

THE NEW DESIGN ARGUMENT AND GOD*

I

This paper aims at a critical discussion and evaluation of a new version of the teleological or design argument for the existence of God advanced by Brandon Carter. In this discussion I shall concentrate on his claims and arguments to “Long Number Coincidences and the Anthropic Principle in Cosmology,”¹ limiting myself to what is called the *Strong anthropic principle* and leaving aside the even stronger *Final anthropic principle*. In his paper he makes the following fundamental claims respecting the *Strong anthropic principle*.

In his article entitled “What is the anthropic principle in cosmology?”² David H. Bailey explains (1) the *Strong anthropic principle* thus: “The Universe must have those properties which allow life to develop within it at some stage in its history,”³ and defines (2) the *Final anthropic principle* as “Intelligent information-processing must come into existence in the universe, and, once it comes into existence, it will never die out.”⁴ For instance he writes:

This [the strong anthropic principle] stems from some interpretations of the laws of quantum mechanics, wherein a phenomenon cannot truly

be said to “exist” until it is observed. For example, a light beam passing two slots forms an interference pattern on screen behind the slotted medium. Strangely, this happens even when the beam is reduced to just a discrete sequence of individual photons. Yet as soon as some experimental means is used to identify which slot individual photons pass through, the interference pattern disappears. In other words, one cannot really say that an individual photon exists anywhere in the experimental setup until it is measured and/or observed. In a similar vein, a number of leading physicists suggest that a similar principle applies to the entire universe—it cannot really be said to exist in a scientific sense, unless at some point in its history it spawns conscious observers. Many scientists are very reluctant to accept this assertion, and believe that once we have a clearer understanding of the laws of physics, such extrapolations will prove to be unfounded speculations. But ... [some] eminent scientists disagree.”⁵

* I wish to thank the editor/reader of *Philo* for trenchant observations, criticisms, etc. to an earlier draft of this paper.

¹ *Confrontation of Cosmological Theories with Observation*, M.S. Langair, ed. (Dordrecht: Netherlands, 1974).

² 1 Jan 2015.

³ Ibid. Italics in original.

⁴ Ibid. Italics in original.

⁵ Ibid. My italics. Bailey lists a number of scientists, including Christian de Duve, Freeman Dyson, Stuart Kaufman and Andre Linde. The following passage by Professor Jay Roth encapsulates, in a very general way, the strong anthropic principle (or “fine-tuning”) design argument: “There is so much in the physical nature of the universe we inhabit, the exact balances of everything needed to support life, the piling of coincidences on coincidences, every one of which is vitally necessary for development of a stable star with a planet that can support life. These physical properties of the universe lead me to favor a designer or creator.” (“The Piling of Coincidences on Coincidences,” *Cosmos, Bios, Theos*, Henry Margenau and Roy Abraham Varghese, eds. (La Salle, IL: Open Court, 1993), p. 197.

Bailey comments:

[T]he anthropic principle of cosmology has emerged as the centerpiece of an intense debate among leading physicists, astronomers, cosmologists, and theologians, as to the fundamental meaning and ultimate fate of the universe. While many are eager to see the current debates as a “solution” to the age-old debate between science and religion, clearly considerable caution is in order.⁶ More than once, both theologians and scientists have been captivated by some development, only later to see it succumb to a more prosaic explanation. But it will be interesting to see how all of this plays out.⁷

In “Natural Explanations for the Anthropic Coincidences,”⁸ Physicist Victor J. Stenger states what he thinks many theists understand by the “design argument,” in the following way: “Many [theists] say that they see strong hints of purpose in the way the physical constants of nature seem to be exquisitely fine-tuned for the evolution and maintenance of life.”⁹ And Paul Davies provides what he thinks is a telling example of the “fine-tuning”: “Given a random distribution of (gravitational) matter, it is overwhelmingly more probable that it will form a black hole than a star or a cloud of dispersed gas...”¹⁰ And Roger Penrose writes: “The universe was very special to the Big Bang. It had to be so for there to have been a Second Law of thermodynamics, extending right back to the beginning. All thermalization processes depend upon the Second Law, thus they explain neither why we have a second Law nor why we had a very special universe at

the beginning.”¹¹ In his book Penrose speaks of the “fine-tuning” of the universe as a “puzzle.”¹² Actually, there are (at least) *two sorts of related puzzles* concerning it: (A) the scientific puzzle that challenges physicists/cosmologists to provide a natural explanation for the physical coincidences, particularly as they helped enable human life to evolve in the universe, and (B) philosophical puzzles concerning the design argument for the existence of God, based on the presumed “fine-tuning” of the universe. As a philosopher and not a physicist/ cosmologist, I shall limit myself to finding out *whether, from (A) the strong anthropic principle—preferably as defined by Brandon Carter-- as a logical premise, (B) follows as a valid logical conclusion.*

II

In this section I shall examine the views of a number of physicists/cosmologists respecting the scientific aspects of the design argument [A], taking as my point of departure Stenger’s attempt in the first of his two articles (2000, 2006) to refute the design argument,¹³ where he encapsulates the views in *Has Science found God?, The Failed Hypothesis* and other writings. In Section IV I shall discuss his later article, “A Scenario for a Natural Origin of Our Universe Using a Mathematical Model Based on Established Physics and Cosmology.”¹⁴

⁶ A view shared by the present writer.

⁷ Ibid.

⁸ *Philo*, Volume Three, Number Two, Fall-Winter 2000, p. 53. Hereafter referred to as “Stenger 2000.”

⁹ Stenger, *ibid.*, p. 55.

¹⁰ Paul Davies, *God and the New Physics* (New York: Simon And Schuster, 1983), p. 178.

¹¹ Roger Penrose, *The Road to Reality: A Complete Guide To The Laws Of the Universe* (New York: Alfred A. Knopf, 2005)

¹² Ibid

¹³ Stenger’s second article is: “A Scenario for a Natural Origin of Our Universe Using A Mathematical Model Based on Established Physics and Cosmology,” *Philo*, Volume Nine, Number Two, Fall-Winter 2006, pp. 93-102. Hereafter referred to as “Stenger (2006).”

¹⁴ *Philo*, p. 53.

In his 2000 article, Stenger offers “natural explanations” for the anthropic coincidences in terms of contemporary physics, thus denying the existence of a scientific—hence, any philosophical—puzzles. He interprets the argument based on the strong anthropic principle (or the SAP-argument) as stating that “... There exists one possible Universe [,] ‘designed’ with the goal of generating and sustaining observers,”¹⁵ or “... An ensemble of other, different universes is necessary in any natural explanation of the existence of our universe.”¹⁶ He responds by arguing that the universe might have had different physical laws, though he admits that “we have little idea what those might be.... Still, varying the constants that go into our familiar equations will give us many universes that do not look a bit like ours. They still have atoms and stars, but the dimensions of these objects will appear weird by our standards.”¹⁷ He also argues that coexisting multiple universes are also possible. Thus “no basis exists for assuming that a random [i.e., alternative] universe would not have some kind of life. Calculations of the properties of universes having different constants than ours indicate that long-lived stars are not unusual, and thus most universes should have time for complex systems of some type to evolve. A multiple-universe scenario is not ruled out since no known principle requires that only our universe exists.”¹⁸ Indeed, “if many

¹⁵ Ibid., p.55.

¹⁶ Ibid., p. 57.

¹⁷ Ibid.

