

# WHY EVOLUTION IS TRUE

by Jerry Coyne

« [A marine mystery solved \(and a bit about birds\)](#) [What is Islamophobia?](#) »

## A creationist weighs in

I get a fair number of creationists trying to post, and I often (but not always) block them. If I let them post, it's usually because they're at least coherent and articulate—rarities among this crowd. The following comment by "Aaron" arrived two days ago, and my first impulse was to block him. But then I thought that I should let his comment go through, since it instantiates the quality of thought exuded by creationists. I am not going to respond in detail, except to say a few words, but feel free to have at it. Here's what "Aaron" sent:

When will society wake up and realize how foolish the theory of evolution really is. There is so much that evolution does not and cannot explain when it comes to origins. For example, what came first – the heart or the brain. If the heart – what controlled its function absent the brain. If it was the brain – by what did it receive [sic] blood absent the heart. If they came together – well that just rules out evolution completely. You see, it requires throwing out all levels of common sense to force your mind to believe in the incredulous [sic]. Take for instance the complexity of the brain. Even the most die hard [sic] evolutionist would agree that the most brilliant scientists in the world would not know where to begin to be able to design such a complex machine. Yet these same evolutionists would have us believe the brain designed itself. Enough said.

Indeed, more than enough!

I'll just bring up two modern species that might bear some resemblance to our ancient ancestors. The first is a flatworm, which has a primitive brain but no heart or circulatory system. Nutrients and oxygen simply diffuse through the body wall into the animal.

Something a little bit more "advanced," like velvet worms (onychophorans), have both brains and hearts, but no formal circulatory system (i.e., no closed system of blood vessels). The circulatory system is "open," with a muscular pump (calling it a "heart" is generous) that simply circulates "hemolymph" (the "blood" of arthropods, molluscs, and other invertebrates) through the body cavity, directly bathing the organs. The hemolymph is then returned to the "heart" for more pumping. A "closed" circulatory system with a real self-contained network of blood vessels obviously evolved later.

Traits can develop in sequence, of course, all the while being adaptive, or two primitive and connected features could evolve in concert. There's no problem with envisioning that.

As for the complexity of our brains, and how that disproves evolution, well, I'll leave that to the readers as an exercise.

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**UPDATE:** The “Thinking Christian,” who has his/her own website, sent me this comment:

You’re a scientist, Dr. Coyne. You know better than to present a single, non-randomly chosen, anecdotal case as typifying a group. This message represents the quality of its own sender’s thought, not the thought that is “exuded” by a group.

LOL! Why, first of all, is it nonrandom? In what respect? Because I didn’t select one creationist out of all of them in the world? It’s “random” with respect to “creationists who write fairly literate posts on evolution websites” (it has only two errors of spelling or usage).

As far as this comment not typifying the thought of a group, all I can say is that the Thinking Christian hasn’t been doing his/her homework: this is actually perfectly representative of the views of many creationists. It instantiates not only the God-of-the-gaps argument with respect to the complexity of the brain, but also the “irreducible complexity” view that two organs that seem to need each other (although they actually don’t!) can’t have evolved together. It must have been God! Above all, it bespeaks the embarrassing ignorance of biology—willful or otherwise—evinced by creationists.

Thinking Christian, put your thinking cap back on.

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*This entry was written by [whyevolutionistrue](#) and posted on September 21, 2012 at 8:57 am and filed under [creationism](#), [LOLz](#). Bookmark the [permalink](#). Follow any comments here with the [RSS feed for this post](#). Post a comment or leave a [trackback](#): [Trackback URL](#).*

## 72 Comments



1.

thinkingchristian

Posted September 21, 2012 at 9:12 am | [Permalink](#)

You’re a scientist, Dr. Coyne. You know better than to present a non-random, single, anecdotal case as typifying a group. This instantiates the quality of one person’s thought, not that “exuded” by a group.

Reply



o

clubschadenfreude

Posted September 21, 2012 at 11:54 am | [Permalink](#)

so, TC, would you want to claim that you’ve Never ever seen this nonsense repeated again and again on forums and creationist websites?

Reply



o

azoomer

Posted September 21, 2012 at 1:56 pm | [Permalink](#)

it would have been probably worse if he picked a few creationist posts randomly.

[Reply](#)



2.

Greg Esres

Posted September 21, 2012 at 9:13 am | [Permalink](#)

You see, it requires throwing out all levels of common sense to force your mind to believe in the incredulous [sic].

One of the most astounding things to me is the typical belief among creationists (and climate change denialists) is that scientists operate with the same level of knowledge than untrained individuals have, alleviating any need to actually investigate a conclusion before pronouncing it stupid.

[Reply](#)



3.

thinkingchristian

Posted September 21, 2012 at 9:14 am | [Permalink](#)

You're a scientist, Dr. Coyne. You know better than to present a single, non-randomly chosen, anecdotal case as typifying a group. This message represents the quality of its own sender's thought, not the thought that is "exuded" by a group.

