

Dec 15 2009

## [Biocentrism Pseudoscience](#)

Published by [Steven Novella](#) under [Pseudoscience](#), [Skepticism](#)  
[Comments: 81](#)

[Writing for the Huffington Post](#), Deepak Chopra and Robert Lanza promote the notion of “biocentrism” – “that an accurate understanding of the world requires putting observers firmly into the equation, and that life may not be the accident of physics and chemistry that evolution suggests.”

This idea is really nothing new – it is a transparent abuse and misunderstanding of modern physics and quantum mechanics in order to insert mysticism into science.

They begin with what is known as the anthropic principle:

Why, for instance, are the laws of nature exactly balanced for life to exist? There are over 200 physical parameters within the solar system and universe so exact that it strains credulity to propose that they are random — even if that is exactly what contemporary physics baldly suggests. These fundamental constants (like the strength of gravity) are not predicted by any theory — all seem to be carefully chosen, often with great precision, to allow for existence of life. Tweak any of them and you never existed.

We currently have no idea why the laws of the universe are the way they are. We also don't know if they have to be the way they are, or if there are many, perhaps infinite, variations and the universe we know is just one. Is the mass of an electron always the same? Is the gravitational constant different in every universe? Are there even other universes?

What is undeniably true is that the laws of nature are such that long term stable and complex structures are possible. But the claim that the laws of the universe are what they are so that we can exist is to commit several logical fallacies all at once. First, it is an argument from final consequences – assuming that the final result is the cause. Rather, it is more valid to say that we are here because the laws of nature allow it – rather than that the laws of nature were designed so that we may be here.

It is also the lottery fallacy. If we hold a world-wide lottery and only one human in the 6.5 billion wins, the odds of that person winning is very small. But someone had to win. Chopra and Lanza are arguing that the winner could not have one by chance alone, because the odds were against it.

In other words – if some other universe existed then some other type of conscious beings might be contemplating how perfectly the laws of their universe fit their existence. It is also possible (and this is one cosmological theory) that there are many universes and perhaps only in a small percentage can complex organisms evolve. In the other universes there is no one around to contemplate the fact that the laws of nature do not allow for life.

Also, this gets to the fact that life is fine-tuned to the universe, not the other way around. The kind of life that can exist in this universe is the kind that arose. This is similar to marveling at how coincidental it is that the earth's climate is so well suited to human life. The earth provides us water, sunlight, and food, and in many places on the earth (the temperate zone) during much of the year we can walk around quite comfortably with minimal clothing.

But of course we evolved to adapt to the environment, the environment was not made for us. The sun does not provide light that just happens to be in the spectrum our eyes can detect – our eyes evolved to detect the spectrum of light that happened to be put out by our sun. So Chopra and Lanza get it backwards.

And finally, the entire argument is an argument from ignorance – we do not know what determines the laws of the universe, therefore they were designed just for us.

Chopra and Lanza then take the anthropic principle to its most ridiculous extreme:

Beyond these laws and constants, consider everything that had to happen to bring about humans. There are literally trillions of events that had to be just right — ‘this way’ and not ‘that way’ — for us to be here. Consider the meteor that wiped out the dinosaurs — if its trajectory had been slightly different, or the asteroid had been slightly larger, we might not be here.

This is pure lottery fallacy. If the meteor did not wipe out the dinosaurs, perhaps a reptilian intelligent species would rule the earth, making gods in their image, and marveling at how unlikely their existence was, and therefore it must have been preordained.

Next some Chopra's signature quantum woo:

No physicist challenges the fact that particles do not exist with definite physical properties until they are observed. If the present determines the past as Stephen Hawking, John Wheeler (who coined the word ‘black hole’), and others have suggested, then it couldn't be any other way.

Well, [here is a physicist who does challenge this “fact”](#) – Vinod K. Wadhawan (along with Ajita Kamal), a physicist, goes into great detail as to why quantum mechanics does not say that physical properties require an “observer.” They nicely deconstruct Chopra and Lanza's nonsense – essentially pointing out that consciousness is not required in quantum mechanics. The

environment itself can act as the “observer”. When matter interacts with itself it results in decoherence, the translation of the micro quantum world to the macro classical world we experience.

They finish with a swipe at Darwin, just to celebrate the 150th anniversary of the publication of Origin:

Darwin’s theory of evolution is an enormous over-simplification. It’s helpful if you want to connect the dots and understand the interrelatedness of life on the planet — and it’s simple enough to teach to children between recess and lunch. But it fails to capture the driving force and what’s really going on.

An enormous over-simplification? Has he read On The Origin of Species? Prior to Darwin it was already recognized that life changed over geological time – life evolved. Darwin’s primary contribution was in proposing a “driving force”, that of variation and natural selection. His genius was in seeing how blind forces, acting over vast amounts of time, could add up to cumulative significant change, enough to forge an elephant out of a single-celled creature.

What Chopra and Lanza are trying to do is replace an awesome view of nature – one with explanatory power, elegance, and subtlety – with simple-minded mysticism. In doing so they are trying to wipe away or ignore some of the greatest intellectual contributions to our understanding of reality. And while denying science and replacing it with their mysticism, they are simultaneously trying to wrap their spiritual notions in the language of science.

What they are doing is the very essence of pseudoscience – using the superficial form of science to promote mystical ideas, but abandoning the true process of science.



[81 responses so far](#)

## **81 Responses to “Biocentrism Pseudoscience”**

1. [# superdaveon](#) 15 Dec 2009 at 11:58 am

<http://xkcd.com/675/>

tis expresses my thoughts on chopra better than I could.

2. [# Jim Shaveron](#) 15 Dec 2009 at 12:21 pm

Chopra and Lanza are arguing that the winner could not have one by chance alone, ...

There’s won mistake in that phrase.

This idea is really nothing new – it is a transparent abuse and misunderstanding of modern physics and quantum mechanics in order to insert mysticism into science.

Yeah, that sentence pretty well sums up Chopra. Thanks, Steve.

3. [# Old Coyoteon](#) 15 Dec 2009 at 12:35 pm

Great article.

As Julia Sweeney said, “Deepak Chopra is full of shit!”

4. [# mschmidton](#) 15 Dec 2009 at 12:41 pm

It’s really embarrassing seeing people like Chopra conduct this argument. I become embarrassed for them. Using science to essentially ‘debunk’ science is simply ridiculous. They end up looking like complete fools in front of anyone who has just an inkling of an understand of how the world works. Obviously they aren’t writing for those people, but it’s sad nonetheless.

Also, kudos for all the hard work you put in Dr. Novella. I get depressed whenever I have to put extra effort into buying groceries or cleaning my apartment let alone be a neurosurgeon and popularizer of science. I couldn’t do one of those things, let alone do it as frequently as you all at the same time. It’s really inspiring.

5. [# lizkaton](#) 15 Dec 2009 at 12:44 pm

[ Darwin’s primary contribution was in proposing a “driving force”, that of variation and natural selection. His genius was in seeing how blind forces, acting over vast amounts of time, could add up to cumulative significant change, enough to forge an elephant out of a single-celled creature.]

