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2001 MAY -8 AM 8:29

REVIEW COMMISSION



May 3, 2001

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MAY 7 2001

PA. STATE BOARD  
OF EDUCATION

Peter Garland, Executive Director  
Pennsylvania State Board of Education  
333 Market St.  
Harrisburg, PA 17126-0333

Dear Mr. Garland:

I am writing to you concerning the planned changes in wording in the draft standards for science and technology 3.2.10.A.2 and 3.3.10.D.1, and to state my reasons for being strongly opposed to these changes.

I am recently retired from teaching biological science at Bryn Mawr College, where I was employed since 1967. Before that I taught biology at the University of Illinois. In sum, I have been teaching biology for some 40 years, including primarily courses in genetics, evolution and molecular biology. During this entire period (and even before, as a high school and college student) I have been aware of the persistent efforts by various people and groups to either ban or restrict the teaching of biological evolution or else to interject the teaching of religion in science courses as an "alternative" to evolutionary theory in public institutions of education.

Because of repeated defeats to these efforts in the judiciary, these people and groups have progressively modified the terms of their demands so as to mask their unambiguously religious nature. Thus, the latest manifestation of the "creationist" agenda in the guise of "intelligent design theory" is all too transparent to those of us with a long history of resisting unwarranted intrusions into the teaching of our discipline. Such "one-foot-in-the-door" incrementalism, as demonstrated in the present case, is hoped to be more palatable to an electorate which is largely ignorant of the issues at stake. No one should be fooled.

With regard to standard 3.2.10.A.2: this one simply strains credulity. Surely, science students will need to continue to study atoms, black holes, etc., etc., none of which are currently "observable".

Concerning standard 3.3.10.D.1; competently taught science course at any level will, of course, examine all evidence bearing upon the development of a hypothesis or theory. No scientific principle ever reaches the exalted status of "theory" unless and until all current evidence is overwhelmingly supportive of it, a situation which, of course, is subject to change at any time with the appearance of still further evidence. As the most important organizing principle in the field of biology, the theory of evolution has withstood some 143 years of intense scrutiny and testing and has survived largely unchanged. It's major precept that current biological diversity is best explained by change over time by natural selection is accepted by the overwhelming majority of practicing scientists the world over.

In the present case, my opposition to the proposed change in 3.3.10.D.1 stems not from any disagreement that students need to be shown how to evaluate evidence in ANY science, I assert that there is simply no credible SCIENTIFIC evidence currently available which fails to support the theory of evolution, as singled out here. Since all such evidence, rather, falls within the realm of religious belief, the change in wording becomes simply a mandate to include the teaching of religious belief as a valid alternative to scientific evidence. This is an "apples and oranges" situation which is not only unconstitutional but which is harmful to both science and religion by confusing their respective domains. The vast majority of scientists find no conflict with their religious belief in accepting evolution and I therefore strongly oppose this concession by the Board to a tiny minority of individuals seeking to legitimize their agenda by stealth. Thank you for your attention.

Yours very sincerely,



Anthony R. Kaney,  
Professor Emeritus of Biology

148 Gypsy Lane'  
King of Prussia, PA 19406  
arkaney@excite.com

cc: Rep. Connie Williams  
House Box 202020  
Harrisburg, PA 17120-2020

ORIGINAL: 2187

Charlotte Glauser  
50 Eastgate Drive  
Camp Hill, PA 17011

Peter H. Garland  
Executive Director  
State Board of Education  
333 Market Street  
Harrisburg, PA 17126-0333

May 2, 2001

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MAY 4 2001

PA. STATE BOARD  
OF EDUCATION

Dear Dr. Garland:

Since the Pennsylvania Bulletin has published the proposed new goals for science education, I am commenting on some specific wording: "studies that support or do not support the theory of evolution." To put it simply, there are *no studies that do not support the theory of evolution*. The spurious claim of so-called "creation science" is not science at all, it is religion which has no place in the science classroom. We should not be opening the door to the science classroom for non-science discussion. There are far too many topics of critical concern for students to learn.

As the goals suggest, all scientific theories are subject to review at all times. It is more than surprising that the only issue directed to students for "investigation" is the theory of evolution, one of the best documented of all scientific concepts. Fields as diverse as archeology, anthropology, embryology, biochemistry, geology, cell biology and computer reconstruction of the DNA of animals and plants have all contributed to better understanding of the processes of evolution. The only disagreements among scientists studying the topic arise from the rates of change and the mechanisms of such changes.

Science is involved in testing concepts that can be demonstrated to be in coherence with observable phenomena. There are certainly enough avenues of research for students for issues still under investigation or for which there may be some room for question. Scientific theory must be testable and must be *disprovable*. The stories of creation as related by various religious beliefs are not testable. They would make interesting material for a course in comparative religions since many cultures provide such stories. Scripture and belief are not testable nor is their any reason to do so. They are taken on faith and are totally out of the range of proof. This is as it should be.

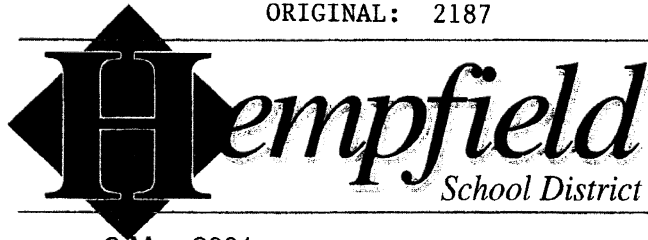
Leaving in language calling into question the theory of evolution in the proposal negates much of the good ideas that are in the otherwise thoughtful presentation of the teaching of science in the public schools. We would be doing a grave injustice to our students by giving credence to the idea that evolution is in any way not supportable. Since Darwin's time, the wealth of evidence has continued to grow with absolutely no studies to refute its validity. The disappearance of animal and plant species in the past and today is not understandable without a basic comprehension of natural selection as promulgated by the theory of evolution.

I would be much disturbed, as a former teacher of science and teacher of science teachers if this language remains in the science guidelines.

Sincerely,

Charlotte Glauser

Charlotte Glauser, Ed.D.



RECEIVED

2001 MAY -8 AM 8:29

HEMPFIELD HIGH SCHOOL  
200 Stanley Avenue  
Landisville, PA 17538  
Phone: 717-898-5500

2 May 2001

Dr. Peter H. Garland, Executive Director  
State Board of Education  
333 Market Street  
Harrisburg, PA 17126-0333

RECEIVED

MAY 7 2001

PA. STATE BOARD  
OF EDUCATION

Forrest E. Adams, Ed.D.  
High School Principal

Dear Dr. Garland,

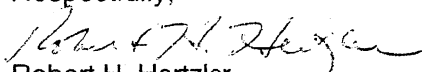
Please consider this a formal concern with the proposed PA Science and Technology Standards. As a biology teacher and instructional supervisor for twenty-eight secondary science instructors, I find the bullets attached to 3.3.10.D ("Analyze evidence...that support or do not support the theory of evolution") and 3.3.12.D ("Analyze the impact of new scientific facts on the theory of evolution") most disturbing. Equally offensive to science instruction are 3.2.7.A.4, 3.2.10.A.2, 3.2.10.A.4, 3.3.10.A, and 3.4.12.A.3 which all contain anti-evolutionary language.

These seemingly benign bullets and standards could probably go unnoticed if they were not the latest phrasing used by Creationists in their attempt to promote the teaching of Biblical Creation along with evolution. "Evidences against evolution," and "new scientific facts" have been used in Creationist literature and rhetoric for several years now; furthermore, in public meetings, Creationists have openly made it clear that these phrases would permit the teaching of their ideas in public school science classes. Where is the voice of scientific reason at the state level that allows an insipid statement such as "analyze evidences that do not support evolution" into the standards? This is presumably offered under the guise of teaching critical thinking. Critical thinking is not taught by being critical of an idea, but by studying the evidences that provide the underpinnings for that idea.

In science education we must teach the best of man's understanding of how the universe works to the best of our abilities; further, we must teach the students how to recognize that understanding as best. We cannot do that by catering to every idea that is out there; not all theories are created equal. Theories must be accepted or rejected on their merit. Theories must be testable, vulnerable to refutation; they must offer problem-solving strategies, be fruitful of new knowledge, offer predictive success, and not be restrictive in any of the above criteria. Most science teachers will realize that there are no real "evidences against evolution," and these bullets will not interfere with quality instruction. Strict interpretation of the standards however, could require teaching Creationist ideas along with evolution.

