

REPORTS



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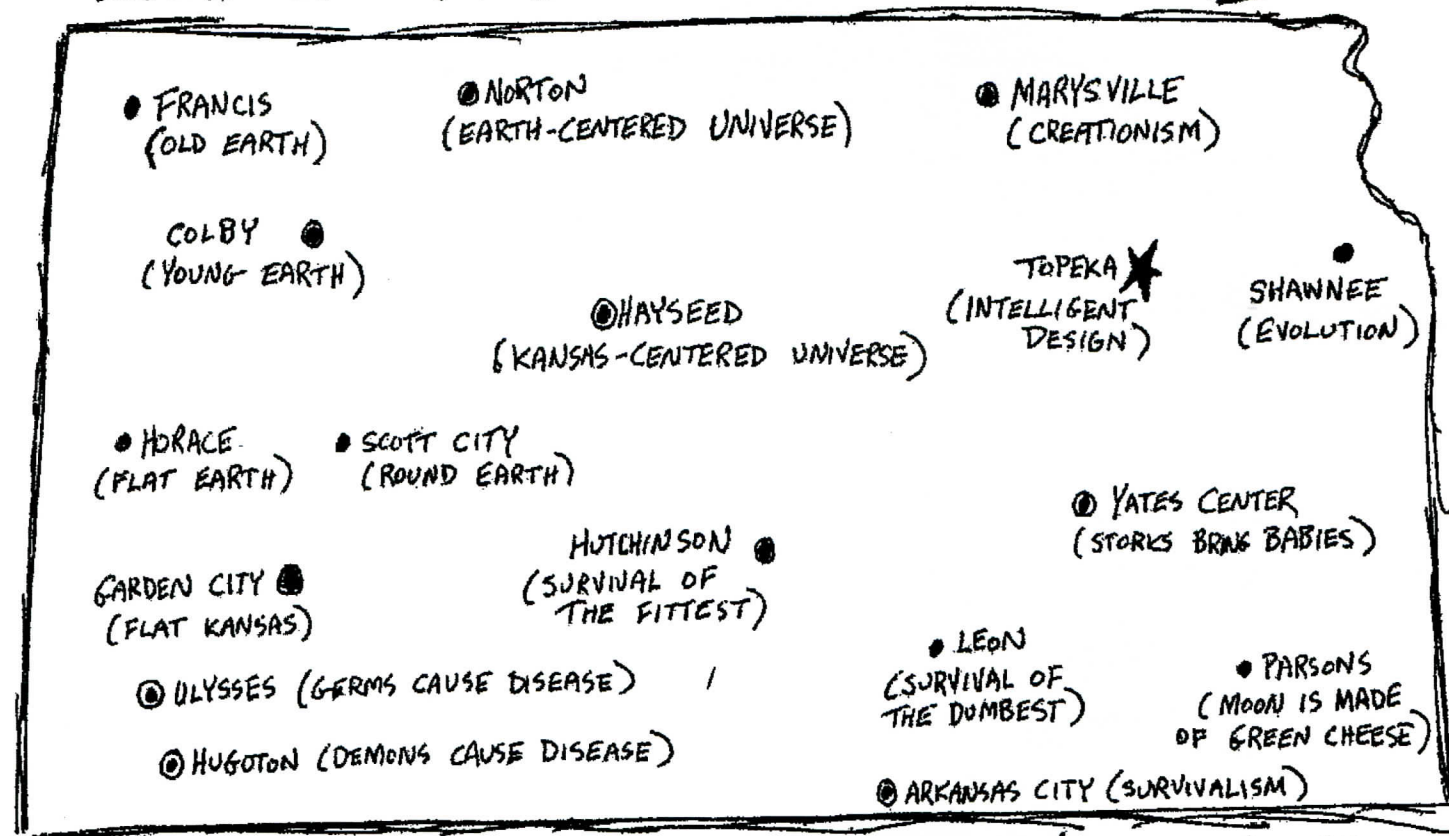
NATIONAL CENTER FOR SCIENCE EDUCATION

Volume 19, Number 4

JULY/AUG, 1999

CONTINUES
NCSE REPORTS &
CREATION/EVOLUTION

LOCAL CONTROL OF SCIENCE EDUCATION IS...



...MAKING A DIFFERENCE IN KANSAS!

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Creationist
Tornado in Kansas

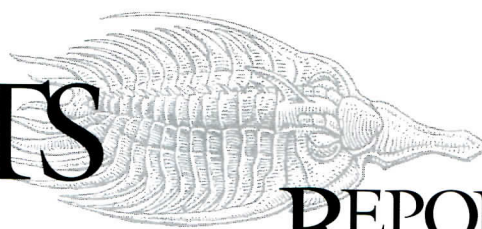
Idaho Science
Standards

Books by Members

Phillip Johnson and
Edward Davis on
Naturalism

A Creation/
Evolution
Continuum

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REPORTS

OF THE
NATIONAL CENTER FOR SCIENCE EDUCATION
CONTINUES NCSE REPORTS & CREATION/EVOLUTION

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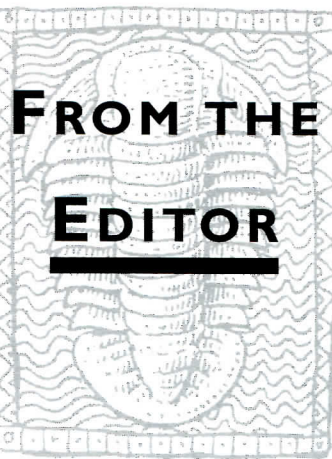
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FROM THE EDITOR

KANSAS, KANSAS, KANSAS

It seems as if nearly everything coming across the desk or over the telecommunications channels since the middle of August has had a Kansas connection. In brief, the Kansas State Board of Education (BOE) voted on a set of science education standards for statewide proficiency exams which eliminated evolution. Now students in Kansas will no longer have to demonstrate that they understand this fundamental concept in the sciences before being certified by the state as qualified to graduate from public high schools. The board also dropped the Big Bang, and a number of individual topics in geology, astronomy, and physics which would lead the students to the conclusions that the universe and our earth are billions of years old. In this issue we report, explore, and respond to the events in Kansas.



Deborah Cunningham attended the infamous BOE meeting at which the final decision was voted, and she sent us her impressions. We also have reactions to the decisions from research, educational, and governmental organizations and agencies. The decision has already had repercussions in other states — namely, Kentucky, Pennsylvania, Washington, and Idaho — in which anti-evolutionists appear to have been emboldened by the success of the evolution-less standards in Kansas and are pushing to promote similar rollbacks in science education standards in their own states.

ARTICLES

NCSE member Edward Davis wrote a review essay which we published in *RNCSE* 18(6) on the state of the “Intelligent Design” model, including a recent book by Phillip Johnson. In this issue we carry a response by Johnson to that essay and a reply by Davis. The issue is the connection — or lack of connection — between naturalism and atheism.

In a similar vein NCSE Executive Director Eugenie C Scott explores the continuum of ideas about the ways in which natural laws and

supernatural beings may relate. Unlike the common view that there are only two opposing camps, Scott points out that there is a vast and varied landscape between the extremes.

BUSY, BUSY, BUSY

Our members are an active and productive group. The centerfold features books written by our members and supporters. Network Project Director Molleen Matsumura has also compiled a short summary of how members around the country promote good science education and support evolution. And don’t miss the next installment in the periodic bibliography on research and news stories related to evolution compiled as always by NCSE Supporter and Board member Frank Sonleitner.

ON THE ROAD WITH...

NCSE Executive Director Eugenie Scott and other members of the NCSE staff and board have been traveling, as well, helping people understand and respond to the Kansas “situation” and to prepare for challenges to evolution education in other states. Check out the upcoming schedule in the centerfold. To make arrangements for someone from NCSE to visit your area or to schedule an event, write, call, or email NCSE.

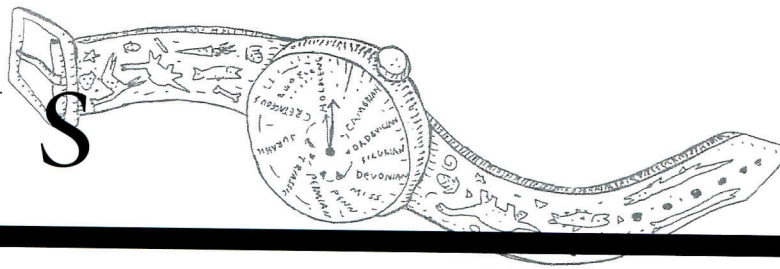
Anj Petto

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REPORTS

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Assault on Evolution Education in Idaho

Gary L Bennett



In early September 1999, local NCSE members met with Carolyn Mauer, the coordinator for textbooks in the Idaho Department of Education. Our purpose in arranging this meeting was to offer our services in book reviews and to learn what textbooks were being considered for adoption for the state's public schools. Idaho is reviewing science textbooks this year.

We learned that the anti-evolutionary text *Of Pandas and People* has been submitted for consideration for adoption as a biology text for Idahoans. We also learned that anti-evolutionists in Idaho have been actively meeting with various members of the Idaho Department of Education to push their position. We were informed that the ant-evolutionists were told that no books would be adopted that didn't support the proposed high school exit standards. That is the good news. Since creationism is not on the list of exit standards, however, the creationists have redirected their efforts to an assault on the exit standards — essentially the same approach which was successful in Kansas. So far, the Idaho Board of Education is holding fast, but the political process could change things. The state legislature is expected to get involved, and there is an opening on the board that is being targeted by anti-evolutionists.

At present, the textbook review committee consists of 18 members drawn from various regions of the state and representing both parents and educators. Carolyn Mauer is the 19th member (and the tie-

breaker in a split vote). Those books approved by the textbook review committee will be submitted to the Board of Education in January 2000 for its review and approval.

In the interim, Idaho NCSE members and others interested in quality science education have been reviewing books proposed for acceptance, staying in contact with state officials and science education groups, and keeping NCSE up to date on the latest developments.

Science Standards in Idaho Draw Fire

Recent testimony before the Idaho State Board of Education (BOE) at a meeting in Boise, focused on 2 themes that we have heard before: "Kids shouldn't be tested on evolution because they don't believe it," and "Evolution is wrong". The Kansas BOE decision (at least partly) on the basis of local "community standards" is likely to promote a further elaboration and spreading of these notions.

According to a report in the Associated Press (AP) on August 18, 1999, Tom Dillon, chairman of the Idaho BOE's standards subcommittee, said that the board is not requiring any school district to teach evolution. He said that students could still pass graduation tests even if they do not answer the questions about evolution.

The usual arguments against the science standards focused on evolution, geology, the age of the earth, and "catastrophic" changes. The most interesting aspect of the Idaho hearings was that some taxpayers appear to have asked the BOE committee on the exiting standards to research other states that are using similar standards to see how effective they are. According to Dillon, Idaho is the 43rd state to pursue statewide standards for its students, but as of now, he told the AP, "Idaho has no clear measure for what students need to know."

[See the news report on the Idaho BOE meetings on the web at <http://www.spokane.net:80/news-story-body.asp?Date=081899&ID=s623163&cat=Idaho>]

UPDATES

Colorado, Loveland: In June 1999 the directors of Liberty Common School, a charter school in the Poudre School District, adopted a "Policy on Teaching Science and Evolution" which says in part, "Teachers are encouraged to include discussions of alternate scientific theories and the data that supports [sic] and contradicts [sic] existing theories." An earlier draft of the policy had instructed teachers to follow specific procedures "in order to respect the religious beliefs of individual students and

their families." Parents of one student have filed a formal complaint with the district opposing the policy, and they report that other parents have discussed joining them in this complaint. [Ed. As this issue went to press NCSE members reported that the Board of Education of the Poudre School District declared by a 7 to 0 vote on October 25, 1999, that Liberty Common School had breached its contract as a charter school when it adopted a policy that prohibited teaching human evolution



and failed to emphasize the importance of "macro-evolution".]

Georgia: On August 1, 1999, the State Board of Education decided to consult the Attorney General before approving funding for some courses submitted to it. Two of these are "Virtual High School" courses, to be taught on the internet. These "Bible as History" courses have been widely criticized for teaching religious views. A third course, on science and religion, had been offered by instructors who suggested that it be taught as an interdisciplinary course, but in the listing presented to the Board of Education it was classified as a science course.

Idaho: The publisher of the "intelligent design" textbook *Of Pandas and People* has submitted this book for consideration of adoption by the state Textbook Commission. NCSE members in Idaho, who are submitting a detailed scientific critique of *Pandas* to the commission, report that the same publisher has submitted 2 other textbooks — one on history and one on sex education, each with a clearly religious bias. It is hoped that this context will make the religious orientation of *Pandas* more apparent to commissioners. (See report on page 4.)