But Darwin’s hypothesis about what drives evolution has not been proven. It can be used to explain some adaptation, but it requires a leap of faith to assume it can account for all evolution.

And by the way, I have stated on this blog that I am not an IDer. So I do not understand why my comments on this subject are usually deleted.

6. [# zen\\_arcadeon](#) 15 Dec 2009 at 12:58 pm

I’ve read some of Lanza’s stem cell texts before and have a hard time reconciling that work with the vaguely-spiritualistic dreck he’s writing for Huffington’s Wide World of Woo.

Also I agree with the sentiment of mschmidt’s comment. Would love to see you publish a popular book a la Shermer/Zimmer/etc., Steve! Always a pleasure to read.

7. [#SkepLiton](#) 15 Dec 2009 at 1:11 pm

Unfortunately, I read both the Chopra and Lanza articles when they were published. I rolled my eyes so many times, I thought they were going to get stuck looking up into my skull.

The willful misrepresentation of facts to support this mystical nonsense makes only one word come to mind: charlatan.

My favorite part of the Lanza article was his bio at the end:

“Robert Lanza, MD is considered one of the leading scientists in the world. He is the author of “Biocentrism,” a book that lays out his theory of everything. ”

“One of the leading scientist in the world”? I’m thinking “not”.

8. [#Doctor Evidenceon](#) 15 Dec 2009 at 1:15 pm

the Wadhawan link is neat.

the President of Physics, priceless.

curious if Mr. Chopra actually believes that unreal stuff.

his income is real enough-

regarding Dr. N and the skeptical team, likewise I’m as impressed by their time-management skills as their defense of empiricism-

(I can only manage the empiricism part)

9. [#Steven Novella](#) on 15 Dec 2009 at 1:20 pm

lizkat – I do not delete comments due to content. Your comments are not being deleted. It is possible that some were picked up by the spam filters. I recommend not copying and pasting vast amount of text or links.

Variation and natural selection have a great deal of empirical support – no “leap of faith” is required.

There is also a distinct absence of evidence or even a theoretical need for any other significant mechanism in evolution. There may be some contribution from epigenetic factors, but I doubt that’s what you meant.

10. [#lizkaton](#) 15 Dec 2009 at 1:49 pm

“Variation and natural selection have a great deal of empirical support”

Yes of course they do. We know for a fact that variation and selection happen all the time. What we do not know, however, is how much of a role they have actually played in the origin and evolution of species in general. That is where the leap of faith comes in.

11. [#Steven Novella](#) on 15 Dec 2009 at 2:25 pm

That is not a leap of faith – it is intelligent inference, which is necessary in an historical science. We know evolution happened, we know that variation and natural selection are taking place and can produce the kinds of changes we see over evolutionary history, we can infer that evolution happened through natural selection.

That hypothesis makes predictions that so far have been confirmed. That's how science works.

12. [#artfulDon](#) 15 Dec 2009 at 2:46 pm

You doubt that's what she meant? What do you think she meant that made you doubt she was referring to the contribution from epigenetic factors and the huge crack in your blind mechanism door that is being forced to open by such contribution? Because life contributing to it's own evolution, no matter how short sighted and distorted its limited view and perspective, is far from a blind process. Yet one that both the Neo-Darwinists and the Chopridiots either can't see at all or refuse to look at.

Because as you surely speak for either side here, there has to be “a distinct absence of evidence or even a theoretical need for any other significant mechanism in evolution.”

13. [#Michael Varneyon](#) 15 Dec 2009 at 3:05 pm

<http://thebigblogtheory.wordpress.com/2009/12/14/s03e11-the-maternal-congruence/>

14. [#lizkaton](#) 15 Dec 2009 at 3:06 pm

“the contribution from epigenetic factors”

That is one problem I have with the current theory — it ignores all possible Lamarckian factors, some of which are beginning to be recognized. So we already have scientific evidence that neo-Darwinism is, at least, an over-simplification. And we have no idea just how over-simplified it might be. My guess — and all anyone can do right now is guess — is that evolution will start to look much more complicated as the scientific evidence comes in.

The current theory says that all variations are independent of the experiences of the organism or its environment. Evolution is directed only after the variations have occurred, by selection, according to the current theory. And the current theory does not consider any exceptions or qualifications.

But we have reasons to suspect that the rate of mutations can vary depending on environmental factors. And we also have reasons to suspect that the experiences of an individual organisms can have some influence on its offspring.

It is much too soon to declare that the mechanisms of evolution have been explained.

15. [#manguekenon](#) 15 Dec 2009 at 3:12 pm

Mark Twain wrote a very humorous rebuttal to biocentrism. His essay is called “Was The World Made for Man”.

Here’s a link

<http://smcgrat.blogspot.com/2007/12/mark-twains-was-world-made-for-man.html>

people will get a kick out of his defense of evolution. Chopra and Lanza should have read it before writing their own rubbish.

16. # [mindme](#) on 15 Dec 2009 at 3:37 pm

lizkat it’s occam’s razor at work. You see a river at the bottom of a deep canyon. You know water can wear down even rock. You can measure it in a lab. You hypothesize the only mechanism necessary to create that canyon was the flowing water and a great deal of time. Your best evidence indicates a single, simple mechanism. You don’t then add in another mechanism until it’s needed. There is no leap of faith unless you want to say it’s the only possible mechanism.

In evolution, no one thinks only selection and random mutation fully explains the origin of new species (ie “account for all evolution”).

<http://www.geol.umd.edu/~jmerck/eltsite/lectures/beyondnatsel.html>

So where’s the leap of faith, lizkat?

17. # [Steven Novella](#) on 15 Dec 2009 at 4:13 pm

Darwin never claimed that natural selection was the one and only mechanism of evolution. And modern evolutionary theory is not closed to other mechanisms. That is a straw man.

Epigenetic factors and environmental factors are interesting. But they are fairly new and their role and contribution have yet to be determined. It is premature to conclude anything about how they will change our thinking of evolution.

And of course evolutionary theory will get more complex as it progresses – that is the usual course of events in science. But scientific theories get deeper and more complex – that does not necessarily invalidate the basic premises. DNA will always be the primary substrate of inheritance, no matter how much more complexity we find.

I would further point out that epigenetic factors are not necessarily outside the realm of natural selection. There must be a mechanism by which gene expression and mutation rates respond to the environment, and that mechanism may be subject to natural selection. We’ll see.

18. [#Michael Varneyon](#) 15 Dec 2009 at 4:51 pm

“And of course evolutionary theory will get more complex as it progresses – that is the usual course of events in science.”

Humm... perhaps it is more accurate to say that science becomes simpler as it progresses, but the questions it can describe answers to becomes more complex?

Newtons laws of motion are exceedingly simple, and makes the description of how things move much more clear and simple than the previous attempts at explaining motion.