[Reply](#)



o

Achrachno

Posted September 21, 2012 at 11:51 am | [Permalink](#)

You seem to think none of us have ever seen creationists or their arguments before. Did this one seem uniquely defective to you? The ones I've seen are uniformly bad and the one Jerry posted was at least more literate than most we see on the web.

Would you like to present a good argument for creationism that we average WEIT readers can have a look at and perhaps comment about?

[Reply](#)



o

deepakshetty

Posted September 21, 2012 at 12:49 pm | [Permalink](#)

Please present the best argument for creationism.

[Reply](#)



4.

John Donohue

Posted September 21, 2012 at 9:16 am | [Permalink](#)

Wow if that is representative of one you let through, how insanely awful are the others?

re: Argument from Complexity:

Dear skeptic: please begin by giving the amount of time you believe true for the evolutionary period of higher organisms. If 6001 years or less, please don't bother to answer. If we can agree on the span, perhaps we can then discuss complexity.

[Reply](#)



5.

Sigmund

Posted September 21, 2012 at 9:24 am | [Permalink](#)

"If the heart – what controlled its function absent the brain. If it was the brain – by what did it receive [sic] blood absent the heart. If they came together – well that just rules out evolution completely. You see, it requires throwing out all levels of common sense to force your mind to believe in the incredulous [sic]."

Wait a second...

Maybe he's got a point!

When you think of it like that, there are plenty of other structures that evolution can't explain!

What about knees and ankles!

Can't you see the problem?

We need both to be there at all times – otherwise our feet would fall off!

Dammit Darwin, why didn't you think of this one!

[Reply](#)



◦

Desnes Diev

Posted September 21, 2012 at 10:27 am | [Permalink](#)

"Maybe he's got a point!"

Which is that blood vessels and nerves use similar molecular mechanisms to grow and, often, follow the same pathways during (vertebrate) development. Pretty clever of him. However, he did not think that the heart can be controlled by its own pacemaker activity.

More seriously, I find remarkable when creationists try to think about changes inside the limit of their static, unchanging worldview. They seem unable to really grasp the idea of temporal morphological modification. By discussing with some, I discovered that most of them were unaware that themselves changed a lot during their own development. They were naive preformationists.

Desnes Diev

[Reply](#)



▪

amelie

*Posted September 21, 2012 at 11:34 am | [Permalink](#)*

I've read something about the ear that implies it was a vestigial in some early organisms but that it never worked in any capacity until it evolved to the whole modern structure it is today. Not sure if that's correct.

[Reply](#)

6.



Neil Rickert

*Posted September 21, 2012 at 9:29 am | [Permalink](#)*

Unfortunately, that kind of magic thinking is all too common among creationists.

I think some of them really believe that a transitional species should have eyes with an iris but no lens or retina. And that's why they are so certain that there are no transitional species.

[Reply](#)

7.



wads42

*Posted September 21, 2012 at 9:39 am | [Permalink](#)*

Creationists always expect evolutionists to recite whole text-books of evolutionary theory to them from memory,-and then ignore or twist them. Why do they expect us to do all the work when they could actually read Darwin, Dawkins etc for themselves, instead of just accepting sound-bites from their "leaders",-eg "10 questions which evolutionists cannot answer".

So you don't accept that evolution occurs naturalistically because you cannot understand, or have not bothered to find out how it happens? But you think "God-did-it" is an acceptable answer? But in order for biologists to accept that hypothesis, you first have to demonstrate the existence of God, then you have to confirm that he is capable and in the habit of going round creating things; but most important you have to show exactly how he did-it,-hands on,-his production line; why some materials are used and not others; why here on Earth but not apparently on Mars or elsewhere. So without complex life, what exactly is the "purpose" of Mars, and other moons and planets? Detailed explanations please;-just as "atheistic" science does.

[Reply](#)

8.



ladyatheist

*Posted September 21, 2012 at 9:46 am | [Permalink](#)*

"Even the most die hard [sic] evolutionist would agree that the most brilliant scientists in the world would not know where to begin to be able to design such a complex machine. Yet these same evolutionists would have us believe the brain designed itself."

This implies the human mind is superior to evolutionary processes, when the writer himself exemplifies the limitations of the human

mind.

It also implies “design,” not evolution. It’s pure psychological projection to think that evolutionary theory depends on concepts that only creationists hold dear.

Aaron, if you’re reading this, you need to know that science is based on evidence, not speculation, and evidence can indeed be difficult to comprehend. You should investigate the evidence for yourself before rejecting evolution. And go beyond “The brain is really complex” as your “evidence.” Try learning about the brains of different kinds of animals and fossils. Although your brain is not up to the task of designing itself, it is up to the task of learning new things about the world.

Reply



o

Bob Johnson

Posted September 21, 2012 at 9:59 am | [Permalink](#)

Hey Aaron, pick up a copy of “The Neuroscience of Everyday Life” from The Teaching Company. It is 18 hours of video – very easy watching. It may be available at your library.

Reply

9.



DV

Posted September 21, 2012 at 9:48 am | [Permalink](#)

1. He’s right on one point but not in a way he anticipated. We do need to throw out common sense because our intuitions are often wrong on explaining the natural world. He overestimates the power of common sense and think it trumps actual science backed by evidence. Ironically contrary to common sense he probably accepts without question the nonsense claims of his religion.

