4. Is the History of Science Evidence for Naturalism? A Reply to Jeffery Jay Lowder

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ABSTRACT: As formulated by atheist Jeffery Jay Lowder, the Evidential Argument from the History of Science, or AHS, is premised on the observation that over the course of modern history, naturalistic explanations have progressively overtaken supernaturalistic explanations. That history, says Lowder, constitutes evidence that metaphysical naturalism is true (hence that theism is false). But it's possible that the historical pattern as described is not actually the result of any genuine explanatory virtues of naturalistic over supernaturalistic explanations. If there are good reasons to suspect that naturalistic explanations fail to accurately or adequately explain the world around us, then we would not have sufficient grounds to follow Lowder's argument to its conclusion. Here I will present three reasons to suspect that naturalistic explanations fail to accurately or adequately explain the world around us: (1) an alternative reading of the history of science according to pessimistic induction; (2) the arbitrary epistemic requirements of methodological naturalism; and (3) the ongoing resistance of certain phenomena (the origins of the universe and of life on earth) to any naturalistic explanations that are coherent and relatively simple.

IN RECENT YEARS, the atheist philosopher and founder of the *Internet Infidels*, Jeffery Jay Lowder, has presented an argument for metaphysical naturalism based on a simple and pragmatic appeal to the history of science. This argument, which he calls the Evidential Argument from the History of

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Science, or AHS, is premised on the observation that over the course of modern history, naturalistic explanations have progressively overtaken supernaturalistic explanations.[2] As Lowder states it, "If there is a single theme unifying the history of science, it is that naturalistic explanations work. The history of science contains numerous examples of naturalistic explanations replacing supernatural ones and no examples of supernatural explanations replacing naturalistic ones."[3] This accumulative success of naturalistic over supernatural explanations is, he says, "antecedently more likely on naturalism – which entails that all supernaturalistic explanations are false – than it is on theism," and therefore constitutes evidence that theism is probably false.

The same basic line of reasoning has circulated in various forms pretty much since the Enlightenment. "In the centuries following the Scientific Revolution," according to the humanist science popularizer Michael Shermer, "the gradual but systematic displacement of religious dogmatism, authority and supernaturalism by scientific naturalism… led to the widespread adoption of *Enlightenment humanism*…"[4] The

[2] Though the AHS is now over ten years old, I had not heard of it until I signed up for a brief foray into the world of Twitter sometime in December of last year (2022), when I noticed a tweet by Lowder asking, "Does the true explanation of the origin of life…require a supernatural designer or not? Why or why not?" I answered in the affirmative, arguing (from what I recall, my tweets are gone now) that "everything we know" about the world around us suggests that abiogenesis is false, i.e., that life has never arisen by natural processes. Lowder disagreed and provided a link to his AHS argument. I then answered that his argument frankly deserved a more comprehensive reply than Twitter could reasonably accommodate. The present article, so many months later, is my more comprehensive reply.

[3] Jeffery Jay Lowder, "The Evidential Argument from the History of Science (AHS)," *Secular Frontier*, 2012. https://secularfrontier.infidels**.** org /2012/06/the-evidential-argument-from-the-history-of-science-ahs/. All further quotations by Lowder are from this same article.

[4] Michael Shermer, "Scientific Naturalism: A Manifesto for Enlightenment Humanism," *Theology and Science*, June 2017, p.222.

religion-displacing worldview Shermer describes has permeated our culture, or at least our conversations about God. Whenever we hear the phrase "God of the gaps," for example, it's usually in the context of something like Lowder's AHS argument. Formally, the AHS runs as follows:

(1) E is known to be true.
(2) Pr(E|B & N) >! Pr(E|B & T).
(3) T is not much more probable intrinsically than N.

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(4) Therefore, other evidence held equal, T is probably false.

where E is evidence in the way of numerous examples of naturalistic explanations replacing supernatural explanations in the history of science, with no examples of the reverse; B is background information, specifically the presumed intelligibility of the universe; T is theism; and N is (metaphysical) naturalism. (Pr stands for probability.)

