



Contradictions and Anomalies

When things don't fit

Definition

- If one statement says (or entails) that something is the case, while another says (or entails) that this is not the case, then the statements are *inconsistent*, or *contradictory*.
- If two statements contradict each other, then at least one is false. *They cannot both be true.*

- E.g.

“John is taller than Mary”

“Mary is taller than John”

Consistent?

No. **Inconsistent.**

- “Smith entered the bar at 9.05pm”
- “Smith entered the bar after 9pm, wearing a blue hat”

Consistent?

Yes, **consistent** (not contradictory)

“Copper is a metal”

“Ottawa is the capital of Canada”

consistent

“Very few women quilt”

“Almost every person who quilts is a woman”

consistent



consistent

Journalist – You criticize the Miranda ruling, which gives suspects the right to have a lawyer present before police questioning. Shouldn't people, who may be innocent, have such protection?

A.G. – Suspects who are innocent of a crime should. But the thing is, you don't have many suspects who are innocent of a crime. That's contradictory. If a person is innocent of a crime, then he is not a suspect ...

[A.G. is U.S. Attorney General Edwin Meese, speaking in 1985]

Consistent (it *is* possible for a suspect to be innocent!)



- **Inconsistent** (taking 'written in stone' literally)



There's no actual *proposition* here.

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Negative Relevance

- Two statements that aren't actually inconsistent may still have *negative relevance* to each other. This means that each statement, if true, make the other *less likely*.
- E.g. (A) Fred is a good basketball player
(B) Fred is 5' 6" tall.

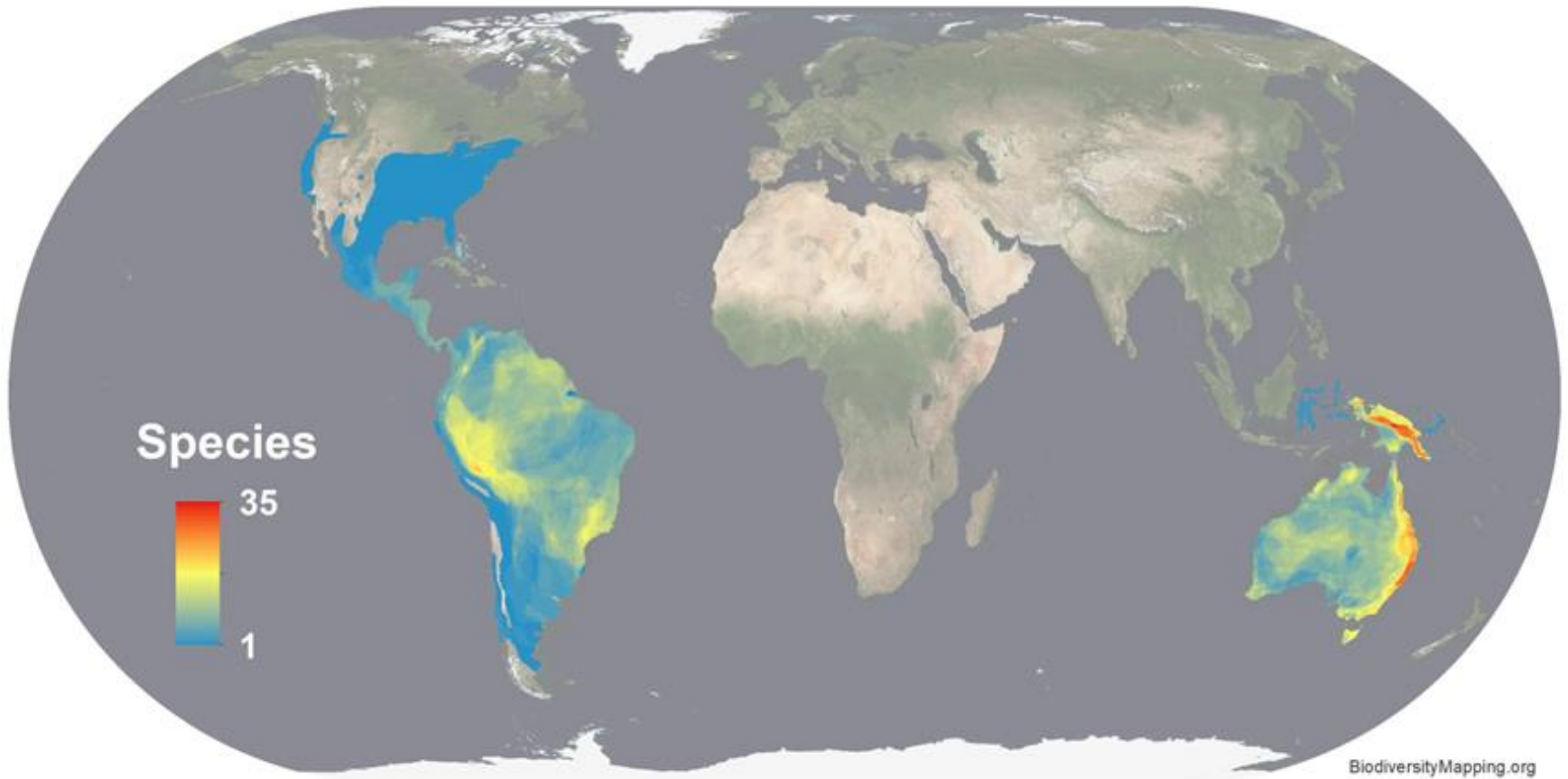
- Inconsistency is actually just the greatest possible degree of negative relevance, where the probability of each statement, given the other, is zero.
- Hence strong negative relevance isn't too far from inconsistency.
- E.g. (A) Fred is a top NBA player
(B) Fred is 4' 6" tall.