Idaho: On October 22, 1999, the State Board of Education defeated by a 7 to 1 vote the proposal to amend the evolution exiting standard to have students identify "two strengths and two weaknesses" of the theory of evolution! The next step is a series of hearings in the state legislature.

Kansas, Pratt County: Activists in this school district are the first to attempt to introduce "intelligent design" at the local level in the wake of the state school board's adoption of science standards that omit evolution. They are trying to have the school board approve *Of Pandas and People* for classroom use. NCSE members in the area are working with members of the newly formed "Kansas Citizens for Science" to inform local school board members of the poor scien-

tific quality of the book.

Pennsylvania, Altoona: The Reverend Gary G Dull fought to install copies of the 10 Commandments in this city's schools as a way to prevent moral decline. When asked by the *Philadelphia Inquirer* about his stand on evolution, he told reporters: "We haven't gone to that discussion in Altoona, but I have always believed that if we are going to teach evolution, we should be teaching creationism" (Sep 5, 1999; p E1, E4). According to the report, Dull is clear in his own mind that evolution is "only a theory" and has been weighing views on what children should be taught about the origin of species. The most outspoken supporter of teaching evolution in the school was Rabbi Burt Schuman of Temple Beth Israel who warned that "comparing biblical creation to evolutionary theory invariably undermines faith because it may lead believers to feel that they need evidence to support their beliefs. 'Faith,' he suggested, 'is sufficient unto itself'" (p E4). The article closed with Schuman's considered remarks: "God has given us minds; He has given us the ability to be critical; He has given us the ability to consider facts and data." The full text of the story is available at <<http://www.phillynews.com/inquirer/99/Sep/05/review/EVOLVE05.htm>>.

Pennsylvania: State science education standards are moving forward. The Pennsylvania Department of Education (PDE) has reviewed comments from a series of statewide hearings and is preparing a new draft. The current draft of the standards is organized differently from, but is consistent with, national standards from the National Academy of Sciences and the American Association for the Advancement of Science. In the past few months, the anti-evolutionary activity in the state has increased, including pressure to post the 10 Commandments in public schools and to include "intelligent design" materials in the curriculum. Although there is only one member of the PDE board cur-

rently committed to anti-evolutionary materials, key committee chairs in the state legislature have expressed an interest in holding hearings on the proposed standards.

National: The Kansas Catholic Conference (KCC) has submitted a report critical of the *National Science Education Standards* to the National Catholic Conference. According to KCC Associate Director of Education Mary Kay Culp, the *Standards* are hostile to religion. At press time the national organization had not responded to the report.

National: Answers in Genesis (AIG), the Kentucky-based "creation ministry", has launched a national effort to oppose the *National Science Education Standards* — curriculum recommendations strongly supporting evolution that were published by the National Academy of Science in 1996. AIG is promoting a book by Jonathan Sarfati entitled *Refuting Evolution*, a page-by-page young-earth creationist critique of the *Standards*. AIG has purchased a quarter-page display ad in *USA Today* claiming that a copy of Sarfati's book was sent to each member of the Kansas Board of Education. Free and discounted copies are offered in the AIG newsletter, together with advice on distributing the books on sidewalks outside schools.

California, Belridge: In August 1999, this rural district with only a single K - 8 school came under fire for a number of church-state violations. Among these were plans to use books donated by A Beka Books, Inc, based at Pensacola Christian University in Florida. Under "Science", A Beka's online catalog includes *Discovering God's World*, *Enjoying God's World*, and *Exploring God's World* for grades 1, 2, and 3 (<<http://www.abeka.com>> provides links to the catalog). *The school's principal agreed not to use the books.*

[NCSE thanks Gary Bennett, Peter Knightes, Don Lindsay, Joe Prince, and Henry G Traylor for material used in this article.]





More Ideas from Our Members and Friends

Molleen Matsumura
Network Project Director

Dennis Coyier has prepared a resolution supporting evolution to be considered by the Dane County (WI) committee of his political party. The resolution affirms the importance of teaching evolution, citing both scientific and Constitutional reasons. Coyier hopes his or a similar resolution will be adopted at the state level as well. If you would like to encourage a similar action by the party of your choice, you'll find plenty of inspiration in the state-

Eugenie Scott. I wanted to do something to help people understand." Eldridge points out that because light travels at a particular, constant speed, much of what we see in the night sky is light that began its journey from distant stars millions of years ago. His calendars are vivid illustrations of "the history of the universe spread out for us in the sky." Eldridge sent us a sample of the "Birth and Death of Stars" calendar which many NCSE members received last year as gifts for their donations. Now he has devised a plan to make more calendars available for classroom use. (see "Astronomy calendars for your classroom", below left).

Andrew Koenigsberg was one of several NCSE members who listened, and called in, when a recent *Talk of the Nation* program on National Public Radio covered the evolution/creation controversy. Koenigsberg got through, and "got in the last word"! He reminded listeners that "science is not a belief or a belief system; it is a way

of knowing and finding out about nature", adding that "creation science" doesn't withstand scientific scrutiny.

Andrew Lutes sent copies of NCSE literature to Rep Tom DeLay, Rep Barney Frank, and newscaster Paul Harvey after reading Harvey's approving report of

DeLay's anti-evolution remarks on the floor of Congress (see RNCSE 19[3]:4).

Robert M Riehemann, already a member of a Great Books Club, is launching a science book club at his local library. Members will read and discuss important books about science. "We'll begin with James Watson's *The Double Helix* [an account of the discovery of the structure of DNA]," Riehemann

says, "and members will suggest future readings at our first meeting." (Bob doesn't know it yet, but he's just launched the member suggestion section of NCSE's online book catalog.)

Members around the country — more than we can name, and probably more than we know of — did their part in making sure that evolution education was defended in opinion and letters pages of newspapers in Kansas, and around the country, in the outpouring of public response to the Kansas Board of Education's action.

A Warm Thank You from the NCSE Staff

New members of NCSE always receive a welcome letter, but in this issue we want to offer a special "thank you" because of special circumstances.

To those of you who accepted invitations to join NCSE: Thank you! We know that you receive many such letters, all from worthy organizations. We're glad that you recognized the tremendous importance of defending and improving evolution education, and we look forward to working with you.

To those of you who sought us out after reading the article about us in *The New York Times*, or seeing us mentioned in other news articles: Thank you for your caring and initiative. Your enthusiastic support has been a real inspiration, and we look forward to fulfilling your expectations ... and then some!

To all of our members, new and old: With every silver lining, there's a little bit of cloud. As the *Times* article said, there are only 4 staff here at NCSE, and at times we were overwhelmed by the outpouring of interest. Phone calls and letters arrived faster than we could answer them, but — and here's that silver lining again — they have meant real growth, which will make us even more effective in the months ahead. So thanks for your patience, and loyalty, and the promise of help with new challenges.

Astronomy Calendars for Your Classroom

Thanks to the generosity of *Astronomy Incorporated*, NCSE has a limited supply of astronomy calendars for the year 2000 which we can donate for classroom use. The calendars are illustrated with beautiful, high resolution images of celestial bodies which bring the history of the universe to the walls of your classroom! Each photograph is accompanied by descriptive text explaining the physical facts and principles depicted.

Choose one from the following:

- Hubble Space Telescope views of *Stars of the Millenium*
- Space Probe views of *Neighbors of the Sun*
- Hubble Space Telescope views of *The Birth and Death of Stars*

To assure that these calendars are used in schools, please give us a *school address* where the calendar should be sent. You may order one for your own classroom or donate one to a local school. Calendars are free during this special offer, but donations of up to \$1.50 for postage and handling are appreciated.

Calendars can be previewed at <<http://www.astronomyincorporated.com>>.

ments of scientific, educational, civil libertarian, and religious organizations compiled in *Voices for Evolution* online at <<http://www.natcensci.org/voicont.htm>>; also available in print from NCSE.

Frank Eldridge publishes 3 different calendars with beautiful astronomical illustrations. He told NCSE, "I got the idea for my calendars after watching the *Firing Line* creation/evolution debate with



Bleeding Kansas: What Happened? What's Next?

Eugenie C Scott, NCSE Executive Director

During August and September 1999, NCSE members and other citizens read in their newspapers, and heard on radio and television, that the Kansas State Board of Education had removed evolution from the state science education standards. Here is the story.

HISTORY

After a year of work, a committee of Kansas scientists and master teachers (including several NCSE members) submitted a draft version of the Kansas Science Education Standards, first to public hearings and later to the State Board of Education (BOE). The Committee had followed guidelines developed by the National Academy of Sciences and the American Association for the Advancement of Science (AAAS) for preparation of such standards, and included evolution as one of the "Unifying Concepts and Processes" of science. Showing sensitivity to the fact that evolution might conflict with religious beliefs of some students and parents, the proposed standards reminded teachers:

Compelling student belief is inconsistent with the goal of education. Nothing in science or any other field of knowledge shall be taught dogmatically.

Evolution was treated matter-of-factly, as the widely-accepted principle of science that it is. Nonetheless, some members of the BOE, offended by the absence of creationism or "alternatives to evolution" in the draft, sought changes. School board member Steve Abrams, assisted by the

Creation Science Association for Mid-America, submitted substitute science standards that not only completely ignored evolution, but included some bizarre notions of the nature of science (for example, that "historical" and "theoretical" sciences are inferior to "technological" sciences). After much arm-wrestling, the BOE finally adopted science standards that were a patchwork of the 2 drafts. Evolution as an organizing principle of science was stripped out along with any mention of the Big Bang, cosmology, the age of the earth, or descent with modification. As a result of these changes, evolution will not be included in the assessment tests students take before leaving high school.

CREATIONISM'S FINGERPRINTS

It is clear that the hybrid standards had a creationist parent.

- These standards spend a great deal of time distinguishing between "macroevolution" and "microevolution". Real biologists do not, nor do other state standards.

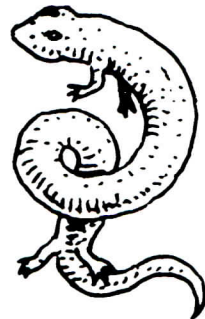
Microevolution refers to the mechanisms of change affecting species and populations within a species; these are primarily genetic mechanisms producing variability in a population or species, and natural selection which acts upon this variation. It also includes nonselective mechanisms such as genetic drift, founder effect and the like. Macroevolution — as used by creationists — refers to the basic principle of descent with modification from common ancestors, what anyone else would refer to simply as "evolution".

Macroevolution is a far more

complex topic to evolutionary biologists than the simple-minded version presented by creationists. In evolutionary biology, macroevolution refers to the patterns and principles that come into effect above the species level — not just the branching of the tree of life at levels such as genera, families, orders, classes, and so on, but also such phenomena as rates of change, the mode of change (smooth or jerky), and other considerations that are relevant to the "big picture" of evolution. The Kansas standards take a typical "¡micro sí! ¡macro no!" approach with which NCSE has become familiar.

- Creationist influence also is apparent in the exhortations to teachers to teach catastrophic geology: a benchmark for 4th grade tells teachers to encourage discussion about "whether or not all fossilized organisms were dead at the time of burial (i.e., closed clam fossils)".

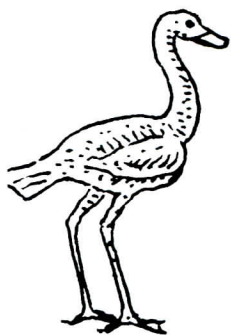
Of course, evidence for sudden burial and other catastrophic deposition is supposed evidence for Noah's Flood. Teachers are also told (twice) to discuss the Mt St Helens volcano, which is certainly an interesting geological feature, but rarely featured so prominently in science standards. Steve Austin of the Institute for Creation Research uses Mt St Helens to promote the universality of catastrophic geological processes. Because scientists witnessed a 30-foot "little Grand Canyon" being carved by a rush of water through unconsolidated ash, Austin argues that the Grand Canyon also could have



been cut catastrophically in a matter of weeks in just the same way. Of course, the Grand Canyon is composed of some 4000 feet of hard limestones, sandstones, granites, and marbles, but that is just a "detail".

- The revised Kansas standards also recommend that teachers discuss the Allende meteorite, something else never seen in other states' science standards.

Creationists cite a scatter of radiometric dates on the Allende meteorite to argue that radiometric dating is invalid. The argument is that if radiometric dating is invalid, then of course the earth cannot be old. If the earth is not old, there is not enough time for evolution to have occurred — so evolution didn't happen. If evolution didn't happen — gee, what *does* explain the great diversity of life on earth?



