Countering the Wedge:
A multi-pronged, multi-year strategy to oppose creationism and intelligent design in the science curriculum of public schools

by Massimo Pigliucci[1], David Baum[2] & Mark McPeek[3]

[1] Dept. of Ecology & Evolution, SUNY-Stony Brook, pigliucci@genotypebyenvironment.org
[2] Dept. of Botany, University of Wisconsin-Madison, dbaum@wisc.edu
[3] Dept. of Biological Sciences, Dartmouth, mark.mcpeek@Dartmouth.EDU

For the joint council of the Society for the Study of Evolution, the Society of Systematic Biologists, and the American Society of Naturalists

Introduction

When Darwin published The Origin of Species in 1859, there was extensive opposition from both religious groups and scientists (Caudill 1997, Larson 1997). However, whereas scientific controversy had entirely dissipated by the 1940's, a significant amount of skepticism or outright rejection of Darwinian evolution in favor of various forms of creationism is still to be found in the public at large. Despite the recent, important legal decision preventing the teaching of "Intelligent Design" as an alternative to evolution in Dover PA (Jones 2005, see Appendix 2), antievolutionism remains active in the United States and many other countries.

Let us make no mistake about it: the evolution-creation problem has major consequences. At a time when evolutionary biology is increasingly important in medicine, agriculture, and environmental science, antagonism towards evolution has the potential to negatively impact the development of sound public policy about our economic and environmental well being. More broadly, the divisiveness of the debate promotes distrust of scientists, reduces support for the funding of basic science, and undermines science education at all levels. Given the unarguable importance of a strong scientific infrastructure for solving the diverse problems faced by humankind, making progress on the evolution-creationism controversy should be a high priority for individual scientists and scientific societies.

The existence of a massive and well-funded network of anti-evolutionary groups has contributed to the persistence of creationism, but at the same time scientists could have been more effective in outreach and education (Pigliucci 2002, 2005). Thus, while scientists certainly cannot hope by themselves to overcome the problem, it seems increasingly clear that inaction is no longer an option. The public already perceives academics as aloof and isolated, lost in a pampered world of irrelevancies, unwilling or unable to come out of the ivory tower even for brief periods to explain why their research is worthwhile (Sagan 1995). We think that professional societies ought to take the lead and generate an internal cultural change within academia, to help scientists rethink their priorities and make outreach and public involvement a matter of normal practice, rather than a suspect activity carried out only by a few individuals.

This document, loosely modeled after the antievolutionary *Wedge Strategy* produced by the *Center for the Renewal of Science and Culture* (Forest and Gross 2004, see Appendix 1) defines a series of goals, and a preliminary set of suggestions on how to achieve them, which we hope will be adopted – with suitable modifications – by the three major US based societies of evolutionary biologists. The time to act has already come upon us, but we are not too late yet.

An anti-wedge strategy: the goals.

- ✗ To defend the teaching of evolutionary theory as the fundamental conceptual framework for all biological sciences.
- ✗ To preclude the teaching of creationism, intelligent design, and other pseudo-scientific "alternatives" as part of the science curriculum in public schools.
- ✗ To positively engage the public, the media, religious leaders, and elected representatives to promote a better understanding of evolutionary biology in particular and science as a method of inquiry in general.

Some principles.

- ✗ The members of our various professional societies must become locally active in their own K-12 educational systems to ensure that only science is taught in the science curriculum. The tenor of all our efforts must be professional and positive (i.e., enlightening and educational) rather than characterized by petty attacks on ID and other anti-evolutionary movements.
- ✗ We must always use sound arguments from the philosophy of science (e.g., Shanks and Joplin 1999; Sober 2001) and draw on solid evidence rather than resorting to the "we're scientists, so we know best" approach.
- ✗ We should assume that the public is capable of understanding the issues at a sophisticated level, but we must express ourselves in plain language, and not the jargon of our various disciplines.
- ✗ We should capitalize on the fact that ID has yielded so much to evolution: many of its proponents accept common ancestry and deep time, and acknowledge that natural selection is a powerful agent of change.
- ✗ We need to challenge ID proponents to provide scientific (i.e., testable) hypotheses. We should clarify that if they cannot expound any testable hypotheses about the designer, his/her capacities, methodologies or agenda, then their hypotheses are not scientifically valid and are thus not within the bounds of science (Young and Edis 2004).
- ✗ We should clarify that there are multiple legitimate scientific controversies about evolution and that we would be delighted if these were taught in schools. This is the basis of how science approaches understanding.
- ✗ We should reinforce the point that education about the process of doing science is critical to the public's understanding of scientifically derived knowledge and their

interpretation of scientific and science-related policy debates.