¹⁸ Ibid., p. 61. The multiple-universe or multiverse theory, as Stenger conceives of it, is quite different from the conception described by Sean Carroll in his lecture series, “Mysteries of Modern Physics: Time,” Course Guidebook, *The Great Courses*, 2012, Lecture 23. *The Multiverse*, pp. 150-157. He writes “[W]hen we talk about the multiverse, we’re not invoking a new kind of thing. Instead, we’re observing that there is a point in our universe’s past that we cannot

universes beside our own exist, then the anthropic coincidences are a no-brainer.”¹⁹

Alternate Universes

To show that alternative universes than ours are possible, Stenger creates a computer program [*Monkey God*] he believes enables him to generate 100 different universes, using different values of four constants, including the mass of the electron and the mass of the proton. “... Over half the universes have stars that live at least a billion years,” which is at least one requirement for life; since, according to some physicists, carbon is necessary for life, whose synthesis, and so [“any life based on amino acid chemistry and DNA], “would require an old universe, with long-lived stars producing the needed materials.”²⁰ He also thinks that we can imagine life based on “silicon or other elements chemically similar to carbon.”²¹ By examining “possible natural explanations for the anthropic coincidences, he believes he can show that “a wide variation of constants of physics to lead to universes that are long-lived

see. Is there an infinite amount of stuff that works exactly like the stuff we can see? Or is there an infinite amount of stuff and conditions that are very different from place to place? * In some sense, assuming that the entire rest of the Universe is infinitely large and just like the region we see is just as presumptuous as assuming that there’s an infinitely large universe where conditions are very different from place to place.” (Ibid., pp. 156-157). As regards the anthropic principle, he, for example states: “When we consider the multiverse, we necessarily invoke the anthropic principle: If there are many different conditions throughout our universe, intelligent beings like ourselves will find ourselves only in those conditions that are compatible with us existing.” (Ibid., p. 157)

¹⁹ Ibid.

²⁰ Ibid., p. 57.

²¹ Ibid., pp. 54-55.

enough for complex matter to evolve, though human life would certainly not exist in such universes.”²² In addition, he rejects the view that if ours is the *only* possible universe, the design argument would be vindicated. As we shall see, this claim is based on his additional claim that contemporary inflationary theory can provide natural, scientific explanations for the physical constants and other “coincidences” in our universe.

A main problem with Stenger’s (2000) *Monkey-God* computer models is that they are only a set of abstract mathematical models; a far cry from any scientific evidence that such alternative universes are physically possible. Alternative mathematical models are just that—alternative abstract mathematical possibilities. What is needed is appropriate actual scientific observations to test the different models and eliminate as many of them as possible that do not tally with scientific observations: an extremely lengthy, laborious process intended to arrive, if possible (if not *per impossible*) at one or at least a few such possible models that fit the observations; thus enabling scientists to make verifiable/dis-verifiable observational predications from them.

Multiple-Universes and the Design Argument

Stenger states that theists, including Richard Swinburne,²³ generally agree that only the existence of multiple-universes (as conceived by Stenger) that include our universe, would make a naturalistic, “accidental” account of the universe’s fine-tuning possible. The general idea is that if the universe is one of an ensemble of *coexisting universes*, it could have come into existence by chance.

²² Ibid.

²³ Richard Swinburne, “Argument from the Fine-Tuning of the Universe,” *Physical Cosmology and Philosophy*, ed. John Lesie, 154-173. .

In his 2000 article, Stenger argues that “we have no reason to assume that ours is the only possible form of life. Some sort of life *could have happened* in a universe of greatly different form;”²⁴ by which he means “in another universe *co-existing with* our in a multi-universe ensemble.” And, “within the framework of established knowledge of physics and cosmology” of our universe’s being only one of many universes, “in an infinite super universe or ‘multi-verse.’ “Each universe within the multiverse can have a different set of constants and physical laws. Some might have life of a different form than us, others might have no life at all or something even more complex or so different that we cannot even imagine it.”²⁵ Stenger considers three different multiple-universe proposals, noting that “multiple random universes within a larger multiverse are suggested by modern inflationary cosmology”. Referring to Andei Linde’s proposal that a “background spacetime ‘foam’ empty of matter and radiation, will experience local quantum fluctuations in curvature, forming many bubbles of false vacuum that individually inflate into mini-universes with random characteristics. In this view, our universe is one of those expanding bubbles, the product of a single monkey god banging away at the keys of a single word processor.”²⁶ Stenger also approv-

²⁴ Op cit., p. 61.

²⁵ Stenger, Op cit., p.63.

²⁵ Ibid.

²⁶ Ibid. Andrei Linde, “Particle Physics and Inflationary Cosmology,” *Physics Today* 40 (1987), pp. 61-68; “Particle Physics and Inflationary Cosmology (New York: Academic Press, 1990; “The Self-Reproducing Inflationary Universe,” *Scientific American* 271 (November, 1994), pp. 48-55. Linde proposed an improved version of the inflation idea in what he calls the “chaotic inflation scenario,” in 1981, according to which the scalar fields take different values, and in which, therefore, different laws of physics operate.” *The Universe: Inflation Out of Chaos*,” *Modern*

ingly describes Smith and Smolin's independent suggestion of "a mechanism for the evolution of universes by natural selection. They propose a multi-universe scenario in which each universe is the residue of an exploding black hole that was previously formed in another universe."²⁷ In addition, he discusses a multi-verse hypothesis by Max Tegmark, according to which "the ultimate 'ensemble theory' in which all universes that mathematically exist also physically exist."²⁸ He adds that Tegmark "examines the types of universes that would occur for different values of key parameters and concludes, as have others, that many combinations will lead to unlivable universes. However, the region of the parameter space where ordered structures can form is not the infinitesimal point only reachable by a skilled artisan, as asserted by proponents of the designer universe."²⁹

There are, however, serious uncertainties about the preceding multiple-universes hypotheses, as well as about the hypothesis of alternative universes. In both cases physicists/cosmologists do not currently know, and may never know, or be able to know, whether the universe could have been actually different—with different physical laws, cosmic constants, etc.—from those in

Cosmology & Philosophy, John Leslie, ed. (Amherst, NY: Prometheus Books, 1998), p. 252.

²⁷ Stenger, *Ibid.*, p.63. Quentin Smith, "A Natural Explanation of the Existence and Laws of Our Universe," *Australasian Journal of Philosophy*, vol. 68, 1990, pp. 22-43. Lee Smolin, "Did the Universe evolve? *Classical and Quantum Gravity*, vol. 9, 1992, pp. 173-191; *The Life of the Cosmos* (New York: Oxford, 1997). Note the similarity of this scenario with Roger Penrose's "cyclic universes" scenario in *Cycles of Time* (New York: Vintage Books, 2012).

²⁸ Stenger, *loc. cit.*, p. 63. Max Tegmark, "Is 'the theory of everything' merely the ultimate ensemble theory?" *Annals of Physics*, vol. 270, 1998, pp. 1-51.

²⁹ Stenger, *op cit.*, pp. 64-65.

the universe.³⁰ We know that the physical conditions at the Big Bang—the presumed quantum fluctuations, etc.—and the inflationary conditions following the Big Bang causally determined the evolution of the universe as we find it. But we do not know and may never know whether the conditions at the Big Bang could have been in fact different. To this may be objected that if it were determined to have the properties it has, it would be clearly possible to ask whether these properties could have been different.³¹ This is true. (But it leads, *inter alia*, to the question whether the concept of time and so the concept of causality applies to the Big Bang. We shall return to these questions later.)

In "Argument from the Fine-Tuning of the Universe,"³² Richard Swinburne provides a strong argument against "Everett's 'Many Worlds' Interpretation (MW1) of Quantum theory," which Swinburne claims is the only multiple-universes "seriously discussed in the scientific literature."³³ He observes that "as far as our background knowledge is concerned, we have no reason for supposing that there are worlds other than our own with significantly different laws and boundary conditions."³⁴ Thus MWI does not provide evidence that our world "is different from what it would be if there were no such worlds. Only if

³⁰ *Ibid.*

³¹ *Ibid.*, p.64.

³² *Ibid.*, pp. 64-65.

³³ Swinburne, *op cit.*, p. 177. Cf. Paul Davies, who also discusses what he calls "perhaps the most popular version of the many-universes idea... from [Hugh] Everett's interpretation of the quantum theory. In his theory all possible quantum worlds are actually realized, and coexist in parallel with each other. ... Each universe is complete with inhabitants..." The universes are disconnected from one another "in the sense that it is not possible to travel from one to the other." *God And The New Physics*, pp. 172-173.