IMPLICATIONS OF THE DECISION: KANSAS

What does this mean for science education in Kansas? If the current standards take effect in Kansas in 2001 as scheduled, students will be taught less evolution, especially because evolution will not be included in the assessment exams. Kansas teachers who know what is good for them will "teach to the test" because these scores will determine how they and their school districts will be ranked. Why waste time on something that the students won't "need to know"? Meanwhile, Kansas teachers already fear that they will be subjected to increased pressure to avoid teaching evolution.

We have found that without state science standards to shield them, teachers are less resistant to parental complaints about evolution. A California teacher once faced a trio of parents questioning

him about whether evolution would be taught. He explained that he was required to teach it because it was in the California Science Framework. One disappointed parent finally burst out, "Well, you don't have to teach it like you *mean* it!" Teachers appreciate the shield provided by including the "e-word" in the state standards.

Also, Kansas students will find themselves shortchanged when they take the ACTs, SATs, and Advanced Placement exams, which include many evolutionary concepts (see RNCSE 1998: 18[3]:27). But perhaps the greatest injustice to Kansas students is denying them the pleasure of learning about one of the most exciting and active fields of science. The net effect of the Kansas science standards is to encourage teachers to pussyfoot around evolution, separating it out from the

RESPONSES TO THE KANSAS STANDARDS

Around the country scientific and educational organizations reacted to the decision by the Kansas Board of Education to eliminate evolution from science assessment examinations. Here is a sampling of that reaction.

American Geophysical Union (AGU)

In a "Science Legislative Alert" dated August 11, 1999, AGU urged its members to contact the school board to reiterate AGU's 1981 position statement opposing the teaching of creationism. "The Council of the American Geophysical Union notes with concern the continuing efforts by creationists for administrative, legislative, and juridical actions designed to require or promote the teaching of creationism as a scientific theory. The American Geophysical Union is opposed to all efforts to require or promote the teaching of creationism or any other religious tenets as science" (<<http://www.agu.org/cgi-bin/asla/asla-list?read=1999-22.msg>>, last accessed Oct 20, 1999.)

American Library Association (ALA)

The ALA made the deletion of evolution the theme of *Banned Book Week*, September 25-October 2, 1999. An ALA press release announced: "The Kansas State Board of Education recently determined Darwinism cannot be mentioned on statewide tests, a ruling the supporters of *Banned Books Week 1999 — Celebrating the Freedom to Read* find 'less than evolved'." Judith Krug, director of the ALA Office for Intellectual Freedom, added, "While the Kansas board may believe it has the best interest of the community at heart, history shows that censorship is not effective. In an evolved society like ours, we should welcome all schools of thought." (<<http://www.ala.org/pio/presskits/bbwkit/bbw99release.html>>, last accessed Oct 20, 1999).

Joint Statement of American Association for the Advancement of Science, National Research Council, and National Science Teachers Association

On September 23, these organizations denied copyright permission for use of their publications in the Kansas Science Standards, explaining, "A law firm representing the Kansas State Board of Education recently sought permission to reprint 'selected portions' of the *National Science Education Standards* (published by the National Research Council), the *Benchmarks for Science Literacy* (published by the American Association for the Advancement of Science), and *Pathways to the Science Standards* (published by the National Science Teachers Association). Our organizations originally gave tentative permission to the writing team from Kansas to incorporate portions of our publications into the Kansas Science Education Standards. But the standards that were approved by the Kansas State Board of

rest of science as a "theory" (read: "guess") that is controversial and doubtful or "questionable" at best. Students going on to college will be in for a big surprise: evolution is taught matter-of-factly at every respected university in this country, including denominational ones such as Baylor, Brigham Young, and Notre Dame. Kansas students will realize they have been lied to about the position of evolution in modern science. I doubt they will be pleased.

IMPLICATIONS OF THE DECISION: NATIONWIDE

What about those of us outside of Kansas? If other state or local boards of education or legislatures follow in Kansas's footsteps and drop, qualify, disclaim, or otherwise downplay evolution, the rest of us will feel the repercussions as textbooks decrease their coverage of evolution. This is a serious mat-

ter, as most teachers rely on a textbook to determine course content. If evolution is in the textbook, there is at least a *chance* that it will be taught. If it is not, the chance diminishes virtually to zero.

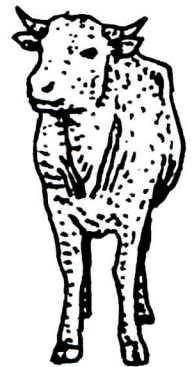
THE FUTURE

The consequences of the BOE decision are extensive indeed. Outraged Kansas scientists and teachers are planning for the election in November 2000, when they will support candidates opposing those incumbent BOE members who voted for the compromise standards. Meanwhile, 3 organizations whose materials were incorporated into the first version of the standards have announced that they are denying copyright permission to the SBE because with evolution yanked out, the compromise draft does not adequately reflect the intent of their documents. The AAAS (publisher of the

Benchmarks for Science Literacy), the National Academy of Sciences (publisher of the *National Science Education Standards*), and the National Science Teachers Association (publisher of *Pathways to the Science Education Standards*) issued a joint statement discussing their reasons for denying copyright permission (available on the NSTA web site <<http://www.nsta.org>>).

The denial of copyright permission will at least make it necessary to rework the compromise draft. With luck, this will provide an opportunity to revisit the content of the standards as well, but I am not holding my breath. The Kansas BOE is unusually independent of any other state agency, and, like the proverbial 600-pound gorilla, it can sit anywhere it wants.

NCSE will continue working with concerned Kansans and will keep *RNCSE* readers informed.



Education in August contained substantive revisions that deleted any mention about the origins and evolution of the universe and life on Earth.... Both individually and collectively, we reached the same conclusion: As modified, the Kansas Science Education Standards do not, as the Kansas State Board asserts, '...embrace the vision and content' of the National Science Education Standards and the Benchmarks for Science Literacy...." (<<http://project2061.aaas.org/newsinfo/kansas.htm>>, last accessed Oct 20, 1999).

Kansas Association of Biology Teachers (KABT)

At a press conference held at their fall meeting on September 18, many members of KABT took the opportunity to announce their intention to cover evolution thoroughly in their biology classes. The day after the vote by the Kansas Board of Education, the editor of the *Kansas Biology Teacher*, John Richard Schrock, wrote a letter printed in many Kansas newspa-

pers reminding Kansans that teaching "creation science" in public schools is unconstitutional. Schrock wrote:

Nearly half of the citizens who testified at the recent [Kansas] Board [of Education] hearings believed that the standards required equal time for creationism in science classrooms, and some Kansas biology teachers have been told by their administrators that adoption of the altered standards will mean that they must adopt a textbook that includes creationism.

Both ideas are incorrect. The new science standards definitely do not require "equal time" or mandate the teaching of creationism in the science classroom. To do so would violate the US Supreme Court decision in *Edwards versus Aguillard*. However, the new science standards have withdrawn evolution from assessment and have made coverage of this one concept a local decision.

Any school administrator who contemplates "equal time" or adoption of a textbook that brings creationism into the public science classroom would be well-advised to consult a school attorney.

Kansas State University (KSU) Faculty Senate

On September 14, 1999, the KSU Faculty Senate passed a resolution reading in part "Whereas new discoveries in... [the] sciences have enlarged our understanding of the ...universe; Whereas the vote of the Kansas State Board of Education to omit essential aspects of these subjects ... will erode scientific literacy...; and... disadvantage many Kansas high school graduates...; and ... diminish the academic reputation of all Kansas educational institutions...; Be it resolved: ... That the KSU faculty are determined to support efforts to reverse that decision at the earliest opportunity...."

Manhattan Mercury, September 15, 1999, page A1.

continued on page 11



Creationist Tornado Rips Evolution out of Kansas Science Standards

Deborah L Cunningham

THE HISTORIC VOTE

On Wednesday, August 11, 1999, the Kansas State Board of Education (BOE) adopted a compromised set of Science Education Standards that left the decision to teach evolution in science classes up to each of the state's 304 school districts. The 6-4 vote occurred after months of public debate and several public fora, the final one taking place on August 10. The BOE's decision won't disallow the teaching of evolution in public schools, but since the standards *will* determine the content of required assessment examinations in the sciences, critics fear that this decision will cause science teachers to spend less time teaching evolution and more time covering subjects that will be included on tests. Supporters of science education are also concerned that this decision will open the door to pressure to include "creation science" and "intelligent design theory" in the curriculum.

The BOE is made up of 5 conservative and 5 moderate members. The conservative victory occurred when Harold Voth, one of the moderates, voted with the conservatives in favor of adopting the new, compromised version of the Science Education Standards. The standards for the public school children of Kansas were

originally written by a 27-member Kansas Science Education Standards Writing Committee. This committee was composed of science educators and consultants from the preschool to the university level and included 5 Presidential Awardees for Excellence in Science Teaching and 2 Christa McAuliffe Fellows. After a year of research, collaboration, and input from the National Science Teachers Association, the American Academy for the Advancement of Science, and the National Academy of Science, the committee presented the 5th, and final, working draft of the document to the BOE in July 1999.

THE 5TH WORKING DRAFT AND THE COMPROMISED VERSION: DELETING EVOLUTION

The 5th Working Draft of the standards was based on the National Science Education Standards and listed 5 "unifying concepts and processes": (1) systems, order, and organization; (2) evidence, models, and explanation; (3) constancy, change, and measurement; (4) patterns of cumulative change; and (5) form and function.

The explanation of the 4th concept in the working draft reads:

Accumulated changes through time, some gradual and some sporadic, account for the present form and function of objects, organisms, and natural systems. The general idea is that the present arises from materials and forms of the past. An example of cumulative change is the biological the-

ory of evolution, which explains the process of descent with modification of organisms from common ancestors. Additional examples are continental drift, which is part of plate tectonic theory, fossilization, and erosion. Patterns of cumulative change also help to describe the current structure of the universe (Kansas BOE Science Standards Writing Team, p 9).

The compromised version of the standards deletes this 4th concept entirely, as well as other items, including the "Big Bang" Theory.

The compromised set of science standards was written by a "subcommittee" of the BOE comprised of Voth and 2 conservative members, Abrams and Hill. Not only did this subcommittee delete "patterns of cumulative change" from the unifying concepts, it also deleted parts of the "Teaching With Tolerance and Respect" section. (This section was added by the science writing committee as a previous concession to conservative BOE members.) In the 5th Working Draft of the standards, this section stated

If a student should raise a question in a natural science class that the teacher determines to be outside the domain of science, the teacher should treat the question with respect. The teacher should explain why the question is outside the domain of natural science and encourage the student to discuss the question further with his or her family and clergy. Neither the Kansas Constitution nor the United States Constitution requires time to be given in the science curriculum to



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accommodate religious views of those who object to certain material or activities presented in science classes. Nothing in the Kansas Statutes Annotated or the Kansas State Board Regulations allows students (or their parents) to excuse class attendance based on disagreement with the curriculum, except as specified for 1) any activity which is contrary to the religious teachings of the child or for 2) human sexuality education (Kansas BOE Science Standards Writing Team, p 6).

Instead, the subcommittee substituted the following single sentence: "No evidence or analysis of evidence that contradicts a current science theory will be censured" (Kansas BOE Science Subcommittee, p 6).

An additional change was made

to an 8th grade benchmark: "The students will observe the diversity of living things and relate their adaptation to their survival or extinction". Instead of "Biological evolution, gradual changes of characteristics of organisms over many generations, has brought variations in populations" (Kansas BOE Science Standards Writing Team, p 41), the compromised standards substituted "Over time, genetic variation acted upon by natural selection has brought variations in populations. This is termed microevolution" (Kansas BOE Science Subcommittee, p 46).

In the next paragraph, the subcommittee deleted, "Students can compare similarities between organisms in different parts of the world, such as tigers in Asia and mountain lions in North America" and "Students tend to think of all individuals in a population responding to change quickly

rather than over a long period of time" (Kansas BOE Science Standards Writing Team, p 42). Then the following sentence was added to the benchmark: "Natural selection can maintain or deplete genetic variation but does not add new information to the existing genetic code" (Kansas BOE Science Subcommittee, p 46). In addition, 2 explanatory statements were added to that same benchmark in the compromised standards, one reiterating that natural selection acts only on the existing genetic code and the other that natural selection is a valid theoretical framework.