The argument does appear valid, in that if the premises are true the conclusion seems to follow. If indeed, that is, the history of science has naturalistic explanations repeatedly "winning" over supernaturalistic ones (while never losing); and if that situation is much more probable given the truth of naturalism rather than of theism; and if theism is not much more probable than naturalism in the first place; then yes, it does seem that – all other things being equal – theism would be unlikely (if not "probably false").[5]

In that case there must be something wrong with at least one of the premises – otherwise theism would appear to be in a bit of trouble. As a Christian theist myself, I have no objection to premise (1) as a matter of historical record. And while

[5] As a technical matter, there are significant distinctions between likelihood and probability when it comes to assessing the relative strengths of broad-based theories and inferences. See for example A. W. F. Edwards, *Likelihood*, New York: Cambridge, 1984.

the prior probability of a metaphysical belief system being true has to be somewhat subjective, and while I personally believe the truth of theism to be much more intrinsically probable than naturalism, I am (with Lowder) willing to grant premise (3) as a philosophically neutral state of affairs for the sake of argument. Premise (2), however, is not as evident as (1), and at the same time makes a stronger and more controversial claim than (3). So the second premise, $Pr(E \mid B \,\&\, N) >! Pr(E \mid B \,\&\, T)$, is where I will focus my attention.

Now it must be admitted that the history of science really has proceeded much like Lowder, Shermer and others have described, in that naturalistic explanations really have systematically displaced supernatural explanations. In other words, yes, (E) is true. But it's possible that (E) is not actually the result of the genuine explanatory virtues of naturalistic over supernaturalistic explanations. If there is good reason to suspect that naturalistic explanations often (or even more often than not) fail to accurately or adequately explain the world around us, for example, then $Pr(E \mid B \,\&\, N)$ would not be especially high – and thus would not give us sufficient grounds to affirm the second premise of Lowder's argument. Here, then, I will present three reasons to suspect that naturalistic explanations often fail to accurately or adequately explain the world around us: (1) an alternative reading of the history of science according to pessimistic induction; (2) the arbitrary epistemic requirements of methodological naturalism; and (3) the ongoing resistance of certain phenomena (the origins of the universe and of life on earth) to any naturalistic explanations that are coherent and relatively simple. I will briefly address these reasons in order.

The history of science in light of pessimistic induction

Lowder arrives at the conclusion that "natural explanations work" from what is known as the *realist* interpretation of history, one in which science continually progresses with the

accumulation of data and the refinement of theories. Realists appeal to this record of empirical success in making what's been called the "no miracles" argument. "According to this argument," says Okasha, "it would be an extraordinary coincidence if a theory that talks about electrons and atoms made accurate predictions about the world – unless electrons and atoms actually exist….On this view, being an anti-realist is akin to believing in miracles."[6] Theists of course have no problem believing in miracles, but the point remains that even for a theist a non-miraculous explanation is generally preferable to a miraculous one in terms of simplicity, all things considered.

Yet many observers have pointed out that the realist interpretation of history is not all that…*realistic*. The actual history of science, they say, is a rather systematic record of theories, mostly naturalistic, that have been falsified outright and replaced (or in some cases modified with so many *ad hoc* additions and conditions that they become indistinguishable from rank pseudoscience). The fact that naturalistic explanations at large have been continually replaced with simply more naturalistic explanations, appears just as plainly evident as Lowder's observation that supernaturalistic explanations have been replaced with naturalistic explanations. Philosophers of science have called this alternative reading of the history in terms of successive failures *pessimistic induction* (or *meta*-induction).

At the same time, many observers have noted that the logic of scientific confirmation appears faulty on its face because it runs afoul of the fallacy of *affirming the consequent*[7]:

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[6] Samir Okasha, *Philosophy of Science: A Very Short Introduction*, New York: Oxford, 2002, p.63.

[7] Affirming the consequent takes the form: If *p*, then *q; q; p*. For example: "If JFK was stabbed to death by a gang of senators, he was assassinated; JFK was assassinated; therefore JFK was stabbed to death by a gang of senators." Scientific confirmation works much the same way, where a theory entails a prediction, the prediction is found to be true, and the theory is then said to be confirmed or even "proven."