³⁴ Swinburne, *op cit.*, p. 173.

other universes spatially related to ourselves... seriously interacted with our own” would we have knowledge of them. “Thus there are no good reasons for adopting any form of the ‘many-worlds’ hypothesis, except ones which postulate ‘universes’ belonging to the same spatio-temporal realm as our own, which have the same intelligent-life producing properties.”³⁵

The preceding discussion directly leads to a fundamental question I have not seen addressed by either theists or their critics, namely the *significance*, if any, of the question of the physical possibility of alternative or multiple universes. More specifically, (1) as the critics of the design hypothesis believe the supposed possibility of alternative/ multiple universes would succeed in showing that the universe was *not* (causally) *determined to come in existence*, hence is an accident. My contention is that the answer to (1) is No: the possibility of alternative/multiple universes *alone* does not show that the universe was not casually determined to come into existence hence is an accident. In other words, was not designed. The universe could be an accident only if its existence and so, its properties, were *in fact not* (causally) *determined*, which would mean that another universe, with different properties, *could have* existed in its place. But that is something we do not and perhaps cannot possibly know.

Again, suppose that the universe was the result of a cosmic designer, he/she could have chosen to create it for some special end—say the evolution of sentient life—out of innumerable possible or multiple-worlds. Yet even if the universe was *not* the result of a cosmic design, the Big Bang’s properties could still have been determined by the particular laws of nature that operated at the beginning-- including its fine-tuning for the rise of sentient life—to give rise to the universe we have.

³⁵ Ibid., p. 178.

Further, even if the only possible alternative to our universe would have been a universe full of black holes, without sentient life, it would not probabilistically follow that our universe was *designed*. It could still have come into existence by accident. Or it could have been uncreated. (The latter, as we shall see, is, inter alia, the view of Davies, Hawking’s and Krauss.) Thus the question remains whether the supposition that alternative universes are possible, or that the universe is one of a multiple-universe, put the design argument for design to rest.

Like other theists, Richard Swinburne rejects the claim that the multiple-universes hypothesis provides evidence against design. He claims that the only multiple-universes “seriously discussed in the scientific literature are the many worlds of [Hugh] Everett’s ‘Many Worlds Interpretation (MWI) of Quantum Theory’”³⁶ according to which, as Paul Davies notes in discussing it in “God And The New Physics,” “the universes are disconnected from one another” in the sense that it is not possible to travel from one to the other through ordinary space or time.”³⁷ Thus he maintains that “MWI does not provide evidence that our world “is different from what it would be if there were no such worlds. Only if other universes not spatially related to ourselves... seriously interacted with our own” would we have knowledge of them. His overall conclusion with respect to “any form of the ‘many worlds’ hy-

³⁶ Ibid.

³⁷ Paul Davies, who also discusses what he calls “perhaps the most popular version of the many-universes idea... from [Hugh] Everett’s interpretation of the quantum theory. In this theory all possible quantum worlds are actually realized, and coexist in parallel with each other.... Each universe is complete with inhabitants. ...” The universes are disconnected from one another “in the sense that it is not possible to travel from one to the other.” *God and The New Physics*, pp. 172-173.

pothesis,” is that “there are no good grounds for adopting any form of the ‘many worlds’ hypothesis, *except ones which postulate ‘universes’ belonging to the same spatio-temporal realm as our own, which have the same intelligent-life producing properties.*”³⁸ John Leslie goes beyond Swinburne in seemingly suggesting that the ‘idea of many universes ruled by different basic laws is a wild one.’³⁹ But since we do not and perhaps may never know whether any other universes besides ours exist, Leslie is guilty of going beyond any possible evidence.

Returning to Swinburne, if Swinburne’s preceding argument—leaving the part I italicized, is true, Swinburne *would be correct* in stating that MWI does not provide evidence that our world “is different from what it would be if there were no such worlds. But I said “would be correct,” since that account of MWI is not shared by, e.g., Sean Carroll of the California Institute of Technology.

If the preceding conception of a multiverse is adopted, Swinburne’s objection would fail—except, perhaps, with respect to his claim that if the multiverse view is to be feasible, these universes must have “the same intelligent-producing properties” as our universe: something all but impossible for us to know!⁴⁰

Two important conclusions that I think we can draw from the preceding discussion of the many-worlds idea are the following: (1) that at least given the present state of our scientific knowledge, no multiple-universe hypothesis hitherto formulated can provide any valid grounds

against the design hypothesis, But (2)—and by the same token—that *ignorance* cannot provide any valid grounds *in support* of design, either.

The “Coincidences” and the Laws of Conservation of Energy, etc.

In the section on “Interpreting the Coincidences: They are Natural,” Stenger writes that “Since all scientific explanations until now have been natural, then it would seem that the best bet is a natural explanation for the anthropic hypothesis.” “The most powerful ‘laws of physics,’” “the laws of conservation of energy, momentum, angular momentum, charge, and other quantities that are measured in fundamental interactions”, apply “whenever a system of bodies is sufficiently isolated from its environment.”⁴¹ Emphasizing the idea that the universe is an isolated system of laws, he adds that the universal conservation ‘laws’ are exactly what will occur in an isolated universe with no outside agent acting. They derive from global symmetries, such as space translation and time translation. Only a *violation* of these laws would imply an outside agent. The data so far are consistent with the absence of an agent.”⁴²

To establish his conclusions Stenger appeals to the “standard model of elementary particles and fields.” This model, he writes, “has, perhaps for the first time in scientific history, given us a powerful theory that is consistent with all experiments performed to-date. More than that, in developing the standard model physicists have gained significant new insights into the nature of so-called laws of nature.”⁴³ “The laws of physics are basically descriptions of certain symmetries observed in nature and the way in which these symmetries, in some cases, happen to be bro-

³⁸ Swinburne, op cit., p. 178. My italics.

³⁹ John Leslie, *Universes* (London & New York: Routledge, 1989), p. 64. Leslie fancifully adds: “Unless, that is to say, God could be expected to have reason for producing them: for instance, a liking for Variety.” (Ibid.)

⁴⁰ Stenger, op cit., p. 58.

⁴¹ Ibid., p. 59.

⁴² Ibid. Italics in original.

⁴³ Ibid.,

ken.”⁴⁴ In sum, “The forces of nature have come to be recognized—and described theoretically—as spontaneously broken symmetries.”⁴⁵ Stenger next turns to the model of the “inflationary big bang” “as the standard model of cosmology” respecting the origin of the universe, and claims that it “offers a plausible natural scenario for the uncaused origin and evolution of the universe, including the formation of order and structure, without the violation of any laws of physics.”⁴⁶ “This particular version of a natural scenario for the origin of the universe... is consistent with all current knowledge and cannot be ruled out at this time.” *That fact “demonstrates that no rational basis exists for introducing the added hypothesis of supernatural creation. Such a hypothesis is not required by the data.”*⁴⁷ But Stenger’s conclusion, which I italicized, commits an obvious non sequitur, since the *origin* of the Big Bang is the crucial—indeed, the most crucial—question. For it is at that logical point that the theist would appeal to the idea of an eternal, supernatural being, God as the creator of the Big Bang. Appeal to the Big Bang is not and cannot be the end of the matter. As we shall see later, advocates of the view that the universe came out of nothing, such as Krause and Hawking, advance the idea of A Universe Out of Nothing—the title of Krause’s book—scientifically approach the atheistic conclusion quite differently from Stenger’s.

Further, the basic problem with Stenger’s appeal to inflationary theory, in his earlier paper, is that he does not tell us how inflationary is supposed to explain the physical coincidences, or provide an explanation of a *single* coincidence or

physical constant on the basis of inflationary theory. He just says that it does.

