The "obvious implausibility" of evolution

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Professor Granville Sewell is a mathematician, but he likes to say that his objections to evolution arise from physics:

1. The "tension between the second law of thermodynamics ... and the origin and evolution of life".[1]
2. That evolution cannot happen when "nothing is going on but diffusion".[2]

His first objection is false, as Professor Sewell himself acknowledges. A careful reading[3] reveals that his actual claim is that evolution violates some potential future generalization of the second law of thermodynamics — a generalization with at least 118 but perhaps more[4] different kinds of entropy — a generalization that neither he nor anyone else has yet been able to discover.

His second objection is true, but this demonstrates only the commonplace observation that in nature there are actions at play other than diffusion: crystallization, hydraulic sorting, phase segregation, gravity, electromagnetism, etc.

Sewell's real objection concerns not thermodynamics, nor diffusion, but — in his own words — the "obvious implausibility" of evolution.[5] Evolution just doesn't seem right — it's hard to believe.

It is certainly true that evolution is hard to believe, but that doesn't mean evolution is false. Charles Darwin found evolution hard to believe. That's why he labored on his ideas for 21 years before publishing them. (From his 1837 inklings in "Notebook B" to his 1 July 1858 paper "On the Tendency of Species to form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection.") Ultimately he and other scientists (particularly Alfred Russel Wallace) found so much evidence *for* evolution that Darwin realized evolution was true even though it was obviously implausible.

This is a common occurrence.

Look around you. You see people, and clothing, and computers, and walls and glass and trees and sky and dirt and rocks. What if I told you that you really saw only three things: protons, neutrons, and electrons. And that in fact those three things individually are invisible! This claim, like evolution, is "obviously implausible". And indeed, atomic theory was proposed in 1803 by John Dalton but was not accepted by the eminent chemist Friedrich Wilhelm Ostwald until about 1909, nor by the eminent physicist Ernst Mach until about 1911. It is true despite its "obvious implausibility".

[1] Granville Sewell, "Entropy and evolution", *BIO-Complexity* **2013** (2), 1–5 (2013). See page 1, left column, lines 2–4. See also page 2, right column, line 45.

[2] Granville Sewell, "On 'compensating' entropy decreases", *Physics Essays* **30**, 70–74 (January 2017). See page 73, right column, line 7.

[3] Reference 1, page 5, left column, line 22.

[4] In Professor Sewell's potential future generalization, there is one kind of entropy for each element but perhaps also for each compound. He has not yet discovered the relationship between "water entropy" and twice "hydrogen entropy" plus "oxygen entropy".

[5] Reference 1, page 4, left column, line 12.

Planetary motion is so obviously implausible that on 22 June 1633 the Holy Office of the Inquisition sentenced Galileo to life imprisonment for discussing the possibility. The Catholic Church maintained Galileo's condemnation for more than 359 years until Pope John Paul II issued a quasi-apology on 4 November 1992.

The star Betelgeuse is a tiny pinprick in the winter night sky. It is obviously implausible that this star is larger than the orbit of Jupiter.

Some find it implausible that anyone voted for Hillary Clinton.

Others find it implausible that anyone voted for Donald Trump.

Whether a statement is "obviously implausible" is a completely separate issue from whether that statement is correct: relativity, quantum mechanics, gyroscopic motion, the wave theory of light, the germ theory of disease, the U.S. Electoral College, and evolution are all implausible. Like it or not, they are all also true.

Note added concerning the germ theory of disease (© 12 August 2020)

Since August 1969 I have been a backpacker. I have often encountered bears, and bears do not worry me. I have encountered wolves, and wolves do not worry me. I have encountered rattlesnakes, and rattlesnakes do not worry me. I have encountered rabbits, and chipmunks, and shelter mice. The mice eat my food, but they do not worry me.

So it's obviously implausible that I and everyone else should worry about a coronavirus one one-millionth the volume of a single speck of dust. It's true despite its obvious implausibility.