"Despite being the most blatant of fallacies," says Kevin Korb, "and disparaged in popular texts on logic, this form of argument is *pervasive* in the sciences."[8] The resulting problem confronting realists is that there is no objective rational grounds for believing, as Larry Laudan has it, "that we can reasonably presume of any scientific theory that it is true."[9] On the other hand there are a *great number* of reasons to think that most scientific theories are false, namely the great number of scientific theories – even "empirically successful" theories – that have been falsified and replaced (by a presumably better theory). Laudan mentions a few such theories – the humoral theory of medicine, the effluvial theory of static electricity, the phlogiston theory of chemistry, the caloric theory of heat, and theories of spontaneous generation – from a list "which could be extended *ad nauseum*."[10] (Evolution seems to be a special case. An argument could be made that in recent years the textbook theory of evolution by natural selection was in danger of replacement; but since the leading alternative theory, intelligent design, was deemed religiously motivated, the courts stepped in to defend evolution on legal rather than scientific or evidentiary grounds.[11])

Now it might seem reasonable to simply assume that previous generations of scientists had it wrong, and present-day scientists, being much more enlightened, have it right. The problem with such an assumption is that *every* generation has believed itself more enlightened than previous generations –

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[8] Kevin Korb, "Bayesian Informal Logic and Fallacy," *Informal Logic*, Vol. 23, No. 2, 2003, p. 51.

[9] Larry Laudan, "A Confutation of Convergent Realism," p. 30.

[10] Laudan, p. 33.

[11] Clearly the courts and the justices presiding over them, like John E. Jones in the *Dover v. Kitzmiller* case, do not have the scientific expertise to decide scientific questions. This situation highlights the metaphysical and even political implications of methodological naturalism, in that it requires scientists to accept interpretations of the evidence that may well be nonrational and nonscientific.

so there is no reason (other than what C.S. Lewis once termed "chronological snobbery") to think that present-day scientists alone are justified in the belief. Kuhn notes that in their study of theories like phlogistic chemistry or caloric thermodynamics, historians of science recognize that those theories were "neither less scientific nor more the product of human idiosyncrasy than those current today":

> If these out-of-date beliefs are to be called myths, then myths can be produced by the same sorts of methods and held for the same sorts of reasons that now lead to scientific knowledge. If, on the other hand, they are to be called science, then science has included bodies of belief quite incompatible with the ones we hold today.[12]

But let us suppose that despite all this our best contemporary theories are true. In that case we should expect them to at least be compatible with one another. Yet two of the most empirically successful theories of the modern era – quantum mechanics and general relativity – are fundamentally at odds, so much so that physicists have had to invoke elaborate auxiliary hypotheses like string theory or M-theory (which posit a number of the "extra dimensions" mentioned earlier) just to work up a picture of "quantum gravity" that is not incoherent. While this example is arguably the most notorious, the kind of tension it describes abounds among various contemporary theories, as it has for the entire history of science.

Given the history of science in light of pessimistic induction, one could argue just as easily for a position exactly contrary to Lowder's. That is, natural explanations, or at least most of them, do *not* work. After all, if theory *a* is replaced by theory *b*, theory *b* by theory *c*, theory *c* by theory *d*, and so on, the fact that theory *a* is supernaturalistic and the others

[12] Thomas Kuhn, *The Structure of Scientific Revolutions* (3rd Ed.), Chicago: University of Chicago Press, 1996, p. 2.

are naturalistic doesn't seem to argue well for naturalism – because the naturalistic theories suffer precisely the same fate as the supernaturalistic theory. In any case, if Lowder's AHS argument depends upon a history of science in which naturalistic explanations work, and instead the history of science indicates that naturalistic explanations for the most part do not work, then clearly that argument fails.

Methodological naturalism and reality

Most philosophers these days are careful to distinguish methodological from metaphysical naturalism. McDonald and Tro, for example, agree with natural scientists like Kenneth Miller that "the practice of methodological naturalism in science need not commit the Christian to *metaphysical* naturalism (the idea that only the natural exists)." [13] Lowder remarks similarly: "…a common misunderstanding is the idea that a 'naturalistic explanation' means an explanation based on metaphysical naturalism. That is not how 'naturalistic explanation' is used here. Rather, a naturalistic explanation simply means any explanation that does not appeal to supernatural agency."

At the same time Lowder advocates for "modest" methodological naturalism, the idea that scientific explanations "may appeal to the supernatural only as a last resort." While I applaud Lowder's willingness to leave the door cracked in case a good supernatural explanation needs to get through, his permissive definition of methodological naturalism is not typical of the scientific community – and that happens to be the same scientific community that decides, and has decided, which theories become paradigmatic over the course of history. According to Shermer, for instance, methodological naturalism is now the dominant operating principle of science,

[13] Patrick McDonald & Nivaldo J. Tro, "In Defense of Methodological Naturalism," *Christian Scholars' Review*, 38, 2, 2009, p. 202.

which holds "under the presumption that the world and everything in it is the result of natural processes in a system of material causes and effects that does not allow, or need, the introduction of supernatural forces."[14] So it was that in the 2005 *Dover v. Kitzmiller* case, the scientific community rallied to ensure that the teaching of Intelligent Design was essentially prohibited from public school classrooms, in the process making it clear that scientists are deeply committed to excluding supernatural, specifically religious, explanations from the practice of science.[15] The prevailing ethos of scientists on the question of methodological naturalism, then, is decidedly not modest.