	<i>A</i>		<i>B</i>	Consistent? (Yes/No)
(i)	Fred just hit a hole-in-one		Fred never played golf before today	
(ii)	Between 4 and 6 people were involved in the crime		At least 2 people were involved in the crime	
(iii)	Simpson is a heavy smoker		Simpson is a world-class skier	
(iv)	Qin's theory is rejected by all relevant scientific authorities		Qin's theory is true	
(v)	Ali stabbed a man in Vernon, B.C. in 2018.		Ali first entered Canada in 2021.	

Anomalous data

- The term ‘anomaly’ has many different meanings.
- One meaning of ‘anomaly’, used here, is “a piece of evidence that *doesn’t fit a certain theory*”.
 - It might *not be predicted* by the theory
 - Or (worse) be *contrary to* what the theory predicts
- E.g. Darwin’s theory of evolution didn’t predict the observed distribution of some biological groups, including marsupials.
 - How did Darwin respond to this?

The global distribution of marsupials

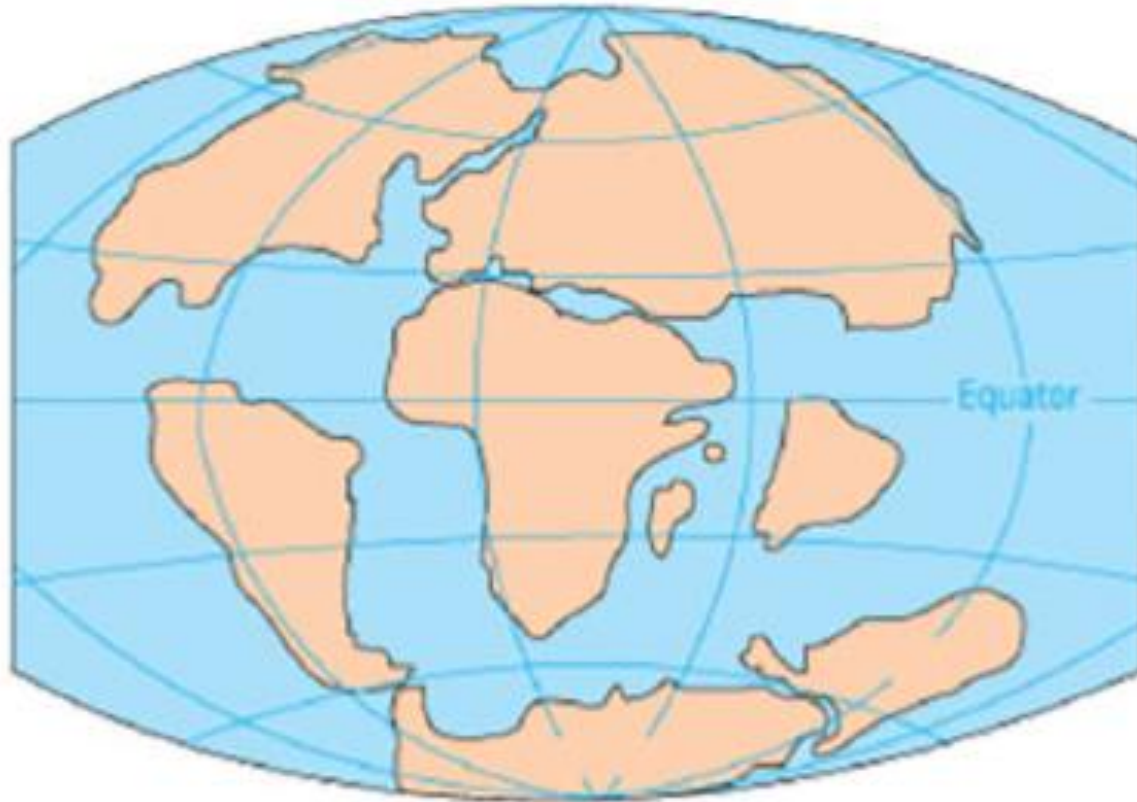


“Undoubtedly **there are many cases of extreme difficulty** in understanding how the same species could possibly have migrated from some one point to the several distant and isolated points, where now found. Nevertheless the simplicity of the view that each species was first produced within a single region captivates the mind. He who rejects it, rejects the vera causa of ordinary generation with subsequent migration, and calls in the agency of a miracle. It is universally admitted, that in most cases the area inhabited by a species is continuous; and when a plant or animal inhabits two points so distant from each other, or with an interval of such a nature, that the space could not be easily passed over by migration, the fact is given as something remarkable and exceptional.” (Darwin, 1859)

How do scientists respond to anomaly?

- Darwin's response is typical.
- Scientists do not drop their theories over a few anomalies, as often solutions are found.
 - They say, “Oh well, something will probably turn up”
 - Anomalous evidence (for a given hypothesis) is negatively relevant to that hypothesis, but **doesn't actually contradict it.**
- Did something turn up for Darwin?

