The Three Failures of Creationism: Logic, Rhetoric, and Science

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Anticreationism for Students


The Three Failures of Creationism: Logic, Rhetoric, and Science is Walter Monroe Fitch’s attempt to help resolve the perennial American problem of creationist arguments, along with his rebuttals, to “intelligent high school seniors or college freshmen or sophomores” who would like a “relatively fair” discussion of those arguments (p. 1). Fitch, who died one year before the book’s publication, was motivated by “the failure of scientists to present clearly what they do and why” (p. 1). He wanted to show the usefulness of logic in addressing scientific questions, to explain how the scientific method is employed in studying evolution, and to counter the misconception that “evolutionary biology and reasonable religious beliefs” are incompatible (p. 151). However, this threefold purpose was meant to serve Fitch’s primary goal, which was to show that whereas “biological evolution is a scientific study… creationism, intelligent design, and irreducible complexity are not scientific” (p. 2). Although the quality of his presentation is uneven, Fitch generally succeeds in conveying this message.

A member of the National Academy of Sciences and other prestigious organizations, Fitch founded the field of molecular phylogenetics and helped to advance the understanding of evolutionary change at the molecular level. He developed methods of creating phylogenetic trees based on physical and genetic relationships among species. He also cofounded the Society for Molecular Biology and Evolution and the journal Molecular Biology and Evolution, serving as its editor for a decade.

According to Fitch, a student’s understanding of the nature of science is hindered partly by an unfamiliarity with the logic of scientific reasoning. He therefore offers a survey of basic deductive and inductive logic, including an explanation of the fallacies and rhetorical devices that creationists frequently employ. For example, he explains the fallacy of equivocation using a syllogism based on creationists’ persistent misunderstanding of the term theory. Whereas standard logic textbooks typically illustrate this fallacy with trivial examples, Fitch demonstrates its seriousness by showing the two very different arguments—one invalid and one valid—that result, respectively, from defining theory as “only a guess,” as creationists do, and defining it scientifically as “a well-supported explanation of many observations” (pp. 10–12). His treatment of logic also includes occasional imprecisions, such as defining genetic fallacy as “arguing against an idea on the basis of the proponent’s personal character” (p. 14), which properly defines the more specific ad hominem fallacy. Fitch too narrowly defines deduction as “reasoning from the general to the particular” and induction as “reasoning from the particular to the general” (p. 42), although he states correctly elsewhere that “the conclusion of a valid deduction must be true if the premises are true, whereas an induction may be correct but is not proven” (p. 8).

The most basic issues in both science and religion revolve around epistemological questions concerning what knowing properly means. Fitch addresses these questions in his book by proposing seven ways of knowing: experience, observation, logic, authority, intuition, revelation, and faith. This is followed by his outline of four areas of knowledge: theology, ethics, esthetics, and logic/epistemology.

Fitch’s discussion here could have been improved by more precise philosophical analysis and terminology. For example, his definition of logic as a “mathematical subject” (p. 30) will probably convey to students the idea that logic incorporates mathematics. Although it can be mathematics-like (e.g., propositional logic proofs), mathematics is not integral to logic (as many philosophy majors can happily attest). More seriously, Fitch conflates logic with epistemology and erroneously defines logic/epistemology as “the study of matter and energy and their interactions” (p. 38)—that is, as physics. Logic and epistemology are not natural sciences but separate branches of philosophy, with epistemology comprising different—and not necessarily compatible—definitions of knowledge. This confusion leads Fitch to say epistemological when he means empirical: “Theology has no authority in the area of the epistemological study of the material world” (p. 39).

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Fall Focus on Books

("Some simple math and statistics"), he shows how to calculate the probabilities of inherited traits, using as an example the alleles for pigmentation in a population of flowers. He explains fossil-dating methods and shows the importance of Occam's razor in avoiding creationist miscalculations concerning Earth's age. He demonstrates how base sequences of DNA are used to determine ancestral relationships in the construction of phylogenetic trees. After explaining molecular clocks and the roles of mutation and natural selection in speciation, Fitch concludes with six "intriguing observations" of the fossil record (e.g., a continuing increase in diversity and complexity) and 10 requirements for explaining these observations scientifically.

In chapter 4 ("'Young-Earth' creationism"), the only chapter devoted exclusively to critiquing creationism, Fitch reviews the standard litany of problems stemming from biblical literalism, such as the meaning of the Hebrew word for day and the contradictions between Genesis 1 and Genesis 2. Although intelligent design is a form of old-Earth creationism, he includes it here, commenting briefly on William Dembski's rejection of the criticism that intelligent design implies optimal design and more extensively on Michael Behe's concept of irreducible complexity. After briefly discussing the anthropic principle, Fitch resumes his critique of well-known creationist claims such as the impossibility of macroevolution, the supposed absence of transitional fossils, and the equation of evolution with atheism. He devotes some time at the end of the chapter to theological issues and, in an epilogue, some time at the end of the chapter to other critiques of creationism and introductions to evolution are available that will be more helpful to students.

References cited


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FROM FINS TO LEGS AND BACK AGAIN


Some 55 million years ago, in the Early Eocene epoch, a number of mammals forsook their terrestrial homes to return to life in the sea, beginning one of the strangest and most interesting chapters in evolutionary history. They were the ancestors of today's marine mammals, which (unlike fishes and most other aquatic creatures) arose from land-living, air-breathing animals. On the shallow shores of the ancient Tethys Sea, which stretched across what is now southern Asia and the Middle East, slender, cat-sized creatures gave rise to the cetaceans (whales, dolphins, and porpoises), and squat, elongate elephant relatives evolved into sirens (manatees and dugongs). These and other fascinating creatures are described in Annalisa Berta's wide-ranging and fact-packed new book, Return to the Sea: The Life and Evolutionary Times of Marine Mammals.

Berta is a professor of biology at San Diego State University, where she specializes in vertebrate morphology and evolution—fields of expertise that figure prominently in this engaging tour through the highlights of marine mammal history. How did these ancestors survive the tremendous challenges of their new environment? In turns serious and playful, Berta outlines many of the extraordinary adaptations that enabled these animals—and their living descendants—to survive and thrive. For example, walruses have countercurrent heat exchangers in their flippers, and the males make gong-like sounds to attract females. Blue whales are born with rudimentary teeth, which are later resorbed, before they grow 300 plates of filtering baleen, which are made of the same keratin as are in our hair and fingernails. Sperm whales can dive close to two miles deep and can stay below the surface for over two hours, all on a single breath of air. Abundant facts are woven into a compelling story of the history and biology of marine mammals that will delight while it informs readers.

Berta writes in an engaging, jargon-free style, which makes the book readily accessible to students and teachers at both the graduate and the undergraduate levels, but it is especially