Why, in all of science, is evolution singled out for denigration by the standards? If the above proposed statements are worthy of consideration, why do they not appear in the national standards? Why have none of the major scientific organizations adopted these statements into their criteria for good science? Why is the state board considering these ideas for adoption? Send these proposals into the marketplace of science and see if they withstand testing and scrutiny; if they do, they will appear in the legitimate science journals and texts, and then we will teach them. I suspect that will not happen. Passing the Science and Technology Standards with these non-science statements would undermine the standard's validity and credibility, and be an embarrassment to the state board.

Respectfully,

  
Robert H. Hertzler  
Science Supervisor

John A. Sparmblack  
Assistant Principal

Jay V. Butterfield  
Buchanan House Principal

John R. Smith  
Franklin House Principal



**From:** Dr. Paulette Monchak [monchakp@ahsd.org]  
**Sent:** Tuesday, July 24, 2001 1:43 PM  
**To:** 'irrc@irrc.state.pa.us'  
**Cc:** 'laoe@ahsd.org'; 'claynsheer@aol.com'  
**Subject:** Academic Standards for Science and Technology

2001 JUL 25 AM 9:15

REVIEW COMMENT

Dear Mr. Nyce,

Having read the July 12, 2001 pennlink regarding the decision of the State Board of Education to modify that section of the Academic Standards for Science and Technology to read: that students must "analyze data from fossil records, similarities in anatomy and physiology, embryological studies and DNA studies that are relevant to the theory of evolution," has prompted me to respond.

As an educator, I am deeply concerned about the fact that we as educators are being forced into teaching our students from the perspectives of one group or another based on what are often referred to as facts. And probably one of the greatest errors we are facing in recent times is that of promoting theories as facts to our students. Not only is this approach erroneous at its center, but also it is deceptive in its result. A case in point is the theory of evolution.

The theory of evolution is fascinating. It can give one a perspective for reflection and consideration based on the known scientific evidence supporting same. And we can ponder this information regarding the questions: "What is man?" and "What is the origin of man?" Yet, given all of our knowledge about embryological studies and DNA studies, evidence of fossil records, and similarities in body structures, we still cannot prove that evolution is anything more than a theory.

The question, then, is this. Why would we as educators limit ourselves in answering life's most basic questions by choosing to focus only on that which supports one particular theory? Would it not be more scientifically acceptable, as it is in proving any hypothesis, to consider that which does and does not support the hypothesis in question, in order to come to the most accurate conclusion possible, based on the known evidence? Knowing that man is not only a physical being, but also an emotional and psychological being, why would we choose to limit our study to only one-third of his/her nature?

In light of the fact that fossil records, similarities in body structures, embryological studies and DNA studies may or may not support the theory of evolution, it seems appropriate to argue that to force educational content in only one direction: toward the theory of evolution, is lacking in the fullness of inquiry regarding the questions: "What is man?" and "What is the origin of man?"

Therefore, I urge you to support the former language that required students to "analyze evidence of fossil records, similarities in body structures, embryological studies and DNA studies that support or do not support the theory of evolution"; support the removal of language that required students to "analyze the impact of new scientific facts on the theory of evolution"; and to support the addition of language calling for students to "recognize that mutations can alter a gene" and to "apply the concept of natural selection as a central concept in illustrating evolution theory".

Thank you in advance for your support in this matter, for sharing this letter with appropriate parties, and for advancing an unbiased approach toward our search for truth.

## IRRC

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**From:** Paul A. Bove [bove@pitt.edu]  
**Sent:** Tuesday, July 03, 2001 11:54 AM  
**To:** IRRC@irrc.state.pa.us  
**Subject:** Creationism Out of PA Schools!

I am sending this link over a note to emphasize that Creationism and other forms of religious belief have no place in public education. They subvert science, critical thinking, and scientific standards and training. They substitute superstition for truth. If there remains doubt, reread Inherit the Wind or look at the film. Religion and state must be kept separate.

PAB

<http://www.post-gazette.com/regionstate/20010703creationism0703p6.asp>

Paul A. Bove  
Editor, boundary 2  
Professor  
Department of English  
University of Pittsburgh  
Fifth Avenue  
Pittsburgh, PA 15260  
412-624-6523  
fax: 412-624-6639  
bove@pitt.edu

REVIEW COMMISSION

2001 JUL -3 PM 1:19

07/03/2001

ORIGINAL: 2187

Stephen Ruger  
31 Hydrangea Road 2001 JUN 26 AM 9:16  
Levittown, PA 19056-1330  
June 22, 2001

INDEPENDENT REGULATORY  
REVIEW COMMISSION



Independent Regulatory Review Commission  
John McGinley, Chair  
14<sup>th</sup> Floor, Harristown 2  
333 Market Street  
Harrisburg, PA 17101

Representative Matthew Wright referred me to your committee in order to express my opinion on the Science Standards Curriculum.

I know that, especially in Pennsylvania, you will come under intense political pressure to include "Creation Science" in the curriculum or to dilute any reference to evolution. This pressure will be place on you in order to appease those fundamentalist Christians who wish to impose their beliefs on all of us.

Let me say that I oppose any attempt to introduce religious beliefs into the classroom under the guise of "science". Creation Science is nothing more that a camouflaged attempt to force one group's interpretation of the King James Bible on all of us.

Not one "theory" proposed by Creation Scientists has ever been demonstrated as actually happening or tested independently. Everything they have suggested can be demonstrated as wrong through simple, High School level experiments or reviews of existing observations. If they come before you, ask them for the documentation of their assertions and listen for their evasions.

While I would support some type of mentioning that, "some religious beliefs do not permit acceptance of certain scientific observations": I believe that any attempt to teach "alternative theories" is nothing more than junk science dressed up as real scientific work.

I just wanted to give you some support in resisting the pressure.

Singed

Stephen Ruger

May 15, 2001

Dr. Peter Garland, Executive Director  
PA State Board of Education  
333 Market Street  
Harrisburg PA 17126-0333

201 MAY 23 AM 9:29

REVIEW COMMISSION

RE: Draft Standards for Science and Technology Education

Dear Dr. Garland:

I wish to comment on the proposed Standards for Science and Technology Education. I am concerned that the standards on the theory of evolution would leave room for local schools to teach creationism. The language included in the latest draft of the standards appears to be little more than a thinly disguised attempt to undermine the teaching of evolution. The proposed standard that teachers include "evidence that does not support" evolution would require that they acquire teaching materials from frankly sectarian religious sources, since the only curriculum materials that take this point of view are those of a few, very conservative religious denominations. The current consensus in science and science education is that evolution belongs as the unifying theme of scientific practice and education based on its merits and performance.

Courts have consistently declared that such religious positions cannot be taught as science, even when they do not explicitly use religious language. In several cases, state and federal courts have ruled that the use of secular language does not overcome the constitutional barrier to the inclusion of sectarian religious ideas. The proposed standard that calls for evidence "that does not support" evolution is an example of that sort of sectarian idea wrapped up in secular-sounding language. It is unlikely that this standard and those similar to it would withstand judicial scrutiny — a costly and wasteful use of limited resources when the economic and educational future of Pennsylvania's young people is at stake.

It is important to remember that the educational standards are meant to prepare our students to compete in a 21<sup>st</sup> century economy — one that is increasingly dependent on scientific and technological enterprises. Will employers looking for workers with a solid understanding of science be able to find those among Pennsylvania high-school graduates who have received inaccurate instruction in biology? Will corporations that manufacture health related products find that prospective Pennsylvania employees are conversant with modern scientific theories? If the current proposed standards on evolution remain unchanged, the answer will be "No!" Pennsylvania owes its public school students an accurate and establish rigorous set of standards for the science and technology education.

I urge the State Board of Education to reconsider the current proposed standards with regard to teaching evolution. The standards should make it absolutely clear that evolution is to be taught as the established scientific theory that is the basis of all the life sciences and that religiously motivated alternatives or "evidence against" does not belong in science classrooms. This change will bring the proposed standards into compliance with the United States and Pennsylvania Constitutions and will promote the best interests and future success of Pennsylvania's public school students.

Very truly yours,

*Lyndee Greenberg*

12520 Mongel Hill Rd  
Shippensburg PA

17257



[illegible]

FOR FORTH COMING  
FILE  
R

## Memorandum

**DATE:** June 1, 2000  
**TO:** Rich Sandusky  
**FROM:** Sarah Miller  
**RE:** Academic Standards Meeting  
(Science & Technology, Environment & Ecology, Civics  
& Government)

On May 25, 2000, the State Board of Education held a public meeting on proposed academic standard relating to science and technology, environment and ecology, and civics and government. The following is an overview of commentators and the major issues raised during their testimony.