And it is this simplicity that allows more complex questions to be answered.

Maxwell's equations are far more simple due to their unification of electricity and magnetism than prior theories, and there simplicity is their power in explaining a vast array of ever more complicated phenomena.

I am certain that genetic theory and evolutionary theory will become simpler as mechanisms once thought to be separate will be unified in a better framework. And this will allow us to explain how more complicated processes happen, and allow is to do more complex manipulations of our environment.

As for epigenetics, I have seen it abused often in attempts to explain observation in phenotype expression.

Not sure what is causing said expression? How about epigenetics! =)

Such a tendency is common when people are first exposed to an exciting new concept, and also by people who do not understand the concept. (Such as with the quantum-dolts abusing quantum mechanics)

19. [#artfulDon](#) 15 Dec 2009 at 4:51 pm

So then you didn't really mean it when you said there is “a distinct absence of evidence or even a theoretical need for any other significant mechanism in evolution.”

Because if there were no theoretical needs for one to learn more about the “mechanism by which gene expression and mutation respond to the environment” then what is it that you are waiting to see in that regard?

And modern evolutionary theory does seem closed to any mechanisms other than those in the list furnished by those Neo-Darwinists such as mindme (who thinks water wearing down a rock is analogous to a purposive mechanism). Note that his list has nothing to say about anything that smacks of Lamarckianism – epigenetics included.

20. [#Justin L.on](#) 15 Dec 2009 at 5:25 pm



This is an awesome post. It's just too bad we're not likely to here a response from Chopra. Thanks!

21. # [Michael Varneyon](#) 15 Dec 2009 at 5:37 pm

Chopra is trying to beam the answer through the collective consciousness! 😊

22. # [artfulDon](#) 15 Dec 2009 at 7:18 pm

“Also, this gets to the fact that life is fine-tuned to the universe, not the other way around.”

Most likely it's both, that life and the universe it may have always been a part of are fine tuned to each other (assuming there is a metaphorical each other to begin with).

“The kind of life that can exist in this universe is the kind that arose.”

But perhaps it's only one of many “kinds” that have arisen or have yet to arise. And thus yours also becomes an argument from final consequences, no less silly than the Chopraesque varieties.

23. # [johnmatthewson](#) on 15 Dec 2009 at 8:47 pm

Although the simple idea of “collapsing a wavefunction” by looking at it has long since been discredited there are some serious scientific issues relating observation to quantum physics.

Decoherence Theory is a multiverse theory in which our classical universe is an entangled state. According to decoherence theory there are potentially an infinity of such universes but you would need to be outside of our universe to see this (!).

As a multiverse theory the question remains as to why our particular universe has the form that it has. The anthropic principle is not an unreasonable approach to this problem. According to decoherence theory there are an infinity of universes and ours must by definition be one that allows us to exist (or at least amoebae and hence us to exist).

There are many other problems. See [QM and New Empiricism](#) for a discussion. One of the most interesting features of theoretical investigations of the anthropic principle is that biological entities of our type are related to a particular cosmology (dimensional structure) in our universe.

24. # [Dietrichdanielson](#) 15 Dec 2009 at 8:48 pm

Another Day, another steaming pile of Lanza BS on the HuffPo:

[http://www.huffingtonpost.com/robert-lanza/can-science-resurrect-god\\_b\\_392849.html](http://www.huffingtonpost.com/robert-lanza/can-science-resurrect-god_b_392849.html)

“Can Science Resurrect God? New Scenario Says ‘Yes’”

Ugh.

25. [# John D. Draegeron](#) 15 Dec 2009 at 9:38 pm

Great post Dr. Novella. The anthropic principle is flung like a steaming pile from believers in supernatural woo everywhere.

I'd like you to send a letter like this blog post to the Huff Post! If Shermer can get published there, you can too. Your writing is excellent and so far you haven't ticked off too many people by preaching politics like Shermer has. So you can do a lot to promote science vs. pseudoscience/supernatural/paranormal woo – and that's exactly what is needed for people to work together on a global scale right now. You've got to write a book on scientific skepticism. Books, magazines, newspapers, TV, radio, YouTube videos – you need to reach more people!

26. [# smoon](#) 15 Dec 2009 at 10:20 pm

<>

artfulID,

I think there might be some confusion about the logic that underlies Steven's comment. Let's be more precise. Suppose that a universe  $X$  comes equipped with an arbitrary class of parameters. As far as we currently know, these parameters will determine the class of lifeforms  $L(X)$  which can exist in the universe  $X$ . (Think of  $L$  as a function from the class of all universes to the class of all lifeforms which assigns to each universe all the possible lifeforms which can exist in that universe. Then  $L(X)$  is the image of the universe  $X$  under the function  $L$ ).

Suppose then our universe is  $U$ . All Steven is saying is that the set of lifeforms we observe, call it  $O(U)$ , is a subset of  $L(U)$ . In a sense this is a completely obvious and trivial statement. There's no argument from final consequences, just simple class theory and logic.

You could of course argue that no such function  $L$  exists. To do so though is to essentially say that either the universe or life is fundamentally not bound by physical laws.

27. [# mindmeon](#) 15 Dec 2009 at 11:32 pm

ArtfulD I only use erosion as an example of a simple mechanism that can have a very large effect over time and how other forces are not invoked until necessary. Stating that it would appear simple erosion carved a deep canyon is provisional until evidence is brought to light that another mechanism is required on top of erosion is not a leap of faith, as liz would have it.

Where you're getting notions I meant anything it beyond that is quite frankly bizarre to not only me but I'm sure most readers of this blog.

And where you get "And modern evolutionary theory does seem closed to any mechanisms other than those in the list furnished by those Neo-Darwinists such as mindme" is also bizarre. I simply list known mechanism of evolution beyond liz's sophomoric claim that evolution explains everything via selection of favorable random mutations. ("It can be used to explain some adaptation, but it requires a leap of faith to assume it can account for all evolution.")

I'm sure you've had this patiently explained to you many times, but modern evolutionary theory is not closed to any mechanism backed by sufficient evidence.

Is that not at all clear to you? Is that too subtle a point for you? Or is this all some kind of elementary exercise for you?

28. [#weingon](#) 15 Dec 2009 at 11:42 pm

"Most likely it's both, that life and the universe it may have always been a part of are fine tuned to each other (assuming there is a metaphorical each other to begin with)."

And you have evidence for this claim?

""The kind of life that can exist in this universe is the kind that arose."  
But perhaps it's only one of many "kinds" that have arisen or have yet to arise. And thus yours also becomes an argument from final consequences"

I don't follow this. What are you talking about? What other kinds of life do you have evidence for?

29. [#artfulDon](#) 16 Dec 2009 at 12:18 am

mindme, your erosion example has no relevance to anything that can be called a selective mechanism. And lizkat made no claim that remotely resembles the one you labeled sophomoric. Her claim was that the current theory, as one example, ignores all possible Lamarckian factors, and you were quick to confirm that.