The subcommittee also made changes in the 8th-grade standards on geologic time, allegedly to make them more "academic" (according to Abrams), but the result is that they avoid teaching the students about the age of the earth. Another indicator was also



RESPONSES TO THE KANSAS STANDARDS continued from page 9

School Library Journal

This journal's October editorial discussed how school libraries should respond if "school boards ... push libraries to add materials on creationism."

Is there any reason not to have materials in libraries on religious beliefs about creation? No. Well-educated students should be aware of both evolutionary theory and creation beliefs....

But books that attempt to blur religion and science do a disservice to young readers. Finding reviews of creationist titles is difficult, in part, because ...[they] fall outside the trade book category. What's ... useful [are] the criteria NCSE used: Does the book present religious doctrine in disguise? Is the content scientifically accurate?

We need more quality introductory material on the origins of humanity. But we also need an educational community that

doesn't absolve itself of teaching established scientific theories when faced with political pressure from the far right (<<http://www.bookwire.com/slj/opinion.html>>, last accessed Oct 20, 1999).

The John Templeton Foundation

On August 31, 1999, Charles Harper, Executive Director of the Templeton Foundation, which funds publications, conferences, and academic programs concerning the relationship between science and religion, released a statement that was posted on *Meta*, a list-serve for theologians and scientists discussing these issues.

The Templeton Foundation is not directly involved in debates over creationism and the teaching of evolution in the public schools.... In general, we encourage exploration of the theory of evolution as an aspect of the created order and believe that there are rich insights potentially available from such

study which have important theological significance. Thus the Foundation in no way shares the quarrel with evolutionary science that is typical of Christian fundamentalism in the United States. It is simply not possible for well-informed scholars to hold such positions either in terms of theology or science.... Overall, the mission of the Templeton Foundation in the area of the long-standing confrontation between fundamentalism and science is to help to provide a way around the impasse. This ... task ... has no immediate linkage with issues regarding possible litigation over the policies of the Kansas School Board and the ongoing saga of similar and recurrent public policy conflict....

(This is a posting from the Meta-List <<http://www.meta-list.org>>. Copyright 1997, 1998, 1999. William Grassie).

added describing the importance of falsification: "No matter how much evidence seems to support a theory, it only takes one proof that it is false to show it to be false. It should be recognized that in the real world it might take years to falsify a theory" (Kansas BOE Science Sub-Committee, p 58).

The bulk of the changes occurred at the 12th grade level. The subcommittee added an assertion that natural selection and random genetic drift are the primary mechanisms of genotypic change. Other standards about geologic formation and earth's history were

changed in order to include "different methods" of estimating geologic time and evaluating fossils. Finally, another benchmark description was expanded from "As a result of activities in grades 9 - 12, students should develop an

understanding of the universe, its origin, and evolution" (Kansas BOE Science Standards Writing Team, p 70) to "Students should develop an understanding of the universe. The origin of the universe remains one of the greatest questions in science. Studies of data regarding fossils, geologic tables, cosmological information are encouraged. But standards regarding origins are not mandated" (Kansas BOE Science Sub-Committee, p 78). It is from this section that the "Big Bang" theory was deleted. Hill, when explaining why this change was made, said that he didn't want to limit the information available to children.

The rest of the changes occurred in the appendices. In Appendix 1, the Glossary, the compromised version of the standards altered several definitions. In the original standards, the definition of "evolution" was subdivided into two sections. In the first, "biological" evolution was defined as

A scientific theory that accounts for present day similarity and diversity among living organisms and changes in non-living entities over

time. With respect to living organisms, evolution has two major perspectives: The long-term perspective focuses on the branching of lineages; the short-term perspective centers on changes within lineages. In the long term, evolution is the decent [*sic*] with modification of different lineages from common ancestors. In the short term, evolution is the ongoing adaptation of organisms to environmental challenges and changes (Kansas BOE Science Standards Writing Team, p 78).

The second definition of evolution was "cosmological":

With respect to non-living entities, evolution accounts for sequences of natural stages of development. Such sequences are a natural consequence of the characteristics of matter and energy. Stars, planets, solar systems, and galaxies are examples (Kansas BOE Science Standards Writing Team, p 79).

Instead, the compromised version defines "evolution", without subdividing it, as

A scientific theory that accounts for present day similarity and diversity among living organisms and changes in non-living entities over time. With respect to living organisms, evolution has two major perspectives: The long-term perspective (macro-evolution) focuses on the branching of lineages; the short-term perspective (micro-evolution) centers on changes within lineages (Kansas BOE Science Sub-Committee, p 86).

The subcommittee also changed the definition of "science" from "The human activity of seeking natural explanations for what we observe in the world around us" (Kansas BOE Science Standards Writing Team, p 80) to "The human activity of seeking

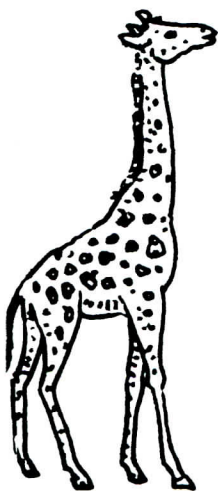
logical explanations for what we observe in the world around us" (Kansas BOE Science Sub-Committee, p 88, emphasis added). The elimination of the word "natural" leaves room for a variety of supernatural and theological explanations to count as "scientific" under this new definition. Finally, the definition of "theory" was changed from "In science, a well-substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses" (Kansas BOE Science Standards Writing Team, p 80) to a version that leaves out "well-substantiated" (Kansas BOE Science Sub-Committee, p 88).

The subcommittee also added a definition of "falsification":

A method for determining the validity of an hypothesis, theory or law. To be falsifiable a theory must be testable, by others, in such a way that, if it is false, the tests can show that it is false (Kansas BOE Science Sub-Committee, p 87).

The issue of falsification was apparently so important to the subcommittee that it replaced the original contents of Appendix 2 with a 2-page treatise on "Falsification - An Essential Verification Strategy". This modified Appendix 2 begins

Repeatability is an inadequate criterion and is supplemented with falsification. The reason for falsifiability may not be intuitively obvious. It is fine to make statements like 'this theory is backed by a great body of experiments and observations,' but often overlooked is the fact that such claims are meaningless. **Experiments and observations do not verify theories, they must be evaluated by human reason to determine the degree of verification they provide** (Kansas BOE Science, p 90, boldface type in original).



The original appendix contained a diagram explaining the new science standards and a short description illustrating the connections among them.

The final changes were the deletion of Appendix 3, "Scientific Thinking Process", in which specific thinking processes were linked to grade levels, and Appendix 5, "Achievements in the History of Science and Technology", which listed *Homo erectus* as existing at 750 000 BCE.

THE KANSAS BOE: EVOLUTION OF A CONTROVERSY

This isn't the first disagreement between conservatives and moderates on the BOE. Since conservatives took hold of half the seats in 1996, the board has deadlocked over several issues, from federal initiatives for developing career programs to the use of calculators in the math classroom. Other deadlocks have occurred over student testing, sex education, school accreditation, and teacher licensing. In these discussions conservatives often invoked the issue of "local control" or family prerogatives.

The current controversy began when some Kansans asked the BOE to reject the proposed science standards because evolution goes against their belief that God created the earth and all of its creatures. Conservative board members agreed that the standards focused too much attention on evolution, and one member wanted the standards to include other theories of how life began (Beem 1999a).

In April 1999 the controversy began in Kansas newspapers. Numerous editorials and letters to the editor were published, both for and against teaching evolution. Many of the letters calling to strike evolution from the standards took the form of old creationist arguments, such as the "religion of evolution", the lack of transitional fossils, the unfairness of teaching only one theory, and, of course, the right of local communities to control the curriculum.

On the other hand, many letters

and editorials were pro-evolution. One letter argued, "It is science teachers and scientists — not citizens with a religious agenda — who should judge when and if alternate theories of evolution should be presented in the classroom" (Connaghan 1999: B6). Several editorials and letters pointed out the possibility of lawsuits if "creation science" is taught in a public school environment. Even the state's Republican governor, Bill Graves, publicly criticized the BOE for considering the compromised document. Just before the final vote, the presidents of 6 Kansas universities wrote in support of teaching evolution arguing that the compromised proposal "will be detrimental to the future of science education in Kansas. . . [and] will set Kansas back a century" (Hemenway and others 1999: B6).

It was also in April, according to *The Kansas City Star* (Beem 1999b), that conservative board member Abrams presented a revised version of the standards to John Staver, the director of the Center for Science Education at Kansas State University, Professor of Science Education at Kansas State University, and member of the writing committee for the Kansas Science Education Standards. While Abrams's version gave authorship credit to the science writing team, he acknowledged that it was actually written by "various citizens" including Tom Willis, the president of the Missouri-based Creation Science Association for Mid-America, and members of a group called the National Committee for Excellence in Science Education. Several moderate members of the board objected to the contributions of anonymous "various citizens" to the revised document.

THE CREATIONIST INPUT

Tom Willis, who volunteered to help the board rewrite the science standards to exclude evolution, was quoted in *The Kansas City Star* as saying "I believe that history is only available to us in detail if you have a reliable witness. If you

believe a reliable witness, then there's no evolution. The testimony in the Bible goes against it" (Beem 1999a).

The version of the standards that Willis helped the subcommittee to write is a stronger creationist version than the compromised version adopted by the BOE. However, some of its elements were still obvious in the adopted standards, such as in an exercise for 12th graders on fossil dating. This exercise has the students "[r]esearch *all* published data on the fossils present in the layers of the Grand Canyon" (Kansas State Board of Education Science Subcommittee, p 78, emphasis added) in order, according to the *Lawrence Journal-World*, for students to contemplate the possibility that the Grand Canyon was formed by a sudden, cataclysmic event (Seba 1999).

In fact, the next exercise directs students to "Investigate how rocks and fossils are dated. Identify assumptions used in radioactive decay methods of dating. Compare and evaluate data obtained on ages from such places as Mount St Helens and the meteorite named Allende" (Kansas BOE Science Subcommittee, p 78). The interview with Willis in the *Lawrence Journal-World* quotes him as saying "The Grand Canyon was not caused by erosion but by a volcanic eruption. We know that from Mount St Helens" (Seba 1999: 3A).

THE OPEN FORUM

On August 10, 1999, the last public forum was held by the BOE in Topeka. About 60 people were allowed one minute each to state their opinions; the majority of those who spoke opposed the teaching of evolution in the public schools of Kansas. Comments included "We can't know what happened in the past", "Creation involves just as much science as evolution", "Evolution involves just as much religion as creation (secu-



**Conservative[s]
... agreed that
the standards
focused too much
on evolution.**

lar humanism)", "Both theories require faith", "Since neither theory is proven it is crucial that the decision is made locally", and, my personal favorite, "We taught our children they were evolved from animals, and then we wonder why they act like animals".

Evolution supporters were present, however, and pointed out that Kansas students could lag behind their peers from other states in their performance on national standardized tests, such as the SAT and ACT, if evolution was

not taught to them, and that the Supreme Court has already ruled that "creation science" cannot be taught in public schools. One member of the writing committee, Patrick Wakeman, when addressing the subcommittee's statement that 95% of the original document was left

intact, said, "If I dissect a human heart, 95% of the body will be the same, but it won't function." Unfortunately, the evolutionists' logical and persuasive arguments were not heeded by the board.

THE VOTE

On the morning of August 11, 1999, Loren Lutes, a member of the science writing team, a school district superintendent, and a former physics professor, recommended to the BOE that the 5th Working Draft of the Kansas Science Education Standards be adopted. He pointed out that the draft is widely supported by science organizations and the governor because it is based on national science education standards. He stated that the writing team could not support the compromised proposal because it is incomplete, inaccurate, and omits evolution.

John Staver added that the American Association for the Advancement of Science and the National Science Teachers Association indicated that they would need to see the compromised proposal, if approved, prior to giving permission to include

text from their documents in it (see section on responses to Standards, page 8). He also recommended that the Kansas attorney general and the BOE's attorney examine the compromised document for potential legal problems. Staver went on to say that over half of the members of the original writing team whom he had contacted would request that their names be removed from the compromised document, if passed.

After these opening statements, 3 of the members made statements in support of the 5th Working Draft. At this point, conservative member Hill made several last-minute changes to the subcommittee's document, including removing assessment flags and changing Appendix 2. The moderates pointed out that if board members rewrite documents such as these science standards, it will become increasingly difficult to ask experts to put in long hours working on such documents. One member objected to having been unaware of the appointment of Abrams, Hill, and Voth to a special subcommittee without their offering the opportunity to other board members to serve on it. One moderate member called for a response by the original science writing committee to the new document, but BOE chairwoman Holloway refused, stating that the board had already heard from the experts.