### General

Keith Verner – Department of Pediatrics at Penn State, Science and Health Education

- Wants standards approved
- Stressed the importance of the first 12 years of education
- Feels that many high school graduates are not prepared for college level work

Edward Owens – retired public school science teacher

- Feels that with adoption of academic standards, redundancies from grade to grade will drop, and students moving into new school districts will benefit

Elliot Seif – Bucks county School District

- Standards should suggest priorities on what to teach and what not to teach
- Should define basic curriculum and allow teachers to dig more deeply based on their specific classes.
- Technology standards lack clarity within the elementary grades
- Civics and government should include more research and decision making skills

Kathy Blouch – College Biology professor

- Supports funding for skilled teachers and assessment of student learning
- “How” is just as important as “what” a student is taught
- Standards should impact teacher courses

### Evolution

Ralph Sipes

- Wants “theory of evolution” changed to “theories”

Larry Wittig – School Board President, former member of Governors Commission on Education

- Believes that evolution should not be taught as the only theory possible
- Sited that many biology textbooks are providing false information about evolution as facts

Steve Minnick – Vice President of School Board

- Does not want evolution taught as proven fact
- Wants students to be given more options

- Feels the difference between macro and micro evolution should be taught
- Stressed that he is not asking for creationism to be taught

Roger Thomas – Geology and Evolution Professor at Franklin and Marshall College

- Requests that no changes be made to existing draft provisions for evolution or creationism

## Science

Richard Cleary – Science Department of Dallas Area High School

- Believes that enacting these standards will mean more staff, new facilities, and economic ramifications
- Unwise to offer courses that are too sophisticated to all students i.e. – thermodynamics
- Science standards lack balance, should cover broad range of topics
- Recommends clear standards for eighth and tenth grade goals and that standards represent levels that all students will be able to meet, not just intelligent few.

Stephen Sexsmith – Chemistry teacher at Susquehanna High School

- Standards do not allow for a logical progression of chemistry
- Understanding is as important as learning
- Section 3410a and 3412a are fundamental topics that should be taught in tenth grade but are delegated to twelfth grade.
- Students can not practically learn everything in one year (chemistry, physics)
- Suggests fewer concepts, greater depth.

Donald Kline – President of PA Science Teachers Association (PSTA)

- Standards should include provisions for professional development and assessment of teachers
- More hands on and inquiry based science should be taught

Mary Pat Evans – High School science teacher

Mike Gannon – DEP Geographical Information Systems (GIS)

- Bring GIS into the classroom

## Ecology

Margot Taylor – PA Resources Council outreach educator

- Support for teacher training
- Standards should not be limited to one subject matter
- Not about teaching values

## Agriculture

Fred Brown – PA Association of Agriculture Educators

- Happy that agriculture is included
- Should be taught to all students in commonwealth

ACADEMIC STANDARDS HEARING  
MAY 25, 2000  
HARRISBURG, PA  
(Science & Technology, Environment & Ecology, Civics & Government)

LIST OF PARTICIPANTS

1:00 p.m. Elliott Seif <sup>X</sup>

1:10 p.m. Kathy Blouch

1:20 p.m. Ralph Sipes

1:30 p.m. Richard Cleary <sup>X</sup>

1:40 p.m. Stephen Sexsmith

1:50 p.m. Donald Kline

2:00 p.m. Mary Pat Evans *n/ Mike Baunell*

2:10 p.m. ~~Thomas Gillespie~~

2:20 p.m. Margot Taylor  
~~Patricia Imperato~~

2:30 p.m. Edward Owens

2:40 p.m. Roger D.K. Thomas <sup>X</sup>

2:50 p.m. Keith Verner

3:00 p.m. Larry Wittig <sup>X</sup>

3:10 p.m. Steve Minnick

3:20 p.m. Fred Brown

May 15, 2001

Dr. Peter Garland, Executive Director  
PA State Board of Education  
333 Market Street  
Harrisburg PA 17126-0333

2001 MAY 23 AM 9:29

REVIEW COMMISSION



RE: Draft Standards for Science and Technology Education

Dear Dr. Garland:

I am writing to express my concern about the current proposed Standards for Science and Technology Education. I am particularly concerned that the sections of evolution will give students the impression that evolution is not a widely accepted theory that is fundamental to all research and technological achievement in the life sciences.

The proposed standards expect science teachers to present "evidence" against evolution in the public school science curriculum. We do not find this so-called evidence "that does not support" evolution in the scientific research literature — the proper place for new scientific ideas and concepts to be tested. Almost all of the materials — for both the general public and for classroom use — come from sources that stand for a religious opposition to evolution or that have major funding from one or several sectarian religious organizations or donors. In short, these ideas represent not new *scientific* evidence, but rather old religious ideas dressed up in secular-sounding language.

However, even if these new ideas eventually achieve some scientific standing, they do not represent the current consensus position among practicing scientists — one fundamental requirement for inclusion in the science curriculum. Even *bona fide* new scientific theories (whether about evolution or anything else) are not typically included in school science curricula as soon as they are proposed; before they achieve this status. They must be tested in all the applicable fields and be modified according to those results. Even the Nobel Prize committee sometimes has to wait decades before deciding that a new theory or a new model has lived up to its early promise and deserves a place in the scientific consensus. The so-called evidence "that does not support" evolution has not achieved this status, and, in fact, has repeatedly failed to perform in scientific research.

Of greater concern is the potential for the frankly sectarian and unconstitutional intrusion of religious ideas in the guise of a science curriculum. The only current source for classroom materials for this evidence "that does not support" is among publishers of religious books and sectarian home-schooling materials. These publishers often change only the religious *language* that they use in their materials, but the arguments (such as the "problem" of complexity) are the same as those raised in their sectarian versions. The terminology, but not the intent, is changed.

I urge the State Board of Education to restore the theory of evolution to its rightful place at the foundation of the life sciences by removing the language in the standards that singles out evolution for special criticism and that forces to teachers and school districts to seek nonstandard, and frankly sectarian, classroom materials in order to comply with the directives of the proposed standards.

Yours truly,

*Malcolm Reis*  
1181 William St  
State College, PA  
16801

IRRC #2187  
State Board of Education  
Academic Standards and Assessment

[illegible]

ORIGINAL: 2187

**Garland, Peter**

**From:** Donna Cleland [donnacleland@earthlink.net]  
**Sent:** Tuesday, May 22, 2001 8:14 AM  
**To:** Garland, Peter  
**Cc:** Tom Kerr; Tom Kerr; Pat Simpson; Anthony S. Lombardo; Suzanne Meech; Reeny Davison; Midge Barilla; Marlene Hilkowitz; Ling Liang; Hunt, Peg; Donna Brown; Don McKinney; Debra Simpson; Bollinger, G; Ted Otten; Marlene A Hilkowitz; Steven Dooley; Dennis Bartow; Andrea Zeises; Wayne Ransom; Tom Tobin; Suzanne Griffin; Shelley Wepner; Rich Thurlow; Phyllis Buchanan; Peggy Vavalla; Olivia Spencer; Maureen Harrigan; Martha Menz; Joe Jacovino; Jim Capolupo; Janie Zimmer; Greg Plank; Ed Bureau; Bruce Grant; Bill Anderson; Andrea Fulginiti; Anne Mosakowski; Richard Clevenstine; Steve Madigosky; Tom Marinelli; Mike Barnett; Bruce Ward  
**Subject:** Proposed 22 Pa. Code Chap.4 App.B Standard 3.4.4D

To the members of the Commonwealth of Pennsylvania's State Board of Education:

This letter is being written due to deep concern over the Pennsylvania Science Standards 3.4.4D dealing with Astronomy which states that by Grade 4 students should be able to "Describe the composition and structure of the universe and the earth's place in it.

- Recognize earth's place in the solar system
- Explain and illustrate the causes of seasonal changes
- Identify planets in our solar system and their general characteristics
- Describe the solar system motions and use them to explain time (eg days, seasons) major lunar phases and eclipses."

