



IN THIS ISSUE:

• Nucleus	
New Editor	2
• Letters	5
• News	
A Whimper in Weed	6
The Oranges and Peaches	8
Selling Pandas	10
• CC Update	
Fighting in the Popular Press	14
• Resources	17
• Tracking Those Incredible Creationists	
Natural Selection by the Numbers	18
• Keeping Tabs	
The Ghost of Gosse	20
The Giraffe, Explained	21
Pseudogenes	22
• Teaching Science	
Teaching New Science Teachers	23

School District Institutes Creationism Unit Distressed Over Evolution in Textbooks

Eugenie C. Scott

In a February 5, 1991 meeting, Morton (IL) District 709 reluctantly approved three high school biology books that exclude creationist theory and promote evolution, according to a story in the *Peoria Journal Star* (2/6/91). Because in their view evolution was an unproven theory, the Board voted to direct the staff to develop a creationist supplement by next fall, when the books first would be used.

"I think we do an educational disservice to our kids when we teach just one side of an issue," said Board member Bill Mayo. A parent was quoted as saying "It's important to note that there has been a lot of scientific research in the past few years that has uncovered a tremendous amount of evidence refuting the theory of evolution."

The biology books selected were Prentice Hall's *Biology* (Miller and Levine), Prentice Hall's *Biology, the Study of Life* (Schraer and Stoltze) and Saunders' *World of Biology*.

It is not yet clear what form the creationist unit will take. From the newspaper article and discussions with the reporter who attended the meeting, it appears that the district may be planning a *religious* unit wherein frank religious instruction is presented to the students. Yet, reportedly an administrator claims that the unit will consist of a required oral reference to creationism by the teacher whenever evolution is encountered in the textbook. The students will be told that an alternative view exists, and directed to the

library, where suitable materials will be available for them to study on their own. At this point it is unsure what will actually happen in Morton next fall. Suffice it to say that there is considerable misunderstanding of evolution in this community.

As Executive Director of NCSE, I wrote a long letter to the president of the board of education in Morton, pointing out that, contrary to opinions expressed by some members of the community, evolution is definitely not a suspect idea to scientists. I enclosed a copy of NCSE's *Voices for*

Morton, continued on p. 8

NCSE Gets C/E Journal

John R. Cole

NCSE has acquired *Creation/Evolution*, a magazine/journal formerly published by the American Humanist Association. Most people have assumed that NCSE already published it (or vice versa), but in fact we have been totally separate, despite common interests, some shared subscription services and an overlapping list of contributors. Subscribers to each publication will now receive both of them, if they did not already (fewer than half are joint subscribers). Joint subscribers have received a letter explaining their special situation.

This is a gamble—but the NCSE Board voted for it unanimously at their meeting in January because it seemed the right thing to do to advance NCSE goals.

Journal, continued on p. 9

Nucleus

From the (New) Editor

Following Bob Schadewald as editor will be difficult, but he and his predecessors have done a good job of making *Reports* an ongoing project, not a one-person show. I'll try to keep up the tradition, and I'll have help from Bob, Karl Fezer, and other NCSE members and former editors. Readers' contributions will be crucial, as usual.

A major and exciting change this year is that NCSE is acquiring *Creation/Evolution* (see article, p. 1.)

NCSE's acquisition of C/E will regularize its publication schedule and allow a rationalization of previously semi-separate missions. Or rather, this will allow us better to coordinate efforts toward common goals of evolution and general science education and opposition to

anti-evolutionism.

Many readers are long-familiar with both, but the majority of you subscribe to one or the other, not both, publications. It will be my daunting task to help make the transition a success—to be “mid-husband” (?) to the birth of a new and improved publication series incorporating the best of both predecessors. I'll appreciate your help. I hope I can foster some changes, too. Previous editors have had to do far too much of the work of putting out a publication of a grassroots organization. My hat is off to them. However, I do not think it is simply that I am lazier when I pledge to work to involve more people in NCSE publications. I invite you to participate more actively. This is not just an idle editorial note but a promise to do my best to enlist more contributors and viewpoints.

