DESIGN ISN'T SCIENCE

Why biology classes shouldn't teach intelligent design
by Craig E. Nelson

SUMMARY

ENSI Co-Director Craig Nelson wrote this article for the Fort Wayne Journal Gazette Perspective page, Sunday, Aug. 28, 2005. He discusses four common reasons widely given why ID should not be taught in biology classes:
1. It is not science; 2. It would be unconstitutional; 3. Defending such requirement would require substantial legal costs; and 4. It would hold back local or regional economic development.

He adds a crucial fifth reason: teachers would be forced to critically confront religious beliefs of students, probably resulting in non-productive defensiveness by students, and precious time focusing on the false claims of ID and creationist proponents.

Read Nelson's elaboration and examples. If you find yourself confronted with any student who insists on "equal time," "arguments against evolution," or other challenges, you might want to share these points with the student. This would probably be best on a one-to-one discussion, if possible.

However, such confrontations can generally be avoided entirely if you have done an effective job of teaching the nature of science, in which the many common myths about science are exposed for what they are. Part of that experience should include a clear understanding of what topics are simply not appropriate for science, especially those involving supernatural explanations, and *why* that is inappropriate. Teachers should make very clear that science is neutral on topics of faith and the supernatural. Science merely seeks to understand how, when and why natural phenomena occur, based on observation and the testing of hypotheses. All of the ENSI lessons are based on these rules of science. Try some of our Nature of Science lessons at www.indiana.edu/~ensiweb/natsc.fs.html.

Design isn't science

Why biology classes shouldn't teach intelligent design

By Craig E. Nelson

The controversy over teaching intelligent design, or "ID," in high school biology courses has taken some strange twists recently.

The scientific community has almost universally determined that intelligent design is not science. The U.S. National Academy of Science is the most authoritative scientific voice in this country. This conservative group of major research scientists avoids taking stances on scientifically controversial issues. It has clearly stated that ID is unambiguously a religious position, not a scientific one (and that large-scale evolution is a "fact").

Surprisingly, President Bush's own official science adviser stated earlier this month that "intelligent design is not a scientific concept." Scientists and science educators almost universally agree that if something is not science, it definitely should not be taught in a high school science class.

A major additional reason explains why intelligent design cannot be required in science classes (with or without the teaching of evolution). Requiring it is an unconstitutional advocacy or "establishment" of a religious position.

A pragmatic third problem results. Any school board or state that requires the teaching of ID can anticipate substantial and expensive legal entanglements. The major organized support for ID has come from the Discovery Institute, a group that includes some scientists as well as lawyers

and philosophers. Again surprisingly, the director of the Discovery Institute recently reversed its position and stated that students should not be required to learn about ID.

An additional pragmatic problem from teaching ID is also important. Just as much of the 20th century was the century of chemically based economic progress, it is clear that much of 21st will be based on applied biology. The evolutionary core of biology has been made even more essential by advances in genomics, proteomics and molecular developmental biology. Each of these fields and more are providing deeper documentation of the evolutionary affinities among all animals. More important, evolution is the core explanation of the patterns and mechanisms they find.

New workers in states that de-emphasize the underlying evolutionary biology will be underprepared for college science courses and for jobs in biotechnology, biomedicine and related fields. These fields are already driving major economic growth and redevelopment.

In summary, there are four important and common arguments against requiring the teaching of intelligent design. It is not science. Requiring it would be unconstitutional. And, pragmatically, defending any such requirement would require substantial legal costs and also would tend to hold back local or regional economic development.

Teachers' dilemma

To these I wish to add a fifth.

Each of the many high school biology teachers with whom I have worked has tried very hard to respect the religious faiths of their students. These teachers are quite careful to be non-confrontational with respect to religion. To this end, they have frequently underplayed the strength of the scientific support for evolution. Requiring that intelligent design be taught alongside evolution in a science class would require that these teachers directly confront their students' beliefs. I cannot see how this can possibly be good for either science or belief.

Let me explain.