In the section entitled “Successes of Inflation” in “What Caused the Big Bang?”⁴⁸ Paul Davies maintains that inflation provides “an elegant explanation of many of the previously ad hoc features of big bang cosmology,” including fine-tuning paradoxes. One of these “remarkable ‘coincidences’ related to the way in which the strength of the [primeval] explosion was exactly matched by the gravitational power of the cosmos such that the expansion rate today lies very close to the borderline between re-collapse and rapid dispersal. *A crucial test of inflationary scenario is whether it produces a big bang of this precisely matched magnitude.* It turns out that because the nature of exponential expansion—the characteristic feature of the inflationary phase—the explosive power is indeed automatically adjusted to yield exactly the right value corresponding to the universe just escaping its own gravity. *Inflation can give no other explanation rate than the one that is observed.*”⁴⁹ A problem with this explanation is that the universe is now expanding faster, not slower, as Davies supposes: a fact that was not known in 1984, when he wrote the passage I quoted. For since the universe is escaping *faster* “its own gravity,” it follows from what Davies himself claims that the inflationary theory needs some—possibly some serious—revisions in order to square with our present knowledge of the actual rate of the universe’s expansion.

Like Stenger, Davies adds that inflation also explains the puzzle of the “large-scale [but not complete] uniformity of the universe.”⁵⁰ “Inflation occurs while the quantum state of the universe is hanging in the unstable ‘false’ vacuum

⁴⁴ Ibid., p. 60.

⁴⁵ Ibid.

⁴⁶ Ibid..

⁴⁷ Ibid. My italics.

⁴⁸ *Modern Cosmology & Philosophy*, pp. 226-244.

⁴⁹ Ibid, p.238. My italics.

⁵⁰ Ibid.. p.239.

state. Eventually the false vacuum decays, its excess energy going into heat and matter. At this point the cosmic repulsion disappears and inflation ceases. However, the decay of the false vacuum does not occur at exactly the same instant throughout space.... Irregularities will therefore appear in the final state.”⁵¹ However, he significantly adds that “The theorists have been modeling the fluctuation mechanism mathematically, though with mixed success. Generally, the effect is too big, the computed irregularities too pronounced. But the models used are crude, and a more refined approach could prove successful. Although the theory is tentative at this stage, it is at least possible to see the sort of mechanism that could give rise to galaxies without the need for special initial conditions.”⁵²

Davies offers no inflationary explanation of any other “coincidences.” In short, as in Stenger’s case the promise of “natural” explanations of the “coincidences” in terms of inflationary theory remains only a possibility. The same, perhaps, is no different with Andrei Linde’s appeal to inflationary theory in terms of his improved version of the inflation hypothesis, put forward in 1981—the “chaotic inflation” scenario. Linde claims that the “chaotic inflation scenario provides a simple solution to most of the problems with the standard big bang model.” A little earlier he states that “we live in a domain [the universe] in which the interactions just happen to have been broken into the strong and the weak forces and electromagnetism. *This has clearly influenced the development of life, as well as the evolution of the universe as we know it*, and life of our own type may be impossible in other domains with different laws of physics.”⁵³ Although the statement I have

italicized does imply some putative general connection between his improved form of the inflationary theory and the fine-tuning of the universe, he leaves unclear how that theory is supposed to explain any one of the coincidences themselves. Similarly, though he says that “the classic inflation scenario provides a simple solution to most of the problems with the standard big bang model,” leaving aside the singularity problem (whose final solution, he says, “will be possible only after the development of a complete quantum theory of gravity”), he does not tell us, once, again, whether, or how, that scenario is supposed to explain any of the coincidences.

Roger Penrose is highly critical of inflationary cosmology, not least because of its adherents’ claim that it can satisfactorily explain the physical constants and other coincidences. His criticism of the theory in relation to the question of the creation of the universe is symptomatic of his overall criticism. For instance, he states that “because of the Second Law [of thermodynamics], there is an extraordinary degree of precision in the way that the universe started, in the Big Bang, and this presents what is undoubtedly a profound puzzle. We ask: is the solution of this puzzle of the Big Bang’s precision something beyond our present-day scientific understanding? [This is essentially my view.] Or must we resign ourselves to it being some kind of ‘act of God?’ The view of the inflationists... is that the puzzle is essentially ‘solved’ by their theory, and this belief provides a powerful driving force behind the inflationary position. However, I have never seen the profound puzzle raised by the Second Law seriously raised by inflationists.”⁵⁴

In his latest book, *Cycles of Time*,⁵⁵ Penrose writes the following:

⁵¹ Davies, “The Universe: Inflation Out Of Chaos,” *Modern Cosmology & Philosophy*, p. 252. My italics.

⁵² *Ibid.*, p. 238,

⁵³ *Ibid.*, p. 252. My italics.

⁵⁴ Penrose, *op. cit.*, p. 854.

⁵⁵ New York: Vintage Books, 2012.

Sometimes the argument is made (perhaps in conjunction with the above⁵⁶) that the presence of a Second Law is an essential prerequisite for life, so that living beings like ourselves could only exist in a universe (or a universe epoch) in which the Second Law holds true, this law being a necessary ingredient of natural selection, etc. This is an example of 'anthropic reasoning'.... Whatever value this type of argument may have in other contexts, it is next to useless here. Again there is the very dubious aspect of such reasoning that we do not have a great deal more understanding of the physical requirements for life than we do for consciousness.⁵⁷

And:

In 1961, Robert Dickie (with a refined later argument by Brandon Carter⁵⁸) pointed out that according to the accepted theory of stellar evolution, the lifetime of an ordinary 'main-sequence' star is related to the various constants of Nature in such a way *any* creature whose life and evolution depends upon its being around somewhere roughly in the middle of the time-span of such an ordinary star's active existence, would be likely to find a universe whose age, in Planck time units, is indeed around N^3 . So long as the particular N^6 value of A can be theoretically understood, this would also explain the puzzle of the apparent coincidence of a cosmological constant being into play just around now. Yet, these are clearly speculative matters, and

admittedly some better theories will be required to provide understanding of these numbers.⁵⁹

Again:

It has been frequently argued that there are many coincidences in the relations between the constants of Nature upon which life on Earth seems to depend. Some of these might be readily dismissed as being of value only to certain kinds of life we are familiar with.... Others seem to present a more problematic challenge, such as the threat that the whole of chemistry would have been impossible had not the neutron been just marginally more massive than the proton, a fact which leads to a whole variety of different kinds of stable nuclei... that would not otherwise have come about. One of the most striking of such apparent coincidences was revealed by... Fred Hoyle's remarkable prediction of the existence of a particular energy level of carbon which, had it not existed, would have meant that production of heavy elements in stars would not have been able to proceed beyond carbon.⁶⁰

Penrose states the essentials of this principle as follows:

The term 'anthropic principle' was coined by Brandon Carter, who made a serious study of the notion⁶¹ that had the constants been not exactly right in this particular universe, or in this particular place or particular time in this particular universe, then we would have had to have found ourselves in

⁵⁶ Namely the argument that our experience of the passage of time is "dependent upon an increasing entropy as part of what constitutes our conscious feeling of the passage of time..." (Ibid., p. 52)

⁵⁷ Ibid., p. 53. The rest of page 53, and 54 about the Second Law are also important for the above.

⁵⁸ Ibid., p. 264: "Dirac's Cosmology and Mach's principle,' *Nature* 192 440-441. B. Carter (1974), 'Large number coincidences and the anthropic principle in cosmology', in *IAU Symposium 63: Confrontation of Cosmological Theories with observational Data*, Reidel, pp. 291-98."

⁵⁹ Ibid., pp. 163-164. Italics in original.

⁶⁰ Ibid., pp. 170-171.

