What is right with ‘teaching the controversy’?

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In an important recent Opinion article in TREE [1], Eugenie Scott and Glenn Branch propose five criteria for evaluating whether it is appropriate to teach a controversy in a public school science class. They argue that antievolutionary alternatives to the standard science account of organic evolution fail on most of the five criteria and, therefore, should not be discussed within the framework of a science course.

I propose a sixth criterion: the controversy should be taught if it clarifies the demarcation between science and other ways of knowing about nature. Most introductory biology texts (e.g. [2–4]) begin with a chapter that reviews both the foundational assumptions about nature that underlie science (e.g. natural phenomena have natural causes, natural ‘laws’ operate everywhere and for all time), and the ethical ideals that the scientific community recognizes as being essential for scientific knowledge to progress (e.g. detailed public reporting of scientific research so that peers can accurately evaluate and replicate it, all accepted scientific claims are provisional and therefore might be revised or rejected upon further review). US national science education standards direct high-school science teachers to cover the assumptions and ideals of science [5].

The most popular antievolutionary alternatives to the standard scientific account, young earth creationism and ‘intelligent design theory’, reject or weaken several of the foundational assumptions and ethical ideals of science. For example, young earth ‘creation science’ adds an additional assumption that supercedes all others: the Bible is inerrant and literally true, therefore scientific claims about nature can only be valid if they do not violate this assumption. Because so many forms of material evidence indicate that the Earth is far older than 6000 years, creationists are forced to infer that natural processes were radically different in the past compared with what is observed today; for example, radioactive decay rates were far more rapid a few thousand years ago, making the Earth seem older than it really is*.

I teach an introductory biology class to first-year college students who are not specializing in science. They are not far removed from the high-school classroom, and their science literacy is generally rudimentary and rife with the fundamental scientific misconceptions reviewed in [6]. After an introduction to the beliefs and practices of science, I spend much of my course focusing on Darwin, Mendel, the modern synthesis, and the history of life on Earth. I then tackle the issue of antievolutionary alternatives to the standard scientific account; I provide an overview of the basic claims of young earth creationism and intelligent design theory, and then have students evaluate them in relation to the foundational assumptions and ethical ideals of science. I provide my opinion about why these antievolutionary theories are merely pseudoscientific alternatives to the standard scientific account, followed by a discussion among the students on whether these popular antievolutionary alternatives can truly be categorized as science.

It has been my experience that many students are skeptical of professorial dogma, especially on a subject of popular controversy, such as organic evolution, and consider it disingenuous when a teacher avoids presenting popularly held beliefs that differ from the instructor’s own. To ignore antievolutionary theories in the science classroom because they are not accepted science beggars the question what, indeed, is accepted science? Examining antievolutionary theories in relation to the assumptions and ideals of standard accepted science can help to clarify on what ethical and epistemological grounds most scientists come to vehemently reject antievolutionary claims as coequal rivals to the standard evolutionary account. When I assess students, I find that most, including committed creationists, appreciate having a chance to examine the assumptions and beliefs about science that provide the foundations of standard accounts of evolution and the antievolutionary rivals, because it helps them reason for themselves what can be appropriately labeled as ‘science’.

References


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