As the board discussed each change, no religious reasons were cited as being behind the alterations. Instead, subcommittee members would say "wording was included to satisfy concerns by board members" or "we're making it more academic." Other justifications for the changes were that they didn't want to limit information available to children and did not want a dogmatic approach when teaching about the origins of the universe.

Moderate BOE members questioned Hill about the source of the new information which the subcommittee had included in the new document. Hill insisted that since the subcommittee didn't take any verbatim language from

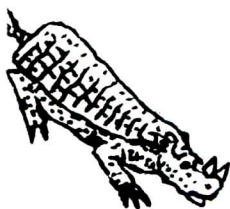
any source, it didn't feel it necessary to include acknowledgments. He added that the subcommittee's members did not want to add their own names to the document because they are not experts in science. The discussion went on until moderate member Voth stated that he supported the compromised proposal, after which the board approved the new document 6-4. Voth justified his vote by saying that the majority of people who contacted him about this matter encouraged him to vote for the compromised proposal, and also that he believes that local school boards should decide whether to teach the theory of evolution.

THE REACTION

The public reaction in Kansas newspapers to the vote has been overwhelmingly negative, both from politicians and concerned citizens. Tom Willis told the *Lawrence Journal-World*, "I couldn't have done better" (Seba 1999). Republican Governor Bill Graves issued a formal statement after the vote which read, "This is a terrible, tragic, embarrassing solution to a problem that did not exist." Representative Ralph Tanner, the chairman of the Kansas House Education Committee, said that he would introduce measures during the 2000 legislative session that would either change the way the board is selected or alter its makeup. Tanner also said that he didn't subscribe to the idea that the argument is really about local control, not about evolution. He was quoted in *The Wichita Eagle*: "We are supposed to have a sense of uniformity across the curriculum across the state. Some people are trying to hide behind the issue of local control. There is no issue of local control on this type of thing" (Rothschild 1999, p 11A, 14A).

Chris Grenz from *The Topeka Capital-Journal* surveyed some Kansas religious leaders and got a mixed reaction. While many agree with the board's decision, others think that it is important to maintain the separation of church and state (Grenz 1999). Most of the let-

Even Bill Nye "The Science Guy"... released a statement to the Associated Press.



ters to the editor published in Kansas papers were against the decision, and *The Kansas City Star* took pains to assure readers that this was because of the staggering imbalance of negative versus supportive letters.

Even Bill Nye "The Science Guy" joined the fray. He released a statement to the Associated Press that said, "To reject this fundamental, beautiful thing about the world around us is hare-brained. It's nutty" (Associated Press 1999, p 14A). The National Science Teachers Association called the board's action misguided (Associated Press 1999), and Steve Case, a teacher and a member of the grassroots group Citizens for Science, stated in *The Wichita Eagle* that "Ordinarily, when a group comes in and demands that something be in the curriculum, you go to your state standards and say, 'Here is what the state says is good science.' That's the leg you stand on. Now, the board has cut those legs out from under [educators]" (Tobias 1999, p 6A).

The Associated Press reported that the legal director of the Americans United for Separation of Church and State sent a letter to Education Commissioner Andy Tompkins and board chairwoman Linda Holloway warning of a possible lawsuit if the new standards favor a creationist perspective (Miles 1999). The American Civil Liberties Union also sent a letter to Kansas school districts warning them of possible legal action if they taught "creation science".

However, most school districts are reporting that the decision will have little immediate impact on their curricula. Only in the Pratt school district has there been pressure from a group of parents for school officials to adopt a new science textbook that includes "intelligent design orientation". As *The Wichita Eagle* reported, the request was referred to the committee developing science standards for that district (Tobias 1999). However, the BOE's decision practically assures that more such requests will follow.

The image of Kansas has defi-

nately suffered because of the BOE's decision, and it has already hurt the state financially. Ron Burley, the president of an Oregon software company, Broadcast Software International, scratched Topeka off of his list as a possible location for a new regional technical center after hearing of the BOE's decision. In an August 11, 1999, email to *The Topeka Capital-Journal*, Burley wrote, "The issue for us ... is whether ... we can count on finding a good selection of well-educated future employees in the area. Following today's decision, that is in doubt" (McLean 1999, p 1A).

Soon Kansans will have another opportunity to express their opinions on this issue. Of the 6 BOE members who voted for the compromised proposal, 4 are up for reelection next year: Holloway, Brown, Abrams, and Hill. One way to make it clear to the BOE and to political leaders that the compromised standards result in a compromised education is for Kansans to go to the polls and change the makeup of the state school board. Until then, science education standards in Kansas must be listed as "missing in action".

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TRACKING THE CHANGES IN KANSAS'S SCIENCE STANDARDS

The Kansas Association of Biology Teachers (KABT) web site has a version of the science education standards document which shows how the document was modified before final adoption. The KABT site indicates changes by underlining the passages that were changed (modified, added, or removed) by the school board. See this document at <http://kabt.org/ks_standards/KS1.htm>.

Keep in mind that this web page doesn't contain the *final* version of the standards, because a number of additional amendments were voted on by the school board after they received the document. To find those modifications, it is necessary to compare the board's final version at <<http://www.cjnetworks.com/~barfield/science.htm>> with the draft drawn up by the educators and scientists. One strategy is to do a manual search on the word "evolution" in both documents and then to record instances in which the surrounding text was different or is missing.

[Contributed by Brett Vickers.]

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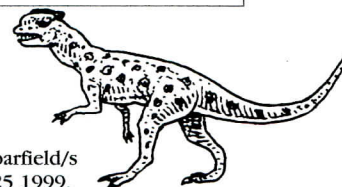
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The Creation/Evolution Continuum

Eugenie C Scott
NCSE Executive Director

The first page of the "Members" section of this issue of *RNCSE* presents a graphic that I have used in many of my public presentations. So many people have requested copies of the graphic and supporting information that I decided to make it available in *RNCSE*. Now anyone can make a transparency from page 17 and use it with the information in this article to present some very important information to audiences. [Ed.: We can also send a copy of the graphic electronically to readers who request a copy by writing to <editor@natscied.org>.]

Many — if not most — Americans think of the creation and evolution controversy as a dichotomy with "creationists" on one side, and "evolutionists" on the other. This assumption all too often leads to the unfortunate conclusion that because creationists are believers in God, evolutionists must be atheists. The true situation is much more complicated. I encourage people to reject the creation/evolution *dichotomy* and recognize the creation/evolution *continuum*. It is clear that creationism comes in many forms. So, when a student tells a teacher, "I'm a creationist", the teacher needs to ask, "What kind?"

THE CREATION/EVOLUTION CONTINUUM

Page 17 presents a continuum with creationism at one end and evolution at the other. The strictest creationists are the Flat Earthers.

Flat Earthers — Members of the Flat Earth Society believe that the shape of the Earth is flat because a literal reading of the

Bible demands it (Schadewald 1991). Charles K Johnson is the head of the International Flat Earth Society, headquartered in Lancaster, CA, and he is very serious about the planet's shape being as the ancients perceived it: circular and flat, not spherical. The earth is shaped like a coin, not a ball. References in the Bible to the "four corners of the earth" refer to the cardinal directions; more relevant are references to the "circle of the earth", implying a 2-dimensional, flat plane. The International Flat Earth Society has only about 200 members (Schadewald 1980) and is insignificant in the anti-evolution movement. However, it represents the most extreme biblical literalist theology: the earth is flat because the Bible says it is flat. Scientific views are of secondary importance.

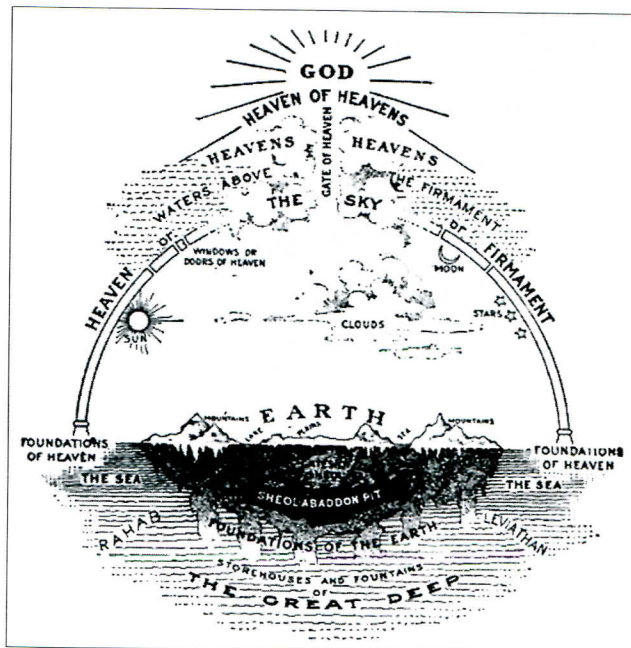
Geocentrists — Geocentrists accept that the earth is spherical,

but deny that the sun is the center of the solar system. Like flat earthers, they reject virtually all of modern physics and chemistry as well as biology. Geocentrism is a somewhat larger, though still insignificant, constituent of modern anti-evolutionism. At the Bible-Science Association creationism conference in 1985, the plenary session debate was held between 2 geocentrists and 2 heliocentrists (Bible-Science Association 1985). Similarly, as recently as 1985, the secretary of the Creation Research Society was a published geocentrist (Kaufmann 1985).

Both flat-earth and geocentrist views reflect the perception of the earth held by the ancient Hebrews — that the earth is a flat disk floating on water and the heavens are held up by a dome (or firmament) with the sun, moon, and stars attached to it (Cartmill 1998). The waters above the firmament, flowing in through

the windows of heaven, were the source of the 40 days and nights of rain of Noah's Flood.

The next group of creationists on the continuum are less strictly literal in their interpretation of the Bible, but they still hold to Special Creationism.



The Ancient Hebrew Conception of the Universe (from Robinson 1913, p. 13)

continued on page 21

THE CREATION/EVOLUTION CONTINUUM

CREATION

Flat Earthers

Geocentrists

Young Earth Creationists

Old Earth Creationists

Gap Creationism

Day-Age Creationism

Progressive Creationism

*Intelligent Design
Creationism*

Evolutionary Creationists

Theistic Evolutionists

Materialist
Evolutionists

EVOLUTION

BOOKS BY NCSE MEMBERS AND SUPPORTERS



The Pattern of Evolution

Niles Eldredge

Niles Eldredge, a curator in the Department of Invertebrates at the American Museum of Natural History, may be best known as the coauthor of the concept of "punctuated equilibria". Here Eldredge explores how the physical forces shaping our world relate to the process of biological evolution in the context of the history of ideas on evolution. Praised by Ian Tattersall for "weav[ing] together an extraordinary diversity of information into a single coherent theory of the evolution of the biosphere" and as "smoothly flowing and highly readable". The humorous and thought-provoking opening pages are online at <http://www.whfreeman.com/generalreaders/book.asp?1002002098>. *Cloth*, 150 pages. List price \$17.47.

The Sacred Depths of Nature **Ursula Goodenough**

In prose that has been lauded as elegant and eloquent, Goodenough offers incisive explanations of the scientific facts of what she calls "The Epic of Evolution", and personal philosophical reflections suggesting how one may draw a sense of meaning from these facts. The Epic of Evolution explores the origins of the earth and life on the planet, the way life and organisms work, the mechanisms of evolutionary change, the evolution of biodiversity, awareness, emotions, the role of sexual reproduction in evolution, multicellularity, death, and speciation. The factual sections provide an accurate and engaging primer on biology and evolution; the personal reflections weave in a range of inspirations from thinkers such as Oren Lyons, Faith-keeper of the Onondaga Nation, poet Sharon Olds, and pioneering psychologist William James. *Cloth*, 197 pages. List price \$24.00.

What do NCSE members and supporters have in common? They are interested in promoting science, scientific literacy, and especially evolution education. They share those interests in many ways, and we are pleased to make this special offer of books written by some of our members and supporters.

In this issue we list new and recent books to add to the rich array that our members and supporters have produced in the past.

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[See "NCSE Expanding Book Program" RNCSE 1999 Jun/Jul; 19(3):9.]

So, peruse this list, and when you are ready to order, connect to the NCSE website

<http://www.natcensci.org/bookcat.htm>.

Darwinism Defeated?