⁶¹ Brandon Carter, "Large Number Coincidences and the Anthropic Principle in Cosmology," *Confrontation of Cosmological Theories with Observational Data* (Dordrech, Holland: D.Reidel Publishing Company, 1874).

another, where these constants did have suitable values for intelligent life to be possible.⁶²

He adds *inter alia* that “I am not altogether sure what my own position on the matter is, though I do believe that too much reliance is frequently placed on this principle in attempts to give support to what are, to me, implausible-sounding proposed theories.”⁶³ He argues, for instance, that the arguments from the anthropic principle are “fraught with uncertainties, although they are not without genuine significance”, consequently, his own principle is to be “extremely cautious about the use of the anthropic principle, most particularly the strong one.”⁶⁴

Stenger on the Natural Order of the Universe

We now turn to the third major facet of Stenger’s anti-design thesis in his 2000 paper, based on the physical lawfulness of the universe.

As we saw earlier, one of Stenger’s fundamental theoretical claims is that the universe as a whole is an isolated system with respect to the laws of conservation of energy and matter; consequently it requires not outside agency to explain its natural order. In other words, the universe is uncreated. For a consideration of this crucial question I shall turn to several views on the subject: Adolf Grunbaum’s view in “The Pseudo-Problem of Creation in Physical Cosmology,”⁶⁵ and Paul Davies’ views in “What Caused The Big Bang?” and “Our Place in the Universe.”

⁶² Penrose, *op cit.*, p.171.

⁶³ *Ibid.* Penrose lists Lee Smolin’s *The Life of the Cosmos*, Oxford University Press, 1999.

⁶⁴ *Op cit.*, p. 758. And, “My impression is that the strong anthropic principle is often used as a kind of ‘cop-out’, when genuine theoretical considerations have seemed to reach their limit.” (*Ibid.*, p. 759).

⁶⁵ *op. cit.*, p. 113.

⁶⁶I shall also consider Hawking’s and Krauss’s view about the issue.

In his article, Grunbaum dismisses what he calls the “alleged problem of ‘creation’ posed by the pre-quantum version of the big bang theory, as treated by Lovell, Narlikar, and even Bondi.”⁶⁷ He does so, *inter alia*, by examining the models which “at first sight seem to warrant the sort of question asked by Narlikar and Lovell”⁶⁸ prompted by the claim that there was a *bona fide* instant of time [t=0] “at which ‘the primary creation event’ actually occurred (Narlikar, 1977, pp. 236-137).”⁶⁹

To refute the claim, Grunbaum considers two cases: Case (i) and Case (ii) that Narlikar’s and Lovell’s models “have been claimed to allow.”⁷⁰ Case (i) “features a cosmic time interval that is closed at the big bang instance t=0), and... *this instant had no temporal predecessors*. Thus t=0 was a “singular, temporally first event of the physical space-time to which all of the worldliness of the universe converge. This means that there simply did not exist any instants of time before t=0!” Grunbaum adds that it “would be (potentially) misleading to describe this state of affairs by saying that ‘time began’ at t=0”; since in the big bang model under consideration, “there were no such instants [unlike, e.g., the start of a concert] before t=0 and hence no instants when the big bang had not yet occurred.”⁷¹ The questions “what happened *before* t=0? or “what *caused* the big bang to occur at t=0?” are therefore illegitimate, are denied by the “very

⁶⁶ *Ibid.*

⁶⁷ *Ibid.*

⁶⁸ *Ibid.*, p. 113.

⁶⁹ *Ibid.*

⁷⁰ *Ibid.*, p. 114.

⁷¹ *Ibid.*

model to which these questions are being addressed.”⁷²

Grunbaum adds that “the question-begging presupposition of instants before $t=0$ is also made in another form by asking in the context of the pre-quantum models, by asking: “How did the matter existing at $t=0$ come into being?”... To ask how this matter came into existence in the first place is to presuppose not only earlier moments of time, but also the non-existence of any matter at those supposed earlier times.”⁷³

“Case (ii) This subclass of the big bang models differs from those in Case (i) by excluding the mathematical singularity at $t=0$ as not being an actual moment of time. Thus, their cosmic time interval is *open* in the past by lacking the instance $t=0$, although the duration of that past interval in years is finite, say 12 billion years or so.”⁷⁴

Grunbaum concludes that the big bang cosmology does not “validate the traditional cosmological argument for divine creation.”⁷⁵

Grunbaum’s argument would seem to deal a mortal blow to the cosmological argument for God’s existence and for the view that the universe was created. One way (a) in which the theist can get round Grunbaum’s conclusions would be by showing that God caused the universe to

exist, and designed it, “out of time,” “in eternity” – a view maintained by some theists. An alternative way of getting round it is to (b) “to distinguish a ‘metaphysical time’ that is distinct from the physical time created at the big bang.” A view “which seems more promising than timeless creation.”⁷⁶

Like Grunbaum but on quite different, highly speculative theoretical grounds, Davies too maintains that the universe is uncreated. Beginning with the presently-accepted view about the Big Bang in terms of quantum fluctuations in a vacuum, etc., he arrives at the novel conclusion that the universe is “self-creating” by the “spontaneous appearance of matter of out empty space.”⁷⁷ And “...entirely from within its own physical nature, the universe infuses itself with all the energy necessary to create and animate matter, driving its own explosive origin.”⁷⁸ He observes that “The idea of *space* being created might seem exotic, yet in a sense it is happening around us all the time. The expansion of the universe is nothing but a continual swelling of space.”⁷⁹ “Just as the quantum theory applies to the activities of matter, so it applies to space and time...if quantum theory allows particles of matter to pop into

⁷² Ibid., p. 115. Italics in original.

⁷³ Ibid., Earlier Grunbaum argues that the same conclusion can be drawn in relation to the steady-state cosmology. But I have omitted his discussion in my summary. It is worth noting that in his discussion of the possible implications of “radiation from black holes,” Stephen Hawking suggests that “Maybe the quantum principle would mean that one could... avoid the histories [of the particles escaping from black holes] having a beginning in time, a point of creation, at the big bang.” (“Einstein’s Dream,” *Black Holes and Baby Universes and Other Essays* (New York: Bantam Books, 1993), p. 81.

⁷⁴ Grunbaum, op cit., p. 115.

⁷⁵ Ibid., p. 117.

⁷⁶ Ibid., p. 117. An alternative to (a) suggested by the reader of the earlier version of this paper.

I might add that in my *Physical Reflections* (Saarbrücken, Germany: Lambert Academic Publishing, 2012) I rejected the Cosmological Argument on the different ground that the extension of the causal chain in the universe backwards in time [e.g., to a purported time before $t=0$], to an alleged Supernatural First Cause, commits a *category mistake*. Whether this criticism applies to contemporary (re-) formulations of the Cosmological Argument remains to be seen.

⁷⁷ Davies, “What Caused the Big Bang?” *Modern Cosmology & Philosophy*, p. 238.

⁷⁸ Ibid., p. 238.

⁷⁹ Ibid., p. 244. Italics in original.

existence out of nowhere, could it also, when applied to gravity, allow space to come into existence out of nothing?"⁸⁰

Whether or not Davies' preceding speculative claims are borne out, Grunbaum's well-grounded argument would seem to deal a mortal blow to the cosmological argument for God's existence and for the view that the universe was created. Indeed, as far as I can see, the only way for the theist to get round these conclusions would be by showing that God caused the universe to exist, and designed it, "out of time," "in eternity," by means of some kind of non-temporal causation. The idea that God created and designed the universe "out of time," "in eternity," is not unfamiliar in traditional philosophy and theology. The problem, though, is whether something's being caused, of coming to be in the absence of time, "out of time," can be given *any meaning at all, let alone any clear meaning*. Unless the theist is able to do so, Grunbaum's argument against the cosmological argument and the creation of the universe would seem to pose an insuperable problem for him/her.⁸¹

The next question is whether, if the universe is uncreated, any logical room would still be left for the design argument. In "Our Place in the Universe,"⁸² Davies essentially responds to this question. He writes:

Now you may think I have written God out of the picture. Who needs a God when the laws of physics can do such a splendid job? But are we bound to return to that burning question: Where do the laws of physics come from? And

⁸⁰ Ibid., pp. 311-318.