2. Is this the new canard now – the brain is too complex to have evolved? No more love for the eye?

Reply



o

Strider

Posted September 21, 2012 at 11:08 am | [Permalink](#)

@DV +1 Common sense is \*way\* overrated!

Reply



o

SLC

Posted September 21, 2012 at 2:03 pm | [Permalink](#)

If we had to rely on common sense for explanations, we would not have quantum mechanics or relativity, the cornerstones of modern physics.

Both of these theories defy common sense in many ways.

Reply



10.

Bob Johnson

*Posted September 21, 2012 at 9:49 am | [Permalink](#)*

My first reaction involved only the basal ganglia. Fortunately, the prefrontal cortex (evolved later) kicks in before any real harm is done.

[Reply](#)

11.

coelsblog

*Posted September 21, 2012 at 9:49 am | [Permalink](#)*

Has anyone noticed the remarkable coincidence that all of us have legs *exactly the right length to reach the ground!* Surely this can not be a coincidence?

If our legs were an inch shorter, we'd be floating in mid-air, with no traction, and so totally unable to move. Yet, if our legs were an inch longer, they'd be ploughing (US = plowing) through mud and concrete, and we'd never get anywhere!

This remarkable coincidence can only be explained by God's magnificence and beneficence.

[Reply](#)

12.

eric

*Posted September 21, 2012 at 9:52 am | [Permalink](#)*

You see, it requires throwing out all levels of common sense to force your mind to believe in the incredulous [sic].

Take my advice and do just that. Throw out common sense and prepare to believe in the incredible. Nature is far more remarkable (and absurd) than anything you could imagine.

If thinking about evolution makes your brain seize up, don't try QM. Modern biology is far less absurd than modern physics.

[Reply](#)

13.

bernardhurley

*Posted September 21, 2012 at 9:54 am | [Permalink](#)*

Some men are born stupid  
Some achieve stupidity  
And some have stupidity thrust upon them!

[Reply](#)

14.

warren c

*Posted September 21, 2012 at 10:00 am | [Permalink](#)*

Beyond the specifics here, we see a misapprehension that runs through many creationist arguments: that the human being, or the cell, or whatever marvel they bring up must have sprung into existence fully-formed, like Minerva. It's like pointing to a 747 to prove that the Wright brothers could not possibly have invented the airplane.

[Reply](#)

Hempenstein

*Posted September 21, 2012 at 10:53 am | [Permalink](#)*

It seems it's that exactly with Aaron – he's first and foremost bought the concept that our only predecessor was dust. (It's us, it's us, it's all about US!) Absent a creator, how could that possibly have happened? No concept of ancestry in deep time.

And Aaron, to pick up on Greg's comment @ 1, you can go a long way toward catching up with the scientific outlook on all of this by reading a book. As Richard Dawkins once said, "There are shelf-miles of them."

[Reply](#)

15.



Curt Nelson

*Posted September 21, 2012 at 10:01 am | [Permalink](#)*

Aaron, the first living things were extremely simple. They didn't have hearts or brains, just like a lot of simple creatures today. The idea of evolution is that complicated things like hearts and brains formed (evolved) slowly from much simpler versions in much simpler creatures. It's important to realize that life started out very simple and complexity slowly evolved. Things like eyes and hearts and brains didn't just pop into existence.

[Reply](#)

Veroxitatis

*Posted September 21, 2012 at 10:20 am | [Permalink](#)*

Cellular chemistry is anything but simple. Recognising that is not intended to provide even a fig leaf far less a defence for creationism. But to appear to trivialise the deep mystery of the origin of life or the complexity of archaic life is simply to give ammunition to the biologically semi-literate.

[Reply](#)

16.



lamacher

*Posted September 21, 2012 at 10:04 am | [Permalink](#)*

These YECs are incapable of understanding, even acknowledging, the concept of `deep time`. When your timeline is limited to 10,000 years or less, the notion of time stretching back more than 100,000

times that long is beyond their comprehension. To keep their brains from bursting, they cling to childish fantasies. Poor babies!

[Reply](#)

17. 

**Michelle Beissel**

*Posted September 21, 2012 at 10:19 am | [Permalink](#)*

Aaron, step off your mental merry-go-round of no intention, no explanation, no common sense, brains make themselves, enough said. This circular ride has made you dizzily impervious to the uncommon sense of climbing Mount Improbable, that is, the recognition that complexity results from the accumulation of small changes through time.

[Reply](#)



Scott near Berkeley

*Posted September 21, 2012 at 10:53 am | [Permalink](#)*

He can't help it. There is no Free Will, and he's just along for the ride. It's like telling a compulsive shopper ("Retail Therapy") hey, quit buying stuff to make yourself feel better.

They can't help what they feel compelled to do.

Neither can we, in our compulsion to write an answer!!

[Reply](#)

18. 

**Tom**

*Posted September 21, 2012 at 10:19 am | [Permalink](#)*

I think these Creationist arguments also miss a pretty glaring fundamental point about trajectory.