The Johnson-Lamoureux

Debate on Biological Origins

Phillip E Johnson,

Denis O Lamoureux

No, the NCSE member/author isn't Phillip Johnson, the Boalt Law School professor who has written a series of anti-evolution books beginning with *Darwin on Trial*. It's Denis Lamoureux, a University of Alberta theologian and biologist who studies dental development and evolution. In this book, Lamoureux brings his scientific knowledge to bear as he challenges Johnson's views on how Christians ought to respond to the theory of evolution. The written exchange between Johnson and Lamoureux is followed by essays from a number of scientists and theologians with varying perspectives, including Michael Behe, Howard Van Till, and Rikki Watts. A vivid reminder that the "evolution controversy" is very much a religious discussion, in which opposition to evolution is far from reigning supreme. *Paper*. List price \$17.95.

The End of the World: An Annotated Bibliography

Tom McIver

Compiled by the author of *Anti-Evolution: An Annotated Bibliography*, this is an extensive survey of publications about the "end of time". Most of the sources listed are from a Christian perspective, but this book includes other major religions and popular myths about topics like UFOs and psychic powers. McIver begins with an introduction discussing "different meanings of the end", guiding us through the historical background and basic terminology. The book also contains a chronological survey of source documents from the 2nd century BCE to 1800, with selected examples right up to the present — including web sites! Descriptions contain bibliographic

information and background information including biographical notes about authors, theme of the work, historical significance, and more. References and an index enhance the book's usefulness for research. *Library binding, 389 pages. List price \$55.00.*

The Complete Idiot's Guide to Dinosaurs

Jay Stevenson, George R McGhee, Kevin Padian

NCSE President Kevin Padian, a fervent advocate of making science accessible and interesting for all ages, is a coauthor of this comprehensive description of every known dinosaur species. He promises on the cover, "If you're feeling inferior because your kids are geniuses about dinosaurs, then this book is for you." Full color illustrations and up-to-date, non-technical descriptions of dinosaurs' physical characteristics and behavior as well as likely reasons for their disappearance. *Paper, 396 pages. List price \$17.95.*

Encyclopedia of Dinosaurs

Kevin Padian, Philip J Currie, editors

Want to splurge on the ideal dinosaur book for someone special? This could be it! 275 articles by leading researchers provide a comprehensive survey of dinosaur behavior and biology, major sites, important discoveries, and recent advances in dinosaur discovery and research. Beautiful illustrations and diagrams include a 16-page section on the most popular species. Extensive cross-referencing, a glossary, and a chronology make this enjoyable book a useful research tool. *Cloth, 869 pages. List price \$99.95.*

Mystery of Mysteries: Is Evolution a Social Construction?

Michael Ruse

Ruse tells us in his introduction, "This is a book about the nature of science using evolutionary theory as a case study ... intended for a general audience." This highly readable book isn't bogged down by footnotes, but it *does* have a glossary to make the going easier, an extensive bibliography, and lively profiles of the thinkers whose work it discusses. Ruse examines the history of evolutionary thinking, and the work of leading researchers and popularizers from Darwin to Dawkins, in order to shed light on the question behind the "science wars": do scientists offer objective information about an independent reality, or just one more set of culture-bound beliefs? Michael Shermer, author of *Why People Believe Weird Things*, praises the book for "show[ing] us how to find an intelligent middle route." Ruse concludes that "in the key area of evolutionary biology we can resolve the debate", and urges others to study the physical and social sciences to learn how far his generalizations extend. *Cloth, 296 pages. List price \$27.50.*

Evolution! Facts and Fallacies

J William Schopf, editor

Evolution! is a collection of papers presented at a symposium convened by the Center for the Study of Evolution and the Origin of Life at the University of California, Los Angeles. In this book, noted experts sort facts from fallacies by answering questions most often asked of Darwin's grand theory. Written to be accessible to general readers, each paper both presents information about what we know about the history of life and explains the scientific methodologies used and current problems in the field. Then it places this knowledge in the context of public understanding (or misunderstanding

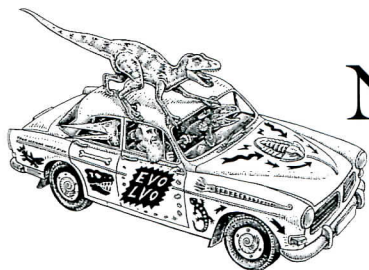
ing!) of science. Chapters written by leading scientists focus on the evolution of life, methods for dating events and specimens in life's history, the question of "missing links", and connections between science and the media. Detailed illustrations and provocative topics — such as "Ancestors Are Not Important to Paleontologists" (chapter 3), "Search for the Smoking Gun" (chapter 5), and "The Myth of Malevolent Martians" (chapter 6) — draw the reader into the book, which offers suggested readings for further adventures. Whether you're looking for answers to "arguments against evolution" or want to enjoy reading about the latest findings in evolutionary science, this is a must-read. *Paper, large format, 159 pages. List price \$29.95.*

How We Believe: The Search for God in an Age of Science
Michael Shermer

How We Believe explores how and why people maintain religious beliefs, examining psychological and social aspects of the question, and the relationship between religious belief and scientific thought. Shermer, founder of the Skeptics Society and a professor in the Cultural Studies Program at Occidental University, closes his preface by remarking that he hopes that this study "adds to our understanding of the human condition." *How We Believe* includes sections on "God and Belief" and "Religion and Science"; and appendices on "What Does It Mean to Study Religion Scientifically?" and "Why People Believe In God — The Data and Statistics". Philosopher Michael Ruse commented, "... [H]e obviously cares about the issues on which he writes. I loved his discussions of God and of morality, and when I disagree I simply want to argue the more." *Cloth, 302 pages. List price: \$24.95.*



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NCSE on the Road

A CALENDAR OF SPECIAL EVENTS, PRESENTATIONS, AND LECTURES

DATE December 16, 1999
CITY San Francisco CA
PRESENTER Eugenie C Scott
TITLE Evolution and the American Public: Perspectives Differ Outside the World of Science
EVENT American Geophysical Union Annual Meeting, Symposium: "Explaining Evolution"
TIME 8:45 AM - 12:00 Noon
LOCATION Moscone Center, room TBA
CONTACT Dr Pete Folger, pfolger@agu.org

DATE February 12, 2000
CITY Los Angeles CA
PRESENTER Eugenie C Scott
TITLE Anti-Darwinism in the 1890s and 1990s: More Alike Than Different
EVENT Center for Inquiry West "Darwin Day" Celebration
TIME 7:30 PM
LOCATION CFI West, Marina del Rey CA
CONTACT Jim Underdown, (310) 306-2847, www.cfiwest.org

DATE March 22, 2000
CITY Minneapolis MN
PRESENTER Eugenie C Scott
TITLE "Intelligent Design Creationism": The New Kid on the Block
EVENT American Physical Society
TIME 11:00 AM - 1:25 PM
LOCATION Hilton Minneapolis, room TBA
CONTACT Barry Karr SkeptInc@aol.com

DATE April 6-8, 2000
CITY Orlando FL
PRESENTER Eugenie C Scott
TITLE Can's, Can'ts, Shoulds and Shouldn'ts: Teaching Evolution
EVENT National Science Teachers Association Annual Meeting
TIME TBA
LOCATION TBA
CONTACT David Berenhaus dberenhaus@nasta.org

[Check for updates and details on the NCSE web site —
<http://www.natcensci.org>.]

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Young-Earth Creationism:

The term "Young-Earth Creationist" (YEC) is usually reserved for the followers of Henry Morris, founder and recently-retired president of the Institute for Creation Research (ICR), and arguably the most influential creationist of the late 20th century. Few classical YECs interpret the flat-earth and geocentric passages of the Bible literally, but they reject modern physics, chemistry, and geology concerning the age of the earth, and they deny biological descent with modification. In their view, the earth is from 6000 to 10 000 years old.

Henry Morris defined anti-evolutionism in its modern form. In 1961 he and John C Whitcomb published their book, *The Genesis Flood*, a seminal work that claimed to provide the scientific rationale for Young-Earth Creationism (Whitcomb and Morris 1961). As the title suggests, the authors accept Genesis literally, including not only the special, separate creation of humans and all other species, but also the historicity of Noah's Flood. *The Genesis Flood* was the first significant 20th century effort to present a *scientific* rationale for Special Creationism. "Creation Science" was fleshed out by subsequent books and pamphlets by Morris and those inspired by him.

The Institute for Creation Research (ICR) remains the flagship creationist institution to which all other YEC organizations look. Most literature promoting "creation science" originates with the ICR, and promotes YEC. The National Center for Science Education provides information refuting the scientific claims of "creation science". Criticisms of "creation science" from a pedagogical standpoint can be obtained from the National Association of Biology Teachers and the National Science Teachers Association. The US Supreme Court has declared the teaching of creation science to be an illegal advancement of sectarian religion (*Edwards v Aguillard*). More information on

YEC can be found in Scott (1997), Scott (1994), and Scott and Cole (1985).

Old-Earth Creationism

(OEC): The antiquity of the earth was well-established in science by the mid-1800s and was not considered a radical idea in either the Church of England or the Catholic Church (Eiseley 1958). From the mid-1700s on, the theology of Special Creationism has been harmonized with scientific data and theory showing that the earth was ancient.

Theologically, the most critical element of Special Creationism is God's personal involvement in Creation; precise details of *how* God created are considered secondary. The present may indeed be different from the past, but OECs see God as an active causal agent of the observed changes.

Gap Creationism: One of the better-known accommodations of religion to science was Gap or Restitution Creationism, which claimed that there was a large temporal gap between Genesis 1:1 and Genesis 1:2 (Young 1982). Articulated from about the late 18th century on, Gap Creationism assumes a pre-Adamic creation that was destroyed before Genesis 1:2, when God recreated the world in 6 days, and created Adam and Eve. A time gap between two separate creations allows for an accommodation of the proof of the ancient age of the earth with Special Creationism.

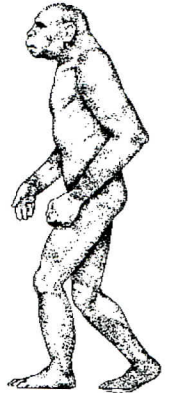
Day-Age Creationism: Another attempt to accommodate science to a literal, or mostly literal, reading of the Bible, is the Day-Age model, which was more popular than Gap Creationism in the 19th century and the earlier part of this one (Young 1982). This model accommodates science and religion by rendering each of the 6 days of creation as long periods of time — even thousands or millions of years — instead of merely 24 hours long. Many literalists have found comfort in what they think is a rough parallel between organic evolution and Genesis, in which plants appear before animals, and human beings appear last.

Progressive Creationism

(PC): Although some modern activist anti-evolutionists may still hold to Day-Age and Gap views, the view held by the majority of today's Old-Earth Creationists is some form of Progressive Creationism. The PC view blends Special Creationism with a fair amount of modern science. Progressive Creationists such as Dr Hugh Ross, of Reasons to Believe ministries, have no problems with scientific data concerning the age of the earth, or the long period of time it has taken for the earth to come to its current form. Astronomer Ross, a University of Toronto PhD, cites the Big Bang as evidence of the creative power of God. Although modern physical science is accepted, only parts of modern biological science are incorporated into PC.

PCs generally believe that God created "kinds" of animals sequentially; the fossil record is thus an accurate representation of history because different animals and plants appeared at different times rather than having been created all at once. PCs reject the inference that earlier forms are genetically related to later ones; "kinds" are separate creations: descent with modification does not occur. The definition of "kinds" is inconsistent, but usually refers to a higher taxonomic level than species.

Most PCs accept that God created creatures containing at least as much genetic variation as a Family (such as Felidae, Canidae, and so on) and then considerable "evolution within a kind" occurred. A created cat kind thus would have possessed sufficient genetic variability to differentiate into lions, tigers, leopards, pumas, bobcats, and house cats through the normal microevolutionary processes of mutation and recombination, natural selection, genetic drift, and speciation. The "basic body plans" of major



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phyla which appear in the Cambrian "explosion" are seen by most OECs as evidence of Special Creation. In PC, God is seen as acting through natural law (for example, microevolutionary processes) but also as an active creator.

Intelligent Design Creationists (IDC): Intelligent Design Creationism is a lineal descendent of William Paley's Argument from Design (Paley 1803), which asserted that God's existence could be proved by examining his works. Paley used an analogy: if one found a watch, it was obvious that such a thing could not have come together by chance; the existence of a watch implies a watchmaker who has designed the watch

with a purpose in mind. Similarly, the finding of order, purpose, and design in the world is proof of an omniscient designer.