⁸¹ The theist can perhaps appeal to the concept of imaginary time, maintaining that God created the universe in imaginary time. But that would not work against Hawking's proposal in *The Theory of Everything*.

⁸² Davies, op cit., pp. 311-318.

why *those* laws rather than some other set? Most especially Why a set of laws that drives the searing, featureless gases coughed out of the big bang, towards life and consciousness and intelligence and cultural activities such as religion, art, mathematics and science?⁸³

Davies' conclusion leaves out a crucial question. If the universe is "self-creating," what room can logically exist for a putative divine being's designing, or creating, its laws or order? What would the universe's "self-creation" be minus its laws? Some kind of inchoate "stuff"? What? Some law or laws must exist at or following the Big Bang for the universe to evolve. That too follows from the fact that, as Grunbaum argues, the concept of causation is inapplicable to the Big Bang. Note that that conclusion is not affected by the supposition that an omnipotent God can exercise his/her creativity out of (space and) time. However, the concept of "God's omnipotence remains as unclear and problematic as ever. Note for example David Ray Griffin's critical discussion of the concept in *God, Power, and Evil: A Process Theodicy*.⁸⁴ It is also worth noting that the difficulties with the cosmological and design arguments would still leave the ontological argument in Alvin Plantinga's new formulation of it, if Plantinga's concept of God as a "necessary being," a being that exists in all possible worlds, can be made sense of.

It is worth adding that starting from the very same premise, namely that the universe is uncreated, Stenger (2000) and Davies arrive at contradictory, diametrically opposite conclusions about the "naturalness" or "non-naturalness" of the

⁸³ Ibid., p. 314. He goes on to speak of "the true miracle of nature," "found in the ingenious and unswerving lawfulness of the cosmos," (ibid., pp. 315-316.) And so on and so forth.

⁸⁴ Philadelphia: The Westminster Press, 1976, pp. 265 ff.

universe's order. Since the two opposite views cannot both be true, one is led to wonder whether subjective reasons may not be at play in Davies' theistic as well as in Stenger's anti-theistic conclusion. Evidence for the former at least is found in Davies' earlier book, *God and the New Physics*, where Davies states that "[i]t is hard to resist the impression that the present structure of the universe... has been rather carefully thought out." To which he immediately adds: "Such a conclusion can, of course, only be subjective. In the end it boils down to a question of belief. Is it easier to believe in a cosmic designer than the multiplicity of universes necessary for the [*sic.*] weak anthropic principle to work? It is hard to see how either hypothesis could ever be tested in the strict scientific sense.... Perhaps future developments in science will lead to more direct evidence for other universes, but until then, the seemingly miraculous concurrence of numerical values that nature has assigned to her fundamental constants must remain the most compelling evidence for an element of cosmic design."⁸⁵

Given that physicists/cosmologist do not presently know the source or origin of the (energy) of the quantum fluctuations, which according to quantum theory resulted in the explosion called the Big Bang—or in terms of Einstein's general relativity theory, the gravitational energy that, according to Stephen Hawking, gave rise to it—there is, as far as I can see, no *decisive* theoretical or empirical evidence at present for or against the view that the universe *is* an isolated system. Support for the former would be forthcoming if convincing indirect evidence for one or another of the many-worlds hypothesis becomes available at some future date; given that no direct knowledge of whether any other universe does or does not coexist with the universe is pos-

sible. (This, irrespective of whether the Big Bang itself turns out to be a singularity, hence whether at that point the laws of physics we have break down.)

Like Davis and Hawking Lawrence M. Krauss argues in *A Universe From Nothing*⁸⁶ that the universe is uncreated. For instance in Q & A WITH THE AUTHOR, he summarizes his various discussions and claim that the universe came out of nothing:

[T]he remarkable non-miraculous miracle is that combining quantum mechanics with gravity allows stuff to arise from no-stuff. Now, that state of no-stuff may not be "nothing" in a classical sense, but it is a remarkable transformation nevertheless. So, the first form of "nothing" is just empty space. But one is perfectly reasonable in questioning whether this is really "nothing" because space is there, as is time. I then describe how it is possible that space and time themselves could have arisen from no space and time, which is certainly closer to absolute nothing. Needless to say, one can nevertheless question whether that is nothing, because the transition is mediated by some physical laws. *Where did they come from? ... One of the more modern answers is that even the laws themselves may be random, coming into existence along with universes that may arise.* This may still beg the question of what allows any of this to be possible, but at some level it is ... 'turtles all the way down.' There are questions we can address effectively via empirical methods and questions we can ask that don't lead to physical insights and predictions. The trick is to tell the difference between the two.⁸⁷

Concerning the anthropic principle he writes *inter alia*: "The fundamental constants of nature, so long assumed to take on special importance, may just be environmental accidents.... Maybe literally, as well as metaphorically, we are making

⁸⁵ Davies, *Ibid.*, p. 189.

⁸⁶ ATRIA *Paperback* (New York: Simon and Schuster, Inc., 2013).

⁸⁷ *Ibid.* [pp.]

ado about nothing. At least we may be making too much of the nothing that dominates our universe....Maybe we will never find a theory that describes why the universe has to be the way it is.

Or maybe we will.”⁸⁸

There are a number of fundamental claims in Krauss’ theory of a universe from nothing, summarized in the preceding passages. Among them are the following: (1) And perhaps what is most troublesome about his theory is (2) his continual misconception of the nature of the laws of nature in his book: the constant *reification* of the physical laws of nature; his constant assumption they exist, or could exist, *apart from and so before the putative coming into existence of energy and matter (or energy and/or matter) in the universe* (and before the Big Bang?). Further, (3) the putative empty space Krauss envisions must have predated the quantum fluctuations believed to have caused the Big Bang. Hence it presupposes the existence of *actual time before the fluctuations themselves*. But what scientific evidence exists for that supposition? Or—even-- that it is physically meaningful to suppose that temporal duration existed *before* these fluctuations? That especially since it is supposed that before the fluctuations there was only empty space, according to both Krauss and Hawking. In other words, no energy or matter at all, hence that nothing was happening. The supposition therefore is that despite that, time simply elapsed. Once again, what evidence exists—or even, can exist—for this supposition?

(4) A further problem with Krauss’s theory about the universe from nothing, is his erroneous view that space is expanding because (or with) the (increasing) movement of the galaxies away from one another. For that does not imply or entail that space itself is expanding but that more

and more empty space is being occupied by galaxies as they move further and further apart.

(5) A further problem with his theory is his clear reification of the laws of physics, his conception of the laws of nature as existing independently of, hence apart from and temporarily prior to the Big Bang and the evolution of the universe.

In the Fifth Lecture of *The Theory of Everything, The Origin And Fate Of The Universe*,⁸⁹ Stephen Hawking responds, inter alia, to what he refers to as the “anthropic principle”⁹⁰ by detailing a “proposal” according to which too the universe is uncreated, but on different grounds than Krauss. There, he appeals to the quantum theory of gravity, in which “there would be no boundary to space-time. He writes:

If Euclidean space-times direct back to infinite imaginary time or else started at a singularity, we would have the same

⁸⁹(Fort, Mumbai- 400 001: JAICO Publishing House, Tenth JAICO Impression, 2009), pp. 71-93.