Manuscripts, Reviewers, Referees Needed

John R. Cole

As the new editor of *Creation/Evolution* journal, which NCSE has just acquired, I invite new manuscripts for consideration. In addition to the usual topics, I would welcome an occasional article about a new breakthrough in evolution or scientific theory. I believe that the best defense against scientific creationism is a good offense on behalf of evolution and science in general, not just refutations of specific claims, although this remains extremely important. Suggestions of topics for articles and possible authors are also solicited.

I also need manuscript reviewers. Articles submitted will be subject to review by an editorial staff and also by one or more outside peers who will be asked to comment. Articles will be sent to referees with the authors' names deleted to promote impartiality. Occasional articles requested by the editor may not be sent to blind referees but normally will still be reviewed by more than one editor. Book reviews and similar short items will not normally be refereed.

If you would like to be on the list of article

referees, please let me know what topics you feel comfortable reviewing, and please enclose a resume or vita, if possible. I do not want at all to restrict this process only to academic professionals, but I do want to get advice from people who know more about given topics than I do!

Also needed are book reviewers. We receive a smattering of books from publishers and solicit other books. If you would like to be a book reviewer (paid only in the form of a free book!), please let me know about your interests and expertise. I hope to begin a regular series of short reviews and occasional longer reviews covering a wide range of topics relating to evolution and the nature of science, not just the creationism controversy. I would like to review 4-6 books per year in *C/E* and others in *NCSE Reports*.

Publication guidelines will be published later, although interim rules of thumb (for both *C/E* and *NCSE Reports*) are that submissions should be typed doublespaced with ample margins and submitted in duplicate; also retain your own copy in case the post office or your crack editorial team

**Writers Wanted:
Glory Offered!**
(...no pay....)

misplaces it. Please enclose a self-addressed envelope stamped with adequate postage in case your manuscript is rejected and you want it returned. A stamped, self-addressed postcard or envelope should accompany any submission so that I may acknowledge it. (I hope to receive enough manuscripts to make this an economically significant rule, keeping subscription prices down.)

I would appreciate your suggestions of topics and books to review as well as your reports about local creationist activities and examples of good science.

ERRATA

In Karl Fezer's article [10(4):14-16] arguing that natural selection is not tautologous, that word was misspelled in the headline, and other corrections are needed. Readers are referred to Stephen Jay Gould, 1983 without the full citation of "Darwin's Untimely Burial—Again!", pp. 139-146 in Laurie R. Godfrey, ed., *Scientists Confront Creationism*, W.W. Norton & Co., NY. Typographic errors included the last word in the first column of page 14, which should read "do," not "to". Page 15, paragraph 3 of column 2 (and also the margin insert) should begin "Like theorems of plane geometry," not "or".

NCSE Reports

John R. Cole, Editor
c/o WRRRC, Blaisdell House
University of Massachusetts
Amherst, MA 01003

413-545-5533

Eugenie C. Scott, Publisher

Contributing Editors:

Karl Fezer
Robert J. Schadowald
Jack Friedman
Richard Wakefield

Consulting Editors:

Laurie Godfrey
Kevin Padian

Drawings by Thomas Barefield

Production Editor: Liz Rank Hughes

NCSE Supporting Scientist Honored

NCSE Supporter and former Missouri Committee of Correspondence Liaison Dr. James A. Gavan, retired professor of anthropology at the University of Missouri-Columbia, has been made a Sesquicentennial Professor. To honor the 150th anniversary of the University, seven of the college's most distinguished emeriti professors have been given this title in recognition of their influence on their professions, colleagues, and students. We are pleased to congratulate Jim on this honor.

We Always Knew She Was a PEARL

NCSE Executive Director Eugenie C. Scott has been honored by being asked to serve on the Executive Council of PEARL, the National Coalition for Public Education and Religious Liberty. NCSE is one of PEARL's several supporting organizations which include the American Civil Liberties Union, Americans for Religious Liberty, the American Association of University Women, the National Education Association, and others (see article, *NCSE Reports* 10(3):2). We congratulate Dr. Scott on her election.

Yes, Your Stamp Does Save Us Money!

