

PHYSICS COMMUNITY

Scientists View Kansas Board's Decision as a Wake-Up Call

The Kansas Board of Education's recent move to drop evolution from statewide science education standards came as a most unpleasant shock to the science community. How did this happen? many wondered. And how can we prevent it from happening again?

The standards adopted by the board on 11 August downplay the importance of evolution, not just in biology, but in geology and cosmology too. Intended as guidelines for the state's 304 school districts to prepare their science curricula, they will also be used to write new statewide achievement tests, which will be administered starting in 2001. School districts will continue to decide what subjects will be taught in their classrooms, and many districts and individual teachers have vowed to continue teaching evolution. But the incentive to do so has been reduced.

How it happened

Writing the standards had initially been the task of a 27-member committee of science educators from across the state. Drawing heavily on the science education standards recommended by the National Science Teachers Association (NSTA), the National Research Council (NRC), and the American Association for the Advancement of Science (AAAS), the committee also received input through regular public meetings. Earlier this year, creationist supporters began complaining about the inclusion of evolution in the standards, and it soon became clear that some on the board of education shared their view.

After several iterations, the committee presented its final draft to the board in July. Over the next few weeks, three board members went through the document and amended it to their liking. Their version was the one that the board approved, 6 to 4. Board member Howard Voth, a moderate Republican and former school superintendent who cast the deciding vote, says he viewed the adopted standards as a compromise

▶ Shifting tactics, creationists now focus on discrediting evolution.

between antievolutionists and evolution supporters.

Indeed, the adopted standards retain much of the original language of the writing committee's draft. But the differences were significant enough that, on 23 September, AAAS, NRC, and NSTA announced they would not grant the Kansas board permission to use sections of their publications that had been incorporated into the standards. In a joint statement, the groups called the Kansas board's action "contrary to modern science and to the basic visions and goals that the *Kansas Science Education Standards* claim to espouse." Implementation of the standards could be delayed, as the board now tries to figure out a way around the copyrights.

The response by science organizations nationwide was immediate. "What is needed from scientists now

National Center for Science Education, a watchdog group that promotes the teaching of evolution. In New Mexico, for example, two creationists who won seats on the state board of education were defeated in the next election. For nearly three years, changes that they had introduced into the state's teaching guidelines, which required that evolution be presented alongside alternative theories, were vigorously opposed by scientists and teachers there. Last month, the New Mexico Board of Education agreed, voting overwhelmingly that evolution alone should be taught.

A closer look

Observers have noted a shift in creationists' tactics in recent years: Instead of insisting on the teaching of creationism, they now focus on discrediting evolution. In the standards adopted in Kansas, "they basically took out anything that suggests an old Earth and an old universe and that contradicts the literal interpretation of Genesis," says Adrian

Melott, a University of Kansas cosmologist. (A line-by-line comparison of the writing committee's draft and the adopted standards can be found on the Web at <http://rna.world.bio.ukans.edu/evolve/>.)

The standards still mention microevolution, the process of change within species, but not macroevolution, the change from one species to another. The questioning of methods and theories used to support evolution, such as radioisotope dating and the extinction of the dinosaurs, is now explicitly encouraged, and greater emphasis is given to the second law of thermodynamics, often cited by creationists to prove that evolution is impossible. In the guidelines for high schoolers, it's suggested that students "research all published data on the fossils present in the layers of the Grand Canyon." Such a survey would turn up creationist literature suggesting that the Grand Canyon was created during Noah's flood.



HONK IF YOU LOVE DARWIN. A bumper sticker issued by Kansas Citizens for Science gets in a dig at the state's board of education.

is... not expressions of outrage, but active participation in state and local decision making," said Fred Spilhaus, director of the American Geophysical Union, in a statement released a day after the Kansas board's decision. "Creationists won in Kansas, and they are likely to win elsewhere, simply because they care enough to get elected to school boards." That sentiment was echoed by NSTA, the American Chemical Society, and the Society of Physics Students. At press time, several other groups, including the American Physical Society, were also preparing official statements on the events in Kansas.

"It is important to remember that this is not an irreversible situation," says Molleen Matsumura of the

All mention of the Big Bang, with its 10 to 20 billion year old universe, has been deleted; instead of understanding the universe's "formation," students should now understand its "structure," such as the grouping of galaxies into clusters and superclusters. Melott, whose own research lies in this area, finds the change intriguing. "It look harmless. But if you know their literature, you can see what they're preparing for." One of the creationists' arguments against the Big Bang is that there hasn't been enough time to form the observed structures, Melott says. But discussing the many flaws in that claim would be "too complex to deal with in high school," and so he worries that it will simply be presented in class as "proof" that the Big Bang theory is wrong.

Local control?

