

EXHIBIT 17
DATE 2-7-05
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February 21, 2004

Darby School Board
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Attn: Ms. Gina Schallenberger, Chair

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SENATE EDUCATION

EXHIBIT NO. 17

DATE 2-7-05

BILL NO. SJ-8

Dear Ms. Schallenberger and other members of the Darby Board,

I have been following the controversy in the Darby School District about evolution with great interest.

I am writing—as a member of the National Academy of Sciences—to voice my strong support for the Darby Objective Origins Science Policy that would encourage teachers to have students critically analyze evolutionary theory. The Darby Board is to be commended not only for the idea of developing higher level thinking skills in students, but also for the idea of encouraging objectivity about a subject that is unquestionably controversial, not only from a scientific, but from a cultural standpoint.

All too often, the issue of how to teach evolutionary theory has been dominated by voices at the extremes. On one extreme, many religious activists have advocated for Bible-based ideas about creation to be taught and for evolution to be eliminated from the science curriculum entirely. On the other hand, many committed Darwinian biologists present students with an idealized version of the theory that glosses over real problems and prevents students from learning about genuine scientific criticisms of it.

Both these extremes are mistaken. Evolution is an important theory and students need to know about it. But scientific journals now document many scientific problems and criticisms of evolutionary theory and students need to know about these as well.

Many of the scientific criticisms of which I speak are well known by scientists in various disciplines. (My own work has been in chemistry and biochemistry including work on the development of antibiotics, a topic often addressed in evolution curriculum).

I don't know why, but I have found that some of my scientific colleagues are very reluctant to acknowledge the existence of problems with evolutionary theory *to the*

general public. They display an almost religious zeal for a strictly Darwinian view of biological origins.

Darwinian evolution is an interesting theory about the remote history of life. Nevertheless, it has little practical impact on those branches of science that do not address questions of biological history—the vast majority of fields. Most of the great discoveries in biology and medicine over the last century could have been made without Darwinian evolution and provide little or no support for it. Instead, for those scientists who take it seriously, Darwinian evolution has functioned more as a philosophical belief system, than as testable scientific hypothesis.

This quasi-religious function of the theory is, I think, what lies behind many of the extreme statements that you have doubtless encountered from some scientists opposing your curriculum. It is also why many scientists make public statements about the theory that they would not defend privately to other scientists like myself.

In my judgment, this state of affairs has persisted mainly because too many scientists were afraid to challenge what had become a philosophical orthodoxy among their colleagues. Fortunately, that is changing as many scientists are now beginning to examine the evidence neo-Darwinism more openly and critically in scientific journals.

Your Board has adopted a Policy that really reflects the true nature of science. It will allow students and teachers to exercise this same freedom of thought—the freedom to examine evidence without worries about meeting an ideological or philosophical litmus test.

Intellectual freedom is fundamental to the scientific method. Learning to think creatively, logically and critically is the most important training that young scientists can receive. Your approach to teaching evolution will, therefore, prepare students, not only to understand current scientific arguments about evolution, but also to do good scientific research.

I commend you for your Board's Policy and for your leadership in making a brighter future for science and science education possible.

Yours sincerely,

Professor Philip S. Skell
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February 6, 2005

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Montana Senate
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RE: Senate Joint Resolution No. 8

Ladies and Gentlemen,

I was asked yesterday to comment on the Joint Resolution because I have personal knowledge of a number of the factual matters that conflict with its recitals.

Although trained as a geologist, I have focused my professional career primarily on the practice of law in Kansas City since 1968. During the last four years I have specialized in constitutionally appropriate ways for public schools to educate children about a question that is addressed by both religion and science: *What is the origin of life and its diversity?*

Coincidentally, what triggered the request for this letter is an event that caused me to switch my speciality from business litigation and corporate finance to constitutional law. The event involved a December 7, 1999 action taken by the Kansas State Board of Education about the teaching of evolution. I was asked to write this letter to comment on the following recital in the Resolution about that event:

Certain unnamed "national fundamentalist organizationspressur[ed] the Kansas State Board of Education into removing evolution theory from the science curriculum..."