Now it's not hard to see that if science permits only explanations that are naturalistic, then the history of science will reflect systematic replacement of supernaturalistic with naturalistic explanations in much the way that Lowder describes. But again that would mean that the success of these naturalistic theories is a function of a methodological rule rather than an indication of their strength in terms of criteria normally thought to make for a good scientific theory – criteria like explanatory power, simplicity, and testability (falsifiability). Of course, it may be, as naturalists would certainly argue, that naturalistic explanations *are* in fact stronger; but the fact remains that when a methodological rule permitting only naturalistic explanations is in place, any strengths or virtues of competing supernaturalistic theories become simply irrelevant (out-of-bounds) to the practice of science. As the philosophers Evans and Manis suggest, "If science is limited to natural explanations of natural phenomena, this implies

[14] Shermer, p. 222.

[15] As Monton recounts, the Dover decision was largely based on a definition of *science* that requires methodological naturalism to explain "natural" phenomena and exclude all others in practice, and thereby begs the question of what might actually be explicable in principle. – Bradley Monton, "Is Intelligent Design Science? Dissecting the Dover Decision" [Preprint], January 18, 2006, http://philsci-archive.pitt.edu/2592/.

simply that science could be 'blind' to certain truths; some features of the world may be, in principle, impossible for science to even recognize…"[16]

The fact that methodological naturalism *requires* naturalistic theories to dominate the sciences means that naturalism has little actual explanatory power with respect to the (institutional) success of naturalistic theories. That becomes clearer in a Bayesian context, where if Pr(E | B) is extremely high, then the ratio Pr(E | B & N) / Pr(E | B) – which translates to explanatory power – cannot be much higher.[17] As Swinburne explains, "A theory has high explanatory power in so far as it has high predictive power and the evidence has low prior probability."[18] But of course the probability of the history of science being as it is, Pr(E | B), is not low but high, even if only because of a methodological decree essentially requiring it to be high. Thus where methodological naturalism is the rule, Pr(E | B & N) becomes explanatorily meaningless, because Pr(E | B) can be explained *only* in light of (N).

There are reasons to think the "natural" v. "supernatural" metaphysical dichotomy is unhelpful in the first place. For starters, "supernatural" is used not only to describe serious subjects of philosophy and theology like God and miracles in history, but has become a categorical placeholder for virtually anything that seems utterly unreal or fantastic: ghosts, goblins, fairies, leprechauns, unicorns, etc. The natural v. supernatural distinction, then, favors naturalism not just procedurally but rhetorically. At the same time there seems to be currently no objective or agreed-upon criterion for distinguish-

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[16] Evans & Manis, p. 142.

[17] Bayes' theorem, or Bayes' rule, says that the probability of any hypothesis H given evidence E is a function of the prior probability of the hypothesis and its explanatory power:

$$Pr(H \mid E \,\&\, B) = Pr(H \mid B) \cdot Pr(E \mid H \,\&\, B) / Pr(E \mid B)$$

[18] Richard Swinburne, *The Existence of God* (2nd Ed.), New York: Oxford, 2004, p. 57.

ing natural from supernatural entities, though some have suggested materiality, observability or repeatability.[19]

I have a number of problems with the usual proposed criteria, two with the observability criterion in particular: First, *much of the natural world according to modern science is no more observable than God or angels.* Just as Aquinas inferred the existence of God as a necessary being, the First Cause of all contingent beings, biologists infer a first organism (a "universal common ancestor") as the necessary being required for the existence all other organisms. Neither the First Cause nor the first organism is any more observable or verifiable than the other. General relativity invokes black holes, which are unobservable both in practice and in principle; that is, by the very definition of black holes and the implications of GR, light cannot escape beyond the event horizon of a black hole, meaning literally nothing within can be observed. The most we can see is its "shadow."[20] Quantum mechanics invokes not only a host of unobservable particles, but postulates that some of those particles have come into being uncaused (hence unexplained). To date no one is on record as having seen a gravitational force. And so forth.