The Business Reply Envelope (BRE) that NCSE sends out with its subscription renewals has a motto imprinted on it saying, "Your Stamp Saves Us Money." Putting a stamp on our BRE is a good idea, if you can. For each BRE that is returned to NCSE, the post office charges us \$.36. If the letter is stamped, they will *still* charge us \$.36, but we can collect all the stamped ones and take them back to the post office for \$.29 credit each.

So, if you can spare the postage, NCSE appreciates the stamp!

Postal Rates Up (and UP)

You may have seen news about postal rates going up 20% for bulk mail (such as this *Reports*.) But that's for commercial mail. For nonprofit organizations, the increase is over 32%!

Since postage is a major part of our budget, our revenues must increase or else we must cut our activities. This, plus the purchase of *Creation! Evolution* (see article, p. 1) means we will be asking you, our members, to donate as generously as you can this spring, during our semi-annual fund-raising drive. Please remember this when you receive your donation request!

Still More CCs

In addition to the organization recently formed by retired Marine Colonel Oliver North, (*NCSE Reports* 10(6):2) NCSE has become aware of other "Committees of Correspondence" over the years. A few years ago we negotiated a name change with a national political group of Greens (environmentally-oriented activist progressives) who, to avoid confusion with us, kindly agreed to call themselves the "*Greens* Committees of Correspondence." Another organization formed several years ago in Massachusetts to promote drug prevention, with which NCSE's Committees of Correspondence are not likely to be confused.

A Massachusetts environmental organization has also adopted the name "Committee of Correspondence," and so has a conservative fundamentalist organization, the Plymouth Rock Foundation, also located in Massachusetts (do we detect a trend?)

Imitation is the sincerest form of flattery and confusion. OUR Committee of Correspondence resurrected a noble old term used by the "Sons of Liberty" and other subversives who plotted the American Revolution more than two centuries ago. If memory of history serves, there was a Massachusetts component to that cause, as well.

Some of our imitators may offer no confusion, but we are also reminded of the recent successful lawsuit by the manufacturer of the "Stealth Bomber" against the manufacturer of "Stealth Condoms." In that case, it was determined that airplane product identification and sales might be affected, so the latter company was compelled to change its product name.

We, too, seek to avoid public confusion. Remember that WE are the original new and improved Committees of Correspondence—the unique nationwide network of defenders of evolution education. Please be careful when confronted with alternative products.

To add to the confusion, there also exists in Washington, D.C., an organization called the National Center for *Improving* Science Education, affiliated with the Biological Sciences Curriculum Study. NCISE has

published some very good critiques of elementary school education and we wish them well. But they don't do what we do, and vice versa.

So please keep us informed about other CCs (or NCSEs) you may encounter. We do not want to inhibit other organizations from imitating our strategy, but we do want to keep tabs on the uses and misuses especially of the term "Committees of Correspondence."

Sorry if You've Heard It Before...

In November, 1990 and again in January, 1991, NCSE conducted direct-mail campaigns to bring in new members. The envelope had a map of the USA on it, with the slogan, "Not In MY Back Yard?" in reference to the growing grass-roots threat of creationism. The letter and supporting materials discussed what NCSE has done over the last couple of years to defend the integrity of science against sectarian religious threats. We used a recycled paper envelope with a recyclable glassine "window," rather than a plastic one. All the materials inside the envelope were recyclable.

We purchased names from organizations we thought would have as members individuals who might support NCSE, including the American Humanist Association, Americans for Religious Liberty, *Skeptical Inquirer* and some others. If you received more than one of our membership appeals, please pass the extra one on to someone you think might support us. Although it would be beneficial to be able to cull the new lists of individuals who are already members, the cost is prohibitive for a small organization like NCSE.

The January campaign results are just coming in! We hope to gain several hundred new members from the two appeals. This is the first issue of *Reports* many of these new members will receive, so we will take a moment to say, "Welcome" to you. We hope you enjoy reading the *Reports*, and will tell your friends and associates about us.

Considering that the Institute for Creation Research has a mailing list of 100,000 and a budget of over \$3 million, NCSE has a long way to go to catch up!

