Strict science procedures evaluate evolution

The Scientific Approach to Evolution: What They Didn't Teach You in Biology
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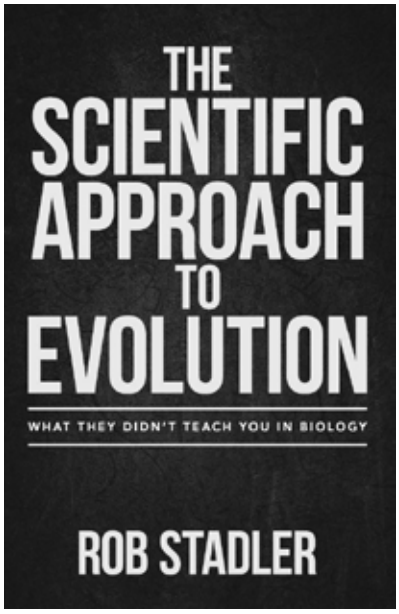

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Did evolution really happen? An answer would depend on what one means by 'evolution'. It will also depend on the design of experiments used to test evolution. Rob Stadler's first book evaluates evolutionary ideas using a fresh and clear technique. I know of no other written work that has taken his approach, which supplies readers a new tool to evaluate fuzzy thinking that often muddies origins discussions.

The author has a master's degree in electrical engineering from MIT, a Ph.D. in biomedical engineering from Harvard, 17 technical publications and medical device patents related to heart health. He has almost as much expertise as is humanly possible on the subject of his book, a subject that begins with six criteria for 'high-confidence science'.

Theoretically, anyone willing to practise applying them should be able to begin ranking the confidence level that science can answer any given research question. Without despoiling the book's core content, those criteria include: 1) procedural repeatability versus non-repeatability; 2) measurement directly or indirectly; and 3) analysis prospectively versus retrospectively.

What should the reader expect from this book? First, its 201 pages do not reveal what the author believes about origins. Its tone should thus appeal as much to an atheistic evolutionist as to a biblical creationist, and any stripe in between, provided they like logic and are willing to let science confront beliefs. Tastefully selected bold text emphasizes certain main points. Two helpful appendixes flesh out the six criteria and handle objections. And the book's 10 chapters come packed with examples, and include several helpful 'figures', which are basically illustrations that simplify some of the concepts. Further, one need not have much technical background to understand its contents. When he discusses numbers, he illustrates them first. Before discussing mutations, he explains in just a few pages how DNA works.

Six criteria for 'high-confidence' science

Stadler quickly tutors his readers, using both real and hypothetical research questions, how to apply the six criteria. For example: "How fast would a bowling ball fall 5,000 years ago?" Without a time machine, this question fails the repeatability criterion. However, by introducing assumptions, science could at least take a stab at its answer. Science cannot answer this directly, but only indirectly. Even taking someone's blood pressure with a sphygmomanometer is an indirect measurement, and yet close enough to be practical.

The author builds a case, aided in greater detail for the über-interested by an appendix, that the qualitative degrees to which a particular question meets the six criteria reveal the confidence one should expect in experimental science's ability to test that question. The author uses as a high-confidence science example a study of aspirin's effects on potential blood clotting in 39,876 women (p. 20). It was repeatable, very directly measurable, and removed bias, among other qualities. The reader quickly begins to feel confidence in evaluating all kinds of research questions in light of how confidently science can answer them. With this training in place, the author rigorously evaluates origins questions like creation versus evolution.

He clearly defines evolution, perhaps in ways that biblical creationists do not prefer, but in ways that should appeal to evolution-leaning readers. 'Generalized evolution' basically means any change, 'microevolution' means minor changes, 'macroevolution' means major changes, and 'grand evolution' makes no distinction between micro and macro versions. This way, Stadler sets up future chapters to evaluate research questions that fit each definition. Microevolution, mostly including 'speciation', research questions meet very-high-confidence science, macroevolution research questions meet very-low-confidence

science criteria, and toward the end of the book Stadler graciously but firmly leads the reader to evaluate 'grand evolution'.

Evaluating experiments on evolution

He considers Lenski's ongoing study of 'evolution' in *E. coli*. How does it stack up on the six criteria? It basically asks the question: "How much evolutionary change can occur in *E. coli* under a restricted diet in lab conditions?" The 30-year exercise remains extremely repeatable. It uses very direct measurements, even to the level of analyzing time-stamped, freeze-dried bacterial genomes from generations long past. Its prospective analysis designed the experiment in advance and controls all the pertinent variables along the way. I'll let the reader discover how the remaining criteria apply.

Meanwhile, the author clearly shows that 'microevolution' occurred in these bacteria, but that it took 33,000 generations and about 10 trillion individual bacteria in order to merely duplicate one gene and damage another. That's how the bacteria grow in their particular restricted diet.[1] At the end of the book, Stadler brings this and several other examples back around to show that the very science that demonstrates microevolution refutes macroevolution.