Yes, there are structures and adaptations that the Theory of Evolution has not yet explicitly, directly explained; there are some features such that we don't fully know how they evolved. But we should look at the bigger picture here. Evolutionary biology is what philosophers of science would call a 'progressive' research program: it continues to make novel, risky predictions, and those predictions are generally verified. In contrast, Creationism is a degenerating research program: it fails to make risky predictions, or when it does, they tend to be falsified; and the "room" left for Creationist explanations keeps getting smaller and smaller.

Analogy: Suppose your favorite baseball team loses 161 games and is about to play its final game of the season. You might still insist that it's actual the best baseball team, and that we'll finally see that in the last game of the season. In contrast, another team might win 161 games, and you might insist that its players will finally all choke in that 162nd game. Yes, they haven't played that final game yet. But we're pretty sure how it will turn out. (And that team that's won 161 games has already clinched its division championship anyway.)

[Reply](#)



19.

**Ben Goren***Posted September 21, 2012 at 10:36 am | [Permalink](#)*

What I'd like to know, is who stacks the gumballs in the gumball machine?

Well?

b&

[Reply](#)



20.

**revelmundo***Posted September 21, 2012 at 10:38 am | [Permalink](#)*

The saddest part here is that Aaron probably see nothing in JC's response that he will take (infuse) into his brain (in the same fashion as the flatworm) as something worthy of causing a re-evaluation of his mental rut.

He's stuck in the rut and can't get out.

Help, someone call Brain Alert.

[Reply](#)



◦

Scott near Berkeley

*Posted September 21, 2012 at 10:56 am | [Permalink](#)*

That's not "sad", it's simply reality.

Your statement might be akin to "the saddest part of inadvertently falling off a cliff is the gravitational acceleration."

Saddist??!!

[Reply](#)



21.

**Gasper Sciacca***Posted September 21, 2012 at 10:40 am | [Permalink](#)*

Professor Coyne, why do you and PZ Myers for that matter give voice to creationists? That is what they want. You have recognized them. You only help them hone their ability to get more attention. They are all over the place now. The best way to stave them off is to ignore them completely. Would an astronomer condescend to a dialogue with an astrologer?

[Reply](#)



◦

Scott near Berkeley

*Posted September 21, 2012 at 11:06 am | [Permalink](#)*

It's important to see what others are believing, and I am glad Prof Coyne printed this. These are simplistic arguments, but it's =more= important that we open-minded folk hone =our=

arguments.

How do you treat people's Fear of Flying?

Certainly, whatever the first approach was, it evolved through trial and result. Same thing here. I've never heard this "heart and brain" argument before. It is stunningly wrong on so many levels, but because of that, it is difficult to unpack. And mere hesitation leads to an "Ah-haaaaaaa!" moment for the purveyor.

It's the same as all the "Classroom, Teacher, and Student" stories. Teacher says "X". Lone student says, "But if X, then why is Y also the same as X?" Teacher, slack-jawed, has no answer. Student knows truth, which is Y, and teacher is humiliated for holding X to be true.

Reply



Ben Goren

Posted September 21, 2012 at 11:16 am | [Permalink](#)

I've never heard this "heart and brain" argument before. It is stunningly wrong on so many levels, but because of that, it is difficult to unpack.

No, it's not. It's just irreducible complexity at the scale of organ systems rather than organelles.

And Jerry showed just how to unpack it. We've got examples of organisms with very simplistic circulatory and nervous systems but neither heart nor brain. You can trace the complexity scale all the way from there to humans, including the advantages offered by each refinement *as well as* how the organism is able to get by (but not as effectively) without the next-higher rung in the ladder. Plus, there are many scaffolds along the way that originally serve one purpose but either get repurposed or discarded, many dead ends that still get explored, and so on.

In other words, same deal as the eye, same deal as the flagellum.

Cheers,

b&

Reply



invivoMark

Posted September 21, 2012 at 11:22 am |

[Permalink](#)

But irreducible complexity, if it could be demonstrated, would be a valid argument against evolution. It won't be demonstrated, and arguably it couldn't be demonstrated even in principle, even if it were true. But because of the possibility of validity, it can't be simply dismissed. Calling a creationist out on using IC doesn't win you the argument.

That's why it's important that people like Jerry and PZ, who understand evolution better than most of us, take these arguments to task.

Reply



Ben Goren

Posted September 21, 2012 at 11:49 am | [Permalink](#)

Oh, I'm not suggesting that we should ignore these arguments — quite the contrary. Jerry dealt the them, I dealt with them, we all should deal with them. We should, of course, deal with them in a dismissive manner that still gets the education out there, but that's a rhetorical matter.

All I was trying to do was caution Scott that he shouldn't give up just because he's never heard of this particular variation on the IDiot theme before.

Cheers,

b&

Reply



invivoMark

Posted September 21, 2012 at 12:14 pm | [Permalink](#)

Ah, that makes sense. Carry on!

Reply



Scott near Berkeley

Posted September 21, 2012 at 12:38 pm | [Permalink](#)

Ben, I appreciate your comments.