Imitation is the
sincerest form of
flattery....

ISLAM AND EVOLUTION

In a recent issue (July-August 1990), you stated: "Most Islamic scholars find no contradiction between evolution and the Koran, although the latter's story of creation closely parallels Genesis. The growth of fundamentalism among Muslims could change that."

First of all, I totally agree with you that the incarceration of Professor Ibrahim for teaching evolution should be condemned and every effort made to get his release from prison. But I disagree with you on a few other statements.

Webster's Dictionary defines fundamentalism as follows: A militantly conservative movement in American Protestantism originating around the beginning of the 20th century in opposition to modernist tendencies as emphasizing as fundamental to Christianity the literal interpretation of the Scriptures, the imminent and physical second coming of Jesus Christ, the virgin birth, physical resurrection, and substitutionary atonement. Based on [this definition] there is no way even a garden variety Muslim or fanatic Muslim can be called a fundamentalist.

If what you really meant by Muslim fundamentalism is a belief that was [evidenced] in initial periods of [the] origin of Islam, then here also you have made a mistake. We came to the present discussion due to the perverted behavior of the government of Sudan with respect to the teaching of evolution in school. So [allow me to] use the history of the theory of evolution to repudiate the claim that original Muslim thought contradicts evolution. In fact, [the] theory of evolution was part of the curriculum of Muslim schools attached to their mosques long before Darwin, [and] I am working on a book on the Muslim Portrait of Creation based on Qur'an, pre-Darwin Muslim scholars. [E]arlier Muslims believed Adam the first perfect man. According to these early Muslims, Adam and Eve as well as their children are a twig on the bush called Life.

[Excesses by some] Muslims of our time to the idea of evolution are not based upon beliefs which existed during their classical time. So these Muslims also cannot be called fundamentalists because their belief

does not corroborate with early Muslim thoughts.

T. O. Shanavas, M.D.

Editor's note: Dr. Shanavas raises some important points, and I would quote and endorse my predecessor Bob Schadewald's response:

I understand that "Fundamentalist" originally meant a Christian who subscribed to the Five Fundamentals, as you note. In recent years, and especially since the revolution in Iran, the press has been using the word as a synonym for religious fanatic. I resisted this usage for some time, but I now accept it (reluctantly) as less offensive than "fanatic." When I use the term in its original sense, I capitalize it, and I use lowercase "f" when I use it in the generic sense, as I did in the article to which you refer.

Extremists have appropriated and redefined too many words! I might also note that when *The Fundamentals* were published, the writers were split on whether evolution was acceptable to their version of Christianity.

I would add that a similar linguistic dilemma applies to the term creationist. NCSE opposes bad science and pseudo-science, and it opposes teaching so-called creation "science" in science classes because it is a religious doctrine. NCSE strongly supports the American concept of separation of church and state for various reasons, not the least being that it has proven very successful in protecting diverse personal views while advancing knowledge about the things we can all agree upon. Rather than write the arch-sounding "so-called 'scientific creationism'" constantly, we tend to use the term creationism as a commonly understood shorthand with no intent to include in that category the vast range of believers in a Creator, First Cause, and so forth.

SNUFF SAID?

Your so-called publication should be snuffed out. God will have His way, and the wages of sin is death.

Anonymous call

Thanks for your ongoing support —Ed.

Letters

Islam, like Christianity and other faiths, has all sorts of adherents. Religion and evolution are not inherent opposites.

Letters, *continued*

JUDGING CRATERS

Two recent items referring to earth and moon craters [10(2):7 and 10(3):14-16] did not spell out the most devastating implications for young earth creationists. Since the earth, with its greater size and gravitational pull, could hardly have escaped a bombardment as great as that producing the moon craters, and such craters have now been seen on virtually every object in our solar system capable of preserving their effects, it is not likely that creationists will invoke Henry Morris's 1972 explanation [that they result from] holy wars on the moon.