Continental Drift



CRETACEOUS
65 million years ago

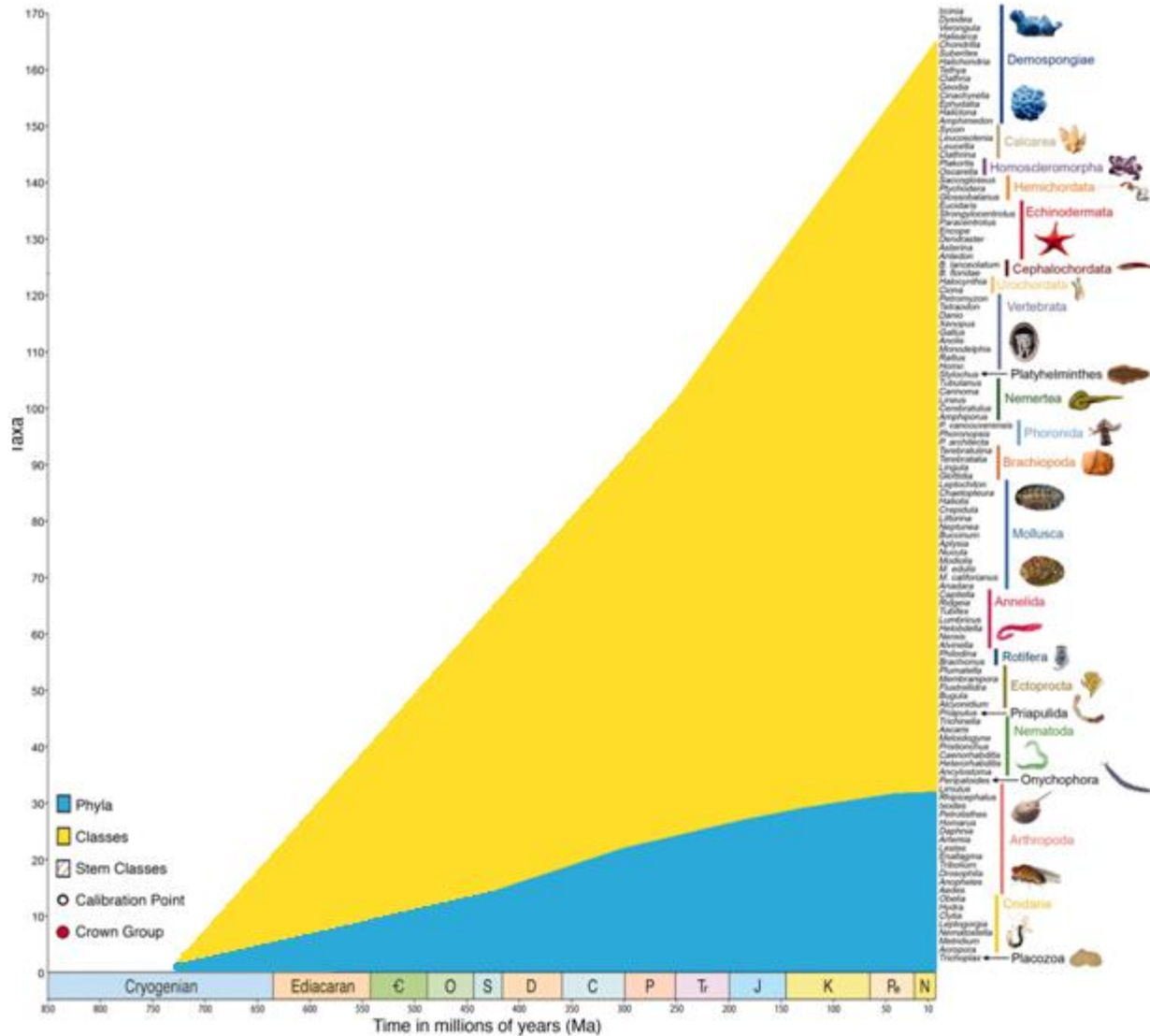
Anomalies

- One shouldn't get too excited about anomalies. Every scientific theory has anomalies to contend with!
(Remember the hair on Duck's bill?)
- On the other hand, when anomalies are serious, and numerous, then it's worth looking for alternative theories.

The 'Cambrian explosion' anomaly.

- Darwin's theory of evolution proposed that new species (and families, classes, phyla, etc.) emerge as a result of very gradual changes over long periods
 - (However, most biological phyla and classes appeared within the short space of 5-10 Myrs, according to the fossil record.)

Darwinism predicts something like ...



Anomalies

- What does one do with anomalies?
- That usually depends on whether they're considered "serious" or "trivial".
- E.g. What do biologists say about the Cambrian explosion?

Responses to Anomaly

1. The anomaly is not really there. It's just an artifact of the measuring apparatus. (In this case, perhaps the Ediacaran was teeming with complex life, but conditions weren't right for leaving fossils. Or, as Darwin said, maybe we just haven't found those fossils yet.)
2. The theory is basically right, but incomplete. When we know more, the anomaly will disappear. (E.g. we still don't understand much about how body plans evolve, and when we do, then we might *expect* them to appear suddenly.)
3. The theory is wrong and should be replaced.

Serious vs. Trivial anomalies

- This suggests that we ought to distinguish between *serious* and *trivial* contradictions or anomalies.
- A trivial contradiction is one that might be easily resolved by a small correction. The contradiction does not involve the “central claim” of the story.
- A serious contradiction does involve the heart of the story, so that it cannot be resolved without revising the story in a substantial way.