To state my idea more clearly, I say this:

I prefer to construct my answers to make sense at the level of other person's expertise. To do that, I have to expend extra mental energy to do satisfactorily both formatting and data assembling simultaneously.

I know from prior experience that sometimes I am slow to construct an effective, on the spot, at the moment, rejoinder to weird arguments. My preference is to be prepared in advance, so I welcome seeing novel garbage (to a point!) Often, the purveyor of such weird arguments will

perceive one's hesitation as "Proof of the Truth!!" It happens, have had it happen to me.

I did not know about the flatworms and velvet worms, brains, circulation, etc. Now I do! More bullets. And, I will use them as needed. To wit: I've (successfully!) used the laryngeal nerve example from Jerry's book (page 82-84) on many occasions.

[Reply](#)



Greg G

Posted September 21, 2012 at 1:36 pm |

[Permalink](#)

But irreducible complexity, if it could be demonstrated, would be a valid argument against evolution.

Not really. Herman Muller predicted "interlocking complexity" from Darwinian principles nearly a hundred years ago.

[Reply](#)



invivoMark

Posted September 21, 2012 at 1:56 pm | [Permalink](#)

"Interlocking complexity" is different from "irreducible complexity".

Of course we expect to see stuff that looks like Behe's IC, but that doesn't mean they ARE Behe's IC.

[Reply](#)



invivoMark

Posted September 21, 2012 at 11:16 am | [Permalink](#)

Because the alternative is far worse. What, should we just ignore creationist arguments and pretend like they don't exist? What happens then?

Then when people are talking with friends or acquaintances about evolution, they don't know how to answer these challenges. Then when people are reading random posts or websites on the internet by creationists, they don't know why the creationist logic is bad. And then evolution starts to look a lot more flimsy than it is.

People change their minds. We aren't all born on one side of the debate on the other, never to switch sides. But the only

way a person's mind will be changed to accepting the fact of evolution is if they know that the arguments for evolution are solid.

Evolution is true. There is nothing to fear in allowing discussion over challenges to that fact, because the truth only becomes stronger with discussion. When we discuss the arguments of creationists, we have nothing to lose, but a lot to gain.

[Reply](#)



Rebecca Harbison

Posted September 21, 2012 at 11:19 am | [Permalink](#)

One example I can see is that it would help people 'on the fence' so to speak: those that aren't that knowledgeable about science, but who aren't heavily invested in a creator God. Seeing that when YECs say 'evolution can't explain that!', scientists say 'Um, yes it can and let me give examples and explanations'.

Our fence sitter then learns that scientists do have explanations for things and that they no more consider natural selection a theory in trouble (or whatever) than we consider the theory of gravitation.

[Reply](#)

22.



lamanga2004

Posted September 21, 2012 at 10:41 am | [Permalink](#)

Jerry, I'm a teacher of science, an avid reader of this blog, and the owner of many wonderfully accessible books on all manner of topics – yours included.

Sic-ing this email was fine up to the point where you left yourself open to be sic-ed back.

Nuff said.

[Reply](#)



whyevolutionistrue

Posted September 21, 2012 at 11:17 am | [Permalink](#)

Well, who ever said I was perfect? 😊 . I still maintain that my level of grammatical imperfection and misspelling is less than that of most creationists!

What was my mistake?

[Reply](#)



joe piecuch

Posted September 21, 2012 at 11:30 am | [Permalink](#)

"I'll just bring up two modern pecies..."

Reply

23.



Scott near Berkeley

Posted September 21, 2012 at 10:48 am | [Permalink](#)

Because the brain and its functions are so unfathomable complex, I'm beginning to simply let people such as Aaron make their rationalizations and I say no more. Because of their brain chemistry, these people are not open to reason. Fear of heights, fear of clowns, fear of spiders, .... people have all manner of phobias, as well as irrepressible desires (need for religion, child porno, drug-induced happiness, need for adrenaline) that are anomalous, and sometimes harmful to society. Irrationalities are hard-wired within us. Ions, chemicals, and hormones work in billions of synaptic networks, and people will go to great lengths to defend their complex biochemical networks. It's all just like the businessman in WEIT: "...but I still don't believe it."

If some idea or concept is presented that their biochemical networks won't allow, they defend their condition, or attack the thinking of others. They dress up their irrationalizations and present them on a Stage of Common Sense. If you find flaw, they re-rig the costume, the stage, and the speech, and show it again. If ever there were an argument against free will...

Nothing to be done....

Hey, how is that "Common Sense" and the Earth circling the sun doing, Aaron? Go out in the backyard, and prove with "Common Sense" that the earth circles the sun.

Reply



Ben Goren

Posted September 21, 2012 at 11:11 am | [Permalink](#)

You need to spend some time on Richard Dawkins's "Convert's Corner" and read all the stories from people who once were as dain brammaged as Aaron who came to their senses after having their fantasies challenged with reality.

Indeed, I'd go so far as to suggest that Aaron's letter to Jerry may well represent Aaron's first steps down that same path.