⁹⁰Neither in that Lecture nor in his earlier book, *Black Holes and Baby Universes and Other Essays* does Hawking distinguish the weak and the strong anthropic principles. But in both works he clearly has in mind the latter principle. In the latter book he writes that the anthropic principle “can be paraphrased as, Things are as they are because we are.” (Ibid., p. 52) He adds: “According to one version of the principle, there is a very large number of different, separate universes with different values of the physical parameters and different initial conditions. Most of these universes will not provide the right conditions for the development of the complicated structures need for intelligent life. Only in a small number, with conditions and parameters like our own universe, will it be possible for intelligent life to develop and to ask the question. “Why is the universe as we observe it?” The answer, if course, is that if it were otherwise, there would not be anyone to ask the question.” (Ibid., p.52)

⁸⁸ Ibid. [pp.]

problem as in the classical theory of specifying the initial state of the universe. ... On the other hand, the quantum theory of gravity has opened up a new possibility. In this, there would be no boundary to space-time. Thus, there would be no need to specify the behavior at the boundary. There would be no singularities at which the laws of science broke down and no edge of space-time at which one would have to appeal to God or some new law to set the boundary conditions for space-time. One could say: "The boundary condition of the universe is that it has no boundary." The universe would be completely self-contained and not affected by anything outside itself. It would be neither created nor destroyed. It would just be.⁹¹

He adds on the same page: "I should emphasize that this idea that time and space should be finite without boundary is just a proposal. It cannot be deduced from some other principle. ...the real test is whether it makes predictions that agree with observation. This, however, is difficult to determine in the case of quantum gravity, for two reasons. First, we are not yet sure exactly which theory successfully combines general relativity and quantum mechanics, ... Second, any model that described the whole universe in detail would be too complicated mathematically for us to be able to calculate exact predictions. One therefore has to make approximations—and even then, the problem of extracting predictions remains a difficult one."⁹²

A little later he suggests that "imaginary time is really the fundamental time.... In real time, the universe has a beginning and an end at singularities that form a boundary to space-time and at which the laws of science break down. But in imaginary time there are no singularities or boundaries. So maybe what we call imaginary time is really more basic, and what we call real

time is just an idea that we invent to help us describe what we think the universe is like."⁹³

He concludes: "So long as the universe had a beginning that was a singularity, one could suppose that it was created by an outside agency. But if the universe is really completely self-contained, having no boundary or edge, it would be neither created nor destroyed. It would simply be. What place, then, for a creator?"⁹⁴

It is clear, I think, that his proposal has important theoretical advantages over Krauss's theory: (1) that on the former theory, the quantum fluctuations that are presently believed to cause the Big Bang and the Big Bang, would be, in real time, *within* the universe, part of the universe; while Krauss' theory does not explain how these fluctuations and the Big Bang arise from presumed primordial empty space; and (2) how the universe consists originally in nothing but empty space. Indeed, (3) it theoretically leaves open the question whether Krauss has, or can have, any theoretical—let alone observational—grounds for supposing that these fluctuations and the Big Bang did not exist—or came into existence—*before the putative empty space*: which would precisely leave open, for the theist, the argument that these events were caused by agency (God) *outside* the universe: in terms of Krauss' theory, outside the presumed empty space.

(4) A further fundamental question regarding the theory is evidence that the universe originally consisted in empty space; i.e., how it came about, how it arose in the first place. For even empty space needs some causal explanation. Finally, (5) empty space is not nothing; hence it is incorrect for Krauss to state that the universe came from nothing.

⁹¹ Op cit. pp. 88-89.

⁹² Ibid., p. 89-90.

⁹³ Ibid., p. 91.

⁹⁴ Ibid., pp. 92-93.

III

I turn to Victor J. Stenger's fundamental claims in his 2006 article, "A Scenario for a Natural Origin of Our Universe Using a Mathematical Model Based on Established Physics and Cosmology"⁹⁵ (hereafter referred to as Stenger 2006), to find out if it provides "the resources for a response to any of the objections to Stenger's 2000 article I have earlier made."⁹⁶

In the *Abstract* to the paper Stenger writes:

A mathematical model of the natural origin of the universe is presented. The model is based only on well-established physics. No claim is made that this model uniquely represents exactly how the universe came about. But the viability of a single model serves to refute any assertions that the universe cannot have come about by natural means.⁹⁷

I shall leave the mathematical model, pp. 93-100 to the mathematically savvy, limiting myself to the *Interpretation*, where he says that the Hartle-Hawking model (considered earlier) "gives one possible scenario for the universe to come about naturally."⁹⁸ But Stenger adds: "In this picture, another universe existed prior to ours that tunneled through the unphysical region around

$t=0$ to become our universe."⁹⁹ He responds to critics who will argue that "we have no way of observing such an earlier universe.... Nothing in our knowledge of physics and cosmology requires the nonexistence of that prior universe...."¹⁰⁰

An alternative view to the prior universe is that "the universe simply starts at $t=0$. [Where in Hawking's view, the universe begins with 0 in *real time*]. It is just a matter of setting a boundary condition."¹⁰¹ "Vilenkin interprets his solutions as tunneling from 'nothing,'..."¹⁰²

He sums up that view thus: "Two universes 'begin' in the unphysical region around $t=0$ that Vilenkin calls 'nothing.' These universes then evolve along the opposite directions of the time axis."¹⁰³

Given the plausibility of Hawking's own proposal, Occam's razor would in fact eliminate the putative "prior universe," contrary to Stenger's *misinterpretation* of that principle in stating that "it would violate that principle to exclude it [the "prior universe]."¹⁰⁴

How Can Something Come From Nothing?

Even supposing that it is possible for us to conceive of absolute nothingness, Stenger's attempt to explain how the universe could have come from absolutely nothing is utterly confused, obscure, replete with non sequiturs, and utterly

⁹⁵ In an article on the internet entitled "The Beginning of Time," Hawking states that time began at the Big Bang. Quantum theory introduces the idea of imaginary time, which is as real as real time. Euclidean space-time consists of the "three directions in space" together with imaginary time, result in Euclidean space-time. Together with Hartley, he proposed that space and imaginary time are together "finite in extent, but without boundary." In this article he is more confident about the proposal, believing that its predictions "seem to agree with observation." www.hawking.org.uk/the_beginning-of-time.html.

⁹⁶ Philo Editor/Reader's comment.

⁹⁷ Op cit., p. 93.

⁹⁸ Ibid., p. 100.

⁹⁹ Ibid. This additional scenario must represent Vilenkin-Stenger's addition to the Hartle-Hawking model, which, in neither Hawking's *The Theory of Everything* or in the (presumably recent) article, mentions such a scenario.

¹⁰⁰ Ibid., pp. 100-101.

¹⁰¹ Alexander Vilenkin, "Boundary conditions in quantum cosmology," *Physical Review* vol. D33 (1986) 3560-3569, Stenger adds: "The Vilenkin wave function is given in *The Comprehensive Cosmos*." (Ibid., p. 101)

¹⁰² Ibid., p. 101.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

unconvincing. The fact that Nature is capable of “building complex structures by processes of self-organization; simplicity begets complexity”¹⁰⁵, and that “many simple systems of particles are unstable... have limited lifetimes as they undergo spontaneous phase transitions to more complex structures of lower energy”,¹⁰⁶ are a very far cry from the universe coming out of nothing! The following passage is a good illustration of the foregoing:

Since “nothing” [note the quotation marks] is as simple as it gets, we would not expect it to be very stable. This consistent with the estimate given above that the universe twice as likely to be found in the physical state than the unphysical state [?] we are identifying with nothing.[?] The unphysical state undergoes a spontaneous phase transition to something more complicated, like a universe containing matter.¹⁰⁷

Stenger’s unsuccessful struggles to provide a meaningful concept of absolute nothingness, then to successfully explain how something--the universe--can come out of nothing, is a more general question faced by any cosmological theory that maintains that the universe came out of nothing, such as Davies’ and Krauss’s, which we considered earlier. In Davies’ case the special problem is how to account for the primordial existence of empty space—which, by the way, is not absolutely nothing. In Stenger’s case it clearly arises in relation to Vilenkin’s alternative view “in which the universe simply starts [as in Hawking’s

proposal] with at $t=0$Vilenkin interprets his solutions as tunneling from “nothing...”¹⁰⁸

Significantly, the Hawking-Hartle proposal “no-boundary” model seems *at first sight*, to escapes the problem of the cause or origin of the universe—which means responding to the *cosmological argument* for God’s existence as the presumed creator of the universe—a question that would require a separate treatment, since in this paper our concern is with the question of the soundness or unsoundness of the new teleological argument. But as Stenger notes, that proposal includes the view that universe will eventually collapse in a “big crunch.”¹⁰⁹ Despite Stenger’s assertion to the contrary, Hawking’s view that the universe will ultimately collapse would face the question of origin if “our” universe is *not the very first universe* to exist but came about after one of more earlier “big crunch” collapses—even supposing that the very first universe was a “no boundary” universe. The question would be whether the “original” universe was “eternal” or had some kind of origin.