This statement is false and misleading in many respects. The standards that were adopted did not "remove evolution theory from the science curriculum" or the science standards. I am attaching three pages of excerpts of science standards dealing with evolution that were included in the Standards adopted by the Kansas State Board on December 7, 1999. You can find the complete standards at <http://www.IntelligentDesignNetwork.org/kansas99stds.htm>. Furthermore, the standards do not constitute "curriculum." In Kansas, curriculum is developed by local school districts. I have reviewed the Montana Science Standards and I believe I would be challenged to find as much information about evolution in those standards as was adopted by Kansas in 1999.

February 6, 2005

Page 2

My interest arose in 1999, not because of evolution *per se*. It arose over an official bias that effectively protects evolution from criticism called *methodological naturalism*. I was shown a proposal made by the science committee that would cause the state to embrace that bias and thereby promote the philosophy of Naturalism. They sought to promote that philosophy through an arcane definition of science that is not contained in text books and that is not familiar to the public: "Science is the human activity of seeking *natural* explanations of the world around us." This was troubling to me because the limitation on explanation would effectively require the state to endorse a fundamental tenet of non-theistic religions like Secular Humanism, atheism, agnosticism and scientism.

This caught my interest and I, along with a zoologist and a university professor having a PhD in biochemistry, urged the Board to change the word "natural" to logical.² By accepting this advice, the Kansas State Board rejected the philosophy of Naturalism in origins science in favor of doing science the way it is portrayed to the public and in text books - an objective, evidenced-based activity driven by the scientific method rather than a controversial religious philosophy. Two years later, the nineteen member Ohio State Board took exactly the same action and rejected a similar naturalistic definition. The current debate in Kansas is now focused on the same issue.

I believe public education about origins is profoundly important to our world views about many issues important to life, including religion, ethics and government. For this reason I switched my legal focus to a full time study of a scientific and constitutionally satisfactory way to teach origins in public schools. This search led to the conclusion that what is needed in this area is objectivity, not bias. Objectivity produces the best science and that leads to constitutional neutrality. Objectivity requires the disclosure of any bias that may be lurking in the background. On the other hand, bias produces bad science and unstated assumptions that cause the state to embrace one side of a controversy that has an enormous impact on religion.

Objectivity is needed because origins science itself is an historical science that is very subjective due to extreme limitations on observation and experiment. It also unavoidably impacts both theistic and non-theistic religious beliefs. The unavoidable religious implications of origins science essentially requires public education to open up the scientific discussion of origins, rather than to promote only one side of the scientific controversy.

While I am at it, I should mention other items in the Resolution that trouble me.

Although one often hears about "separation of Church and state," this is a very misleading portrayal of the way the Supreme Court has construed the Establishment and Free Exercise Clauses of the First Amendment.

"Nor does the Constitution require complete separation of church and state; it affirmatively mandates accommodation, not merely tolerance, of all religions, and *forbids hostility toward any*. Anything less would require the "callous indifference" we have said was never intended by the Establishment Clause. Indeed, we have observed, such hostility would bring us into "war with our national tradition as embodied in the First Amendment's guaranty of the free exercise of religion."¹ (emphasis added)

February 6, 2005

Page 3

The problem with the phrase "separation of Church and state" is that it suggests that the function of government is to exclude only one religion - Christianity - from the public square, while allowing others to occupy the vacancy. But *exclusion* of only one of many religions is actually the opposite of the holdings of the Court. Its decisions show that the role of government is to achieve separation of government from the plethora of diverse religions that exist in this country through *neutrality*, not through *exclusion*:

"An attack founded on disparate treatment of "religious" claims invokes what is perhaps the central purpose of the Establishment Clause - the purpose of ensuring governmental neutrality in matters of religion.....Necessarily the constitutional value at issue is "neutrality.""