Cheers,

b&

Reply



Scott near Berkeley

Posted September 21, 2012 at 11:58 am | [Permalink](#)

OK, certainly, I hope you are right.

The evidence you cite makes a case. Then I see people on Fox News, and think "This is like Fear of Flying. No one who is rational and intelligent can truly believe this stuff, unless their biology makes them so!"

Reply



Ben Goren

Posted September 21, 2012 at 12:32 pm |

[Permalink](#)

People overcome fears all the time. Doing so is generally simple, though not necessarily easy (or cheap).

If you're afraid of flying, go to the nearest flight school and tell them you want to conquer your fear of flying. Assuming they're not know-it-all hotshot assholes, they'll be delighted to do so (though it'll cost you money).

A good program would start with the exact same ground school as any student pilot gets. You'll learn about the physics of flight, especially the forces that act upon a plane. You'll learn how the control surfaces operate, what the instruments on the panel measure, basics of weather and navigation, all that sort of stuff.

Once you've got the book learning, there shouldn't be any more mystery to flight, but that doesn't help you with the instinctual irrational nature of the fear — all it does is give you an internal running narrative to reassure yourself that it's not as bad as you feel it is. But that's okay; that's enough to start. You'd probably want a week or so for this, depending on how long the classes are.

The next step is to go out to the plane and examine it closely — that is, do a thorough pre-flight inspection, with the instructor showing you everything, answering all your questions, and telling you the questions you should be asking but don't know enough about. It means wiggling the ailerons, running your hands over the propeller, draining a bit of fuel from the tanks, checking the oil in the engine, all that stuff.

That should, of course, include an inspection of the cockpit, including having you sit in the left seat, playing with the controls, and reviewing all the instruments.

And that might be enough for a single day, especially if coupled with more ground school.

The next time, the instructor would have you start the engine, play with the throttle, and do a bit of taxiing. Plenty for the day.

If you're up to it for the next day, the instructor would have you fill out a complete flight plan for a short loop around the airport. You'd then taxi the plane to the end of the runway, radio in the request for permission from the tower to take off while the instructor does all the engine run-up tests, and then the instructor (sitting in the right seat; planes have dual controls) would fly you around the airport according to your filed flight plan. Assuming you're not reaching for the barf

bag, you'd even get to take the controls for a minute or so in the middle.

At this point, either you've desensitized yourself enough that flying is tolerable or you know how much more instruction you'll need to get comfortable. Chances are excellent, though, that you'll be hooked and want to continue all the way to get your own private pilot's certificate.

Most other fears can be treated similarly.

Cheers,

b&

Reply



amelie

Posted September 21, 2012 at 12:45 pm | [Permalink](#)

The exposure part is correct Ben but I can tell you first hand that it only works with cognitive work with a professional. If you do it wrong you'll make the fear much worse. Have to tread carefully and intelligently using the best informed methods. I'm afraid the media again have skewed the science and oversimplified it.

Reply



amelie

Posted September 21, 2012 at 12:48 pm | [Permalink](#)

My personal experience by the way was trying to drive through a feared storm during a tornado watch to get over my phobia – the road flooded and I ended up fleeing the car in a hail storm to get indoors. That's the example – no help from a professional, ta da! I set myself back a good year or so.

Reply



Ben Goren

Posted September 21, 2012 at 1:06 pm | [Permalink](#)

Excellent point, and that's why I added that bit about, "Assuming they're not know-it-all hotshot assholes...."

A flight instructor is a highly-trained, highly-certified, carefully-regulated professional. Granted, that's all generally geared towards the task of

operating an aircraft, and flight instructors aren't mental health professionals by any stretch of the imagination...but a competent instructor will either have the passion for flying and experience teaching to know how to help somebody overcome a fear of flying, or will know that the right thing to do is hand the student off to another instructor better suited for the job. And the owner of a successful flight school will know which instructors in the pool should get those sorts of students.

Just as you'd want to shop around before settling on a counselor rather than picking the first person you see in the phone book...well, due diligence is always called for.

Cheers,

b&



amelie

Posted September 21, 2012 at 1:39 pm |

[Permalink](#)

Agreed. I think the knowledge is valuable of we dismiss the idea of the phobic being in a moving aircraft. With one caveat I'd say being fearful someone can easily take any bit of information and turn it into a danger.

[Reply](#)

24.



Max

Posted September 21, 2012 at 10:52 am | [Permalink](#)

Aaron,

Long ago, way way back, beings existed without hearts or brains. They were called "Republicans." And over time- a long long incomprehensible amount of time- nothing changed. But don't let this stop you from believing in evolution.

[Reply](#)



Scott near Berkeley

Posted September 21, 2012 at 11:08 am | [Permalink](#)

Plus, a thousand!! I laughed out loud (and, I have time to actually write it out.)

[Reply](#)

25.



MAUCH

*Posted September 21, 2012 at 10:53 am | [Permalink](#)*

The creationists are so obsessed with what is not known in science. Does he ever wonder how it is that his god should be the answer to everything? I would wonder if I should trust a god who claims to be the know all and the be all yet refuses to give us the details of how he pulled this thing off.