- To figure out how serious an anomaly is, you have to think of *possible* ways to resolve the anomaly.

- If a theory faces a number of *serious* anomalies, then this provides good reason to reject it altogether.

(Previous quiz questions)

“In the conversations below, the speaker claims to find a contradiction. In each case say whether the inconsistency is serious or trivial, i.e. whether it threatens the general truth of the account. Briefly explain your judgement. (If you think that additional information is required to make this judgement, then briefly explain why.)”

- The FBI has concluded that the 2001 anthrax attacks were carried out by just one man, Bruce Ivins, who worked with anthrax at the US Army Medical Research Institute of Infectious Diseases. However, this claim is contradicted by experts in biological warfare, including Richard O. Spertzel, chief biological inspector for the U.N. Special Commission from 1994 to 1998. The experts claim that Ivins lacked the time, the expertise and the equipment needed to produce such a sophisticated weapon by himself. They say it would require a team of at least 5-6 people.

- I'd say this is *fairly serious*, assuming these experts are right.
- While they don't contradict the view that Ivins was involved, there is a *big difference* between a lone nut and a large team of terrorists.
 - (I can't think of a minor adjustment to the theory that would resolve the anomaly.)

- The official explanation of JFK's murder in Dallas, that he was shot by a lone sniper Lee Harvey Oswald, has never been able to explain the actions of "umbrella man" that day.

Just at the time of the shooting, "umbrella man" pumped open his umbrella, just as JFK was being shot. It was a sunny day, so there was no apparent reason to carry an umbrella, much less open it at that precise moment. Most likely it was some kind of signal to the real shooters.