Christian fundamentalists are not the only ones that have a stake in the origins debate. The Darwinian claim that life is just the product of unguided purposeless processes supports, but does not require, belief in Secular Humanism, atheism, agnosticism and Scientism. The contrary proposition that natural selection and chemical evolution are not adequate to explain the origin of life and its diversity supports, but does not require, belief in traditional theistic religions, including Islam, Judaism and Christianity. Both *Epperson v. Arkansas* and *Edwards v. Aguillard* suggest that suppressing one of multiple scientific views about origins is constitutionally problematic. The way to achieve neutrality is by opening up the discussion rather than suppressing one side of the controversy. This idea was recently recognized by the National Assessment Governing Board. In defining the phrase "secular, neutral and nonideological," the board ruled that "neutral and nonideological" requires a discussion of both sides of a controversial matter.

In my opinion, it is not the role of the state or any state institution to take sides on this issue. It worries me that the Resolution seems to do exactly that. It gives one the impression that it's "*hidden agenda*" is one that implicitly denigrates Christian fundamentalists in order to promote a Naturalistic philosophy key to non-theistic beliefs.

I have been working in this area for five years, and I don't know of any national "fundamentalist" organization that is seeking "to force local schools to adopt a science curriculum that conforms to their particular religious beliefs." I do know that a number of organizations, like Intelligent Design network, inc. are urging public schools to ensure that origins science is taught honestly and objectively so that students and teachers are encouraged to apply critical thinking to an area of extreme scientific controversy that unavoidably impacts both theistic and nontheistic beliefs. As explained, the reason for the quest for objectivity, is that the current paradigm for teaching origins is not objective. It uses a generally unstated and irrefutable naturalistic bias that suppresses legitimate scientific alternatives and criticisms of evolutionary theory. Because of this bias, students are shown only one side of a raging scientific controversy. The side they are shown just happens to harmonize with non-theistic beliefs.

The impact of this naturalistic bias on Secular Humanism is made clear in the case that held it to be a religion:

February 6, 2005

Page 4

"Dr. Kirk defines Secular Humanism as ".....a creed or world view which holds that we have no reason to believe in a creator, that the world is self existing, that there is no transcendent power at work in the world, that we should not turn to traditional religion for wisdom; rather that we should develop a new ethics and a new method of moral order *founded upon the teachings of modern naturalism and physical science.*"

The Resolution speaks of national organizations pushing particular religious views. There are national organizations that are pushing a particular world view in the area of origins science, but I do not believe they fit the identity of the organizations intended by the Resolution.

It is true that Kansas was held up to ridicule. However, I believe that ridicule is not deserved given the record the Board actually left. Indeed, I anticipate that the history books twenty years from now will look upon Kansas in a much different light.

The resolution appears to equate intelligent design theory to a religious belief. That is not the case. An inference of design, is just that, an inference from observed data. Design theory is simply the scientific disagreement with the core claim of Darwinian evolution that the apparent design of living systems is an illusion and not objectively real. A significant body of scientific evidence contradicts that claim.

The resolution argues that "these national efforts undermine a community's local control, a teacher's academic freedom and a student's opportunity to receive a quality education." I wonder how a quest for objectivity can ever detract from these goals. What proscribes these goals is an institutional bias, not objectivity. In this case, the bias is one embraced by evolutionary biologists, not organizations like IDnet whose very mission is to encourage the disclosure of both personal and institutional bias.

The very last recital is very interesting, because, it correctly recites that the constitution does not contemplate "government adopting or endorsing a particular religion's teachings." If that is the case, then government should not be "endorsing" "modern naturalism" the key tenet of the religion of secular humanism. However, it seems to me that an unstated purpose of this Resolution is to promote that philosophy.

With respect to clause (2), the Resolution seeks to denigrate particular religious beliefs. Although the particular beliefs are not described, there seems little doubt that they are targeted at the Christian community. That seems inconsistent with the obligation of the legislature to be neutral as to religion.

Clause (3) urges the addition of religion classes in public schools to accommodate the side of the scientific controversy over origins that happens to support theistic beliefs, while not importing the non-theistic side to that inappropriate forum. This suggests religious discrimination between theistic and non-theistic religion. Under this formula, the science class can only be occupied by non-theistic religious bias but not by evidence that supports a theistic perspective on the same issue. This really describes indoctrination, not education. Also, I would think that teaching religion in a public school would offend many parents and religions for fear that these so-called religion classes would destroy, rather than build up religion. In reality, the science of origins

February 6, 2005

Page 5

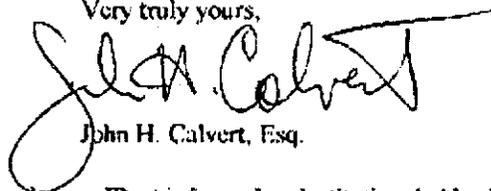
unavoidably impacts both theistic and non-theistic religions. So long as it is kept theoretical and objective, then there should be no conflict. It is when the state brings in a bias that major religious conflict arises. That is the case now, because current origins science is biased and not objective. Bifurcating the discussion and moving one side into the hands of a teacher not scientifically qualified to discuss it, would only exacerbate the problem, not cure it.

In closing, I believe the way to promote the lofty goals of clause (4) is to see that origins science is taught objectively in the science classroom. The religious problem is solved if you take out philosophic and religious biases and simply show students both sides of the scientific controversy. This scientific and legal formula is what the students and patrons of public education want and deserve.

I have one final suggestion. The issue you are debating is exceedingly complex and can not be properly resolved through sound bites issued by advocates. What is needed are in-depth hearings that will gather facts and cogent opinions from experts on both sides of the controversy. You would then be equipped with the information necessary for an informed decision about the matter. Accordingly, I would urge you to further investigate the matter before acting.

Thank you for considering my remarks.

Very truly yours,



John H. Calvert, Esq.

1. I am also an officer of Intelligent Design network, inc. IDnet is focused on *institutional objectivity in origins science*. The name advertises intelligent design because that is the scientific disagreement with naturalistic claims of "no-design" that is generally suppressed by institutions of science. The suppression is due to a bias not due to an objective consideration of the evidence. Hence, IDnet seeks to replace any official or institutional bias, including any religious bias, in origins science with the kind of objectivity one would normally expect from science. We believe scientific objectivity in origins science will produce two positive secular results: good science and religious neutrality. It is objectivity, not naturalism, that will take religion out of science.
2. This was the only change that we suggested that was accepted by the 1999 Kansas State Board. Other changes we proposed during the final stages of the process were not adopted.
3. *Lynch v. Donnelly*, 465 U.S. 668, 673 (1984): holding that the erection of a nativity scene as a part of a traditional holiday display in a privately owned park to celebrate the Holiday recognized by Congress and national tradition and to depict the origins of that Holiday; are legitimate secular purposes.
4. *Gillette v. United States*, 401 U.S. 437, 449-50 (1971).
5. *Smith v. Board of School Commissioners of Mobile County*, 655 F. Supp. 939, (SD Ala 1987, holding that Secular Humanism is a religion) rev'd on other grounds 827 F.2d 684(11th Cir 1987). The Supreme Court has recognized the existence of a number of non-theistic religions; *Welsh v. United States*, 398 U.S. 333, *concurring opinion, note 8* (1970): "This Court has taken notice of the fact that recognized 'religions' exist that 'do not teach what would generally be considered a belief in the existence of God.'" *Torcaso v. Watkins*, 367 U.S. 488, 495 n. 11, e. g., "Buddhism, Taoism, Ethical Culture, Secular Humanism and others."

**EXCERPTS FROM KANSAS SCIENCE STANDARDS ADOPTED BY THE
KANSAS STATE BOARD OF EDUCATION ON DECEMBER 7, 1999**

Eighth Grade - Continued

Standard 3

Benchmark 5: The students will observe the diversity of living things and relate their adaptations to their survival or extinction.

Millions of species of microorganisms, animals, and plants are alive today. Animals and plants vary in body plans and internal structures. Over time, genetic variation acted upon by natural selection has brought variations in populations. This is termed microevolution. A structural characteristic or behavior that helps an organism survive and reproduce in its environment is called an adaptation. When the environment changes and the adaptive characteristics or behaviors are insufficient, the species becomes extinct.

Instruction needs to be designed to uncover and prevent misconceptions about natural selection. Natural selection can maintain or deplete genetic variation but does not add new information to the existing genetic code. Using examples of microevolution, such as Darwin's finches or the peppered moths of Manchester, helps develop understanding of natural selection. Examining fossil evidence assists the student's understanding of extinction as a natural process that has affected Earth's species. Indicators: The student will:

7.1. Conclude that millions of species of animals, plants and microorganisms have similarities in internal structures, developmental characteristics and chemical processes.

Example: Research numerous organisms and create a classification system based on observations of similarities and differences. Compare this system with a dichotomous key used by scientists. Explore various ways animals take in oxygen and give off carbon dioxide.

2. Understand that microevolution, the adaptation of organisms - by changes in structure, function, or behavior - favors beneficial genetic variations and contributes to biological diversity.

Example: Compare bird characteristics such as beaks, wings and feet with how a bird behaves in its environment. Then students work in cooperative groups to design different parts of an imaginary bird. Relate characteristics and behaviors of that bird with its structures.

7.3. Associate extinction of a species with environmental changes and insufficient adaptive characteristics.

Example: Students use various objects, such as spoons, toothpicks, clothespins, to model bird beaks. Students use "beaks" to "eat" several types of food, such as cereal, marbles, raisins, noodles. When "food" sources change, those organisms which have not adapted die.

STANDARD 3: LIFE SCIENCE

Experiences in grades 9-12 will allow all students to develop an understanding of the structure and function of the cell, the molecular basis of inheritance, **biological evolution**, interdependence and behavior of living things; and organization of living systems and uses of matter.

6. Mutations occur in DNA at very low rates.

Example: Some changes make no difference to the organism or to future generations.

Most phenotypic changes are harmful; a few mutations enable organisms to survive changes in their environment.

Some favorable mutations are passed on to offspring.

Only mutations in the germ cells are passed on to offspring and therefore can bring about beneficial or harmful changes in future generations.

7. Biologists recognize that the primary mechanisms of genotypic change are natural selection and random genetic drift.

Example: Natural selection includes the following concepts: 1) heritable variation exists in every species; 2) some heritable traits are more advantageous to reproduction and/or survival than are others; 3) there is a finite supply of resources required for life; not all progeny survive; 4) individuals with advantageous traits generally survive; 5) the advantageous traits increase in the population through time.

Benchmark 3: Students will understand the history of science.

Indicators: The students will:

10 1. Demonstrate an understanding of the history of science.

Example: Modern science has been a successful enterprise of the last two centuries, contributing to dramatic improvements in the human condition.

Science progresses by incremental advances of scientists or teams of scientists.

Example: Some concepts have long-lasting effects and include: Copernican revolution, Newtonian physics, relativity, geological time scale, plate tectonics, atomic theory, nuclear physics, *theory of biological evolution*, germ theory, industrial revolution, molecular biology, quantum theory, medical and health technology.

Evolution: A scientific theory that accounts for present day similarity and diversity among living organisms and changes in non-living entities over time. With respect to living organisms, evolution has two major perspectives: The long-term perspective (macro-evolution) focuses on the branching of lineages; the short-term perspective (micro-evolution) centers on changes within lineages.

Theory: In science, an explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses (e.g., atomic theory, evolutionary theory).