[Reply](#)

26.



Achrachno

*Posted September 21, 2012 at 10:58 am | [Permalink](#)*

Aaron "Even the most die hard [sic] evolutionist would agree that the most brilliant scientists in the world would not know where to begin to be able to design such a complex machine."

Evolution is smarter than you and I are. Evolution skips the whole design phase and goes right to building: millions of variants over many years. Most don't work out, but the ones that do go on to make offspring similar to themselves, and some of those work even better. Repeat indefinitely many times.

"Yet these same evolutionists would have us believe the brain designed itself."

No one believes any brain designed itself. Saying things like that makes you look deeply ignorant, which is a bad way to look.

Please go get Darwin's original book, *The Origin of Species*, so that you'll at least know what he was arguing back in the 1850s: more than enough to settle most creationist arguments IMO. But, also get a copy of a modern summary such as "Why Evolution is True" to get some idea of what we've learned since then. There are whole wings of libraries of books on this topic, more that any of us will ever read or understand. Conversely, creationism literally has nothing. Not even a proper hypothesis.

[Reply](#)

27.



JonLynnHarvey

*Posted September 21, 2012 at 11:05 am | [Permalink](#)*

Actually, a lot of things contrary to common sense are demonstrably true, starting with Isaac Newton's discovery that unimpeded by friction an object traveling in space at 5mph will stay traveling at that speed forever.

Before Newton. standard (Aristotelian) physics assumed everything ran out of "steam" (energy) after a certain point and naturally came to a stop. The Aristotelian model is more common-sense, but it is wrong.

As Carl Sagan observed, a scientist needs two qualities which are somewhat in tension- one is the willingness to entertain the idea that ideas very contrary to common sense might be true, and the other is to subject them to rigorous testing. One of Sagan's own examples was from quantum physics, naturally.

It is in one sense perfectly natural to believe that the human skeleton and brain are in fact designed by God. There is a half-truth to Alvin Plantinga's assertion that it is natural to extrapolate from our awareness of other minds to belief in invisible spirits or a creator-deity. But the fact that may be the main natural impulse of our minds does not necessarily make it true.

There is a mountain of evidence supporting evolutionary theory, which includes certain elements of awkwardness in the design of humans. For example, our rib-cage is much better suited to a four-legged creature than a two-legged one. See also the book "The Accidental Mind" which as one reviewer put it "addresses how the brain has evolved in a sloppy manner and is the result of many imperfect components and/or developmental processes." especially the first chapter "The Inelegant Design of the Brain". (Warning to readers of WEIT: The author believes that except for fundamentalism, science and religion are compatible!)

Reply



Scott near Berkeley

Posted September 21, 2012 at 11:13 am | [Permalink](#)

I stick to my simple example of asking someone touting "common sense", to use that "common sense" and any of his at-hand hardware, to demonstrate that the earth circles the sun, as one watches the sun rise in the east, move overhead, and descend in the west....day after day after day.

Common sense tells you that we live in a geocentric universe.

Reply

28.



Darth Dog

Posted September 21, 2012 at 11:10 am | [Permalink](#)

"...what came first - the heart or the brain..."

The old which came first, the chicken or the egg. The problem here with creationists that I have spoken to is that they don't know enough biology to have any idea of what simpler forms of organs like the brain or heart would look like, so they have no idea of how a simpler system could have led to the current one.

I've had luck with some of them by pointing to human systems that have changed over time. Look at automobiles. There is no way the current system could have been put in place complete as it is. There are millions of cars, miles of roads, gas stations every few blocks, trained mechanics to service cars, car dealerships to sell and service cars, and a whole world-wide industry which finds and delivers gasoline for your neighborhood.

So which came first? The car or the gas station? How could you have one without the other?

Most people can easily understand how the system started very simply and became more complex over time. And no one had the end result in mind when they invented the first cars.

So Aaron? What do you think?

[Reply](#)



29.

[TheWordpressGhost](#)

Posted September 21, 2012 at 11:10 am | [Permalink](#)

Did you intend to write 'species?'

Ghost

[Reply](#)



30.

Bob Carlson

Posted September 21, 2012 at 11:16 am | [Permalink](#)

I happen to presently be reading the electronic version of Eric Kandel's *In Search of Memory: The Emergence of a New Science of Mind*. One of his remarks on evolution seems appropriate here:

Thus we gain from the new science of mind not only insights into ourselves—how we perceive, learn, remember, feel, and act—but also a new perspective of ourselves in the context of biological evolution. It makes us appreciate that the human mind evolved from molecules used by our lowly ancestors and that the extraordinary conservation of the molecular mechanisms that regulate life's various processes also applies to our mental life.

.

[Reply](#)



31.

[amelie](#)

Posted September 21, 2012 at 11:32 am | [Permalink](#)

This is a decent example of what Coyne talks about, but an even better example of blind denial. Creationists would dream up any scenario in the planet in order to meet their delusions.

The first question I ask all Creationists (and Deniers especially, since they might kill us all with their idiocy) is to read studies I post then comment on why they think the methods are wrong.