As to your version of "patient explanation" either to her or to me, it's like a child explaining their view of the world to an adult – amusing but not usually or hardly informative.

Your Neo-Darwinist version IS closed to any view that smacks of the Lamarckian, and your previous simplistic remarks about application of Occam's razor and the old water running down hill canard are typical of your superficial understanding of even your own doctrines. Too subtle for me? Well I get the part about the way erosion works. The subtlety of its selective choice making functionality does escape me.

30. [#artfulDon](#) 16 Dec 2009 at 12:29 am

weing, what evidence do you have that life, as we (or at least you) have observed it, is the only form that ever existed in this universe? Assuming you can come up with a definition of life that we can work with to suggest other forms that may or may not fit the question.

31. [#sonicon](#) 16 Dec 2009 at 12:53 am

Serious question-

Darwin suggested bacteria could be bred and eventually you could end up with elephants.

The people who actually breed animals will tell you that is not true and that they have millions of examples compiled over thousands of years to make the point.

Darwin argued that it could happen given millions of years- and nobody can deny it.

How is that different from an argument from ignorance?

32. [#artfulDon](#) 16 Dec 2009 at 1:47 am

sonic, I'd ask those breeders if they accept that bacteria and elephants had a common ancestor to begin with. The time span having covered a bit more than the thousands of years the breeders claim to have turned to for their evidence.

In any case Darwin wasn't arguing that he was right because it couldn't be proved he was wrong. He did have a pretty good idea that if elephants once had bacteria as an ancestor, bacteria might be persuaded to repeat the process.

Mindme's ancestors would of course have offered to select a hill they could roll the bacteria down from.

33. [#bachfiendon](#) 16 Dec 2009 at 5:08 am

Sonic,

Where is your reference that Darwin believed that bacteria could be bred into elephants? I don't know whether Darwin had much knowledge of bacteria at all; they were only named as such in 1838, and Pasteur only proved that they were responsible for fermentation in 1859. I don't think that they were on many peoples' horizons during Darwin's lifetime.

34. [#mindme](#) on 16 Dec 2009 at 8:25 am

||mindme, your erosion example has no relevance to anything that can be called a selective mechanism. ||

You really need to start reading what people write. Again, you return with wild eyed claims. Go back, re-read what I wrote, and then actually comment on that. K?

||And lizkat made no claim that remotely resembles the one you labeled sophomoric. ||

Again, you really need to start reading what people write. I quoted her directly.

||Your Neo-Darwinist version IS closed to any view that smacks of the Lamarckian, and your previous simplistic remarks about application of Occam's razor and the old water running down hill canard are typical of your superficial understanding of even your own doctrines.||

Again, you really need to start reading what people write.

|| Too subtle for me?||

Yup. Seems so.

35. [#johnmatthewson](#) on 16 Dec 2009 at 8:45 am

Here is an excellent paper that Steven Novella might enjoy reading:

[Time, Quantum Mechanics, and Probability \(Saunders 1996\)](#). Its by that rare beast, a philosopher that knows their physics. The reflections on continuity in time are particularly interesting (See also [QM and New Empiricism](#)).

36. [#weingon](#) 16 Dec 2009 at 9:22 am

Artie,

That's a dodge, and not a very artful one to boot. You made the claim, but as you have no evidence, I assume it's just idle speculation on your part. What is the definition of life that you were using? Not the standard textbook one?

37. [#Steven Novella](#) on 16 Dec 2009 at 9:30 am

sonic – this is not true for a very important reason. Stephen J Gould pointed this out, I don't know if Darwin ever discussed it.

As life evolved it becomes progressively constrained, and the potential for later disparity is reduced. Bacteria living today are highly evolved bacteria. They are not the same as the single-celled created from 3 billion years ago.

A dog cannot evolve into a giraffe, because it is already committed down a different developmental path. It might evolve into a giraffe-like dog.

Gould argued that life on earth achieved maximal disparity (not diversity – that's different) soon after the Cambrian explosion. From that point forward we had more diversity but within narrower disparity (amount of difference among forms). Once committed, for example, to a basic vertebrate body plan the ability to evolve radically different forms was lost. A vertebrate will never evolve into a seastar.

38. [#Steven Novella](#) on 16 Dec 2009 at 9:35 am

artfulD wrote:

““The kind of life that can exist in this universe is the kind that arose.”

But perhaps it's only one of many “kinds” that have arisen or have yet to arise. And thus yours also becomes an argument from final consequences, no less silly than the Chopraesque varieties.”

You misunderstand – by “kind” of life I only meant that any life that does arise, by definition, must be compatible with the laws of physics in this universe. That is the only constraint.

We can imagine (we don't know if it's possible) a different universe with different laws but that still allow the complex and stable interactions necessary for something like life to arise. They would think their universe if fine-tuned to them.

There is simply no reason to hypothesize that our universe if fine-tuned to life. All we can say is that this universe allows for the possibility of life.

39. [#islandon](#) 16 Dec 2009 at 11:49 am

heh... Lanza is a hack and Chopra is a full blown crank, but the author of this blog appears to be utterly clueless as to why we have an anthropic principle, and I can't even believe that Varney let the crackpot run off at the mouth, unabated.

*But the claim that the laws of the universe are what they are so that we can exist is to commit several logical fallacies all at once. First, it is an argument from final consequences – assuming that the final result is the cause. Rather, it is more valid to say that we are here because the laws of nature allow it – rather than that the laws of nature were designed so that we may be here.*

um, no actually, that's no why they say that. It is “the appearance of design” that the bio-oriented physics presents which inspires these speculations.

I could go on and on and on... but I'll just leave it at... the author, like Lanza, is a doctor, not a physicist, and they should both mind their own uneducated business.

40. [#artfulDon](#) 16 Dec 2009 at 2:53 pm

Dr. Novella, you quote the Chopradolts are saying “These fundamental constants (like the strength of gravity) are not predicted by any theory — all seem to be carefully chosen, often with great precision, to allow for existence of life.”

The weakness there is the “carefully chosen” conclusion based on the evidence of what “seems” to be.

But as to fine tuning, that's not necessarily a matter of choice. All causation can be plausibly regarded as a fine tuning process.

Further, we cannot assume that life began in the cosmos at some time subsequent to the existence of the laws of physics. It's more logical to posit that the choice making process that is essential to life, and the laws that this process will necessarily "obey," have existed together forever. Less logical would be the assumption required to qualify as a creationist that before there was something there was nothing – until a Godlike entity rose out of the nowhere into the somewhere.

More likely (based on our logic that is the determinant of the likely) if there was any fine tuning needed at all to produce life, it would have been to the inevitability of the combined effects of natural causation. The laws by which choice may have always been a factor "creating" our version of the choice making process, the only life that we know, accordingly.

41. [#artfulDon](#) 16 Dec 2009 at 3:14 pm

weing, you're doing the dodging because of course what I wrote was speculative and clearly identified as such. You protest that the speculation lacks plausibility but cant say why. Par for the course where you're concerned. You also imply you are using the text book definition of life. Would that be the definition of life on earth or perhaps one like Sagan's definition allowing for different forms elsewhere in the cosmos?