- This is certainly a puzzle, but in general *even a true theory does not explain everything that happens.*
- Some events are just coincidences, caused by unrelated events. It's possible that "umbrella man" did this for strange reasons of his own, unrelated to the assassin(s).
 - Louie Steven Witt came forward in 1978 claiming to be umbrella man, and that he was heckling the POTUS for his father's role in appeasing the Nazis.



- Neville Chamberlain, with his trademark umbrella, appeasing in the Nazis in 1938.

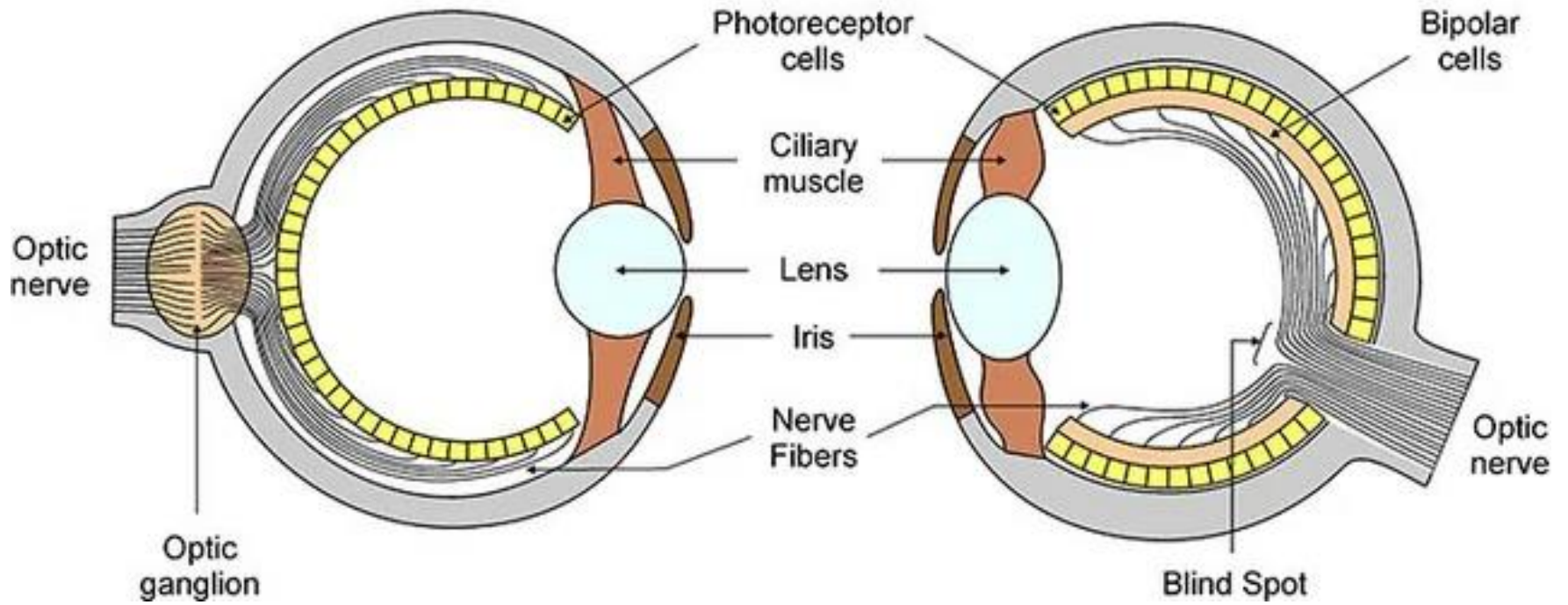
The eye is ‘wired backwards’

- Intelligent design (ID) is the claim that living organisms did not arise through any natural process, following the laws of physics, but rather were deliberately made by a very good engineer.

ID is contradicted by the empirical evidence, however. The “design” of living systems often appears to be far from optimal. Vertebrate eyes, for example, are “wired backwards”, with the nerves carrying signals from photoreceptors to the brain passing *in front of* the retina, blocking incoming light.