Our organization, the Southeast Pennsylvania Regional Science Initiative, is composed of five school districts, the Delaware County Intermediate Unit, Widener University, the Franklin Institute and The Dupont Company. In our collective experience (which represents hundreds of years of work with children) we have found that **it is not possible for children to have mastered the concepts listed in this Standard by Grade 4. The end of grade 5 seems to be the EARLIEST possible date for children to be cognitively ready to begin to understand this material.**

Our strong feelings about this matter are born of our own experiences in classrooms as educators who deal with young children on a daily basis. One of our members, Dr. Richard Clevenstine, whose school district has had an active planetarium for many, many years states "I can personally attest that while Ridley has been teaching these concepts in grades 3 and 5 for years in conjunction with our district's planetarium, **the children really don't seem to catch on to some of the basic principles until end of Grade 5.**" Dr. Clevenstine's experiences echo our own and are also validated by statements from researchers and experts in the field.

The research base is dependent in large part on the work of Vosniadou (1991, 1992) *Benchmarks* outlines this research as follows:

The ideas "the sun is a star" and "the earth orbits the sun" appear counter-intuitive to elementary-school students (Baxter, 1989; Vosniadou & Brewer, 1992) and are not likely to be believed or even understood in those grades (Vosniadou, 1991). **Whether it is possible for elementary students to understand these concepts even with good teaching needs further investigation.** Explanations of the day-night cycle, the phases of the moon, and the seasons are very challenging for students. To understand these phenomena, students should first master the idea of a spherical earth, itself a challenging task (Vosniadou, 1991). Similarly, students must understand the concept of "light reflection" and how the moon gets its light from the sun before they can understand the phases of the moon."

At the recent National Association for Research in Science Teaching (NARST) convention in March 2001, Dr. Michael Barnett of Indiana University delivered his paper on "Addressing Children's Alternative Frameworks of the Moon's Phases and Eclipses". In line with Dr. Clevenstine's experience and the existing research base, Dr. Barnett began his study with **late fifth grade elementary students**. His study is available on-line at: <http://inkido.indiana.edu/presentations/narst2001/curriculum.pdf>

Probably the most eloquent and expert opinion we have is that of Dr. Bruce Ward of Harvard's Astrophysics Center who has written the ARIES curriculum, Astronomy units which deal with the teaching of the moon's phases, eclipses, the solar system, etc. **Please take the time to read his thoughtful response to our simple query about the developmental appropriateness of Standards 3.4.4D which is enclosed as an attachment.** His reply to us stirred a response from Dr. Andrew Ahlgren. Dr. Ahlgren co-authored the book "Science for All Americans" upon which Project 2061 and the *Benchmarks for Science Literacy* are based. Dr. Ahlgren states "The letter from Ward is uncommon and valuable. Evidence of what can be learned when is

5/21/2001

always thin, and we appreciate clues from people struggling with it in the field... *Benchmarks* Chapter 15: The Research Base (pp. 335-336) states much of what Ward says in his message about difficulties in understanding. In intending to be consistent with the benchmark of **spherical shape of the earth and day/night is placed in Grade 5. The seasons and moon phases are placed at grade 8. "**

**Surely in this country, there exist no two greater experts in this matter than these two men who are national giants in the field of science education.**

We are respectfully requesting that the State Board seriously consider moving Science Standard 3.4.4D to the Grade 7 or higher exit standards level so that Pennsylvania children might begin the study of these concepts in Astronomy at the end of their fifth grade year at the earliest as the research and the experts recommend.

Thank you for your consideration. We have made our request in writing to the Board in order to receive the final-form of these academic standards and anxiously await your decision in this matter.

Sincerely yours,

Donna Cleland

Director of the Southeast Pennsylvania Regional Science Initiative

5/21/2001



**Garland, Peter**

ORIGINAL: 2187

**From:** Garland, Peter  
**Sent:** Monday, May 21, 2001 3:55 PM  
**To:** 'neidig@sunspot.noao.edu'  
**Subject:** RE: Science Standards

Dear Dr. Neidig:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

Be assured that your comments will be considered carefully in the development of the final-form of these regulations.

The Regulatory Review Act provides that information on the final-form of regulations be mailed to public commentators at their request. If you would like to receive the final-form of these academic standards when they are submitted to the Education Committees and IRRC, please make your request in writing to the State Board of Education, First Floor, 333 Market Street, Harrisburg, PA 17126-0333.

Sincerely yours,

H. Garland

Peter

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

--Original Message-----

From: Don Neidig [mailto:neidig@sunspot.noao.edu]  
Sent: Monday, May 21, 2001 3:33 PM  
To: 00statbd@email.cas.psu.edu  
Subject:

TO:  
Dr. Peter Garland  
PA State Board of Education  
00statbd@psupen.psu.edu

Dear Dr. Garland

As a native Pennsylvanian and former science teacher in the Pennsylvania public school system, I am very disturbed to hear that the PA Dept of Education is proposing to adopt standards that would in effect open the door to

2001 MAY 23 AM 9:36  
REVIEW COMMISSION

creationist-religionist views as part of the content of science classes. This proposal is of course purely political in nature and origin, and has no basis in scientific activity or factual evidence. We suffered the same politico-religious intrusion here in New Mexico and spent a few agonizing years in overturning them and repairing the damage they created.

It will do no good to introduce teachings that would attempt to dupe one faction of the population with a religious myth that another faction will flatly ignore on the basis of reason. Pennsylvania can hardly afford an insidious bifurcation that would place the youth of the former group at disadvantage in a rapidly-expanding techno-economy.

It will do no good for the state to promote a distorted, so-called Bible-based belief system that, on the one hand, rejects a spectacular scientific achievement (evolutionary biology), and on the other accepts the Earth's revolution around the Sun which is expressly wrong according to Psalm 93:1 and Joshua 10:12-13.

My advice: Adopt the National Science Standards.

Donald F. Neidig  
Astrophysicist  
Air Force Research Laboratory  
National Solar Observatory

**Garland, Peter**

ORIGINAL: 2187

**To:** wkooi@masd.k12.pa.us  
**Subject:** RE: Proposed science standards changes

Dear Mr. Kooi:

Thank you for your e-mail of May 18, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

Be assured that your comments will be considered carefully in the development of the final-form of these regulations.

The Regulatory Review Act provides that information on the final-form of regulations be mailed to public commentators at their request. If you would like to receive the final-form of these academic standards when they are submitted to the Education Committees and IRRC, please make your request in writing to the State Board of Education, First Floor, 333 Market Street, Harrisburg, PA 17126-0333.

Sincerely yours,

H. Garland

Peter

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

-----Original Message-----

From: Kooi, Warren [mailto:wkooi@masd.k12.pa.us]  
Sent: Friday, May 18, 2001 10:16 AM  
To: '00statbd@psupen.psu.edu'  
Subject: Proposed science standards changes

Dear Dr Garland,

I am writing as a public high school science teacher in support of the proposed changes in the science standards dealing with the topic of evolution. These proposed changes are being challenged by some teachers within the state, but I wanted to assure you that not all of us agree with the teaching of evolution as the sole possible explanation for the abundance and variety of life that exists on the earth today. As part of the dialogue related to these changes, the Pennsylvania

Science

Teachers Association sent out an update that contained excerpts from "Creeping Creationism in Pennsylvania", Reports of the National Center for Science Education 20(4):13-15 2000. Some reflections on this article are included below.

The National Center for Science Education, while having an innocuous and prestigious title, exists for the sole purpose of "working to defend the teaching of evolution against sectarian attack." This organization could not

be expected to present a balanced view of these standards and the changes proposed.

The statement that "Evolution is well-accepted in the sciences as being at

the foundation of our current understanding of biology and all fields depending on the biological sciences," is a gross exaggeration which is unfounded. In the field of biochemistry, for example, evolution has not been

able to successfully explain the organization and function of genes, and evolutionary explanations are conspicuously absent from biochemistry textbooks.

The statement "evolution provides the basis for scientific research in medicine, agriculture... and dozens of related fields" cannot be taken seriously. Natural selection on the genus and species level provides insight into these fields, but not the broad theory of evolution in general.

Far from being "at the foundation of the biological sciences," the foundational aspects of evolutionary theory cannot even be agreed to by those within the field itself.

The quoted article challenges the proposed changes as being unconstitutional, speaking of "issues framed in the language are derived from a particular, sectarian interpretation of Biblical scripture..." Every

major religion embraced by humankind has a Creation account, not an evolution account. To say that challenging evolution is sectarian and solely

Biblical is an outright lie.

The article goes on to say "The difference between micro-evolution and macro-evolution is a false dichotomy - rhetorical ploy." For at least the

past 10-15 years Biology textbooks have been making the distinction between

micro and macro-evolution. When was this aspect of evolutionary teaching declared invalid?