As to mindme, he repeats that lizkat wrote what he says she did, but can't seem to find the quotation – which I can't seem to find as well. Shame on us both. He also seems to deny that he referred to erosion as a mechanism analogous to selection. Leaving that reference then as essentially pointless.

42. [#Steven Novella](#) on 16 Dec 2009 at 3:24 pm

island – I disagree. You seem to be talking about biocentrism more generally, when clearly I was describing the anthropic principle (specifically the strong anthropic principle).

There is no "appearance of design" in the laws of nature themselves in this argument, except that they allow for the existence of life. And so in that case you are making a distinction without a difference.

I would also point out that your drive-by criticism, while common in blog comments, is not constructive. Just saying – "Bah! you don't know what you are talking about" accomplishes nothing of value.

If you have constructive feedback, let's hear it. I am always willing to learn.

43. [#sonicon](#) 16 Dec 2009 at 4:18 pm

Steven-

You (or perhaps more properly Gould) seem to be arguing that evolution has definite limits and that all creatures today are subject to those limits. Yet in some past creature

those limits didn't exist.

If you can't show me the creature, then you are making an argument from ignorance aren't you?

artfulD-

I believe you are making the same argument from ignorance. (ie. The breeders experience/experimental evidence is trumped by the fact we can't disprove what would happen given enough time)

(BTW- Some breeders I have talked to agree that all life has a common ancestor- it just a question of what)

bachfiend-

Leeuwenhoek discovered bacteria in 1676. The name bacterium was coined in 1838. Darwin's book was published in 1859.

island-

good luck!

44. [# islandon](#) 16 Dec 2009 at 4:49 pm

I see, so when speaking of the physics for the anthropic principle, strong atheist physicist and "the father of string theory", Lenny Susskind, says that "the universe appears designed for life", you think that this means that the physics for the anthropic principle isn't bio-oriented.

*I am always willing to learn.*

You would be the first, but let's see... Per Lenny's authoritative opinion of the anthropic physics, do you still maintain that there is no appearance of design in the laws of nature?

*I have to say that if that happens, as things stand now we will be in a very awkward position. Without any explanation of nature's fine-tunings we will be hard pressed to answer the ID critics.*

*The appearance of design is undeniable*

-Leonard Susskind

45. [# artfulDon](#) 16 Dec 2009 at 4:54 pm

sonic, according to the Skeptic's dictionary, the argument from ignorance (argumentum ad ignorantiam) is a logical fallacy of irrelevance occurring when one claims that something is true only because it hasn't been proved false, or that something is false only because it has not been proved true.



Under that definition, the only one in your example arguing fallaciously from ignorance would be yourself. Otherwise, to the extent that no-one can know anything to a certainty, we are all arguing from some degree of ignorance.

46. [#weingon](#) 16 Dec 2009 at 5:04 pm

sonic,

You still haven't given a reference for your bacteria to elephant statement attributed to Darwin. When and where did he ever say such a thing? Or is it something made up for a creationist strawman argument?

47. [#artfulDon](#) 16 Dec 2009 at 5:59 pm

The alleged quotes attributed to Susskind were not to be found in the same context as the comment about the fine tuning was taken from an interview published in NewScientist, <http://www.newscientist.com/article/mg18825305.800-is-string-theory-in-trouble.html?full=true>

And the alleged comment that the appearance of design is undeniable will have come from his book, Cosmic Landscape: String theory and the illusion of intelligent design. Because Susskind is arguing that the appearance is deceptive, and has further asserted that he does not believe in an Intelligent designer.

And then he talks more about the fine-tuning in the same NewScientist interview: "The logic of the anthropic principle requires the strong assumption that our kind of life is the only kind possible. Why should we presume that all life is like us – carbon-based, needs water, and so forth? How do we know that life cannot exist in radically different environments? If life could exist without galaxies, the argument that the cosmological constant seems improbably fine-tuned for life would lose all of its force. And we don't know that life of all kinds can't exist in a wide variety of circumstances, maybe in all circumstances. It a valid objection. But in my heart of hearts, I just don't believe that life could exist in the interior of a star, for instance, or in a black hole."

(Reminds me of what I said earlier that some like weing found implausible.)

48. [#mindme](#) on 16 Dec 2009 at 6:02 pm

||As to mindme, he repeats that lizkat wrote what he says she did, but can't seem to find the quotation – which I can't seem to find as well. Shame on us both.||

Artful she stated (# lizkat on 15 Dec 2009 at 12:44 pm )

||But Darwin's hypothesis about what drives evolution has not been proven. It can be used to explain some adaptation, but it requires a leap of faith to assume it can account for all evolution.||

I quoted that to \*you\* in # mindme on 15 Dec 2009 at 11:32 pm. Go look. Really. Go look. It's right there.

To repeat

“I simply list known mechanism of evolution beyond liz’s sophomoric claim that evolution explains everything via selection of favorable random mutations.”

It can't be much clearer unless you simply ignore what's been written. Which appears to be what you've done.

||He also seems to deny that he referred to erosion as a mechanism analogous to selection. Leaving that reference then as essentially pointless.||

I referred to erosion as an example of a simple mechanism that appears to accomplish dramatic change and requires no additional mechanism until evidence is offered that requires us to abandon the hypothesis about what created the canyon.

It was an analogy to illustrate Dr. N's comment previous.

Where is your massive confusion?

49. [# Rob Heberton](#) 16 Dec 2009 at 6:10 pm

On Susskind:

Just because he admits that something “appears” designed doesn't mean he thinks that it IS designed. I admit that the complexity of living creatures makes them APPEAR designed, but the point of a bottom up, naturalistic method of generating that complexity (mutation and natural selection) is to refute the argument that “if it appears designed, it therefore must BE designed.” The theory of evolution is an attempt to show that intentional design is not necessary to achieve the appearance of design.

As to the commenters who agree with the basic mechanisms of evolutionary theory but feel the need to speculate the existence of some sort of reciprocal, intelligent, driving force to the whole thing, my point—and others'—is that such a driving force is unnecessary, unless its proponents can point to a phenomenon that cannot be explained in its absence.

Sonic-

Modern bacteria and elephants both have extra stuff in their genes that the bacteria from which they both descended did not have. Like, a lot of extra stuff.

Theoretically, we could figure out the elements they have in common and remove everything but those parts, giving us the genetic code of the “old” bacteria whose development eventually branched into modern bacteria and elephants.

Then we would have to figure out how to recreate the proper environment and stimuli, in the proper stages, that would be required to “grow” that bacteria to maturity.

THEN we would have to somehow select (after many, many generations of mutations) only for those changes that would be present in the elephant’s genetic code. This is far, far beyond current technological abilities, and breeding is too blunt an instrument to accurately select for such fine distinctions. It would also take a hell of a long time, orders of magnitude longer than homo sapiens has even been around.