Second, *if a supernatural realm exists, much of it is observable (verifiable) in principle.* Suppose for a moment that the New Testament has accurately reported events taking

[19] Reviewing the failure of observability and repeatability as criteria, Fales argues that the supernatural should include only disembodied minds. But that seems to imply that objects like the Tree of Life in the New Jerusalem, and even conscious beings like resurrected saints and winged angels, would be either "natural" or simply lacking an ontological category. – Evan Fales, "Is a Science of the Supernatural Possible?", from *Philosophy of Pseudoscience: Reconsidering the Demarcation Problem*, Massimo Pigliucci & Maarten Boudry, eds., Chicago: University of Chicago Press, 2013, 247-261.

[20] See Seth Fletcher, "An Exit Chute from the Universe: The Story of a Historic Effort to Image a Black Hole," *Scientific American*, April 10, 2019. https://www.scientificamerican.com/article/an-exit-chute-from-the-universe-the-story-of-a-historic-effort-to-image-a-black-hole/.

place around the turn of the first century. In that case miracles and angelic visitations were observed, just as the reports attest. Now suppose further that the angel Gabriel, having visited Mary to tell her she will give birth to the Christ, decided to stick around and spend the next two-plus thousand years on earth to prove that angels are real before returning to heaven. According to the usual criteria affirming the natural v. supernatural dichotomy, Gabriel would have become identified as a "natural" phenomenon once his existence on earth was repeatedly confirmed and verified; yet nothing about Gabriel, a "supernatural" being, would have changed. In principle there would be literally nothing Gabriel could do to convince naturalists that he really is an angel from a heavenly realm, rather than, say, a startlingly novel species of biological organism, an alien being from another planet, an elaborate holographic or magical illusion, etc.

We should recall here that in the Christian tradition, God, his throne and the angels surrounding him are said to be observable – most vividly so – in heaven. Note also that in heaven Jesus and the resurrected saints inhabit glorious new *bodies* (which clearly consist of something other than "disembodied minds"). According to Christian theology the Son of God was visible on earth as well, in the man Jesus Christ, who worked visible miracles. And one day, again per Christian theology, Jesus will visibly descend from heaven to earth for everyone to see.

In keeping with the previous points, I would propose replacing the false natural v. supernatural dichotomy with new categories based on an expanded vision of reality – in which there may exist both the observable universe and an eternal or extra-dimensional realm. The latter would include entities like parallel universes and angels, and the former more famil-

iar entities like galaxies and humans.[21] One possibility is to mark out anything theorized to exist or operate within the observable universe as *U-internal* and everything else *U-external*. Because on this view scientific-theoretical entities like branes, extra dimensions and other universes would be U-external, but so would angels and the eternal court of heaven, the U-external realm would be a shared metaphysical space, so to speak, where certain entities traditionally designated natural, and others supernatural, could both be explored – at least in principle. The "internal" and "external" realms would be separated by some kind of semipermeable boundary, possibly defined by the boundary of the observable universe or by the number of physical dimensions that theoretically constitute each realm. (What we call miracles and revelations would occur when that boundary is crossed.) As it happens physicists are perfectly at ease exploring extra-dimensional realities when unpacking cosmological ideas like string theory.[22] At present, then, only *religiously significant* extra-dimensional entities remain off-limits to scientific

[21] I realize that such a vision could be theologically problematic in some respects, especially for "classical theism" (as opposed to "theistic personalism"). For the record I believe that on *any* version of Christian theology, God alone is the transcendent creator of everything else. Also it's hard to say to what extent its more abstract elements would be "physical" or "material," though the current state of theoretical physics in no way discourages belief in highly mysterious, even mystical entities and properties of a supposed material universe. For example, consider *quantum entanglement*, which Einstein famously called "spooky action at a distance." See Evrim Yazgin, "Quantum entanglement breakthrough sees physicists achieve world first," *Cosmos*, January 31, 2023. https://cosmosmagazine.com/science/physics/quantum-entanglement-two-photons/.

[22] As Stephen Meyer explains: "To make string theory work… physicists had to postulate extra invisible dimensions of space. These were called *compactifications* of space." – "Is Ours One of a Few Working Universes among Countless Flops?", *Mind Matters*, August 28, 2022. https://mindmatters.ai/2022/08/is-ours-one-of-a-few-working-universes-among-countless-flops/.

investigation – for reasons that appear completely subjective if not prejudiced.