The last and most offensive statement presented is that "evolution is indifferent to the origin of life. Any of the proposals for the origin of

life would be acceptable to evolution." The article's definition of evolution states that "all living things are members of a large family tree

and that their similarities and differences reflect their relatedness through common ancestors." This definition commands that life started with

a single occurrence of a single organism from which all life on earth can

trace its ancestry. Life created by the Biblical or any other account is anathema to evolution.

I have been in public education for over 25 years, most of which has been in

the science classroom. Through my experience in the science classroom I have

come to believe that where there is controversy within the scientific community as there is with evolution, our students are better served by exploring that controversy rather than pretending it does not exist. If the

theory of evolution is valid, then it should stand up to its critics. If

it  
is in doubt, as the majority of Americans believe, then our students  
have  
the right to question the theory and explore its shortcomings.  
Please stand against the cries of those who want to keep our children  
from  
critically examining controversial issues and using their powers of  
logically thinking to challenge the status quo.

Respectfully.

Warren Kooi

\*\*\*\*\*  
Warren J. Kooi  
Oracle Internet Academy  
Applied Physical Science  
Moon Area High School  
904 Beaver Grade Road  
Moon Township PA 15108-2716  
Voice 412-262-9040 X 2262  
Fax 412-264-4858  
\*\*\*\*\*

**Testimony on the Pennsylvania Department of Education Proposed  
Adoption of Standards on Scientific Education**

**Presented by:**

**Thomas D. Gillespie, P.G.  
457 Linden Street  
Coopersburg, Pennsylvania, 18036**

**May 21, 2001**

I am re-presenting my testimony on the proposed state science standards as a Pennsylvania Professional Geologist, as a science educator in the public college and university system, and as a father of three children enrolled in Pennsylvania public schools. I have been on the Board of Directors of the Pennsylvania Council of Professional Geologists, and have been active in the Geological Society of America's Scientific Awareness through GeoScience Education (SAGE) partnering for excellence program. I originally presented comments on the proposed standards on June 12, 2000. These comments reflect my earlier comments, with amendments based on the standards published in the PA Bulletin in 2001. I thank the Department for this opportunity to present my comments on the proposed science standards.

**General comment on the Earth Science Standard:** The vast majority of students graduating from Pennsylvania's public schools will not become scientists, and only a small fraction of that number will become geologists. Yet, in each student's future they will be confronted by many public issues, both local and statewide, which involve environmental resources, land planning and other issues related to the natural world. Making informed decisions about such issues will require some understanding of the scientific method, and of geology and Earth Science in particular. Our public schools provide the only opportunity for citizens to acquire the knowledge and the understanding needed to assess complex issues which will impact local communities, the natural resources of the Commonwealth, and the public policies which will determine how such resources are used, conserved and distributed.

Therefore, because of the importance of the quality of scientific education in the primary and secondary public schools, I applaud the Pennsylvania Department of Education for proposing to adopt the comprehensive Earth Science Standards for Pennsylvania. The standards, if followed, would provide a superior foundation of scientific awareness, would instill an appreciation of the scientific method, and would help our future community leaders develop the perspective they will need to deal with the increasingly complex issues confronting Pennsylvanians which will require consideration of geologic conditions and principles.

Similar to all states, Pennsylvania continues to grow and there is an increasing demand for available natural resources. Among the most important concerns of Pennsylvanians, two are closely linked to geology: a viable economy, which relies on the use of natural

resources, including energy and construction materials; and a clean safe environment with an acceptable quality of life and an abundant supply of safe water. The general public is becoming increasingly involved, directly, in these issues as changes in land use, decided at the local level, either facilitate or limit future opportunities to plan, manage and/or restore natural resources, which are managed by the State.

As a practising geologist and an educator, I am continually confronted by concerned citizens who do not have the scientific education to tackle complex environmental, land use and natural resource management issues in an objective, non-emotional way. What is striking, however, is that no matter what a person's degree of education, they can and do understand the complex issues if someone takes a little time to explain the concepts to them in a manner which is relevant to the problem at hand. Understanding the issues, they are then in a better position to make informed decisions.

An important aspect of the proposed science standards which I urge the board to maintain is that all of the topics and concepts were derived by, and can be understood in terms of, the scientific method and the principles of the natural sciences. In particular, it is significant that the proposed standards do not contain any specific reference to non-scientific Earth processes or non-scientific explanations of Earth history to account for the origins of the Earth or changes to the Earth over time. Concepts such as the creation of the Earth by processes not explainable by the known principles of geology and not based on knowledge gained via the scientific method have no place in a science curriculum. This is also true for the evolution of biologic forms, which is also included in the Earth Science curriculum (palaeontology is a discipline of geology – Darwin first considered himself a geologist). The interaction of life forms with and in the geologic environments of Earth are an integral part of the science of geology; the various geologic time periods were first identified based on changes in the fossil forms found in rocks corresponding to that age.

**Specific comment on the teaching of evolutionary biology:** As an educator I have followed closely the debates around the country regarding the teaching of evolution by natural selection and the strong pressure put on Departments of Education to include the coeval teaching of "creation science" along side, and of equal importance with, the scientifically based knowledge of geology and biology. I applaud, again, the Pennsylvania Department of Education for ensuring that the focus of the proposed science standards is on science and the information and knowledge derived and explained using the scientific method. Any concept, idea or principle which can not be explained, or was not derived, using the scientific method, can not be considered science and has no place in a scientific curriculum.

Similar to other commentators, however, I am concerned about the single phrase in the proposed standards which provides for alternative explanations of biological evolution. To include this apparent concession to pressure to include non-scientific aspects in the science curriculum is inconsistent with the approach taken by the Department in all of the other issues and disciplines covered by the standards. I say that this was a concession on a particular topic because there is no similar ambiguity related to any other topic. For

example, there is no statement in the proposed standards that students should be able to identify and discuss the geologic processes which resulted in the formation of important economic ore bodies *and the evidence for alternative ideas on the subject*. There ARE such alternatives dealing with this very topic, but they are not based on the scientific method, and therefore have no place in a science curriculum. Similar to this example is the inclusion of the clause which implies there are scientifically valid data which refute the facts of evolutionary biology. In fact, there are no such data, despite some claims which are based on bad science. Furthermore, contrary to many statements on the subject, organic evolution is NOT "just a theory" but is an established fact of biology.

Finally, from a personal level, neither I nor my family subscribe to the Judeo-Christian beliefs which are the foundation of Creationism. To provide even a tacit opportunity in a statewide standard for the teaching of non-scientific alternative explanations of the established and fundamental facts of biology (of which there really is only one basic type of alternative – a religious explanation) would be offensive, discriminatory, and in violation of the personal rights of all United States citizens for the separation of Church and State.

Therefore, based on the absence of any scientifically based alternative to organic evolution, I urge the Department to ensure that science curricula are not diluted by allowing for any unspecified (non-scientific) alternative explanations of science.



**Garland, Peter**

---

**To:** Benkovic, Susan  
**Subject:** RE: <no subject>

-----Original Message-----

From: Rodney L Rockwell [mailto:rrockwell@pop.penncom.mindspring.com]  
Sent: Monday, May 21, 2001 8:06 AM  
To: 00statbd@email.cas.psu.edu  
Cc: rrockwell@penn.com  
Subject: <no subject>

Dr. Peter H. Garland,  
Executive Director of the PA State Board of Education,

We are asking that the PA State Board of Education modify the  
hominid  
standard. We are asking you to keep all of the elements of the standard  
that  
encourage a critical, objective approach to the teaching of origins.

Thank You,  
Rodney and Sheryl Rockwell

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REVIEW COMMISSION  
DP

**Garland, Peter**

ORIGINAL: 2187

**To:** RubeSt@CentennialSD.org  
**Subject:** RE: Science Standards

Dear Mr. Rubenstein:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

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Sincerely yours,

H. Garland

Peter

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

-----Original Message-----

From: Rubenstein, Steven [mailto:RubeSt@CentennialSD.org]  
Sent: Monday, May 21, 2001 4:34 PM  
To: '00statbd@psupen.psu.edu'  
Subject: Science Standards

Dear Dr. Garland,

I would like you to comment on revisions made to the Science Standards in the past year. There appears to have been some input from people trying to push creationism as a part of scientific theory, such as the changes to 3.3.10.D.1. Please register my strong objection to this effort. While the historical details of evolution's path can never be observed directly and so remain theoretical, there is no scientific reason to subject this theory to more (or less) scrutiny than any of the other ideas which are part of the scientific understanding of the world such as atomic theory, plate tectonics, heliocentric theory etc. If alternative theories are to be proposed, there are thousands of creation stories from

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around the world that would need to be tested against the evidence.  
Thanks  
for your consideration. S. Rubenstein.