Although we have briefly raised the question of the origin or causation in relation to the universe in relation to Davies, Krauss, and now Stenger and Hawking, that question takes us outside the central topic of this paper to the pros and cons of *cosmological argument* for God’s existence.¹¹⁰

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ Note, for example, the tremendous logical leap from “nothing,” i.e., “the unphysical state”—whatever it is supposed to be—to the universe! And how is the ‘unphysical state,’ whatever that means, “undergo a spontaneous phase transition to something” like “a universe containing matter”?

¹⁰⁸ Ibid., p. 101. Note that Hawking’s cosmology does not, like Stenger, include (in Stenger’s phrase) a “sister universe.” (Ibid.)

¹⁰⁹ Ibid., p. 96; Hawking, *The Theory of Everything*, 106,

¹¹⁰ In relation to that argument the interested reader is referred to e.g., Graham Oppy “Professor William Craig’s Criticisms of Critiques of Kalam Cosmological Arguments by Paul Davies, Stephen Hawking, And Adolf Grunbaum (1995),” (Internal Infidels... <http://www.Infidels.org/> pp. 1-14.

IV

General Assessment of the Scientific Component of the New Design Argument

What, after the rather lengthy discussion can we validly conclude about the scientific component of the new design argument? Given the fundamental uncertainties, doubts, questions and problems we encountered, which included, among others, (1) nagging questions about hitherto-unverified hypotheses about alternative and multiple universes and other physical/cosmological questions and problems, as well as their significance or lack of significance for the design argument, and (2) the inflationists' failure to date to explain any of the cosmic coincidences (as Penrose stresses), the only tenable position, in my view, is to reserve judgment.

One problem with the fine-tuning argument is its anthropocentric character is clearly seen in Davies and Swinburne. The anthropic component of the new design argument attaches too much importance to human existence. And as Hawking writes, "Many people [and that includes the present writer] do not like the [strong] anthropic principle, because it seems to attach too much importance to our own existence."¹¹¹ For instance, the human value extolled by Davies, as well as those human qualities that are explicitly or implicitly extolled by Swinburne, have always been the creation of a relatively small number of creative individuals in the arts, science, philosophy, mathematics, religion, etc., not of humanity in general. It would therefore be more fitting—if we wished to give these individuals extraordinary credit for God's putative creation of the universe—appropriating would be more apt, as far as the actual values "created by man" so far are concerned, to adopt George Santayana's wonderful hyperbole that God created the universe so

that Beethoven may write his Ninth Symphony! (Or, to vary the hyperbole, one could speak in the same breath about the great Greek Tragedies, Dante's *Divine Comedy*, Shakespeare's *Hamlet* and *King Lear*, Michelangelo's Sistine Chapel, etc.) That would make more sense than extolling of Homo sapiens in general as the creator of the aforementioned values, hence "*The be and end*" of the universe's putative supernatural design.

In Davies' extolling art, science, mathematics and religion and in Swinburne's extolling of knowledge, both ignore the opposite picture of the frequent misuse and exploitation of art, science, philosophy for the evil ends of some individuals and groups. What both writers also seem to forget are the powerful malignant, destructive forces in human nature, which have, throughout human history, resulted in demonic evils. If God does (or did) exist, the whole responsibility not only for all the good but also for all the evil we squarely carry on our shoulders would be laid on His shoulders.

It should be emphasized that the first-order and second-order good that concerned individuals and groups do, e.g., in caring and loving relationships to others, even in saintly ministrations to the victims of these "holocausts" and other evils in the world, however great and laudable, does not diminish the quality and magnitude of the evils themselves. Indeed, in a better world than ours supporting a morally superior sentient species than ours, the very need for the compassion and caring that our world sorely needs and sparingly receives would greatly diminish. We do not have to show—what is practically impossible—that human evil exceed, or during the coming five or six billion years of the earth's existence may exceed, the good we may have produced or may produce, to raise serious doubts about the claim that the universe was designed for us. The

¹¹³ *Black Holes and Baby Universes and Other Essays* (New York: Bantam Books, 1994), p. 157.

indubitable fact of human evil is sufficient to raise serious doubts about that hypothesis.

We do not have to show—what is practically impossible—that the evil humans have perpetrated throughout history on their own species, on other species and the environment, exceeds, or during the coming five and or six billion years of the earth’s continued existence, may exceed, the good they have produced or may produce, to raise serious doubts about the claim that the universe was designed for us. The indubitable fact of human evil is sufficient to raise serious doubts about that hypothesis.

The possibility of other forms of sentient, conscious life than ours in certain other regions of space, ignored by Davies and only parenthetically mentioned by Swinburne, further weakens the anthropic claims of the new design argument. Indeed, our ignorance of the conditions for possible sentient life in these regions is other regions of space, is another argument against the strong anthropic principle, weakening both components of the design argument. As far as the anthropic component is concerned, it opens the possibility that other forms of sentient life morally and in other ways superior to us—e.g., with respect to the qualities Davies and Swinburne extol. For in that case these forms of life, not we, would be the divine creation’s putative purpose. For in that case these forms of life, not we, would be the divine creation’s putative purpose. (Compare this to Swinburne’s exclusion of the other higher animals in defending the anthropic component of the design argument, by stressing our putative superiority to them.)¹¹²

¹¹² The *Philo* editor/reader retorted that “The possibility of *superior beings* also existing in addition to humans might actually help (at least a little) with the objection raised in the previous paragraph. Question: Why didn’t God make superior beings? Answer: He did.” (My italics.)

The weakness of the present component of the design argument can be further seen by comparing the new design argument with as a whole to Thomas Aquinas’ fifth, teleological argument for God’s existence “from the governance of the world,” which does not limit the putative purpose to human life but leaves open the question of the creation’s purpose. For it broadly argues from the putative action of “things which lack knowledge, such as natural goodness” “always, or nearly always, in the same way, so as to obtain the best result.” “Hence, [he adds] it is plain that they achieve their end, not fortuitously, but designedly. Now whatever lacks knowledge cannot move towards an end, unless it be directed by some being endowed with knowledge and intelligence, as the arrow is directed by the archer. Therefore some intelligent being exists by whom all natural things are directed to their end; and this being we call God.”¹¹³ Whether or not Aquinas’ argument itself is sound—which does not concern us here—it is superior to the new design argument in leaving open God’s putative purpose in creating the universe.

V

Some Final Conclusions

After the long preceding discussion of the pros and cons of the new design argument, the following conclusions can I believe be drawn:

- (1) On the one hand, if the Hartle-Hawking proposal finds the necessary theoretical and observational support, it would show, as Hawking claims, that the universe was uncreated, dealing the new design argument a coup de grace. But as we know, that theory is only a proposal, as Hawking himself states, thus—

¹¹³ Five Ways to Prove the Existence of God,” *Classical And Contemporary Readings in the Philosophy of Religion*, Second Edition, John Hick, ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1964, p. 43.

as far as it goes-- leaving open, *as far as it goes*, the validity of the design argument.

- (2) On the other hand, the new design argument has problems of its own, a number of which were pointed out earlier in this paper. For one thing, if an omnipotent and omniscient being wanted to create universe hospitable to sentient beings. Why is it that only certain regions of space are or can be habitable to some form or other of sentient life? For it seems theoretically possible for God to

have created a more hospitable world than our own. For instance, Stenger's 100 computer generated universes can surely include some with better conditions than our own. Indeed, going further, we can inquire why a presumed omnipotent, omniscient and perfectly benevolent God—assuming He exists—did not create, in place of our universe, the Best of all Possible Worlds, immeasurably more habitable to advanced sentient beings.