, A. [1998]: 'Theological Misinterpretations of Current Physical Cosmology', *Philo* **1**(1) [Spring/Summer], pp. 15-34. This article is a revision of Grünbaum [1996].
- Grünbaum, A. [forthcoming]: *Philosophy of Science in Action*.
- Heidegger, M. [1953]: *Einführung in die Metaphysik*, Tübingen: Niemeyer.
- Hayek, F. von [1952]: *The Counter-Revolution of Science: Studies on the Abuse of Reason*, Glencoe, IL: Free Press.
- James, W. [1975]: *Pragmatism*, Cambridge, MA: Harvard Press.
- Leibniz, G. W. [1714]: 'The Principles of Nature and of Grace Based on Reason', in P. P. Wiener (ed.), 1951, *Leibniz Selections*, New York: Charles Scribner's Sons.
- Leslie, J. [1978]: 'Efforts to Explain All Existence', *Mind*, **87**(346), pp. 181-94.
- Leslie, J. [1990]: *Universes*, New York: Routledge.
- Leslie, J. [1996]: *The End of the World*, London; New York: Routledge.
- Leslie, J. [1998]: 'Cosmology and Theology', *Stanford Encyclopedia of Philosophy*, <<http://plato.stanford.edu/entries/cosmology-theology/>>.
- Martin, M. [1990]: *Atheism*, Philadelphia: Temple University Press.

- Mayo, D. [1996]: 'The Old Evidence Problem', in *Error and the Growth of Experimental Knowledge*, Chicago: University of Chicago Press, sec. 10.2.
- McMullin, E. [1993]: 'Cosmology & Religion', in N. Hetherington (ed.), *Cosmology*, New York: Garland Publishing, chap. 31.
- Parfit, D. [1998]: 'Why Anything? Why This?' *The London Review of Books*, **20**(2) [January 22], pp. 24-7.
- Parsons, K. M. [1989]: *God and the Burden of Proof*, Buffalo, NY: Prometheus Books.
- Quinn, P. L. [1993]: 'Creation, Conservation, and the Big Bang', in J. Earman et al. (eds.), *Philosophical Problems of the Internal and External Worlds: Essays on the Philosophy of Adolf Grünbaum*, Pittsburgh and Konstanz: University of Pittsburgh Press and Universitätsverlag Konstanz, chap. 23, pp. 589-612.
- Rescher, N. [1984]: *The Riddle of Existence: An Essay in Idealistic Metaphysics*, Lanham, MD: University Press of America.
- Salmon, W. C. [1975]: 'Confirmation and Relevance', in G. Maxwell and R. M. Anderson (eds.), *Induction, Probability, and Confirmation*, Minnesota Studies in the Philosophy of Science, vol. VI, Minneapolis: University of Minnesota Press, pp. 3-36.
- Salmon, W. C. [1978]: 'Religion and Science: A New Look at Hume's DIALOGUES', *Philosophical Studies*, **33**, pp. 143-76.
- Salmon, W. C. [1979]: 'Experimental Atheism', *Philosophical Studies*, **35**, pp. 101-04.
- Salmon, W. C. [1998]: *Causality and Explanation*, New York: Oxford University Press.
- Salmon, W. C. [forthcoming]: 'Inference to the Best Explanation'.
- Schellenberg, J. L. [1993]: *Divine Hiddenness and Human Reason*, Ithaca: Cornell University Press.
- Schick, T., Jr. [1998]: 'The "Big Bang" Argument for the Existence of God', *Philo*, **1**, pp. 95-104.
- Smith, Q. [1991]: 'An Atheological Argument from Evil Natural Laws', *International Journal for the Philosophy of Religion*, **29**, pp. 159-74.
- Smith, Q. [1992]: 'Anthropic Coincidences, Evil and the Disconfirmation of Theism', *Religious Studies*, **28**, pp. 347-50.
- Smith, Q. [1994]: 'Anthropic Explanations in Cosmology', *Australasian Journal of Philosophy*, **72**(3) [September], pp. 371-82.
- Smith, Q. [1995]: 'Internal and External Causal Explanations of the Universe', *Philosophical Studies*, **79**, pp. 283-310.
- Smith, Q. [1997]: *Ethical and Religious Thought in Analytic Philosophy of Language*, New Haven: Yale University Press.
- Smith, Q. [1998]: 'Swinburne's Explanation of the Universe', *Religious Studies*, **34**, pp. 91-102.
- Swinburne, R. [1979]: *The Existence of God*, New York: Oxford University Press.
- Swinburne, R. [1989]: 'Violation of a Law of Nature', in R. Swinburne (ed.), *Miracles*, New York: Macmillan Publishing Co., chap. 8.
- Swinburne, R. [1990]: 'Argument from the Fine Tuning of the Universe', in J. Leslie (ed.),

Physical Cosmology and Philosophy, New York: Macmillan Publishing Co., chap. 12,
pp. 154-73.

Swinburne, R. [1991]: *The Existence of God*, 3d ed., New York: Oxford University Press.

Swinburne, R. [1996]: *Is There a God?* New York: Oxford University Press.

Swinburne, R. [1997]: *Simplicity As Evidence of Truth*, Milwaukee, WI: Marquette University
Press.

Swinburne, R. [1998]: *Providence and the Problem of Evil*, Oxford: Clarendon Press.

Wilson, P. [1993]: ‘The Anthropic Principle’, in N. Hetherington (ed.), *Cosmology*, New York:
Garland Publishing.

Wittgenstein, L.: ‘Lecture on Ethics’, in J. Klagge and A. Nordmann (eds.), 1993, *Philosophical
Occasions 1912-1951*, Cambridge, England: Hackett Publishing Co., pp. 37-44.

Worrall, J. [1997]: ‘Is the Idea of Scientific Explanation Unduly Anthropocentric: The Lessons
of the Anthropic Principle’, in *Discussion Paper Series from the London School of
Economics*, DP25/96.

ⁱ In 1931, Rudolf Carnap (Schleichert [1975]) explained in a major paper that the noun
‘Nothingness’ is a product of logical victimization by the grammar of our language.

ⁱⁱQuoted in Leslie ([1978], p. 181) from Bergson’s *The Two Sources of Morality and Religion*,
pt. 2.

ⁱⁱⁱCited in Quinn ([1993], p. 605) from Leibniz’s *Philosophical Papers and Letters*.

^{iv}Quoted in Parsons ([1989], p. 81).

^vAs I was putting the finishing touches on this paper, Swinburne made me aware of his Aquinas
Lecture *Simplicity As Evidence of Truth* ([1997]). I regret that it was too late to deal with it here.

^{vi}Quinn and Swinburne quantify the ‘amount of matter energy’, which clearly depends, however,
on the choice of units, as well as on the zero of energy in the pertinent physical theory. Does
God’s supposed creative decree contain such mundane specifications?

^{vii}Swinburne ([1991], p. 103) rejects occasionalism as an ‘untenable view’ of the relation
between scientific and theological explanation.

^{viii}For criticisms directed at the particulars of Swinburne’s recourse to religious experience, see
Martin ([1990], chap. 6) and Gale ([1994]).

^{ix}For numerous relevant details, see Leslie ([1990], chap. 1, sec. 1.4).