**Garland, Peter** ORIGINAL: 2187

**To:** pwilson@psu.edu  
**Subject:** RE: New Science Standards

Dear Dr. Wilson:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

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Sincerely yours,

Peter H. Garland

Executive Director

cc: Members of the State Board

Senator Rhoades

Senator Schwartz

Representative Stairs

Representative Colafella

IRRC

-----Original Message-----

**From:** Philip K. Wilson [mailto:pwilson@psu.edu]

**Sent:** Monday, May 21, 2001 2:50 PM

**To:** 00statbd@psupen.psu.edu

**Subject:** New Science Standards

Dear Dr. Peter Garland, Executive Director

As an educator in Dauphin County, I am quite disturbed by the PA State Board of Education's current attempts to "dumb down" the science education standards by

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favoring anti-evolution rhetoric in the "science" classroom. Having taught the history of science and medicine for the past decade (in Missouri, Illinois, and now the great Commonwealth of Pennsylvania), I have read centuries of efforts by the Church to overshadow the communication of scientific findings. Do not get me wrong, I strongly believe that issues of spirituality and religion are critically important in the upbringing of children. However, we are increasingly barraged with pseudoscientific claims from every available media source. The LAST place we need to find confusion over what is science and what is religion and misstatements that the quest of each cannot peacefully coexist is in the elementary and secondary classrooms.

For the sake of our the children in the Commonwealth, please do all that you can to prevent the PA State Board of Education that you direct from altering their current standards. I have asked my elected officials to demand a hearing in the House and Senate on the new educational standards in order that you can better hear what the people of Pennsylvania are seeking in terms of education. We must not let the borders between science and religion become so fluid as to allow the great Commonwealth of Pennsylvania to become entrenched in the mire that has muddled Kansas education over the past year.

For the sake of our the children an the future science-filled community that we are all going to continue operating in please do not modify your current science standards.

Sincerely,

Philip K. Wilson, MA, Ph.D.

---

Philip K. Wilson, Ph.D.  
Historian of Medicine  
Penn State College of Medicine  
The Milton S. Hershey Medical Center  
Department of Humanities, H134  
500 University Drive  
Hershey, PA 17033-2390 USA  
(717) 531-8779 (Office)  
(717) 531-3894 (FAX)  
pwilson@psu.edu

ORIGINAL: 2187

**Garland, Peter**

**To:** bible@cub.kcet.org

**Subject:** RE: Science Education

Dear Ms. Bucknor:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

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Sincerely yours,

Peter H. Garland

Executive Director

cc: Members of the State Board

Senator Rhoades

Senator Schwartz

Representative Stairs

Representative Colafella

IRRC

--Original Message-----

**From:** Miller's Gift & Bible Shoppe [mailto:bible@cub.kcnet.org]

**Sent:** Monday, May 21, 2001 10:33 AM

**To:** 00statbd@email.cas.psu.edu

**Subject:** Science Education

Dear Board Member, I was informed of a decision to be made for the commonwealth of Pa. regarding the teaching of origin of the earth as we know it. A true scientist seeks the truth, therefore by just

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presenting the evolution theory would be contrary to that belief. Please consider this when making your decision. Thank you, Joyce Bucknor

5/21/2001

**Garland, Peter**

ORIGINAL: 2187

To: miyaji@astro.phys.cmu.edu  
Subject: RE: PA Science & Technology Standards

Dear Dr. Miyaji:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

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Sincerely yours,

H. Garland

Peter

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

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2001 MAY 23 PM 9:33

-----Original Message-----

From: Takamitsu Miyaji [mailto:miyaji@astro.phys.cmu.edu]  
Sent: Monday, May 21, 2001 2:31 PM  
To: 00statbd@email.cas.psu.edu  
Cc: miyaji@astro.PHYS.CMU.EDU  
Subject: PA Science & Technology Standards

Dr. Peter Garland, Executive Director  
PA State Board of Education  
E-mail: 00statbd@psupen.psu.edu

Dear Dr. Garland,

I have been informed by American Astronomical Society on a current effort underway in Pennsylvania to modify the Science and Technology Standards in the state education system. I have reviewed the proposed changes and would like to express a deep concern, since these have been made in such a way as to decrease the overall level of scientific understanding and to misrepresent science as it is



practiced and understood by professionals in scientific disciplines.

## 1. Definition of Science

> Old Standard

>3.2.10.A.2 - Know that science is limited to the study  
> of concrete aspects of the world and the  
> universe.

> New Standard

>3.2.10.A.2 - Know that science is limited to the study  
> of observable aspects of the world and the  
> universe.

There is a problem with the definition of science - limited to observable aspects of the world; the word observable can be misunderstood to limit science and scientists to what they can see and directly witness. Much of science - in the physical as well as biological sciences - is based on indirect observation and inference. I am particularly concerned about the word "limited". This wording and/or the curriculum based on this guideline can easily be misinterpreted and make the students vulnerable to ideas from pseudo-science, various forms of fortune-tellings claiming to be lead by some "supernatural powers", and religious fundamentalism intruding into the regime of science.

## 2. Evolution

> Old Standard

> 3.3.10.D.1 - Analyze evidence of fossil records,  
> similarities in body structures,  
> embryological studies and DNA studies  
> that support the theory of evolution.

> New Standards

> 3.3.10.D.1 - Analyze evidence of fossil records,  
> similarities in body structures,  
> embryological studies and DNA studies  
> that support or do not support the  
> theory of evolution.

> Old Standard

> 3.3.10.A - Explain the causes of similarities and  
> differences found among living things.

> New Standard

> 3.3.10.A - Explain the structural and functional  
> similarities and differences found among  
> living things.

While it is important that students learn to evaluate scientific theories, it is inappropriate and incorrect to single out evolution from all other scientific theories as deserving of special criticism or debate. Evolution is well-accepted in the sciences as being at the foundation of our current understanding of biology and all fields dependent on the biological sciences. There may be a number of observations which superficially seem to be against the theory of evolution (or a detail in a certain version of evolution theory) , they actually do not contradict or even support the evolution theory at a deeper level. Requiring students to challenge the theory may lead students to these superficial interpretations of evidence. Also it is important for students to know that the evolution causes similarities and differences among living things



**Garland, Peter**

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**From:** Garland, Peter  
**Sent:** Monday, May 21, 2001 12:47 PM  
**To:** 'mjb1@Lehigh.EDU'  
**Subject:** RE: comment on proposed science standards

Dear Dr. Behe:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

Be assured that your comments will be considered carefully in the development of the final-form of these regulations.

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Sincerely yours,

Peter

H. Garland

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

-----Original Message-----

From: Michael J. Behe [mailto:mjb1@Lehigh.EDU]  
Sent: Monday, May 21, 2001 11:23 AM  
To: 00statbd@email.cas.psu.edu  
Subject: comment on proposed science standards

Dear Dr. Garland,

As a professor of biology at a leading Pennsylvania university, I strongly \*support\* the proposed changes in the Pennsylvania Department of Education science and technology education standards. In particular, it is quite appropriate that students should be taught to "Analyze ... studies that support or do not support the theory of evolution." No theory is immune to critical evaluation, not even the theory of Darwinian evolution. As a professional scientist in the field it is my opinion that there is considerable evidence that points away from natural selection as an explanation for many features of life. Furthermore, it is widely acknowledged that virtually all textbooks used

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to teach evolution to biology students in public schools have contained serious errors of fact. Should students not be encouraged to examine such textbook claims critically? Must Pennsylvania students unquestioningly accept what their science textbooks present, even if texts contain material professional scientists know to be wrong or seriously misleading? If so, for what other subject are students encouraged to blandly accept textbook assertions? History? Political science? Economics? I for one do not want students to accept anything uncritically, even the most dominant theory in a subject.

I realize that you are receiving much mail opposed to the proposed changes, from people concerned that the revised standards are a "smokescreen for creationism." In my opinion that is patently untrue. But even if it were true, opposing critical thinking in science class is a dangerous, emotional overreaction that threatens to throw the baby out with the bath water. One simply must not discourage students from asking questions simply because they might ask the "wrong" questions, or draw the "wrong" conclusions. Science can tolerate wrong thinking; it can't tolerate putting limits on thinking.