50. # islandon 16 Dec 2009 at 6:24 pm

The ratio between the quantum expected vacuum energy density and what’s actually observed is often called the cosmological constant problem. It has perplexed physicists for at least 50 years, and the failure of science to resolve this problem from FIRST PRINCIPLES has been called the single biggest failure of (string) physicists in the last 30 years. It’s also where all this speculation about multiverses and other “bolder explanations” comes from, but none of them are the physics principle that is most naturally expected.

Physicists have been trying to resolve of why our universe looks nothing like our best theories predict that it should look like. The “natural” quantum expectation derives a vacuum energy density that is about 120 orders of magnitude greater than we observe, so it appears there must be a suppression mechanism at work that constrains the vacuum energy density by at least 120 orders of magnitude.

What is observed, looks more like this:

<http://abyss.uoregon.edu/%7Ejs/images/instability.gif>

The observed universe is near-perfectly balanced between diametrically opposing runaway tendencies that would send it racing rapidly toward dramatic extremes, were it not for an unexplained suppression mechanism that somehow constrains it to this unexpected configuration.

The Goldilocks Enigma can also be called the “Goldilocks Constraint”, because the mechanism that produces our balanced universe is also a critical feature of our own local ecobalances. This commonality indicates that there is a direct connection between the mechanism that defines the structure of the universe, and our existence, in other words, and that commonality most naturally indicates that there may be a bio-oriented cosmological principle in effect that requires carbon based life to appear over a specifically defined region and time in the history of the observed universe.

The phenomena that define the habitable zones of the Goldilocks Enigma are always \*near\* perfectly balanced between diametrically opposing runaway tendencies, just like the universe is.

Like the Earth is homeorhetically balanced between the life-prohibiting runaway tendencies that Venus and Mars suffer from.

It is this cosmological principle that is indicated by the “appearance of design”... not an ID.

That requires an unfounded leap of faith that no honest scientist would ever make given the natural expectation for resolution from a natural law that resolves the problem from first principles, which a multiverse will never accomplish.

51. # weingon 16 Dec 2009 at 6:27 pm

“(Reminds me of what I said earlier that some like weing found implausible.)”

There you go again. I happen to agree with Lenny on this. He expresses my sentiments exactly. Sorry, I did not get the same impression from reading your statements.

52. # islandon 16 Dec 2009 at 6:50 pm

quote, me:

*Like the Earth is homeorhetically balanced between the life-prohibiting runaway tendencies that Venus and Mars suffer from.*

This is for people who think that life as we know it can just happen anywhere:

<http://www.astronomynotes.com/solarsys/s9.htm>

*Venus, Earth, and Mars are approximately at the same distance from the Sun. This means they formed out of the same material and had approximately the same initial temperatures 4.5 billion years ago. Long ago these three planets probably had moderate enough temperatures suitable for life. However, Venus is now much too hot for life and Mars is too cold for life.*

How's that search going, btw?... because the testable prediction that falls from this is that life of any kind will never be found outside of the delicately balanced galactic and intergalactic habitable zones that define the Goldilocks Enigma.

Find any other kind of life there either?

I didn't think so, because the next most plausible form of life that we have ever been able to imagine... silicon based life, would have a better chance to form life enabling molecules and chanis right here on Earth than carbon based life does were it not for the precariously balance conditions that exist to permit life as we know it on Earth, since the ratio of carbon to silicon is 10:1 in favor of silicon... on Earth.

53. # Rob Heberton 16 Dec 2009 at 6:50 pm

island-

The universe was just right to produce my parents, that they would meet and breed, and that the specific ovum and sperm that united would generate my specific genetic code, and the presence of the environmental factors necessary for my development to term, and the occurrence of all the meaningful events of my life in sequence, have created the person I am today. The chances are overwhelmingly, astronomically in favor of a situation wherein I would not exist as I do now. But I still exist, despite all odds, so obviously there must be some Rob-oriented cosmological principle at work.

Nice to know the whole universe was made for me 😊

54. [#artfulDon](#) 16 Dec 2009 at 6:57 pm

mindme,

Here's what she said and you confirm she said:

[But Darwin's hypothesis about what drives evolution has not been proven. It can be used to explain some adaptation, but it requires a leap of faith to assume it can account for all evolution.]

Then in a further post, you converted that to the following:

In evolution, no one thinks only selection and random mutation fully explains the origin of new species (ie "account for all evolution").

But she never said "only." That was your unwarranted inference, as we find she was clearly referring to what her next post made clear:

"That is one problem I have with the current theory — it ignores all possible Lamarckian factors, some of which are beginning to be recognized. So we already have scientific evidence that neo-Darwinism is, at least, an over-simplification. And we have no idea just how over-simplified it might be. My guess — and all anyone can do right now is guess — is that evolution will start to look much more complicated as the scientific evidence comes in."

Which commentary you have studiously and repeatedly ignored. Or was that simply a failure on your part to read?

These newer versions of an old idea are of course "massively confusing" to your lot.

55. [#M. Davieson](#) 16 Dec 2009 at 7:00 pm

**island**

*This is for people who think that life as we know it can just happen anywhere*

I don't know many people that think this.

Life emerges under conditions which are amenable to the emergence of life. So what? Any phenomena exists only under conditions which allow it to exist. If physical laws

were different, Venus wouldn't be Venus. That doesn't mean that Venus is existing at some delicate balance point that physical laws conspired to make possible. The same goes for life.

56. [#islandon](#) 16 Dec 2009 at 7:10 pm

And we're seeing that people \*\*\*instantly\*\*\* don't get it. What a surprise.

57. [#islandon](#) 16 Dec 2009 at 7:12 pm

“This is for people who think that life as we know it can just happen anywhere.”

*I don't know many people that think this.*

Gee, I thought that the consensus was that life evolved to the conditions... so simple stupid stuff like this tells us that it could happen just about anywhere.

58. [#Rob Heberton](#) 16 Dec 2009 at 7:24 pm

island-

“I thought that the consensus was that life evolved to the conditions... so simple stupid stuff like this tells us that it could happen just about anywhere.”

That makes absolutely no sense. Life evolved on Earth in certain ways and not others because of the conditions on Earth, therefore life can arise anywhere? That's a complete non sequitur...

59. [#M. Davieson](#) 16 Dec 2009 at 7:25 pm

To talk about how life fits into such a 'delicately balanced zone' reminds me of marveling at “why each creature fits so precisely into the corresponding hole in space” (hat-tip to Jerry Fodor).

60. [#islandon](#) 16 Dec 2009 at 7:29 pm

And now for the reason that people won't get it:

Contrary to popularized modern and “variant” interpretations, the Anthropic Principle was originally formalized by Brandon Carter as an ideological statement against the dogmatic non-scientific prejudices that scientists commonly harbor, that cause them to consciously deny anthropic relevance in the physics, so they instead tend to be willfully ignorant of just enough pertinent facts to maintain an irrational cosmological bias that leads to absurd, “Copernican-like” projections of mediocrity that contradict what is actually observed.