Michael Behe is the most prominent biologist arguing that some features in cells (cilia, for example) are so complex that they could not have functioned in a less complicated form and, thus, apparently could not have evolved. He terms this "irreducible complexity" and concludes that if it appears that these features could not have evolved, they must have been designed by an intelligence. In a class where ID was being taught, teachers would have to help students examine Behe's claims and purported evidence closely. Indeed, the core process of science is the comparison of the strengths and weaknesses of any unresolved issues that are presented.

The first key problem for teachers and students would be with the nature of any intelligent designer. Behe states, "I strongly emphasize that it (ID) is not an argument for the existence of a benevolent God." He states that "candidates for the role of designer include: the God of Christianity; an angel – fallen or not; Plato's demiurge; some mystical New Age force; space aliens from Alpha Centauri; time travelers; or some utterly unknown intelligent force." He also notes that the designer may or may not be interested in humans, may or may not be competent and may have designed only some details, leaving others to "the vagaries of nature."

How is a science teacher supposed to help students deal with the claim that any unexplained design-like features of the cell might be the result of an incompetent, inconsistent and evil alien or a fallen angel? How can a teacher maintain enough control of such a discussion to assure that

the students' various religious views are adequately respected? How can a high school biology class be improved by such a discussion?

It is inconceivable that any courses that were to incorporate ID could proceed without some students asking about the proposed identity of the inferred designer.

Some readers may feel that I am exaggerating here. I am not. No exaggeration is needed. Note that I have used direct quotes from a recent article by the leading biologist who advocates ID (taken from his chapter in the 2003 book "God and Design").

The second key problem for teachers and students would arise from a close analysis of the biological examples that were provided as evidence of "irreducible complexity." Behe claimed that the cilia of cells with a nucleus provide an example. This would mean that no part could be removed without destroying the function. But, as was promptly pointed out by reviewers, a number of organisms have cilia that lack some of the usual parts and some are quite incomplete. Behe made a similar claim for the mammalian blood-clotting cascade. But this cascade is incomplete in some mammals.

If ID is to be examined in biology classes, the teacher will have to directly confront its claims that some features of organisms cannot have evolved, as part of the argument for some kind of a designer. Since these claims fail, the teachers will be faced with the largely insoluble problem of examining the claims in such a way that students feel that their faith is not being challenged by the teacher or other students. Nothing will be gained either scientifically or religiously from such a direct confrontation.

It might seem that if some claims of ID can be rejected on scientific grounds, it is really a scientific alternative – even if an inadequate one – to evolution. What makes ID clearly not science is the conclusion it draws. If a complex feature seems to be inexplicable at the moment, ID claims that it probably will never be explained scientifically and so must be attributed to some kind of a designer. There is no logical justification for such a leap – the correct conclusion would be simply that the feature is currently unexplained.

It would be important to emphasize in any classroom examination of ID that the current set of examples of supposedly unexplained complexity are part of a long series that has failed to hold up. Behe himself earlier asked: If whales evolved from land mammals, where are the missing links? He had the misfortune to publish this query in the same year that the first three such fossil links were made public.

Clear evidence has been found for the evolutionary origins of eyes, of the feathered wings of Archaeopteryx, of insect wings and of many other features that once were claimed to be inexplicable. These evolutionary explanations are made ever stronger by evidence from the emerging fields of molecular genetics and molecular developmental biology.

Any comparison of ID with evolution would require explicit examination of similar past claims. It would also require careful examination of the ways complex structures can arise (often by change in function – extra jaw bones becoming ear bones, etc.). This would in many cases increase considerably the strength of the support presented for evolution in high school biology classes. This is a good outcome, but it can be better achieved by approaches that would much less directly clash with many students' religious beliefs.

One might think that fairness would require that claims that evolution is adequate must be presented alongside evolution in a biology class. Scientists would generally reply that apparently mistaken ideas advanced by a very small minority of scientists do not merit such treatment.

There are far too many such ideas and most previous examples have turned out to be clearly wrong.

I have tried to emphasize that there is another, potentially much more serious, problem. Fairness would require that any side that is presented must also be critiqued. But a direct critique of ID is going to be much more confrontational to students' beliefs than most high-school teachers feel is appropriate. I agree with these teachers.

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