But if the schema described above is valid, both the seemingly transcendent, eternal realm of angels and the familiar, entropy-bound order we inhabit would be constitutive of a larger integrated reality, notwithstanding that the disclosure of certain aspects of that reality would potentially shock scientists and theologians alike. I would argue that scientists (along with historians, anthropologists and sociologists) should seek to explore and explain the reality of which we are a part, whatever that turns out to be and to whatever degree it can be explored and explained, rather than arbitrarily define reality in decidedly antireligious terms and then try to explain just the metaphysically restricted version.

Failures of naturalistic explanation

The question remains as to just what sort of universe would yield a history of science marked by an ongoing failure of mostly naturalistic theories (hence explanations). Possibilities seem limited mostly to (1) a largely unintelligible universe, or (2) a universe whose best explanations are not ultimately naturalistic. Despite the evidence reviewed so far, our universe does appear intelligible; that is, most of our answers do appear rational and coherent even if almost always incomplete. Thus, reason suggests the strong possibility of (2), that the best explanations for the world around us, how it works and how it began, are not ultimately naturalistic. Of course, in some cases we appear to at least be getting closer to the truth. Scientists have made tremendous progress in particle physics, for example, so that the Standard Model of physics is widely regarded as "the most successful theory ever conceived."[23] Other theories have not fared nearly as well. Two

[23] Yvette Cendes, "The Standard Model (of Physics) at 50," *Scientific American,* June 15, 2018. https://blogs.scientificamerican.com/ observations/the-standard-model-of-physics-at-50/.

areas of research that have continually frustrated the explanatory powers of scientists are the origin of the universe and the origin of life.

Now in one sense, the origin of the universe does have the support of a powerful scientific explanation in the *big bang* model. Plenty of evidence suggests that our universe began at a spacetime singularity and has been expanding ever since.[24] In another sense, though, the origin of the universe remains unexplained, and indeed scientifically inexplicable. As Stephen Hawking maintained, anything prior (temporally *or* causally) to the big bang singularity should be cut out of a scientific model because it has no observational consequences.[25] We cannot confirm potential causes or initial conditions prior to the origin of the universe even in principle, because we are trapped within the spatial-temporal boundaries of the universe and thus cannot possibly observe anything before or beyond it. Given all this, it might be more accurate to say we have considerable evidence for the *development* of the universe rather than its origin.

Possibly more frustrating for scientists is the question of how life began on earth. Unlike the origin of the universe, the origin of life theoretically took place *within* the universe, according to most scenarios right here on our home planet. Since they are not theoretically restricted by a spacetime boundary like their colleagues in the cosmology department,

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[24] That's according to the current scientific consensus, at least. But the history of science reviewed earlier suggests that the evidence for the theory may well be overstated; whereas the psychology of scientific revolutions documented by Kuhn suggests that even if there is good evidence for alternative theories, most scientists will not be eager to share it with the rest of us. – See Jerry Bergman, "A Brief History of Intolerance in Modern Cosmology," *Answers Research Journal*, 2, 2009, p. 2.

[25] "As far as we are concerned, events before the big bang can have no consequences so they should not form part of a scientific model of the universe." – Hawking, *The Illustrated A Brief History of Time*, New York: Bantam Books, 1996, p. 62.

optimistic biologists of a naturalist persuasion have thus had reason to expect they could construct a viable, testable theory of abiogenesis. But so far results have been disappointing. In terms of obvious practical limitations, this should not be surprising: "The difficulty arises," say Pross and Pascal, "because historic events, once they have taken place, can only be revealed if their occurrence was recorded in some manner. Indeed, it is this historic facet of abiogenesis that makes the OOL [origin of life] problem so much more intractable than the parallel question of biological evolution."[26] The authors go on to explain why this makes abiogenesis as a singular *event* (like the Big Bang in that respect) an unfalsifiable and scientifically lame hypothesis.