Sincerely,  
Michael J. Behe  
Professor of Biological Sciences  
Lehigh university

```
=====
Michael J. Behe      Phone:      610-758-3474
Department of Biology  FAX:      208-293-6549
Lehigh University    Secretary: 610-758-3680
111 Research Drive    e-mail:   mjb1@Lehigh.edu
Bethlehem, PA 18015
=====
```

**Garland, Peter** ORIGINAL: 2187

**To:** heberlin@fast.net

**Subject:** RE: evolution vs. creationism

Dear Ms. Heberling:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

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Sincerely yours,

Peter H. Garland

Executive Director

cc: Members of the State Board

Senator Rhoades

Senator Schwartz

Representative Stairs

Representative Colafella

IRRC

--Original Message-----

**From:** Linda Heberling [mailto:heberlin@fast.net]

**Sent:** Monday, May 21, 2001 1:42 PM

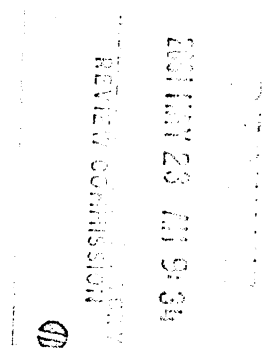
**To:** 00statbd@email.cas.psu.edu

**Subject:** evolution vs. creationism

To Peter Garland, Ex. Dir. of the PA Board of Education:

Dear Mr. Garland:

5/21/2001



I read yesterday in my local paper that the Board is about to decide on new science standards which, I understand, would require the teaching of evolution in Pennsylvania's classroom. I consider this to be a moot point since most schools already do teach evolution. Frankly, it is the fear that creationism might gain a foothold that has caused critics to rise up.

I hope that when the Board makes its decisions, it will consider the following facts:

1) Neither evolution nor creationism are sciences, but rather, belief systems and theories that fit together as much information that we can gather regarding the origins of the world and of mankind. Unfortunately, because the theory of evolution was brought forth by a scientist and the theory of creationism was brought forth by theologians, evolution has gained the upper hand in a society that values "empirical" findings, even if those findings are loosely clothed in the robes of credibility and unproveable.

2) New findings by leaders in the science of physics may literally lead us straight back to the theories of religious tradition rather than forward.

3) The sciences and the field of archeology have found nothing that contradicts the theory of creationism. Although there are questions of how long the earth has existed, neither theory has a final proof. On the other hand, there are many questions regarding the theory of evolution that, to this date, cannot be answered by science. Furthermore, much of the theory of evolution is continually being disproved.

In my view, raising the teaching of evolution to the category of science while not teaching creationism is tantamount to teaching one religion (which science's theory of evolution has become, complete with all the doctrinal trappings that are afforded to religion) to the exclusion of all other religions. As you know, this is not legal under the First Amendment Clause of the Constitution.

Given the fact that both evolution and creationism are now on a level playing field (i.e., both are theories and neither are provable science), I would suggest either one of the following courses for the future:

1) schools should be required to teach both theories and any other theories that cover this topic AS THEORIES OF THE POSSIBLE ORIGIN OF THE WORLD AND MANKIND so that students can be informed about the choices of belief that are before them and be free to embrace whichever they choose, as they will ultimately do once they leave the school system anyway.

2) schools should be prohibited from teaching both theories.

**Garland, Peter**

ORIGINAL: 2187

**To:** kmmasemore@aol.com

**Subject:** RE: New State Science Standards

Dear Mr. and Mrs. Masemore:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

Be assured that your comments will be considered carefully in the development of the final-form of these regulations.

The Regulatory Review Act provides that information on the final-form of regulations be mailed to public commentators at their request. If you would like to receive the final-form of these academic standards when they are submitted to the Education Committees and IRRC, please make your request in writing to the State Board of Education, First Floor, 333 Market Street, Harrisburg, PA 17126-0333.

Sincerely yours,

Peter H. Garland

Executive Director

cc: Members of the State Board

Senator Rhoades

Senator Schwartz

Representative Stairs

Representative Colafella

IRRC

-----Original Message-----

**From:** kmmasemore@aol.com [mailto:kmmasemore@aol.com]

**Sent:** Monday, May 21, 2001 2:38 PM

**To:** 00statbd@email.cas.psu.edu; 00sec@email.cas.psu.edu; 00lega1@email.cas.psu.edu; 00lega2@email.cas.psu.edu; 00lega3@email.cas.psu.edu; 00lega4@email.cas.psu.edu; 00lega5@email.cas.psu.edu; 00lega6@email.cas.psu.edu; 00lega7@email.cas.psu.edu; 00lega9@email.cas.psu.edu; 00lega10@email.cas.psu.edu; 00lega11@email.cas.psu.edu; 00presec@email.cas.psu.edu

**Subject:** New State Science Standards

Dear Department of Education Officials

We were reading an article from the May 20, 2001 issue of The Morning

5/21/2001

Call titled Critics: New State science standards leave door open to teaching creationism. We support the standards you have purposed .

We quote "Genen Strait was in the minority supporting the standards. A high school biology teacher in Lebanon, Strait urged the board to "not cave into the liberal backlash that you undoubtedly have recieved."

This is about teaching our precious children honest science that looks at ALL the facts and not just the ones that fit the theory of evolution," "

We encourage you to move forward with this proposal.

Sincerely,

Margaret Masemore

Lane

Keith and

45 Forever Green

Barto, Pa. 19504

5/21/2001



**Garland, Peter**

ORIGINAL: 2187

**To:** Josh Meade  
**Subject:** RE: Proposed Academic Standards for Science and Technology

Dear Mr. Meade:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

Be assured that your comments will be considered carefully in the development of the final-form of these regulations.

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Sincerely yours,

H. Garland

Peter

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

-----Original Message-----

From: Josh Meade [mailto:jmeade@tntcomp.com]  
Sent: Monday, May 21, 2001 4:52 PM  
To: pgarland@state.pa.us  
Subject: Proposed Academic Standards for Science and Technology

Dr. Peter Garland,

I have just finished reviewing the Proposed Academic Standards for Science and Technology. I find these standards acceptable and right. Despite reports that I have heard from different media, I find these standards to be all encompassing and I believe that they should be used in our state. Thank you for taking the time to read my comments.

Sincerely,

Joshua B. Meade  
jmeade@meadeenterprises.com  
(570) 617-9078

RECEIVED  
2001 MAY 31 AM 9:04  
IRRC REVIEW COMMISSION

**Garland, Peter**

ORIGINAL: 2187

To: Radzilowiczj@csc.clpgh.org  
Subject: RE: Comments on Draft Sci. & Tech. Standards

Dear Mr. Radzilowiczj:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

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Sincerely yours,

Peter

H. Garland

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

-----Original Message-----

From: John Radzilowicz [mailto:radzilowiczj@csc.clpgh.org]  
Sent: Monday, May 21, 2001 12:24 PM  
To: 00statbd@psupen.psu.edu  
Subject: Comments on Draft Sci. & Tech. Standards

May 21, 2001

Dr. Peter Garland, Executive Director  
PA State Board of Education  
333 Market Street  
Harrisburg, PA 17126-0333

Dear Dr. Garland,

I am writing to express my concern and dismay regarding the proposed changes to the draft of the Pennsylvania State Science and Technology Standards as published in the PA Bulletin last month.

It is clear from the new language in the draft Standards, and from the

REVIEW COMMISSION

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comments of various State representatives, that these changes are designed to open the door to the teaching of alternative theories for the development of life on Earth. Specifically, the changes are intended to undermine the teaching of evolution, and provide for the teaching of creationism in Pennsylvania public schools.

As a science educator, parent, and as a citizen of Pennsylvania, I find this position completely unacceptable. This attack on science and support for religious pseudo-science has no place in the science curriculum of the public schools. It is disturbing that the State Board of Education would succumb to the pressure of fundamentalist religious groups at the expense of the students of Pennsylvania.

Despite what has been claimed by some who support the proposed changes, the case is quite clear. Evolution is a well-established and documented framework for understanding the development of life on Earth. It is at the core of our understanding of biological processes. No reputable scientific group accepts creationism as a plausible alternative to evolution.

The current proposed changes will leave Pennsylvania students with an inaccurate representation of science as it is practiced and understood by science professionals. The new language is riddled with misconceptions about the nature of scientific theories and the scientific process. Such a situation makes a mockery of the claim that we want our students to be the best in the world in mathematics and science.