Octopus

Human

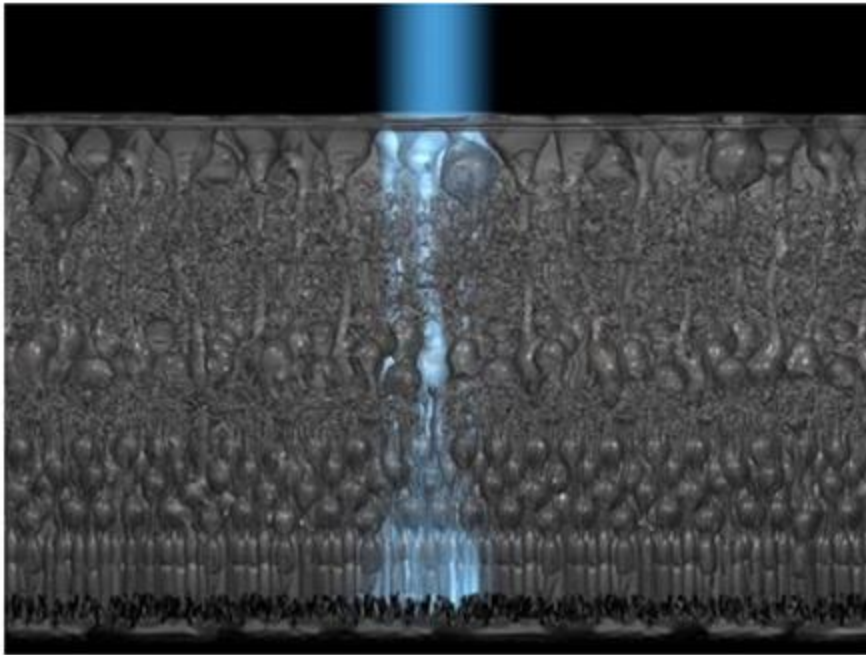


- This anomaly is perhaps serious, if the designer is supposed to be a perfect, divine being.
- But design flaws are not unexpected for designed objects in general.
- It's also possible that this flaw is merely *apparent*, due to our lack of understanding of the whole system.

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Fiber optic light pipes in the retina do much more than simple image transfer

Jul 21, 2014 by [John Hewitt](#) [report](#)



Muller Cells appear to act as living optical fibers. Credit: vision-research.eu

“The idea that the vertebrate eye, like a traditional front-illuminated camera, might have been improved somehow if it had only been able to orient its wiring behind the photoreceptor layer, like a cephalopod, is folly.”

(Phys.org) —Having the photoreceptors at the back of the retina is not a design constraint, it is a design feature. The idea that the vertebrate eye, like a traditional front-illuminated camera, might have been improved somehow if it had only been able to orient its wiring behind the photoreceptor layer, like a cephalopod, is folly. Indeed in

Molten Steel at the World Trade Center?

The official explanation of the WTC collapses on 9/11 claims that the steel frame was weakened only by aircraft impacts and normal office fires. (These fires heated the steel frame of the building, softening and weakening it, until it collapsed.)

But this story contradicts the fact that molten iron or steel was seen pouring out of one corner of WTC 2 before it collapsed. Glowing molten metal was also observed in the rubble piles after the collapses, and spheres of previously-molten iron were found in the dust. (Iron and steel melt at around 1400 Celsius, whereas office fires, even ones started with jet fuel, cannot get hotter than about 1000 Celsius.)

Molten iron?



- If the material seen really is molten iron (or steel) then this is a serious contradiction.
- But is it iron? What alternatives are there?
- (N.B. Steel is more than 99% iron.)

- **National Institute of Standards and Technology (NIST)
Federal Building and Fire Safety Investigation of the World
Trade Center Disaster**

Answers to Frequently Asked Questions (August 30, 2006)

Last updated: January 28, 2008

“NIST concluded that the source of the molten material was **aluminum alloys** from the aircraft”

-- But molten aluminum doesn't glow yellow like that!

“Pure liquid aluminum would be expected to appear silvery. However, the molten metal was very likely mixed with large amounts of hot, partially burned, solid organic materials”



- Molten aluminum *will* glow yellow if heated well above its melting point, to around 1000° C. But even then it doesn't glow brightly in broad daylight, and loses its glow after falling a few feet. So NIST is right about that.

Steven Jones, physicist

“NIST says that flowing aluminum with partially burned organic materials mixed in, “can display an orange glow.” But will it really do this? I decided to do an experiment to find out.

We melted aluminum in a steel pan using an oxy-acetylene torch.

Then we added plastic shavings -- which immediately burned with a dark smoke, as the plastic floated on top of the hot molten aluminum.”

Jones was unable to get molten aluminum to look like the molten metal flowing out of the South Tower.

- (This molten metal anomaly led Jones to research the issue more thoroughly, and eventually to become a leading “9/11 truther”.)
- Did he over-react to an anomaly?