The vertebrate eye was Paley's classic example of design in nature, well-known to educated people of the 19th century. In IDC, one is less likely to find references to the vertebrate eye and more likely to find DNA structure or cellular complexity held up as "too complex to have evolved by chance". The high school biology supplemental textbook, *Of Pandas and People* (Davis and Kenyon 1989), weaves information theory into an exposition of the "linguistics" of the DNA code in an attempt to prove that DNA is too complex to explain by means of natural causes.

In the PC tradition, IDC allows for a fair amount of microevolution, but supporters deny that mutation and natural selection are adequate to explain the evolution of one kind from another, such as chordates from echinoderms, or humans from apes. Major body plans and the origin of life are phenomena supposedly "too complex" to be explained naturally; thus IDC demands a direct role for the "intelligent designer" — God. There have been calls for IDC to be taught with evolution, much as

equal time for creation science and evolution was promoted before the Supreme Court disallowed the advocating of creationism in 1989.

IDCs vary considerably in their attitude towards evolution. Most IDC activists are not scientists, but philosophers or historians. The few biologists among them actually accept a fair amount of evolution. In 1996, Lehigh University biochemist Michael Behe published the most scholarly and scientific IDC book to date, *Darwin's Black Box* (Behe 1996), which offers little comfort to typical anti-evolutionists. Behe accepts that natural selection produces most of the complex structural adaptations of plants and animals, and even accepts that modern living things descended with modification from common ancestors. In a debate with Brown University biologist Kenneth Miller during the summer of 1995, Behe agreed with Miller's point that common pseudogenes between apes and chimps is strong support for their having shared a common ancestor (Miller 1996).

Still, Behe asserts that some biological phenomena cannot be explained through natural processes. He claims that at the level of cell biochemistry there are "irreducibly complex" processes and structures, such as the blood clotting cascade and the rotor motor of a microorganism's flagellum. Such structures cannot be broken down into individually-functioning component parts, says Behe, and therefore cannot be explained through the *incremental* activity of natural selection. Therefore they could not have evolved gradually, and because they could not have evolved gradually, they must have been specially created. Behe argues, as did Paley, that complexity is proof that there must be an intelligent designer, but his examples of complexity are biochemical rather than anatomical.

Because Behe is a research scientist with a track record of legitimate publications (although not in evolutionary biology), his book has been reviewed by scientists. (Coyne 1996; Miller 1996; reviews may be found at a web site:

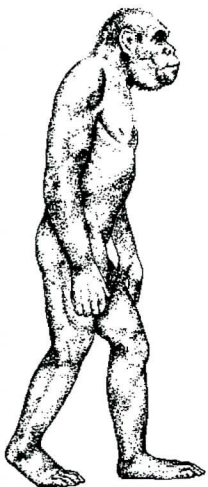
<<http://www.world-of-dawkins.com/box/behe.htm>>). The response of the scientific community has been decidedly tepid. Reviewers were quick to point out flaws in Behe's reasoning and factual and conceptual understanding, especially concerning the cumulative nature of natural selection.

The Creation/Evolution Continuum, like most continua, has few sharp boundaries. There is a sharp division between YEC and OEC, but less clear-cut separation between the various OEC persuasions. Even though OECs accept most of modern physics, chemistry, and geology, they are not very dissimilar to YECs in their rejection of descent with modification.

Evolutionary Creationism (EC): Despite its name, evolutionary creationism is actually a type of evolution. Here, God the Creator uses evolution to bring about the universe according to his plan. From a scientific point of view, Evolutionary Creationism is hardly distinguishable from Theistic Evolution, which follows it on the continuum. The differences between EC and Theistic Evolution lie not in science, but in theology, with EC being held by more conservative (evangelical) Christians (D Lamoureux, personal communication).

Theistic Evolution (TE): Theistic Evolution is the theological view that God creates through evolution. Astronomical, geological, and biological evolution are acceptable to TEs. They vary in whether and how much God is allowed to intervene — some come pretty close to Deists. Other TEs see God as intervening at critical intervals during the history of life (especially in the origin of humans), and they in turn come closer to PCs. In one form or another, TE is the view of creation taught at mainline Protestant seminaries, and it is the official position of the Roman Catholic Church. In 1996, Pope John Paul II reiterated the Church's TE position, in which God created, evolution happened, humans may indeed be descended from more primitive forms, but the hand of God was needed for the

IDCs vary considerably in their attitudes... [Some] accept a fair amount of evolution.



creation of the human soul (John Paul II 1996).

Materialist Evolutionism (ME): Theistic Evolution is followed on the continuum by a non-religious view, Materialist Evolutionism. It is important to distinguish two ways that "materialism" is used. One is in science, which is described as a "materialist" enterprise, focusing on matter and energy and their interactions. Modern science operates under a rule of *methodological materialism* that limits it to attempting to explain the natural world using natural causes; that is, those that focus on the properties and interactions of matter and energy and other phenomena in the physical universe. In this view, science in and of itself is neutral to religion: by definition, it lacks the ability to hold constant supernatural forces. It is neither anti- nor pro-religious: it is neutral because supernatural forces are outside of what it can consider as causation. MEs go beyond the *methodological* materialism of science to propose that the laws of nature are all there is: the supernatural does not exist. This is a form of *philosophical* materialism (naturalism or scientism) which is distinct from the practical rules of how to do science.

Anti-evolutionists such as Phillip Johnson criticize evolution and science in general as being *philosophically* materialistic (Johnson 1995). This is a logical error. It is very likely the case that all philosophical materialists are also methodological materialists. The converse is not necessarily true: that all *methodological* materialists are also *philosophical* materialists. It *may* be the case, but it does not follow logically. In fact, such a claim is empirically falsified, as there are many scientists who use methodological materialism in their work, but who are theists and therefore not philosophical materialists. In addition to many living scientists, Gregor Mendel is a classic case of a scientist who was a *methodological* but not a *philosophical* materialist.

THE CONTINUUM IN THE CLASSROOM

Teachers of both high school and college have told me that many students come into a class with the attitude that evolution is somehow unacceptable for a religious person. Such students are reluctant to learn about evolution. One way to assuage their concerns is to use the "creation/evolution continuum" to illustrate the wide range of opinion within Christianity towards evolution. This often helps religious students understand that there are many options available to them as people of faith. Most students will recognize themselves somewhere on the continuum, whether believers or nonbelievers; it makes for an engaging lecture. It is perfectly legal for teachers to *describe* religious views in a classroom; it is only unconstitutional for teachers to *advocate* religious ideas in the classroom. I have also presented the "creation/evolution continuum" in public lectures to general audiences, and they have also found it of interest. Many people are unaware that there is far more variation among creationists as to how things came to be than there is among evolutionists!

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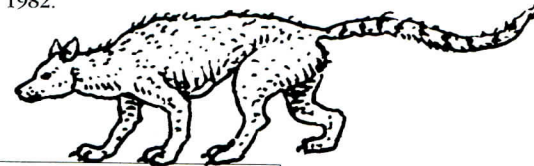
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COLORADO SCIENCE ASSESSMENTS OMIT EVOLUTION

From a report in Denver's *Rocky Mountain News* dated September 26, 1999:

Colorado's eighth graders will be tested in science in the spring for the first time, but there will be no questions about human evolution on Colorado's first statewide science test because state standards don't specifically tell schools to teach it. That requirement was deliberately left out when the standards were written in 1995 by a group that included people opposed to giving more credence to evolution than "creation science." "I believe in divine creation," said Clair Orr, chairman of the state board of education, who helped write the science standard. A majority of the 7-member board — Orr, Ben Alexander, John Burnett, Patty Johnson, and Pat Chlouber — is satisfied with the standards and the test without mention of human evolution.

See the full report at <http://www.insidedenver.com/news/0926evol1.shtml>.



Letters to the Editor

I would like to express my apprehension concerning the "Tangible Benefits of Evolution" contest. The research described by Dave Longtin and Duane Kraemer in *RNCSE* 19(2) is a case in point. Longtin and Kraemer presented the biomedical research on rhesus monkey/baboon hybrids that resulted in a solution for the condition known as hyaline membrane disease in premature infants. While the research was beneficial to premature infants, the research and results that ensued came at the cost of the pain and suffering of both the hybrids and the mothers who bore those infants.

We use nonhuman primates in research because they are closely related to us and similar in their biology. Sharing a common ancestor with us, however, means that other primates also have brain structure that encompasses the ability to feel pain and to suffer from spatial confinement and the deprivation of social contact. Whenever I read an article involving the biomedical research on non-human primates, the question that comes to mind is how much pain and suffering on the part of another primate is worth a human life? I do not know the answer to that question. I do believe, however, the pain and suffering of non-human primates in biomedical research should be fully acknowledged and accounted for.

I would rather see NCSE celebrate the application of evolutionary theory to the discovery of alternatives to the use of live animals in biomedical research. We

should also acknowledge that some ... such research comes at the cost of pain and suffering to other creatures with whom we share a common biology and a common evolutionary past and resolve to honor our shared ancestry by working to eliminate the cost for our own biomedical advancements which are borne by our evolutionary cousins.

Finally, in keeping with NCSE's acknowledged interest in celebrating the shared evolution of life, we must accept that there is no scientific basis for asserting our domination over other animals and that our right to cause pain and suffering to other creatures for our benefit is questionable. My hope is that, in conferring this award, NCSE will find a way to reward those who explore alternatives to basing our scientific progress on the pain and suffering of other creatures.

Linda D Wolfe
Department of Anthropology
Eastern Carolina State University
Greenville NC 27858-4353
<wolfel@mail.ecu.edu>

I joined the Docents of the San Jose Museum of Art, took their excellent preparation, and timidly reported for my first duty on a Saturday morning. An attractive couple appeared, and I was allowed to show them around. The show was a series of photographs of Japan, of which I remember two things. A Haiku poem reads, "From

which bough we cannot tell. Ah, but such fragrance." The other was a clutch of koi carp. Knowing nothing about art, I remarked that they were the only non-mammalian animals in whom diabetes had been discovered. This was remarkable because in fish insulin does not control the blood sugar.

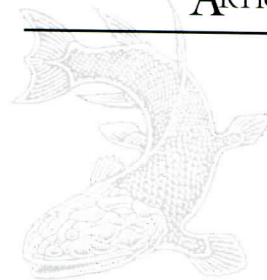
At the end of the tour we entered the garden where there was *equisetum*, "a remarkable plant containing silicon, going back to the carbonaceous age — truly a living fossil." The lovely lady merely said, "We are creationists."

I couldn't cry, so I laughed and told them I hoped they were wrong. The week before this meeting scientists recorded the first supernova to occur while we had instruments to observe it. What a shame to deprive children of the death of a star and the birth of new chemical elements. How mean to deny them plate tectonics, especially for us in earthquake country. The story of the serendipitous discovery of the background radiation from the Big Bang should be relished, not disputed.

But how much more is it a severe disservice to religion itself to ignore the grandeur of the natural world. All religions have their symbolism by which they express the awe and grandeur of our universe. To mistake these symbols for scientific facts subject to objective proof diminishes them. It is not, "Can we prove Genesis?", but rather, "Should we even try?" If we ever invent a telescope capable of seeing light 15 billion years old, what would we conclude if we didn't see God there? Would that change anybody's cosmology? Probably not; nor should it. But it would open up a new window on the natural wonder that is our universe.

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RECAPITULATIONS



[In RNCSE 18(6):20-3 we published a review essay by Edward B Davis which examined 3 major books focused on the issue of design in nature. In this issue we print a response from Professor Phillip Johnson of the University of California at Berkeley, followed by Davis's reply.]

On the whole, I thought the review essay on the Intelligent Design Movement by Edward B Davis was thoughtful and fair-minded. So I write not to complain, but to clarify a single point.

Davis says that I needlessly polarize the debate by referring to methodological naturalism (MN) as "methodological atheism," and by trying "to equate evolution and MN with atheism." *Not exactly*, as they say in the rental car commercial. I did use the term "methodological atheism" in Chapter 5 of my book *Reason in the Balance*, but that was in the context of my response to Fuller Theological Seminary Professor Nancey Murphy, who had used that term before me.

In fact I think that atheism and naturalism are significantly different, and that naturalism is by far the more effective in eliminating God from reality. Atheists (like Richard Dawkins or William Provine) call attention to the importance of the "God question" by noisily insisting that God does not exist. The scientific leadership could not endorse the Dawkins/Provine view and still insist that "science and religion are separate realms." If Darwinian evolution and theism are conflicting answers to the same question ("Who created us — God or nature?"), then it is very difficult to justify saying only that only one answer may be considered in public education, or even in scientific research. Provine recognizes this, and combines his own advocacy of atheism with calls for opening the discussion — in the science classroom and elsewhere — to advocates of theism who think they have evidence to support their position. Wiser heads in the scientific community regard such an open debate as an invitation to disaster.