- ✗ We should continue to emphasize that time should not be taken away from the teaching of good science to satisfy any political/religious agendas.
- ✗ We should emphasize that ID is a cover for creationism (Forrest and Gross 2004), and that creationism is blatantly religious and sectarian.
- ✗ We should emphasize that school curricula should indeed contain more discussion of the evidence for evolution, and we are primarily responsible for articulating and disseminating that evidence.
- ✗ We should encourage the discussion of creationism and ID in non-science classes in contexts where it is clear that these are not scientific theories. This should be part of a larger curriculum about the responses to major scientific discoveries in general.
- ✗ We should be clear that there is no logical incompatibility between evolution and a range of theistic worldviews, and that evolution theory neither undermines nor validates any moral/spiritual claims.

Some proposed measure to achieve the goals

Medium term:

1) Members of SSE, SSB and ASN and other sympathetic scientists should become more engaged locally in outreach. The emphasis should not be on reacting to the latest attacks, but on the use of positive language for the education of the public in both evolutionary theory (natural selection, population thinking tree thinking, etc.) and the nature of science. This could include:

a. Public talks – on and off campus (including in churches, etc.).
b. Radio appearances.
c. Explanatory articles in popular magazines.
d. Op-ed pieces in newspapers.
e. Continued production of popular books.

2) ASN/SSB/SSE should find mechanisms to encourage members to engaged in scientific outreach, for example by acknowledging these efforts in society publications and offering awards for individuals who make major contributions in this area.

3) The societies should work to assist their members and other scientists to become more effective ambassadors for evolutionary biology. Most importantly, the societies should produce and disseminate a booklet providing a detailed discussion of the evidence for evolution and a primer of relevant aspects of the philosophy of science. This document should define very clear standards as to what a well-educated member of society should know and understand about evolution.

4) ASN/SSB/SSE should coordinate efforts with other entities, NAS, AIBS, AAAS, NCSE, etc. to more effectively educate elected representatives in Washington and in state capitals. The message to send is that evolution is part of a complete biology education and central to many cutting edge areas of biomedical research (e.g., genomics), and our economic well-being (e.g., health care, agriculture, environmental science,

biotechnology). We must articulate how attacks on evolutionary education will cause a dramatic lowering of science literacy with concomitant economic impacts (e.g., being seen as unfriendly to the biotechnology industry).

5) The societies should work in consultation with education researchers to develop a reasonable concept inventory for evolutionary education at various levels from the middle school to baccalaureate level.

6) The societies should seek out religious leaders from across the spectrum and work with them to understand the motivations of religious attacks and to alleviate the religious public's misconception that evolutionary biology is part of a conspiracy to undermine "family values" and to promote a hedonistic, morality-free society.

7) To achieve these medium term goals, the societies should establish a joint communications and outreach committee that will coordinate efforts among the societies, and seek professional help in developing an integrated PR/mass communication plan.

Long term:

1) The societies should work with local, state, and federal governments to encourage better educational standards in the area of evolutionary biology (guided by the concept inventory).

2) The societies should work with high-school teachers to develop new biology textbooks that effectively integrate evolution into the entire curriculum.

3) The societies should work with education researchers to encourage the development of better curricular materials for evolution, especially for teaching tree-thinking and historical inference (there are a lot of materials for natural selection).

4) The societies should work with teacher-training colleges to encourage them to require science-teachers-in-training to take appropriate courses on evolution.

5) The societies should work through the societies' membership to ensure that every major University has good course offerings in evolution for biology majors and non-majors.

6) The societies should work with members to change the norms of graduate training so that graduate programs in evolutionary biology (and ideally all areas of biology) train students in effective teaching methods and engage them in outreach activities.

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Appendices

The Wedge Document, produced by the Discovery Institute, an Intelligent Design think tank based in Seattle, WA.

The full text of the decision by Judge Jones concerning the trial in Dover, PA about the teaching of Intelligent Design in public schools.