

This article appeared in the March 23 issue of the *Oklahoma Observer*

Anti-Science Legislation: No Strengths and Lots of Weaknesses

By Richard E. Broughton and Victor H. Hutchison

SB 320, the “Science Education and Academic Freedom Act”, authored by Sen. Randy Brogdon of Owasso, failed by one vote on 17 February in the Senate Education Committee, but we will likely see more proposals to question well established science or to promote non-scientific alternatives in science classrooms (e.g., HB 1001, the “Religious Viewpoints Antidiscrimination Act” by Reps. Reynolds and Kern). Such bills have significant potential to harm the education of our students and the future economic security of our state by casting doubt on science as a valid way of understanding the natural world.

SB 320 contained the following language: “The Legislature further finds that the teaching of some scientific subjects, such as biological evolution, the chemical origins of life, global warming, and human cloning, can cause controversy, and that some teachers may be unsure of the expectations concerning how they should present information on such subjects. . . . teachers shall be permitted to help students understand, analyze, critique, and review in an objective manner the scientific strengths and scientific weaknesses of existing scientific theories pertinent to the course being taught.”

So what harm is there in teaching “strengths and weaknesses”? First, promoting the notion that there are scientific controversies regarding these subjects is just plain dishonest. There certainly are social, political and/or moral controversies regarding several of these topics, but in all cases the scientific evidence is clear. Evolution is listed first and would appear to be the primary target but there is no scientific controversy whatsoever that evolution has occurred. This is universally accepted by an overwhelming majority of scientists around the world and is as well established as the fact that the Earth is round.

Second, there really are no scientific “weaknesses”. If one looks to the sources of these alleged weaknesses, we find they are phony fabrications, invented and promoted by people who don’t accept evolution, mostly for religious reasons. Note also the use of the vague term “weaknesses”. There is no mention of evidence refuting, conflicting with, or inconsistent with evolution. Yes, there are minor areas of disagreement among scientists regarding the mechanisms of evolution, such as the relative importance of natural selection versus neutral change, but these have no bearing on whether evolution has occurred. Fabricating “scientific” doubts about biological evolution, the chemical origins of life, global warming, or human cloning is common among those who do not like the implications. But just because something may be perceived to have negative moral or economic implications does not mean the science is controversial; it is rather, the application of that science. For example, one may not agree with the use of atomic weapons but that does not mean that there is some controversy over the physics or that one may simply reject the science as false.

Promoting false controversies in the classroom teaches our children that science is not always a valid way of understanding the world – that it may be good for some things, but if you don’t happen to like the outcome you can simply ignore those parts you don’t like. Incorporating creationist arguments into the science curriculum will effectively condone their tactics and teach students that acceptable

science involves: promoting untestable ideas, ignoring opposing evidence or denying that it exists, selectively misquoting scientists to support a point, supporting hypotheses with intuition (rather than evidence), and assuming that the popularity of ideas among the public is verification of their scientific validity. This will not only confuse students' understanding of science, it will undermine their entire education.

Discussing the alleged strengths and weaknesses is a clever tactic to open discussion to a so-called alternative to evolution, creationist-inspired "intelligent design". Although dressed in scientific language, intelligent design is not a scientific idea and should not be called a theory. To be scientific, an idea must be falsifiable, i.e., evidence must be able to show that an hypothesis is incorrect. The notion of a designer cannot be falsified and is therefore beyond the realm of science. Intelligent design proponents claim to be performing research on intelligent design. Yet not one iota of scientific evidence supporting intelligent design has ever been provided. In fact, no means for obtaining such evidence has even been proposed. Intelligent design is by definition an idea based on personal belief, unsuitable for science classes.

Promoting intelligent design through politics effectively bypasses scientists who actually work in the relevant fields, and appeals directly to state legislators, school boards, and the general public. The intelligent design movement implicitly exploits an unnecessary dichotomy between religious faith and science. This relies on the common misconception that to accept scientific evidence (for topics such as evolution) one must necessarily be an atheist. Ironically, the vast majority of religions of the world, including most forms of Christianity, find no inherent conflict between science and religious belief. Opposition to SB 320 or other bills aimed at teaching supernatural topics in science courses should therefore not be interpreted as anti-religious. There is certainly no problem teaching the cultural and historical aspects of religion in courses in philosophy, religions of the World and other social sciences, as long as they are not presented in science classes, or in a way that promotes one specific religion over others.

If the proponents of such bills were really interested in clarifying students confusion over science, one wonders why they focus on evolution but seem to have no problems with topics such as gravity and quantum theory. In fact, we know much less about the mechanism of gravity than for any of the topics listed in the bill. Similarly, quantum entanglement undermines Einstein's theory of special relativity. Shouldn't our students know about the strengths and weaknesses of the fundamental forces of the universe? Intelligent design proponents argue that in the interest of academic freedom students should be presented the strengths and weaknesses and allowed to decide for themselves. In fact, the current curriculum does not cover advanced aspects of quantum theory or mathematical population genetics so what is taught would not depend on the outcomes of such technical issues either way. In our view, students should learn about the nature and methods of science and about well established scientific theories, not about vague fabricated weaknesses designed to cast doubt on the practice and value of science.

A few years ago the major controversy over attempts by the State School Board in Kansas to place creationism into science courses led Governor Kathleen Sebelius and presidents of Kansas colleges to state publicly that the publicity was seriously hampering their ability to attract scientists and high-tech industries. Undermining science education will have similar detrimental effects on the prosperity of Oklahoma. A scientifically literate population can make informed decisions on important issues of our time such as on healthcare and the environment. Students who receive a solid science education can contribute to efficient discovery and use of energy sources, provide for competitive advantages in agricultural production, and make advances in biomedicine. This leads directly to increased economic growth and will help attract additional high-tech, energy-based, and med-tech industries to Oklahoma.

If SB 320 or similar bills were to become law, Oklahoma is likely to see major lawsuits on the grounds of constitutional separation of church and state. In Dover, Pennsylvania the local school board tried to place creationist “intelligent design” into science courses (Kitzmiller vs. Dover School Board). In December 2005 Judge John E. Jones in a Federal District Court in Pennsylvania ruled that “intelligent design” was religion and was not science. The Dover School District is now paying one million dollars in court costs.

Ultimately, forcing teachers to present the “strengths and weaknesses” will force them to pretend that we know less than we really do about the natural world and to present ideas that have emerged from a religious think tank as if they were science. The issue here is not about fairness or free inquiry; it is about science vs. nonscience. SB 320 and others like it make the completely baseless association between academic freedom and freedom to cast doubt in students' minds where no scientific doubts exist. Appropriate academic freedom is already present in our schools. Such legislation would not promote academic freedom, but academic deception.

- Broughton is Associate Professor and Hutchison is George Lynn Cross Research Professor Emeritus, Department of Zoology, University of Oklahoma

-