Beyond the impossibility of scientifically confirming a singular historical event, though, the challenge is crossing over from *chemistry* to *biology*. Two specific and sizeable hurdles are replication and metabolism, while one general and giant hurdle is a requisite thermodynamic condition that is both extremely far from equilibrium and at the same time irreversible (otherwise it would slip back quickly towards equilibrium). Nonetheless, interest remains in the theoretical possibility that there are processes at work in nature which might, under the right conditions, come together to produce a living organism from non-living chemicals. Pross and Pascal call these "underlying physico-chemical principles," and claim that they do operate in the natural world presently. A similar approach involves dividing up the overall process into various subdomains, identifying a viable subprocess for each subdomain, and then postulating that taken together these

[26] Addy Pross & Robert Pascal, "The origin of life: what we know, what we can know and what we will never know," *Open Biology*, 3, 2013.

subdomains would result in confirmation of abiogenesis.[27] I maintain that even if apparently successful, such an approach would commit a fallacy of composition. That is, if each of a number of required subprocesses were confirmed it would not follow that the entire process was confirmed, because the subprocesses would still have to be joined together in a precise arrangement and sequence for life to emerge.

Neither of the above approaches amounts to anything resembling an empirical confirmation. From an empirical standpoint, abiogenesis remains an utter failure. The problem is not that life does not arise on earth; life arises on earth many billions of times a day. But in each instance a living organism is born from *another* living organism, by reproduction. Louis Pasteur called this easily verifiable phenomenon the "law of biogenesis" – a law which operates every bit as reliably as the laws of gravitation and orbital motion that keep the Earth revolving around the Sun, and yet a law which precludes abiogenesis. At the same time it was Pasteur who, through a series of carefully designed and controlled experiments, falsified spontaneous generation (the theory that life arises from nonlife in certain favorable environments like those in rotting meat).[28] It would be fair to say that to the ex-

[27] According to Ian Musgrave: "While the basic concept of abiogenesis can be stated simply (development of life from non-living substances), and is often referred to as a theory or hypothesis, abiogenesis isn't a really a theory per se (this is not unique to abiogenesis, it is true of most other "big" theories as well). What it is, is a well defined research program with a number of defined and well connected sub-domains (origin of building blocks, origin of polymers, self-replicator dynamics, transition of a self replicator system to a genetic system, origin of the genetic code, origin of metabolic systems from prebiotic precursors)." – "Progress in Abiogenesis Research," *Talk Origins Archive*, January 2002. www.talkorigins.org/origins/postmonth/jan02.html.

[28] Unfortunately, the scientific academy has effectively suppressed these aspects of Pasteur's work. See Alan G. Gillen & Frank Sherwin, "Louis Pasteur's Views on Creation, Evolution, and the Genesis of Germs," Liberty University: *Faculty Publications and Presentations*. https://digitalcommons.liberty.edu/bio_chem_fac_pubs/ 144**.**

tent that abiogenesis is actually falsifiable in principle, it has in fact been falsified. But to the extent that it's not falsifiable at least in principle, it's not much of a scientific theory.

As a believer, what I find most interesting about the above scenarios is their relevance to biblical theism in particular. Two of the most important miracles in the Bible and Christian tradition, after all, are the creation of the universe (or "the heavens and the earth") and the creation of life on earth. By what is almost certainly not simply a coincidence, these two miracles correspond with two of the more conspicuously unresolved questions in theoretical science – the origin of the universe and the origin of life.[29]

Conclusion

Recall that my rebuttal centers on premise (2) of Lowder's AHS argument: Pr(E | B & N) >! Pr(E | B & T). I have given three broad reasons to suspect that Lowder has overestimated Pr(E | B & N): the history of science interpreted as pessimistic induction; the arbitrary requirements of methodological naturalism imposed upon scientific exploration and research; and the abject failure of naturalistic hypotheses to explain two specific phenomena ascribed to God in traditional theism – the origin of the universe and the origin of life. When Pr(E | B & N) is made to account for these relevant evidentiary considerations and is lowered enough as a result, the inequality of premise (2) fails to hold.

[29] Similar arguments could be made for the origin of consciousness and the origin of moral values. See J. P. Moreland, "The Argument from Consciousness," from J. P. Moreland & William Lane Craig, eds., *The Blackwell Companion to Natural Theology*, Blackwell, 2009, pp. 282-343. For a nonformal, but for many, persuasive argument from moral values see C.S. Lewis, "The Moral Argument for the Existence of God," from Raymond Martin & Christopher Bernard, *God Matters: Readings in the Philosophy of Religion*, New York: Longman, 2003, pp. 136-139.

More informally, the three lines of argument reviewed here suggest that even in the light of the history of science naturalism is (at least) as likely to be false as true. I would argue further still, again informally, that the history of science is just the sort of pattern we would expect to see if the universe was in fact created by God but inhabited by a number of intelligent and influential people, scientists in particular, who for whatever reason were increasingly predisposed against believing it.

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