<http://www.finkjohannes.com/anthropicprinciple.pdf>

*The first known occurrence of the phrase “anthropic principle” appears to have been by the theoretical astrophysicist Brandon Carter, in his contribution to a 1973 symposium titled “Confrontation of Cosmological Theories with Observational Data” honouring Copernicus’s 500th birthday. His article articulated the anthropic principle as the contrary of what has come to be called the Copernican principle (which Copernicus did not articulate), which denies that the situation of humans in the cosmological order is in any way privileged. (Just as Copernicus argued that the Earth is not the centre of the universe, we now know that the sun is a typical star located in a typical galaxy.) Carter’s symposium paper, “Large Number Coincidences and the Anthropic Principle in Cosmology,” included the statement: “Although our situation is not necessarily “central”, it is inevitably privileged to some extent” (IAUS 63 (1974) 291).*

However unfortunate, Carter’s point lends a certain amount of real scientific credence to the claims of IDists, that scientists willfully suppress credible evidence that they wrongly perceive to be in support of the creationist’s position. It is just as unfortunate that this makes the lies and embellishments of the ID movement into a necessary evil, to counterbalance to the unscientific dogma that scientists commonly project into science.

Carter was talking about an equally extreme form of counter-reaction-ism to old historical beliefs about creationism and geocentricism that cause scientists to automatically dismiss evidence for anthropic “privilege” right out of the realm of the observed reality. I intend to put very heavy emphasis on this point, because people go to unbelievable lengths to distort what Carter said on that fateful day in Poland, in order to willfully ignore this point as it applies to modern physics speculations and variant interpretations, which are neither, proven, nor definitively justified, theoretically.

Why do none of the popular definitions of the Anthropic Principle include what Carter actually said?

Because nothing has changed... and we still have not solution from first principles.

Equally surprising is that...

...”a reaction against conscious and subconscious – anticentrist dogma.”

*Unfortunately, there has been a strong and not always subconscious tendency to extend this to a most questionable dogma to the effect that our situation cannot be privileged in any sense. This dogma (which in its most extreme form led to the “perfect cosmological principle” on which the steady state theory was based) is clearly untenable, as was pointed out by Dicke (Nature 192, 440, 1961).*

-Brandon Carter

61. #islandon 16 Dec 2009 at 7:33 pm

*To talk about how life fits into such a 'delicately balanced zone' reminds me of marveling at "why each creature fits so precisely into the corresponding hole in space"*

No dork, it is the commonality that exists between these life enabling conditions and the structure of the universe itself which most apparently indicates that there is a bio-oriented cosmological structure in effect.

Whatever you do though... DO NOT give any degree of plausible credence to something that could resolve the great mystery from first principles.

We DON'T want to look there.

Yeah... Douglass Adams... that's the ticket!

62. [# Rob Heberton](#) 16 Dec 2009 at 7:53 pm

island, I know you're getting a little worked up, but no need to call M. Davies names.

[I've taken the liberty of flipping your phrasing around so the sentence states evidence and its conclusion, not the other way around--I've just changed it from passive to active for clarity]

You said: "the commonality that exists between these life enabling conditions [meaning, for instance, the cosmological constants, right?] and the structure of the universe . . . indicates [the existence] of a bio-oriented cosmological structure."

In other words: because the structure of the universe does not preclude life, a bio-oriented cosmological structure must exist. It's a complete tautology--because life exists, there must be an underlying structure that allows it to exist. Well, of course.

To the extent the statement is accurate, it's useless.

63. [# islandon](#) 16 Dec 2009 at 7:53 pm

Douglassssssss... I mean

"I thought that the consensus was that life evolved to the conditions... so simple stupid stuff like this tells us that it could happen just about anywhere."

*That makes absolutely no sense. Life evolved on Earth in certain ways and not others because of the conditions on Earth, therefore life can arise anywhere? That's a complete non sequitur...*

No, you misunderstood. The consensus of opinion of the majority \*here\* in this forum, and of the author, is that life evolved to fit the conditions, so this logic, not mine, life as we know it should be found in mars or on IO or maybe under the frozen ice on the moon.



Failing to falsify...

And so the testable prediction of the Goldilocks Enigma that science is currently attempting and failing to falsify is that life will not be found outside of the balanced habitable zones that extend to other similarly evolved galaxies in our universe.

64. [# islandon](#) 16 Dec 2009 at 8:00 pm

Rob, had you bothered to read the highly informative information that I've been giving, then you'd know that your statement is lame:

*The Goldilocks Enigma can also be called the "Goldilocks Constraint", because the mechanism that produces our balanced universe is also a critical feature of our own local ecobalances. This commonality indicates that there is a direct connection between the **mechanism** that defines the structure of the universe, and our existence, in other words, and that commonality most naturally indicates that there may be a bio-oriented cosmological principle in effect that requires carbon based life to appear over a specifically defined region and time in the history of the observed universe.*

*The VERY SAME phenomena that define the habitable zones of the Goldilocks Enigma are always \*near\* perfectly balanced between diametrically opposing runaway tendencies, just like the universe is.*

*That commonality Rob.*

65. [# M. Davieson](#) 16 Dec 2009 at 8:08 pm

The fact that evolution is an interaction with an environment, and thus partially determined by that environment, doesn't lead to the conclusion that life can emerge anywhere. I know I never said that life evolves to fit conditions (that is a teleological argument, which has no place in discussions of evolution). The closest I said was that *Life emerges under conditions which are amenable to the emergence of life*. Life won't emerge anywhere; that doesn't force me to conclude the existence of a bio-oriented cosmological structure. Liquid water only exists under particular circumstances, perhaps there is an aqua-oriented cosmological structure?

*And so the testable prediction of the Goldilocks Enigma that science is currently attempting and failing to falsify is that life will not be found outside of the balanced habitable zones that extend to other similarly evolved galaxies in our universe.*

So maybe there are limits as to where life emerges. I don't think this leads to the conclusions you think it does.

66. [# Rob Heberton](#) 16 Dec 2009 at 8:10 pm

island-

If I misunderstood why you brought up the consensus thing about life arising on other planets, I seriously apologize. I don't think that "life can evolve anywhere" is a logical conclusion from the premise that life on Earth evolved to fit the conditions on Earth, so if others have taken that stance, I won't defend it.

I do think that there probably are a limited number of ways, chemically, that life can occur, replicate, etc., and so, there may be some places where life can't arise, or some "materials" that aren't conducive to life. Maybe life requires a certain number of different elements, or elements that can take many different configurations, like carbon, to "work." It's hard to know either way.

Even if life can only arise from carbon structures on Earth-like planets in galaxies like ours, I think the sheer size of the universe means there could be other lifeforms somewhere. Whether we would recognize them is a separate issue. It's just basically Drake's equation, right? So it's more of a speculative thought experiment, rather than an affirmative claim.