However, the book directly tackles the main pillars of macroevolution, too, including vestigial organs, homology, biogeography, and fossils. Each one topples under the weight of its abject failure to meet any of the six criteria of high-confidence science. Perhaps to make this section more palatable to evolutionary readers, the author states the situation positively. For example he describes how the homology research question "Are similarities between life forms a result of macroevolution?" *meets* all six criteria of *low*-confidence science.

Macroevolution is not repeatable. Without directly observing the process that produced the creature, a scientist cannot make direct measurements. And the only practically available data to test this question comes from fossils, which permit only retrospective analyses. Same for the remaining three criteria. The author summarizes each key research question in an easy-to-read, two-column table. Point-by-point, question-by-question, each icon of macroevolution falls into the category of non-science.

Chimpanzees and Lucy

Stadler applies the six criteria of high-confidence science, or the opposite criteria of low-confidence science as the case may be, to King Tut, malaria, orphan genes, Lucy, and human-chimp ancestry. These last two seem particularly relevant for general readers, who typically show more interest in their own human origins than in less familiar subjects like biogeography. In an extreme understatement of the total failure of macroevolution to meet any vestige of any of his six criteria, Stadler writes: "All of this high-confidence evidence speaks to microevolution, not macroevolution" (118). Using language like this, the book gently permits the scientific criteria to violently punch topics like human-chimp common ancestry right in the face.

Speaking of human-chimp origins, the book quotes evolutionary technical literature that admits to huge DNA differences between humans and chimpanzees.[2] Tidy features like this quote list reveal that the author knows his subject and uses that knowledge appropriately. Meanwhile, like repeated body blows, the quiet quotes promise to purge the air right out of the metaphorical lungs of those committed to the false statistic of 99% genetic identity.

Then at just the right time, Stadler recalls studies from his prior chapters which demonstrated the many generations and individuals were required to make just the *handful* of DNA mutations to enable *E. coli* to consume citrate and malaria to resist drugs. This high-confidence microbe research demonstrates the folly of calling upon mutations to explain how a minimum of *75 million* DNA bases changed between chimp and human over evolution's long-held scenario of six million years. In other words, high-confidence experiments expose just how incredibly non-scientific, and therefore faith-based, are claims like human-chimp common ancestry.

Potential for the six criteria

The final chapter calls for sweeping cultural changes in light of the clarity that these six criteria bring to research questions. Public school curricula should clearly state why science cannot directly address chemical evolution ('abiogenesis') instead of current wording that asserts science has demonstrated life from non-life. Museum placards should describe how research questions like, "Did modern humans evolve from Lucy?" meet all six criteria for *low*-confidence science instead of current wording that leads viewers to believe that science has shown we all came from Lucy.

Well, more scientists and thinkers of every origins persuasion equip themselves to better evaluate the scientific credibility of research questions, but Stadler probably asks too much. If people actually ran on good logic, his changes would have a better chance of taking hold. But people run on all kinds of motivations—not the least of which is an intense desire to avoid God and therefore avoid the clearly seen evidence for creation, an inexcusable but common crime against our Creator (Romans 1:18–32).

Even scientists who merely ask basic operational questions instead of more challenging origins questions have proven their motivation. They want to produce publications more than they want to ensure scientifically determined findings. For this very reason, Smaldino and McElreath wrote: "Therefore, when researchers are rewarded [by career advancement] primarily for publishing, then habits which promote publication are naturally selected. Unfortunately, such habits can directly undermine scientific progress", leading to "an increase in false discoveries".[3] So, yes, if scientists were motivated by logic and a sense that they ought to do good science, then they might make the changes for which Stadler calls. But I won't hold my breath.

The Scientific Approach to Evolution explains in an accessible way how six criteria for high-confidence science can expose exactly what's scientifically wrong with our culture's overconfident, pro-evolution answers to origins questions. Along the way, it gives confidence to those willing to let science do only and exactly what it can do. Stadler's stark logic and gracious tone might just turn the tables on what his readers thought they knew about the limits of science and the scientific merits and demerits of evolution. So, can science tell us if evolution happened? After reading this book, you'll know. And you'll know exactly why you know.

References

1. Thomas, B., Evolution's Top Example Topples, *Acts & Facts* **44**(10), 2015; icr.org.
2. See also Bergman, J. and Tomkins, J., Is the human genome nearly identical to chimpanzee?—a reassessment of the literature, *J. Creation* **26**(1):54–60, 2012; creation.com/chimp-dna-lit.
3. Smaldino, P.E. and McElreath, R., The natural selection of bad science, *Royal Society Open Science* **3**:160384, 21 September 2016 | doi:10.1098/rsos.160384.