In defending the board's decision, chairwoman Linda Holloway says she does not expect schools to abandon evolution wholesale. "What we've done is put that decision at the local level." In August, the American Civil Liberties Union sent a letter to Kansas school districts warning that they could face legal action if they began teaching "creation science." Eddie Lorenzo, an attorney in the ACLU's Kansas City, Missouri, office, points out that the US Supreme Court has consistently ruled that creationism is religion and therefore cannot be mandated in public schools. "We're not saying you have to require evolution. What we're saying is that you can't remove it for certain reasons—for example, because it disagrees with your religious point of view."

The argument of local control is one that creationists have been using with great effect, says Liz Craig, a member of Kansas Citizens for Science, a statewide group that has been working to make sure that evolution continues to be taught. Craig, who works in advertising, has been helping develop strategies for countering the creationists. "They position it as a black or white thing: You're for science and against God, or vice versa. When it's posed that way, a lot of people will choose their religion."

Tom Willis, director of the Creation Science Association for Mid-America, says that's justified. Christians who say they believe in evolution aren't really Christians, because they don't defend evolution "on the basis of God's word," he says. "You can sit in a garage and call yourself a car, but that doesn't make either what you call yourself or what you

believe about cars true." Willis played a key role in the recent Kansas debate; in addition to testifying before the board of education, he also advised them in rewriting the standards.

The influence that Willis and others on the religious right have had maddens Douglas Phenix, a Presbyterian minister in Topeka. "They don't represent the religious community, not by a long shot," says Phenix, who studied chemistry before entering the ministry. "They just talk louder than the rest of us. A lot of religious people, like myself, are very alarmed by this. It's time we get off our duffs and do a bit more."

Phil Baringer, a high-energy physicist at the University of Kansas who testified at public meetings about the standards, says he was surprised by the contempt that creationists seem to have for mainstream scientists and their views. "To them, we're just these elitists, trying to tell everyone what to think. When you work umpteen years toward a PhD, you think that has bought you a right to an opinion." Apparently not. Following the August decision, the Institute for Creation Research issued a statement praising the board's "courage in thinking for themselves, rather than deferring to 'the experts.'"

But Janet Waugh, one of the four board members who voted against the standards, believes that the science should have been left to scientists. "All ten of the board members were elected as laypeople, not as science experts. That's why we had 27 of the best experts in science in Kansas making recommendations to us." Among the constituents she's heard from since August, a minority support the standards, "but the majority are outraged," Waugh says. "They're embarrassed that Kansas is getting the image of being backward."

Indeed, while Kansas has been singled out for ridicule, most Americans believe that God played some role in the origin of life, with over 40% believing in creationism, according to a 1997 Gallup poll. (Among scientists, only 5% believe in creationism, 40% believe evolution was divinely assisted, and 55% believe in evolution without God's help.) A number of states, including Alabama and Nebraska, have changed their science education standards to deemphasize evolution. And in Kentucky, where science teachers successfully campaigned to include the word "evolution" in state science guidelines, the education department recently decided to replace it with the term

"change over time."

"Kansas is maybe a little more conservative than the nation as a whole, but not vastly more," observes Tim Miller, a professor of religious studies at the University of Kansas. "This could have happened in any one of a couple dozen states."

Future steps

Last spring, Miller, Melott, and several other Lawrence, Kansas, residents tried to inject a little humor into the debate by forming FLAT, Families for Learning Accurate Theories. If Genesis is to be taken literally, why not the rest of the Bible? FLAT argued. Revelation, for example, refers to Earth's four corners. FLAT therefore urged that all references to the so-called round earth theory be removed from the science education standards. The group has also recommended that the value of pi, which the Bible gives as exactly 3, "should be left to local school boards [to decide], and not mandated by the state." The intent was to use satire to highlight some serious concerns, explains Miller.

"There is no way we're going to convert hardcore creationists," notes Craig. "The people we need to focus on are those in the middle of the road, who may not have thought much about the issue. We need to focus on issues they can relate to, like their children not getting the same quality of education that kids in other states get, or businesses not wanting to move to Kansas because of the image problem." The board's action may also make it harder to attract good science teachers and other professionals to the state, she adds.

As John Richard Schrock, a biologist at Emporia State University who served on the standards writing committee, sees it, "We're paying for our past educational sins. We haven't built up a depth of understanding in the populace. Students in other countries get far more biology, chemistry, and physics than they do here."

Phenix believes that the pragmatism of Kansans will ultimately prevail. Four of the six board members in Kansas who voted for the standards are up for reelection next year, and he predicts they'll be defeated. "And within a year or two, [the board's] position will be reversed," Phenix says. But in the meantime, the education of children will suffer, and "Kansas has an awful lot of mud on its face."

JEAN KUMAGAI