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# Philosophers Notwithstanding, Kansas School Board Redefines Science

By DENNIS OVERBYE

Once it was the left who wanted to redefine science.

In the early 1990's, writers like the Czech playwright and former president Vaclav Havel and the French philosopher Bruno Latour proclaimed "the end of objectivity." The laws of science were constructed rather than discovered, some academics said; science was just another way of looking at the world, a servant of corporate and military interests. Everybody had a claim on truth.

The right defended the traditional notion of science back then. Now it is the right that is trying to change it.

On Tuesday, fueled by the popular opposition to the Darwinian theory of evolution, the Kansas State Board of Education stepped into this fraught philosophical territory. In the course of revising the state's science standards to include criticism of evolution, the board promulgated a new definition of science itself.

The changes in the official state definition are subtle and lawyerly, and involve mainly the removal of two words: "natural explanations." But they are a red flag to scientists, who say the changes obliterate the distinction between the natural and the supernatural that goes back to Galileo and the foundations of science.

The old definition reads in part, "Science is the human activity of seeking natural explanations for what we observe in the world around us." The new one calls science "a systematic method of continuing investigation that uses observation, hypothesis testing, measurement, experimentation, logical argument and theory building to lead to more adequate explanations of natural phenomena."

Adrian Melott, a physics professor at the University of Kansas who has long been fighting Darwin's opponents, said, "The only reason to take out 'natural explanations' is if you want to open the door to supernatural explanations."

Gerald Holton, a professor of the history of science at Harvard, said removing those two words and the

framework they set means "anything goes."

The authors of these changes say that presuming the laws of science can explain all natural phenomena promotes materialism, secular humanism, atheism and leads to the idea that life is accidental. Indeed, they say in material online at [kansasscience2005.com](http://kansasscience2005.com), it may even be unconstitutional to promulgate that attitude in a classroom because it is not ideologically "neutral."

But many scientists say that characterization is an overstatement of the claims of science. The scientist's job description, said Steven Weinberg, a physicist and Nobel laureate at the University of Texas, is to search for natural explanations, just as a mechanic looks for mechanical reasons why a car won't run.

"This doesn't mean that they commit themselves to the view that this is all there is," Dr. Weinberg wrote in an e-mail message. "Many scientists (including me) think that this is the case, but other scientists are religious, and believe that what is observed in nature is at least in part a result of God's will."

The opposition to evolution, of course, is as old as the theory itself. "This is a very long story," said Dr. Holton, who attributed its recent prominence to politics and the drive by many religious conservatives to tar science with the brush of materialism.

How long the Kansas changes will last is anyone's guess. The state board tried to abolish the teaching of evolution and the Big Bang in schools six years ago, only to reverse course in 2001.

As it happened, the Kansas vote last week came on the same day that voters in Dover, Pa., ousted the local school board that had been sued for introducing the teaching of intelligent design.

As Dr. Weinberg noted, scientists and philosophers have been trying to define science, mostly unsuccessfully, for centuries.

When pressed for a definition of what they do, many scientists eventually fall back on the notion of falsifiability propounded by the philosopher Karl Popper. A scientific statement, he said, is one that can be proved wrong, like "the sun always rises in the east" or "light in a vacuum travels 186,000 miles a second." By Popper's rules, a law of science can never be proved; it can only be used to make a prediction that can be tested, with the possibility of being proved wrong.

But the rules get fuzzy in practice. For example, what is the role of intuition in analyzing a foggy set of data points? James Robert Brown, a philosopher of science at the University of Toronto, said in an e-mail message: "It's the widespread belief that so-called scientific method is a clear, well-understood thing. Not so." It is learned by doing, he added, and for that good examples and teachers are needed.

One thing scientists agree on, though, is that the requirement of testability excludes supernatural explanations. The supernatural, by definition, does not have to follow any rules or regularities, so it cannot be tested. "The only claim regularly made by the pro-science side is that supernatural

explanations are empty," Dr. Brown said.

The redefinition by the Kansas board will have nothing to do with how science is performed, in Kansas or anywhere else. But Dr. Holton said that if more states changed their standards, it could complicate the lives of science teachers and students around the nation.

He added that Galileo - who started it all, and paid the price - had "a wonderful way" of separating the supernatural from the natural. There are two equally worthy ways to understand the divine, Galileo said. "One was reverent contemplation of the Bible, God's word," Dr. Holton said. "The other was through scientific contemplation of the world, which is his creation.

"That is the view that I hope the Kansas school board would have adopted."

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