The proposed changes also reflect a lack of understanding of the meaning of evolutionary theory for philosophical or religious beliefs. The State Board does not seem to grasp the key point that evolution says nothing about the ultimate origin or meaning of life. In fact, it cannot do so because it is confined to scientific knowledge and not religious belief. If the Board fails to understand such an important concept it is no wonder that science education is under attack.

I urge the State Board of Education to abandon the proposed changes as submitted in 2000, and restore the original language concerning evolution as drafted in 1998. The failure to do so would be a tremendous disservice to the students of Pennsylvania and would leave the Commonwealth open to the type of ridicule that followed similar actions in Kansas (since overturned) and other states. It would also lead to legal challenges that, as recent history has shown, would eventually overturn this effort to insert religious doctrine into the public schools. The State Board owes it to the citizens of Pennsylvania to step away from this misguided flirtation with pseudo-science now.

Sincerely,

John G. Radzilowicz, Director  
Henry Buhl, Jr. Planetarium & Observatory  
Carnegie Science Center  
Pittsburgh, PA  
412.237.3399

**Garland, Peter**

---

**To:** jcalvert@worldnet.att.net  
**Subject:** RE: Science Education Standards

Dear Mr. Calvert:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

Be assured that your comments will be considered carefully in the development of the final-form of these regulations.

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Sincerely yours,

Peter

H. Garland

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

-----Original Message-----

From: John Calvert [mailto:jcalvert@worldnet.att.net]  
Sent: Monday, May 21, 2001 3:17 PM  
To: 00statbd@psupen.psu.edu  
Subject: Science Education Standards

Dr. Peter H. Garland,

Dear Dr. Garland,

I would appreciate your passing this on to the State Board of education. It concerns the proposed Science Education Standards.

I have been practicing law for the past 32 years. I am also a trained Geologist. About 20 years ago, I became interested in the subject of origins when I learned that science uses a "Rule" to censor viewpoints that compete with Darwinian evolution. The Rule is called methodological naturalism. In practice it amounts to philosophical naturalism.

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I strongly support the proposed revisions to the new science standards. These allow students to be exposed to criticisms of Darwinian evolution and alternative theories.

The objectors seek to censor this evidence so that students are indoctrinated only in a naturalistic explanation for the origin of life and its diversity. Although they do not acknowledge their use of the Rule, this is in fact what drives their objections. They would have you believe that they are ardent defenders of the constitution. In fact, they seek to subvert it by covertly indoctrinating our children into believing that they are just "occurrences" and not the product of any design.

We should be amazed that the science community would be advocating the censorship of ideas and evidence. But that is exactly what they are asking you to do. They are asking you to enforce a Rule that outlaws criticisms of, and alternatives to Darwinian evolution. Although they would have you believe differently, the Rule is actually antithetical to logic and good science. Rules of logic and the scientific method seek to lead us to reliable and trustworthy conclusions and explanations. However, when we censor criticism and discussion of the competing hypotheses we abandon logic and the scientific method. The scientific method requires that a hypothesis be tested against the competing hypothesis. The objectors ask you to exempt Darwinism from this test. If you do, you will be promoting the indoctrination of our children in Naturalism. You will not be educating them about the relevant evidence which bears on the question of our origin. I suggest that this brand of indoctrination is not only contrary to logic and good science, but also our Constitution. See the Memorandum and Opinion at [www.intelligentDesignNetwork.org/LegalOpinion.htm](http://www.intelligentDesignNetwork.org/LegalOpinion.htm)

If you truly seek to educate rather than to indoctrinate the children of Pennsylvania, then you will adopt the proposed revisions and just say "NO" to the objectors.

Thank you.

John H. Calvert, B.A (Geology), J.D.  
Managing Director  
Intelligent Design network, inc.  
[jcalvert@att.net](mailto:jcalvert@att.net)

ORIGINAL: 2187

**IRRC**

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As a concerned parent who is considering the future education of his child, I wish to express my views on the teaching of Darwin's theory of evolution in the PA public schools. Darwin's theory has been completely discredited by the scientific evidence. Even a layperson who investigates his theory will, in relatively short order, determine that natural selection and random mutation of a species do not come anywhere close to explaining the complexity of life in a sample as small as a single-celled organism.

The mathematic probability of human life having been created per Darwin's theory is statistically zero, therefore, on purely scientific grounds alone, this theory should be presented as a disproved theory.

Please take the time to educate yourselves on the science of this matter before you make your decision regarding the wording of the Standards. I can refer you to the research which completely discredits Darwin's theory if you like.

thanks for your time!

**Brian D. Lipinski**  
***Annuity Marketing***  
**Executive Brokerage Services, Inc.**

PO Box 15686  
Pittsburgh, PA 15244

**800-776-9646 Ext. 14**

(412)747-7474

FAX 800-761-9358

7/9/2001

## IRRC

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**Full Name:** Brian D. Lipinski  
**Last Name:** Lipinski  
**First Name:** Brian  
**Job Title:** Director- Annuity Marketing  
**Company:** Executive Brokerage Services, Inc.

**Business Address:** 5787 Steubenville Pike  
McKees Rocks, PA 15136  
or  
PO Box 15686  
Pittsburgh, PA 15244

**Business:** (800) 776-9646 x 14  
**Home:** (412) 278-9008  
**Mobile:** (412) 445-3065  
**Business Fax:** (800) 267-1899

**E-mail:** brian@executivebrokerage.com

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2001 JUL -9 PM 4:07  
REVIEW COMMISSION  
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**IRRC**

ORIGINAL: 2187

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**From:** Brian Lipinski [brian@executivebrokerage.com]  
**Sent:** Monday, July 09, 2001 11:25 AM  
**To:** IRRC@irrc.state.pa.us  
**Subject:** Theory of evolution



Untitled AttachmentBrian D. Lipinski.vcf

2001 JUL -9 11:14:07  
IRRC@IRRC.STATE.PA.US  
BRIAN LIPINSKI



**Garland, Peter**

ORIGINAL: 2187

**To:** The Gillespies  
**Subject:** RE: scence standards

Dear Mr. Gillespie:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

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Sincerely yours,

Peter H. Garland

Executive Director

cc: Members of the State Board

Senator Rhoades

Senator Schwartz

Representative Stairs

Representative Colafella

IRRC

-----Original Message-----

**From:** The Gillespies [mailto:tafga@nni.com]

**Sent:** Monday, May 21, 2001 2:32 PM

**To:** pgarland@state.pa.us

**Subject:** scence standards

Attached are comments regarding the proposed state standards for science and technology.

Thomas D. Gillespie, P.G.,  
Coopersburg, PA

5/21/2001

RECEIVED  
2001 MAY 23 AM 9:21  
INDEPENDENT REGULATORY REVIEW COMMISSION

**Garland, Peter**

ORIGINAL: 2187

**From:** Garland, Peter  
**Sent:** Monday, May 21, 2001 10:37 AM  
**To:** 'Pam Goldman'  
**Subject:** RE:

DearMs. Goldman:

Thank you for your e-mail of May 21, 2001 on proposed 22 Pa. Code, Chapter 4, Appendix B (academic standards for Science and Technology).

Your e-mail is considered as official public comment and is being shared with all members of the Board. Pursuant to the provisions of the Regulatory Review Act, copies of your comments are also being provided to the Independent Regulatory Review Commission (IRRC) and the Chairmen of the House and Senate Education Committees.

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Sincerely yours,

Peter H.

Garland

Executive Director

cc: Members of the State Board  
Senator Rhoades  
Senator Schwartz  
Representative Stairs  
Representative Colafella  
IRRC

-----Original Message-----

From: Pam Goldman [mailto:peg8+@pitt.edu]  
Sent: Monday, May 21, 2001 9:19 AM  
To: pgarland@state.pa.us  
Subject:

Dear Peter Garland:

I am writing as the parent of two children in the Pittsburgh Public Schools to protest vigorously the new state standards for science and technology that allow science teachers to introduce theories that do not support the theory of evolution. This is no way to move our state into the science and technology world of the 21st century.

It is the responsibility of the Pennsylvania State Board of Education to provide our children

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REGULATORY REVIEW COMMISSION

with accurate science information and not to be swayed by the pressure  
of unscientific  
anti-evolution interest groups.

Sincerely,

Pam Goldman  
4334 Saline St.  
Pittsburgh, PA 15217