Atheism accepts the legitimacy of the "God question" by giving a negative answer. A more effective way of disposing of the question is to rule it out of order as irrelevant in science, where we study what really happened. Scientific naturalism accomplishes this by teaching that science is committed by definition to methodological naturalism and that we can have "knowledge" only of things that science can

investigate. Instead of "God does not exist," the scientific naturalist position is that "we have no need for that hypothesis." For intellectual purposes, Occam's razor takes care of the rest of the job. Anyone who wants to bring up God (or intelligent design) is banished instantly to the realm of "religious belief", where subjectivity (faith) rules and there is no objective knowledge to be found.

This is the strategy of Stephen Jay Gould's "non-overlapping magisteria" proposal, for example. Religious people may take their seats as citizens when subjects like moral values are under consideration, but they must cede to science (guided by MN) the sole authority to describe factual reality. When the religious people accept that division, as many do, they implicitly concede that God is no more real than Zeus or Santa Claus.

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REPLY TO PHILLIP JOHNSON

I very much appreciate the genial tone of Professor Johnson's letter and invite further conversation elsewhere, and I thank the editor for space here to elaborate on aspects of my position about which Johnson raises good questions.

The comments providing context for his use of the term "methodological atheism" are especially helpful. I have not read *Reason in the Balance* and did not know that this term was (apparently) first used by Nancey Murphy — a very interesting point. I had known of his use of the term from friends who are close to the "Intelligent Design" (ID) movement.

It is also helpful to see how Johnson distinguishes

between “naturalism” and “atheism” and that he views the former as more dangerous to religion than the latter. I would say myself that atheism is a religious interpretation of the world, based on an extrapolation of methodological naturalism to ontological naturalism — an extrapolation that is certainly not necessary for doing good science (as various historical examples would illustrate well) and that begs the question of whether truth can be attained apart from methodological naturalism. Science is an “as if” story about natural phenomena that assumes, rather than demonstrates, that all things happen “as if” they had only natural causes.

I agree with Johnson that Occam’s razor would be applied by many to cut away any explanations of any phenomena (whether or not they had only natural causes) that appeal to agents or causes beyond those recognized as natural, but I would call for us to recognize (again) that Occam’s razor is itself a methodological principle that originates outside of science *per se*; that is, it regulates what counts as a proper “as if” story and cannot be regarded as infallible. Who are we to say, really, what causes could or could not be producing all the events in the whole universe? Nor do all practitioners of a given science agree what is the “simplest” explanation, even without considering agents or causes beyond the natural. And who or what determines when explanations are “multiplied beyond necessity” (to cite another form of the principle)? Necessary for what, and to whom? To state categorically, for all purposes, that religious explanations of events go beyond necessity is to beg the question of whether religion itself is necessary, and for what purposes.

Questions such as these cannot be decided by “science”, which is one important reason why the founders of the Royal Society tried to establish a forum free from discussions of religion and politics — a goal they found impossible to implement in practice. There are legitimate truth questions that science cannot answer with “as if” stories constructed according to its own rules. Indeed, the very reason why science has attained such a high level of prestige in our culture is that it *has* restricted its inquiry, or tried to restrict its inquiry, to questions for which “as if” stories can be constructed — stories that are capable of gaining a consensus within the scientific community. Might it not be the case that people disagree — that is, they *lack* a consensus — about moral and religious beliefs precisely because they are *more important* than scientific beliefs, since they deal more openly and directly with values? Such a question cannot be answered apart from a direct appeal to those same values, and thus defies a response that could be called “objective” in the usual sense. I believe in the primacy of “values” over “knowledge”, which is why I call for genuine pluralism in publicly funded schools, whether this is achieved by vouchers or by wholly re-imagining what counts as a “public” school. The problem is not that we rule God out of science classes, but that we rule God out of

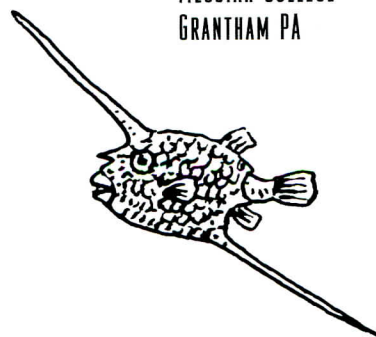
schools entirely, disenfranchising a large part of the citizenry; this is a political issue, not a scientific one.

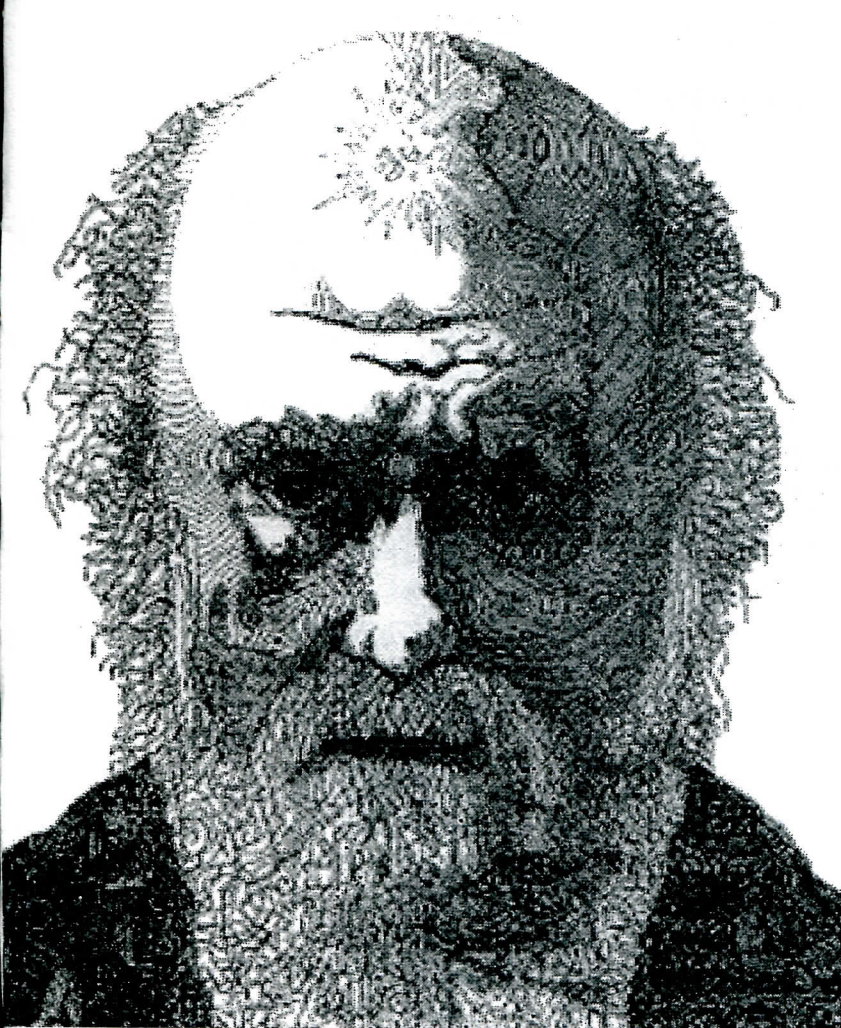
This is not to say that I reject Johnson’s belief that evidence for theism can be found in the world — even within the world that science has constructed for us according to its own rules — but I do not always look for it in the same places. As William Whewell stated in a passage quoted by Darwin opposite the title page of the first edition of the *Origin of Species*, “We can perceive that events are brought about not by insulated interpositions of Divine power, exerted in each particular case, but by the establishment of general laws.” Like Aristotle, I believe that meanings and mechanisms are *both* legitimate, complementary, even necessary parts of explanations; I do not accept the false dichotomy between them erected by post-Cartesians. The fact that human beings come from fertilized ova does not mean that we are not, as individual persons, made in the image of God.

I find evidence of purpose in the astonishing fact, pregnant with meaning, that a deep and often subtle order exists and can be found by rational creatures — in the fact that methodological naturalism is so fruitful, rather than in efforts to demonstrate the inadequacy of methodological naturalism to account for certain natural phenomena. This fact about the intelligibility of the world is hardly necessary for our evolutionary survival and raises profound questions about why this should be so. Such questions are metascientific in nature and have often been asked by great scientists who do not share a common religious orientation. I also see evidence for theism in various anthropic phenomena discovered by cosmology; in the persistent human belief in a meaning for existence that goes beyond our own time and place; in the equally persistent belief in “right” and “wrong” as moral categories compared to considering “good” and “bad” simply as attributes of things that happen; and even in aspects of the biological world, such as the progressive development on this planet of an extraordinarily diverse and interrelated system of organisms, which in some respects mirrors (in my view) the Trinity itself.

Neither Zeus nor Santa Claus represents a serious answer to questions of this type, but many would say that God does. I count myself among them.

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ATTACK OF THE ROGUE SPELL-CHECKER

In *RNCSE* 19(1), there was an error in Dean Jacobson's article, "Stephen Meyer and Creation Week". Our spell-checker inadvertently changed the word *ATPase* to "Aptness" in the course of the editing process. We apologize for the error, and we have taught the spell-checker a lesson!

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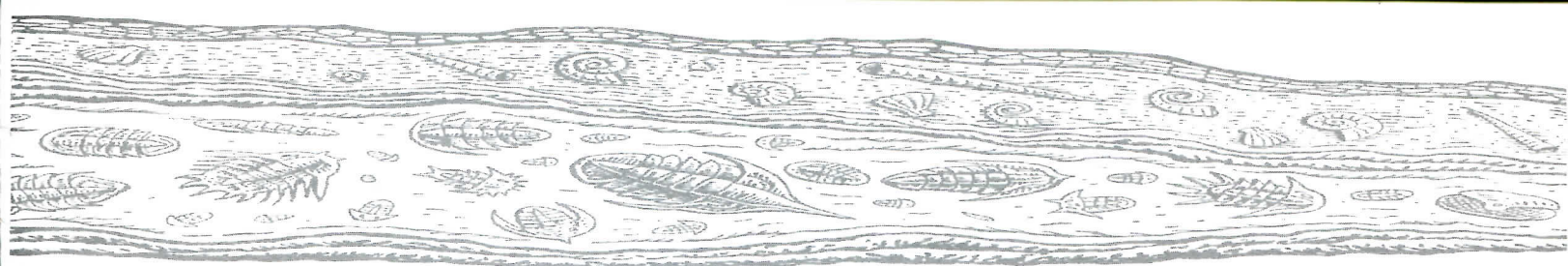
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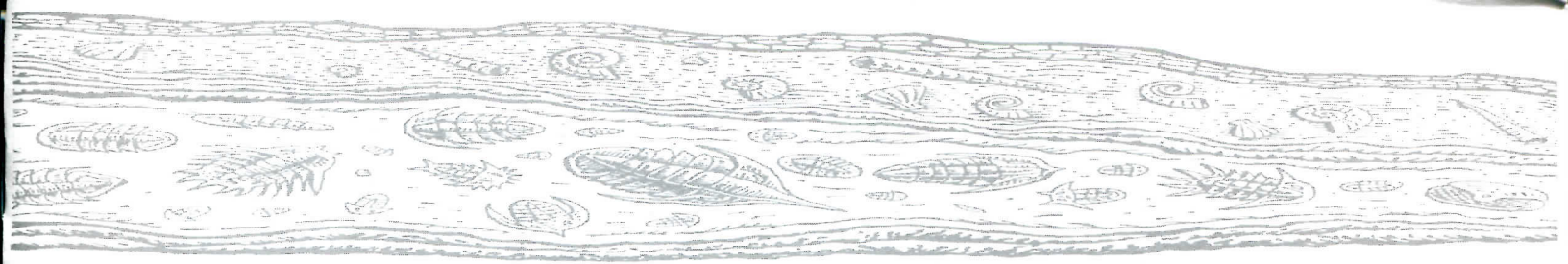
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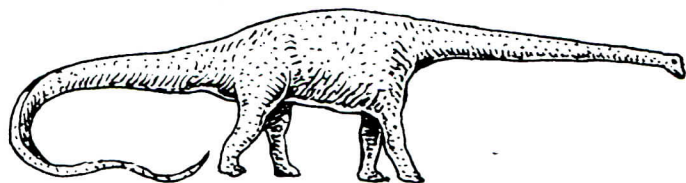
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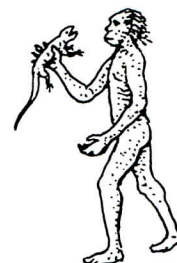
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