67. [#islandon](#) 16 Dec 2009 at 8:13 pm

*The fact that evolution is an interaction with an environment, and thus partially determined by that environment, doesn't lead to the conclusion that life can emerge anywhere.*

Right on, Brutha!!!... 😊

Partially determined????... me thinks not it's more like, totally determined and without any uncertainty.

*So maybe there are limits as to where life emerges. I don't think this leads to the conclusions you think it does.*

Ah, but your belief doesn't justify 50 years of willful ignorance of the evidenced plausibility either.

68. [#Rob Heberton](#) 16 Dec 2009 at 8:16 pm

island-

What mechanism are you referring to and how is it a critical feature of our "local ecobalances"? Do you mean ecobalance in the sense of LCAs, or something else?

69. [#islandon](#) 16 Dec 2009 at 8:17 pm

Rob said:

*It's just basically Drake's equation, right?*

No, the Drake equation defines an extremely strong principle that doesn't take time into account.

<http://arxiv.org/abs/gr-qc/9812093>

When you apply the Goldilocks Enigma, rather than the mediocrity principle, then a much more accurate and testable formula falls-out along with a more accurate statement about a strong biocentric principle, so this “coincidental” Enigma extends to include every similarly evolved galaxy that exists in the same common “layer” of galaxies as we do. The average of extreme opposing runaway tendencies that are common to the anthropic coincidences make many testable predictions about the observed universe.

The “cosmological principle” derives a “mediocre” a priori statistical distribution of values of observables, but this is not what is observed and is the reason for the anthropic physics that defines the “Goldilocks Enigma”, so the combined effect of the cosmological principle with the goldilocks constraint extends to the observed universe to produce a biocentric cosmological principle.

This also addresses the alleged, Fermi “Paradox”, as well, since we should not \*yet\* expect to hear from similarly developed intelligent life, because their radio transmissions have not had time to reach us... \*yet\*... either.

70. [#artfulDon](#) 16 Dec 2009 at 8:28 pm

exogenesis anyone?

71. [#Rob Heberton](#) 16 Dec 2009 at 8:42 pm

[Separate post to the comment you made while I was making my previous post]  
No, I understand what you mean; I've only read certain parts of Davies' book, so I can't really refute his whole argument, but I know he takes the position that we would see more planets that do not satisfy the necessary conditions for life, or fewer planets that would satisfy the necessary conditions for life (in other words, the observed number of potentially life-sustaining worlds is higher than we would expect) assuming a simple statistical distribution of planets with varying conditions. I know that most do not accept this conclusion, partly because of problems defining the limits of “life-sustaining”—how do you know the planet can support life if there's no life on it? What portion of the planets in our own galaxy do we even know that much about? And so on...

I brought up the Drake equation concerning a separate issue, namely, given a certain number of potentially life-sustaining planets, what are the chances that one of them actually has life on it. If Davies were correct in his conclusions about the number of potentially life-sustaining planets in the universe, it would “fudge” one variable in the Drake equation. That would make the equation a little more accurate, because it would replace a blunt statistical estimation with a data point.

72. [# Rob Heberton](#) 16 Dec 2009 at 8:56 pm

Clarification on above:

“I know that most do not accept this conclusion...”

It’s not necessarily wrong—I just know that Davies’ perspective is not the consensus, although I don’t have the knowledge to refute it.

73. [# sonicon](#) 17 Dec 2009 at 2:47 pm

From the ‘Origin of Species’

“Therefore I should infer from analogy that probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed.”

So the complaints that Darwin didn’t say a bacteria became an elephant, I would agree, I have misquoted. He claimed all living things came from one original (probably), what that original was-undisclosed.

Please understand- I am not saying that life didn’t evolve in accord with the current ‘neo-Darwin’ theory. I am suggesting that at the heart of that theory is an argument from ignorance. (An argument from ignorance doesn’t mean the conclusion is wrong, just that the conclusion doesn’t follow from the argument.)

The reason I say this is because whenever I ask for an experimental demonstration of the ‘one that became all’, I am told we don’t know the one and it would take more time to demonstrate than is available to us humans.

But I am not allowed to question the conclusion based on the fact that the experimental and experiential evidence indicate otherwise.

This indicates that there is some idea that the ‘one that became all’ is a proven fact. But it has not been proven by experiment (in fact the claim is it can’t be- too much time), therefore I suggest that the claim must have been proven logically.

But by what logic? The fact I can’t prove otherwise?, or am I missing something?

74. [# artfulDon](#) 17 Dec 2009 at 4:55 pm

To the extent that Darwin proposed this as theoretical and not as a certainty, there was the tacit admission of relative ignorance that preceded the argument. Thus he has neither claimed that something is true only because it hasn’t been proved false, or that something is false only because it has not been proved true.

75. [# sonicon](#) 17 Dec 2009 at 5:47 pm

artfulD-  
excellent point.

(BTW have you ever looked into the recent evolution of the pneumonia bacterium? It might be an example of life evolving as a solution to a problem.)

76. [# Steven Novella](#) on 17 Dec 2009 at 5:50 pm

Sonic – you are taking too narrow a view of scientific methodology. Evolution is a historical science – it uses observation and tests hypotheses, mainly through inference – but is mainly observational and not experimental.

That all life on earth descended from a common ancestor makes predictions – predictions about what we will see in nature. For example – it predicts that there will be a hierarchical branching pattern of relatedness among living species every way we choose to look at them. This hypothesis has been confirmed to such a degree that we can take it as an established fact.

Elephants and bacteria share the same genetic code, for no functional reason. But this is what we would predict if they share a common ancestor. Also, there is no other viable hypothesis to explain this observation.

This is also positive evidence, which means the conclusion of common descent is not an argument from ignorance.

77. [# artfulDon](#) 17 Dec 2009 at 6:27 pm

sonic writes: “BTW have you ever looked into the recent evolution of the pneumonia bacterium? It might be an example of life evolving as a solution to a problem.”

There are examples galore of how life engineers it’s own solutions to problems. Unfortunately if you are a Neo-Darwinian, anything that smacks of Neo-Lamarckianism is an anathema.

78. [# artfulDon](#) 17 Dec 2009 at 6:35 pm

Sonic, on the subject of arguments from ignorance, check this out as one of the Neo-Darwinian stumbling blocks that still persist:

[http://en.wikipedia.org/wiki/Weismann\\_barrier](http://en.wikipedia.org/wiki/Weismann_barrier)

79. [# sonicon](#) 18 Dec 2009 at 9:45 pm

artfulD-  
That is new to me– thank-you much!

80. [# sonicon](#) 18 Dec 2009 at 10:06 pm

Steven-  
You are right- I do prefer experimental evidence to inference.  
I appreciate your comments about a common ancestor, but I’m not sure how that relates to my earlier statements.

81. [#artfulDon](#) 18 Dec 2009 at 10:55 pm

sonic, if you liked that reference, you may like the follow-up commentary on this site as well: