The Texas State Board of Education and Public School Content

The Facts

The Texas State Board of Education is a group of fifteen individuals, representing various districts in Texas. One of their roles is to decide on standardized, statewide guidelines on public school contents for grades K-12. These guidelines are delineated in the Texas Essential Knowledge and Skills (TEKS), which dictate the content for every subject for every grade level that students must master in order to graduate from a Texas accredited public school. Importantly, these guidelines also dictate what textbooks are approved for classrooms and selection criteria for universities. While these guidelines are not enforceable in the private school setting, private schools that are college preparatory must consider these guidelines in determining student advancement and subsequent collegiate eligibility.

The old draft of the TEKS, which was approved in 1998, states that students are expected to "analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information."{1}

The new draft of the TEKS, set for final approval in March 2009, states in the parallel section that students are expected to "analyze and evaluate scientific explanations using empirical evidence, logical reasoning, and experimental and observational testing."{2} This line is in the introduction to the Biology class content under "scientific processes." The content portion of the biology class has various topics listed, and what students are required to

master within each of these topics. Topics include *Cells and Cellular Processes*, *Molecular Genetics and Heredity*, *Evolution and Populations*, *Classification and Taxonomy*, *Biochemistry*, *Systems and Homeostasis*, *Ecosystems*, and *Plants*. Under each of these topics are specific items that students need to know.

The Contentious Issues

Those are the facts of the issue as best as we can describe them. However, these changes have created more than a little uproar from various groups that have a vested interest in how evolution is taught. The lines divided as such: advocates of the unquestioned teaching of evolution in public schools who were in favor of the new wording, and advocates of questioning certain aspects of evolutionary theory who were in favor of keeping the wording "strengths and weaknesses" within the TEKS. Many people that were for the new wording said that there were no weaknesses to evolutionary theory, or accused the other side of using this language of "weaknesses" to somehow smuggle creationism into the classroom. Many people who wanted to keep the strengths and weakness language intact accused the other side of censorship and subversively teaching an ideology and abridging academic freedom.

The Texas State Board of Education hosted a public hearing on Wednesday, January 21 (2009), where they welcomed testimony from individuals. The hearing would close at 12:40 p.m., no matter how many testifiers were left on the schedule. With a list of nearly a hundred, the Board only got through thirty testifiers. Some provision was made for trading up and testifying earlier, and the Board members invited select individuals to testify at the public hearing. However the majority of people there to be heard, including me (spot thirty-nine), and my husband (a science teacher who has taught both in public high school and private middle school and was spot sixty-three) went unheard. While each testifier had a three-minute time limit, an obviously divided Board asked several questions, either for clarification or to be on public

record for having asked.

Whatever one may read or hear in the media, most of the testimonies on both sides were articulate and intelligent, and the testifiers fielded their questions remarkably well. If you look at the audience, you might think it looked like a rally; the room was a bit of a zoo. But the testimonies were certainly at a higher level than some kind of emotionally-charged, rah-rah pep rally. Whether we agreed with them or not, we thought each testifier made good points.

Testimonies

While we do not necessarily agree with everything below, we have summarized the main points presented by each side.

For the Proposed Wording and Against "Strengths and Weaknesses" Wording

- *The old wording does not provide guidance to teachers, especially new teachers.*
- *Students are not necessarily capable of analyzing evolutionary theory, or are not necessarily capable of evaluating the current research.*
- *Academic freedom refers to the university level, and students do not have the same freedoms of speech as adults.*
- *The current draft has more specific wording.*
- *There is a possibility of litigation as has happened in other states.*
- *Students could fall behind if they are taught supposed weaknesses in evolutionary biology.*
- *"Strengths and Weaknesses" wording would block the publication and adoption of good textbooks. In fact, it could result in the adoption of subversive Creationist books*

designed to exploit this flaw in educational guidelines.

• These weaknesses are pseudoscience, or these weaknesses are from sources that engage ifn pseudoscience (no satisfactory definition of pseudoscience was given).

• The word "weaknesses" has changed in meaning due to the use of it for P.R. by certain Creationist groups, and therefore should not be included in the TEKS.

• Warning that people may doubt the integrity of Texas education if strengths and weaknesses are allowed.

• "Strengths and weaknesses" is inaccurate because there are no weaknesses. These supposed weaknesses are false and misleading information. Teaching weaknesses is likened to teaching that Grant surrendered to Lee.

• It's better to get your information from the National Academy of Sciences than from "creationist" sources [quotes are mine].

• The peer review literature does not argue whether evolution happened, it is just researching how it happened. Whether it happened is not in question.

Against Proposed Wording and For "Strengths and Weaknesses" Wording:

• Even within the "strengths and weaknesses" wording, there has been silencing of students, and some teachers are intimidated to even broach the subject. Examples were cited by two of the testifiers.

• Cases of scientific hoaxes were cited by several people, including Piltdown Man and Haeckel's Embryos. These are significant because many evolutionists will not admit these were hoaxes/errors. While they could be examples of how theories grow and change (something they agree is part of

science and should apply to evolution), they instead go unaddressed and worry those who respect true scientific research and achievement.

• No one area of science has answers to everything, so there are always weaknesses in theories.

• There has been no litigation in the last twenty years with the wording "strengths and weaknesses" and to say that this encourages pseudoscience, brings up the question as to whether Texas has been engaging in pseudoscience for the last twenty years.

• Standards should promote academic diversity and critical thinking. Some of the great minds in science were non-conformists.

• Children begin thinking abstractly at young adolescence, and their abstract and cognitive abilities continue to develop through high school. This stresses the importance of including critical thinking skills in the TEKS. Teaching strengths and not weaknesses does not promote abstract thinking.

• Teaching strengths and weaknesses is more honest.

• Examples were cited of students who did learn strengths and weaknesses and it worked well.

• Real science deals with strengths and weaknesses of a theory; why should evolution be held to a different standard?

• We should not proclaim high school students too dumb to understand (my note: two of the testimonies were given by high school seniors).

• "Evolution" is a tricky term because when someone says "evolution" they may mean three different things, one of which is a fact and two of which are conjecture: 1) Microevolution (fact), 2) Common Descent (theory), 3) Natural

Selection acting on mutations is how things evolve (theory). Student should distinguish this.

• Scientific consensus is only one part of science, the conclusion part. Students need to also know the scientific process.

• There is a difference between scientific law, theory and hypothesis.

• All theories are refined in the scientific process. Evolution does not have testable postulates. (This testimony was cut off due to time, but he was going to distinguish between origins and operations science).

Assessment

My husband David is a science teacher who has taught high school science in public school and now teaches middle school science in a private, college-preparatory school. I have two degrees in science and am a research associate at Probe Ministries. Here is our assessment of the TEKS:

The wording "strengths and weaknesses" seems very intentionally omitted from the proposed version, which is suspect, but neither one of us can say definitively that it was left out in order to promote a particular agenda of misleading students or indoctrinating them by evolutionist advocates. "Analyze and evaluate" does convey something different than "analyze, review, and critique" and it does seem to be a very subtle difference that allows for slightly less freedom of discussion within the classroom; however, with this language, by itself, there may still be opportunity to have a rigorous discussion of weaknesses, especially if it falls under the category of "evaluating." Its omission from the TEKS however, as one Board member pointed out, does communicate something as well, so we are skeptical of the perceived freedom with this language.

Another, and what I think is a blatant problem with the evolution curriculum, is in the specific wording within the evolution content section. Within the TEKS Biology section, there are several topics that the students must cover. Within each of those topics are specific things that they must master. In the TEKS proposed draft, the evolution section of high school biology requires students to:

> *A. Identify how evidence for common ancestry among groups is provided by the fossil record, biogeography, and homologies including anatomical, molecular, and developmental;*
>
> *B. Recognize that natural selection produces change in populations, not individuals;*
>
> *C. Describe the elements of natural selection including inherited variation, the potential of a population to produce more offspring that can survive, and a finite supply of environmental resources resulting in differential reproductive success;*
>
> *D. Recognize the relationship of natural selection to adaptation, and to the development of diversity in and among species; and*
>
> *E. Recognize the effects of other evolutionary mechanisms including genetic drift, gene flow, mutation, and recombination.{3}*

The action verb at the beginning of each of these points is important because each verb is intentionally chosen, and from an educator's perspective has a technical meaning. According to Bloom's taxonomy of educational activities, verbs such as "describe," "define," or "identify" represent a low level of cognizance, while words such as "explain," "recognize," "illustrate" and "predict" are mid-level, and words such as "compare" "analyze," "interpret" are higher level of cognizance.{4} In *all* of the other science concepts taught in

biology, students are asked to “compare,” “investigate,” “predict,” “analyze,” and “interpret.” However, evolution is kept at a purely definitional level, meaning that even though the proposed TEKS include “analyze and evaluate” within the general scientific process section, there is no opportunity to do this when the students get to the evolution section; they are only required to essentially memorize definitions or memorize what fossils lead to common descent. Many testifiers claimed that students were free and in fact encouraged to discuss evolutionary theory. They said the “strengths and weaknesses” language was being replaced by the better, more specific “analyze and evaluate.” This is intentionally misleading. The general standards do read that way, but the evolution section itself is exempt from this rigid treatment in the new TEKS.

I was particularly unimpressed with Terrence Stutz’s article from the *Dallas Morning News*, in which he labeled the board members who wanted to include “weaknesses” as being aligned with “social conservative groups that in past have worked to cast doubt on science-based theories on the origins of life,”{5} when really, most of the testifiers and Board members that wanted “weaknesses” left in the TEKS, including my husband and myself, are arguing for academic freedom and free inquiry. The way evolution is handled in the proposal does nothing to promote even an analysis and evaluation, let alone an atmosphere of inquiry on a theory that is supposed to be the cornerstone of biology. {6}

The Vote and Results:

The Texas State Board of Education had a preliminary vote Thursday, and it was tied 7-7, which means that, so far, “strengths and weaknesses” language will not be in the next version of the TEKS (it requires a majority). However, the board has until March to make its final decision, and make a final vote.

While “strengths and weaknesses” is not in the current draft of the TEKS, the board did vote on some amendments that ask students to “analyze and evaluate” specific aspects of evolutionary theory, bringing the evolution science concepts up a notch (or two) on Bloom’s scale.

According to *Evolution News and Views*,{7} the wording change is as follows:

> *(7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to:*
>
> *(A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies including anatomical, molecular, and developmental;*
>
> *(B) analyze and evaluate how natural selection produces change in populations, not individuals;*
>
> *(C) analyze and evaluate how the elements of natural selection including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources result in differential reproductive success;*
>
> *(D) analyze and evaluate the relationship of natural selection to adaptation, and to the development of diversity in and among species; and*
>
> *(E) analyze and evaluate the effects of other evolutionary mechanisms including genetic drift, gene flow, mutation, and recombination.*

Furthermore, the Board passed an amendment that asks students to “Analyze and evaluate the sufficiency or insufficiency of common ancestry to explain the sudden appearance, stasis, and

sequential nature of groups in the fossil record."{8} Unfortunately, media coverage on these particular amendments are scarce. We would consider these amendments a success, especially since they address the issue of low-level cognizance in the evolution requirements. Now they are at a level that seems much more appropriate for high school biology, and we feel will promote good critical thinking and intellectual inquiry. We also believe that these amendments will better serve to prepare our students for the intellectual rigor and higher level thinking skills that they will need at the collegiate level.

Texas State Board of Education
Public Testimony
Heather Zeiger, M.S.
Research Associate, Probe Ministries

I went to Texas public schools for junior high and high school. I knew then that I was going to pursue a career in science, and ended up choosing chemistry my senior year. I graduated in 1999, and at the time, I had received some education in evolutionary biology. That education mostly consisted of memorizing facts and definitions, but gave no indication that there was anything more to be discussed. By way of example, one of the things we learned in biology was the Miller Urey experiment. We learned that this was the prevailing theory on how life began, and this is how it worked. There was no further discussion on chemical origins, and as far as I knew from what I was taught in the public high school, scientists agreed that this was how it happened. Except . . . it turns out that there were and still are many questions about chemical origins. In fact, as I later learned, there is an entire field of study in which chemists deal with the very fundamental questions of how life began. There is more than a little contention among those who believe that life came from an RNA-based world and others who believe that

it was originally metabolic. There are still others who think that life beginning from purely chemical processes may not even be possible under our current theories.

What was presented as a boring little tidbit in our biology books, actually is an entire field of inquiry. Chemical origins is just one area of evolutionary theory; and as we all know there are evolutionary biologists still researching these issues, which means that there are still challenges or unexplained parts of the theory to be investigated. The students that go into science, the ones I've worked with, are fascinated by the unexplained parts of a theory, by the mysteries. I think is a disservice to our children and to the scientific community to gloss over the places where a theory needs more work. We should encourage students to go on and become the next scientist to answer these questions in evolutionary theory. While the proposed draft does discuss strengths and limitations, in science, in general, it does not leave the evolution section open to this, but keeps it at a definitional level. I therefore contend that the Biology TEKS, science concept seven (evolution) should be phrased in such a way that would go beyond the less interesting part of science, identification and description of terms. And hopefully, this will open classroom instruction to analysis and discussion of current strengths and weakness within this important theory.

Texas State Board of Education
Public Testimony
David Zeiger
Texas SBEC Certified Science Composite Teacher for Grade 9-12

My name is David Zeiger and I am a certified composite science teacher for grades nine through twelve. I taught Chemistry and Physics for two years in Garland ISD, and now I teach seventh grade Life Science at Trinity Christian Academy, a private college preparatory school in Addison. In my relatively brief tenure as a science teacher, I have had to come to terms with a simple discouraging fact: most of my students will not love

science as much as I do, let alone become researchers, engineers, doctors, nurses, or even science teachers. In fact the National Science Foundation found that in 2000 only one third of college students earn bachelor degrees in science and engineering.{9}

Therefore, when I read the TEKS as the guiding structure for my curriculum, I have to ask what my job as a science teacher truly is. Am I wasting my time with two-thirds of my students? Memorizing the parts of a plant, reeling off the periodic table, or calculating using laws of motion; are these things that students are going to use again? Do I even want them to memorize a chart with the strengths and weaknesses of evolutionary theory? No. The things that every student can take with them are how to gain information from their environment, whether that environment is a job training manual, a relationship with their spouse, or a new technique for hammering a nail; how to test that new information against their previous experience and training; and most importantly, how to be flexible enough to change their ideas when it turns out they were wrong.

Those important methods of learning are included in the TEKS for non-biology science classes and in the non-evolution biology standards. When teaching science other than the evolutionary theory, students are asked to "compare," "predict," "investigate," "explore," "explain," "analyze," "interpret," and "model," activities from the whole range of cognizance. But, the proposed recommendations on evolution use language that refer to and limit the students to the simplest level of cognitive learning: memorization.

If we don't teach the simple fact that every theory has weaknesses, we don't teach young people true science. If we don't teach them to find and evaluate those weaknesses, we don't teach them to be humble in their search for truth. And if we don't teach them how to keep or reject those theories, we leave them as prey to whoever has a stronger opinion than

they do.

Please keep teaching students to analyze and evaluate scientific theories. Critical reasoning is one of the few things I know all my students will need and use every day of their lives.

Notes

1. 1998 TEKS, Section 112.43, (c), (3), (A).
2. Section 112.43 (c), (3), (A) of proposed TEKS
3. Proposed 2009 TEKS Section 112.43, (7)
4. www.teachervision.com
5. Terence Stutz, "Texas Board of Education votes against teaching evolution weaknesses," *Dallas Morning News*, January 24, 2009. tinyurl.com/bncw55
6. Theodosius Dobzhansky, "Nothing in biology makes sense except in the light of evolution," *American Biology Teacher* 1973, volume 35, pp. 125-129.
7. www.evolutionnews.org/2009/01/recap_texas_board_of_education.html
8. Ibid.
9. www.nsf.gov/statistics/seind04/c2/c2s3.htm

The Controversy over Evolution in Biology Textbooks

Texas, Textbooks and Evolution

Public school textbooks are big business in Texas. Texas is the second largest purchaser of textbooks behind California. Texas also employs an extensive review process which involves input from the public. Independent school districts in the state of Texas can purchase whatever textbooks they prefer. But if they want state assistance in the purchase of textbooks, they'd better pick those texts that are recommended by the State Board of Education.

Publishers know that whatever books Texas approves, other states will adopt as well. Therefore the decisions by the Texas State Board of Education regarding textbooks influence what many students across the country will be reading over the next few years. Publishers pay very close attention to what goes on in Texas.

Evolution has been a contentious issue before the State Board for decades. A few years ago, they passed a resolution that said textbooks were to be free from factual errors and that the information in the texts should allow students to "analyze, review, and critique scientific explanations, including scientific hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information."

This certainly sounds scientific and fair. I mean, who doesn't want both sides of scientific controversies presented? Any "scientist to be" needs to be able to analyze, review, and critique scientific explanations. Scientists rarely want to just take someone's word for something. Scientists tend to be skeptical in nature. That's a good thing. Students ought to be encouraged and trained to think this way.

That is, they ought to be trained to think this way about everything in science, except evolution. Evolution has become the unassailable myth of modern science. No dissension

allowed. No controversies accepted. No challenges tolerated. Evolution is a fact and anybody who doesn't think so is ignorant, dishonest, or religiously motivated.

But for some reason, skepticism about evolution and Darwinian evolution in particular just won't go away. The dissenters are also growing in number and levels of education. So when the Texas State Board of Education announced its two public hearings in the summer of 2003, the battle lines were clearly drawn. Skeptics of Darwinism came loaded with careful examinations of the textbooks up for adoption, pointing out inaccuracies, falsehoods, and skimmed-over controversies. No one came to include creation or intelligent design into the textbooks.

Defenders of evolution came loaded with little else besides crude attempts to discredit their critics and scary words of warning about attempts to get religion into the science textbooks.

What's Wrong with the Textbooks As They Are?

If you have occasion to pick up a high school biology textbook, you quickly realize that the process of writing it must be a daunting task. The amount of detailed information they contain today over a wide range of biological phenomena is truly staggering.

The reality that they contain errors or out of date material can be easily understood. You would think that authors and publishers would welcome those who spot these problem areas and take the time and effort to point them out. For the most part this is indeed the case. Except when the errors concern the presentation of evolutionary theory. Pointing out factual errors, exaggerated claims or poor logic in the presentation of evolution suddenly becomes suspect. One's motives should be questioned. Evolution is a fact, after all, and surely no one

thinks that evolution as presented in textbooks should be altered in any way.

I’m being facetious, of course. Evolution should be open to scrutiny as much as any other area of biology, but it isn’t. Some mistakes in biology textbooks have persisted for decades, despite efforts to point them out and seek their removal or correction.

A classic example involves the Miller-Urey experiment. In 1953, Harold Urey and Stanley Miller published the results of an experiment that was meant to simulate the production of biochemicals necessary for life from gasses that were thought to be in earth’s early atmosphere. Among a host of meaningless organic compounds, Miller and Urey found a few amino acids, the building blocks of proteins.

The experiment caused quite a sensation and launched the origin of life field with a bang. Over the years, however, numerous problems showed up that invalidated the experiment. Chief among these problems was the determination that the atmosphere they used—ammonia, methane, water vapor, and hydrogen gasses—did not represent the early atmosphere. These hydrogen rich gasses were replaced with carbon dioxide, carbon monoxide, nitrogen, and water vapor. When these gasses are used, the experiment is a dismal failure. Trace amounts of the simplest amino acid, glycine, sometimes appears, but not enough to get excited about.

All this has been known since the late 70s. But over thirty years later, textbooks represent the Miller/Urey experiment as if it still represents a realistic simulation. Why? Because it’s the only experiment that works. And there needs to be a naturalistic story of where life could have come from.

Other problems remain in the infamous and fraudulent embryo drawings of Ernst Haeckel, the newly discovered problems with the peppered moth story, the startling evolutionary problem of

the Cambrian explosion, and many others. Some of evolutionists' most cherished examples of evolutionary principles have fallen on hard times.

A Public Hearing in Texas in July 2003

The Texas State Board of Education is a powerful group of people. Every six years they evaluate textbooks for use in the Texas public schools, and many private schools and public schools from other states follow their lead. Part of the reason for this is the extensive review process the board employs.

Not only do the fifteen elected Board members review the texts, but a committee of educators from the Texas Education Agency also reviews them, and the public is invited to state its opinions as well. The Board reviews textbooks every year but they cycle through several categories every six years. The year 2003 was the year for biology textbooks.

I attended the first public hearing on July 9th in Austin, Texas. Citizens of Texas who wish to testify need to sign up about two weeks prior to the hearing. Each testifier is allotted three minutes, which is closely timed, and then a few board members may ask a few questions.

Three minutes isn't very long. It's about the length of one of our daily radio programs. So whatever you need to say, you'd better say it concisely and quickly. I briefly presented my scientific credentials and addressed problems with the Miller-Urey experiment, the Cambrian explosion, and the mutation/natural selection mechanism of evolution.

I kept my remarks strictly along factual lines and discussed the evidence, with no mention of a Creator or Intelligent Design. But before the meeting even started I knew I was in for a long afternoon. At noon, one hour before the meeting, a group from The National Center for Science Education (NCSE)

gave a press conference warning the media to expect another attempt from pseudo-scientists to try to include creationism into the textbooks.

Actually of the forty or so people signed-up to testify, only three of us were there to criticize evolution and no one was there to argue for creation. In the minutes before the meeting there was suddenly a horde of media looking for me and asking for interviews. Thanks to the NCSE I was provided with opportunities for nearly a dozen interviews, mostly TV. I was able to explain our side of the story and correct the NCSE's distorted paranoia.

The defenders of evolution came to say that evolution ought to be left alone: don't cave in to the pressure! But who was exerting the pressure? There were only three of us and over thirty of them. We came with scientific criticisms. They offered little else besides blatant misrepresentations and character assassinations.{1} These testimonies primarily set the stage for the September hearing.

A Second Public Hearing in September 2003

A major player in the entire hearing process was the Discovery Institute (www.discovery.org), a public policy institute out of Seattle, Washington. Discovery sponsors a Center for Science and Culture that provides limited funding for skeptics of Darwinism and proponents of Intelligent Design. I have received two limited fellowships from Discovery to help write a new edition of my book with Lane Lester, *The Natural Limits to Biological Change.* It was Discovery that contacted me about possibly testifying at the July 9th hearing.

Because of the intense media coverage of that hearing, the folks at Discovery spent a great deal of time addressing the media, correcting their errors and explaining the real story. As the September 10th hearing approached, Discovery sent out press releases and sent a team to Texas to hold press

conferences and potentially testify before the State Board of Education.

Because of all the media attention, that ranks of testifiers swelled to unmanageable portions. Over 150 people signed up to testify and they all expected their three minutes. You do the math! This was going to be a long meeting. Most of those associated with the Discovery Institute and a Texas-based organization, Texans for Better Science Education (www.strengthsandweaknesses.org), gained the early testimony slots when the board members were most alert. The meeting dragged on until 1 a.m., a full twelve hours.

Once again, those of us criticizing the textbooks came prepared with specific criticisms of the textbooks and the other side simply wanted to say that we had no place at the table of discussion and should be ignored because we are pseudo-scientists and religious fundamentalists.

Most distressing of all was a pastor from a large Southern Baptist Church in Austin who came to tell the Board that evolution was of science and creation was of Genesis and faith and that the two had nothing to do with each other. He went on to add that he and everyone else knew that the dissenters from evolution were only there to protect their religious beliefs. He received a thunderous round of applause from the theistic evolutionists, agnostics and a theists in the crowd.

How sad that this brother in Christ was so deceived and even pretended to know why I was really there, having never spoken to me, nor had we even ever met. This broke my heart, as did other pastors who came to help but only showed their lack of knowledge about evolution and ended up hurting more than they helped.

While many evolutionists embarrassed themselves by exhibiting a childish paranoia, so did many Christians who just really didn’t understand the issues. I’d love to do a Probe

Ministries Mind Games Conference in all these churches—they need it.

Was Anything Accomplished?

There was heavy media interest from July through early November when the Texas State Board of Education made their final decision. Special interests from both evolutionists and those dissenting from evolution were involved.

Those who wanted to strictly follow Texas guidelines to teach evolution, but remove factual errors and include both strengths and weaknesses of evolution hoped to vote on each textbook individually. But the more liberal majority decided to vote on adopting the Texas Education Agency's recommendation to approve all eleven textbooks. This motion passed by a vote of 11-4. Only two textbooks had made sufficient changes to be judged "conforming."{2} The other nine would have been judged "non-conforming," which would have still made them eligible to be purchased with state funds. Only a book judged "rejected" would not be purchased by the state.

This was a small setback. But some significant changes were made. The fraudulent Haeckel drawings of vertebrate embryos, suggesting far more evidence for evolution than actually exists, have been virtually removed entirely. The fraud has been known for over 100 years. Two textbooks (Holt and Glencoe) have now inserted acknowledgments that the Miller-Urey origin of life experiment was based on ideas about the earth's early atmosphere no longer accepted by scientists. Another textbook has qualified an earlier claim made about evolutionary intermediates. The original textbook claimed that "since Darwin's time, many of these intermediates have been found." The revised text now reads: "Since Darwin's time, some of these intermediates have been found, while others have not." {3}

The journal *Science* matter-of-factly reported, “In response, some textbook publishers made minor changes, including replacing embryo drawings with photos and dropping the term ‘gill slits.’ One also eliminated the assertion that Darwin’s theory is the ‘essence of biology.'”{4}

While many of these changes are small, the public perception of the debate seems to be changing as evidenced by this statement from a *Dallas Morning News* editorial from November 5th:

> *“This ought to be easy; science is supposed to deal solely in facts. But the teaching of evolution is so entangled with politics that warring factions can’t even agree on the facts. (What did the flawed Miller-Urey “origin of life” experiment prove, if anything, for example?) This is an injustice to the people of the state, who have a right to expect their children’s biology textbooks to be a straightforward presentation of the most up-to-date scientific information, facts not privileged from a religious or anti-religious perspective.”*

Other errors and problems still remain.{5} But this has been a good start.

Notes

1. Sample testifier statements:

   - *Steven Schafersman, President of Texas Citizens for Science: “I am aware that the Discovery Institute, a creationist organization out of Seattle, Washington, has become involved in the Texas education process just as they did recently in Kansas and Ohio. They have prepared written testimony about the books submitted*

here and apparently deputized a member of a Texas creationist organization, Probe Ministries, to speak on their behalf." (Hey, that's me!)

- *Ms. Amanda Walker: "So what we are really doing here is talking about using the political process to override the science process to suit creationists whose theories can't stand up in the global scientific community"*
- *Dr. David Hillis, Professor of Biology, UT Austin: "The objections to evolution in textbooks that you have heard are not about science or facts. They are about pushing a religious and political agenda."*
- *Ms. Kelly Wagner: "If you consider at all adding intelligent design to any of these textbooks, I would like you, again, this is a very, very personal question. I would like you to think, am I furthering medical research? Or am I contributing to Kelly Wagner's early death?" Ms. Wagner felt that "weakening" evolution in the high school biology textbooks would compromise medical research and therefore that research on her heart condition could be compromised.*

2. Most likely these would have been the Holt Biology book and the Glencoe Biology book, both of which made numerous constructive changes.

3. Holt Biology, p. 283

4. Constance Holden, "Texas resolves war over biology texts," *Science* Vol. 302(Nov.14, 2003):1130.

5. Use this website from Discovery for full report on the Texas debate. http://www.discovery.org/csc/texas/.

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