I usually never hear back from them. The few times I do they've clearly scanned the abstract or introduction and cherry picked words like "uncertainty" and deliberately misunderstood their meaning.

I have to admit I'm disappointed more scientists don't automatically post links to published studies and demand a response from deniers.

Creationists use the senseless gap argument so it's not as useful.

Reply

32.



Rikki\_Tikki\_Taalik

Posted September 21, 2012 at 11:35 am | [Permalink](#)

Hmmm, the 'ol "you can't explain X therefore Y" gambit.

Usually played by those who demonstrate they haven't even a decent grasp on the general subject of anything relating to "X" at all.

Creationism may have evolved by changing names over time but the games creationists play has so obviously not changed in the slightest.

Reply

33.



clubschadenfreude

Posted September 21, 2012 at 11:53 am | [Permalink](#)

"When will society wake up and realize how foolish the theory of evolution really is. There is so much that evolution does not and cannot explain when it comes to origins."

OH yes, the whine "but but we don't know everything yet, so GOD" argument. How unexpected. 😊

"For example, what came first – the heart or the brain. If the heart – what controlled its function absent the brain. If it was the brain – by what did it receive [sic] blood absent the heart. If they came together – well that just rules out evolution completely."

Yep, one more theists to chalk up knowing NOTHING about which they are talking. It's such a shame, but hey, that's where willful and malicious ignorance gets you, attacking your own strawmen since you can't handle reality.

"You see, it requires throwing out all levels of common sense to force your mind to believe in the incredulous [sic]. Take for instance the complexity of the brain. Even the most die hard [sic] evolutionist would agree that the most brilliant scientists in the world would not know where to begin to be able to design such a complex machine. Yet these same evolutionists would have us believe the brain designed itself. Enough said."

Enough said, Well, yes, since all that Aaron has done is use fallacies and outright lie. What a "good" Christian.

and poor "Thinking Christian", he's doing it too. It's so cute to watch. Just how many instances of the exact same stupidity and ignorance does one have to encounter to know that creationists are simply sad little people who blindly believe the lies told to them by their fellow Christians? The thoughts "exuded" here are repeated again and again, on forums and creationists websites like AiG, the disco'tute, etc. Unless you'd like to claim that only one, or even a few, poor stupid creationists is posting them all, then your argument fails and you have displayed that you, "thinking christian" have done exactly as poor Aaron has done, with your fallacies and nonsense.

You are a wonderful example of how calling yourself "thinking" certainly doesn't guarantee that and indeed, needing to call yourself

“thinking” means that no one would guess that was the case.

[Reply](#)

34.



raven

Posted September 21, 2012 at 12:36 pm | [Permalink](#)

Aaron the creationist:

When will society wake up and realize how foolish the theory of evolution really is.

Well never. We’ve already woken up!!!

What society did was wake up a few hundred years ago and invent modern science. We soon discovered natural explanation for such things as planetary orbitals, disease causes, and how life changes through time.

Creationism is thousands of years old. It will join the Flat Earth, Demon Theory of Disease, and Geocentrism in the dustbin of religious guesses that were just wrong.

[Reply](#)

35.



JonLynnHarvey

Posted September 21, 2012 at 1:00 pm | [Permalink](#)

Dr. Coyne,

If you’re going to note that creationists often misspell words, then go spell “irreducible” correctly (unless you were making a subtle irony that isn’t entirely obvious).

[Reply](#)



whyevolutionistrue

Posted September 21, 2012 at 1:15 pm | [Permalink](#)

Mr. Harvey,

The nature of that misspelling shows that it’s clearly a typo. Or am I never allowed to point out creationist misspellings if I make as many as one typo?

If you’re going to make the point that you think I’m as illiterate as these creationists, try to do so with more manners, okay?

[Reply](#)



Ben Goren

Posted September 21, 2012 at 1:28 pm | [Permalink](#)

Ah, yes — but I, who are never wrong, who has never misspelled a word in my life, whose poorfeeding is perfect, whose tpying is without error, must therefore, Shirley, have free rain to call you the poppyhead that you is!

In all seriousness, I've noticed a clear correlation between poor grammar and spelling and the poor quality of thought that lies behind the typical Creationist: the stupider the arguments, generally, the worse the writing.

On the other end of the spectrum, the more intelligent a writer, the greater the chances of a typo slipping through the cracks...but only if the typo is such that it visually resembles the intended word. Additions and omissions of doubled letters, transposed letters, swapping "h" for "n," that sort of thing, are all hard things to catch when you're proofreading your own work; your brain sees the general outline and fills in the rest. It's even worse when the error results in a word that's in your spellchecker...

b&

[Reply](#)

36.



Jim Thomerson

Posted September 21, 2012 at 1:12 pm | [Permalink](#)

I am fairly familiar with creationist thought and argument. I think this selected example is fairly typical. Some one familiar with a group can easily pick out a typical or average individual. That is what has been done here. One thing all creationist arguments have in common is an expectation of ignorance on the part of the audience. Unfortunately this expectation is often correct.

[Reply](#)

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