The first question for them is when the bombardment occurred. In the young earth scenario it would have to precede the catastrophic flood of Noah (which would be made-to-order for erasing the craters along with the memories and records of all but eight humans). It could not have started until after Day 6 when Adam was created and everything was still "very good". Adding the years from Adam to Noah in Genesis 5 and the age of Noah at the start of the flood in Genesis 6 gives a total of 1656 years as the maximum (or about 2000 years from the rarely credited Septuagint numbers).

But the results of the Apollo Project point to a period of about 2 billion years for the major bombardment [Reports 10(3):14]. If [this] would not result in the equivalent of a continuous nuclear winter, try speeding it up by a factor of a million by compressing the 2 billion years into the 1656 (or 2000) years [young earth creationists would require]. Not good for their pre-flood paradise with 900 year lifespans and a biosphere of such monstrous fecundity as to account for all fossil materials from bones to fuel being buried at the same time [in the flood].

Wilfred P. Anderson
Minneapolis

Two billion years' meteor bombardment compressed into 2,000 years would have left an impact.

News

Weed Creationism Ends Not With Bang, But Whimper

Eugenie C. Scott

The principal of the Weed, CA, elementary school has admitted that a fundamentalist minister has been presenting lectures on "scientific" creationism in the seventh and eighth grade science class for 15 years. We related (see story in the *Reports*, 10(4):1) how Rev. Gerry Sprunger presented traditional "scientific" creationism arguments in his lectures, stated in a handout that "life loses (sic) much of its meaning" if students "are the product of mechanistic chance," and told a Catholic student that she couldn't believe that God created through evolution and still be a Christian. The school board was being petitioned by pro-evolutionists to present evolution in science classes, and to present creationism as part of a comparative religion unit in social studies classes. Simultaneously, the Board was being petitioned by the fundamentalist churches to formalize the teaching of the two model approach in the curriculum. Rumors of impending lawsuits were floating around — regardless of which side prevailed!

At the time of our last writing, Superintendent Aldo (Zeke) Zanutto claimed that an advisory letter he had received from a state Department of Education official did not declare the teaching of creationism illegal. According to a report in the *Weed Press* on January 30, 1991, the letter apparently was much stronger than Zanutto had indicated.

Using a California version of the Freedom of Information Act (the Public Records Act), the *Weed Press* was able to secure a copy of the letter written by Thomas Sachse, manager of the Math, Science, and Environmental Education Unit, which had until then been treated by Zanutto as a "private letter" and allegedly not even released to the Board.

After viewing a videotape of the minister's presentation, Sachse criticized the

science as “extremely uninformed and sloppy,” and described the “rather unfortunate presentation of creationism (as) frankly, irresponsible.” Zanolto was advised, “from the standpoint of the California Department of Education, the State Board of Education and the California Science Framework, that Weed is recommended against presenting the dual model of creationism and evolution.” He also cited a number of legal opinions declaring creation “science” not to be science, but rather, a religious view. Sachse continued, “This position is strongly supported by numerous authorities from both the scientific and educational communities, who conclude that the teaching of ‘scientific’ creationism is pedagogically inadvisable, and even professionally irresponsible.” He quoted the strongly anti-creation science statement passed by the National Science Supervisors Association (reprinted in *Reports* 10(4): 11). Finally, cognizant that feelings are high in Weed on both sides of the matter, Sachse suggested, “if the Weed Trustees are worried about a lawsuit, they should prefer to defend against creationists, given the body of case law on the other side.”

The decision whether to teach creationism or not had been postponed while “more information” was gathered. Zanolto appeared to be working hard to find a compromise that would satisfy both sides — doubtless a difficult task. One “compromise” suggested by Sachse was to have someone with background in both theology and the natural sciences address the class, but not to present religion as science. Dr. Robert J. Russell, of the Center for Theology and the Natural Sciences, was recommended by Sachse, but his schedule did not allow him to travel to Weed. Earlier newspaper accounts spoke confusingly of Dr. Russell supposedly “training” a local minister to present creation science “without referring to religious theory” (*Weed Press*, July 18, 1990, p. 9.) In an interview with NCSE, Russell, who has a Ph.D. in physics as well as a divinity degree, reported that he told Zanolto and the local minister that creation science was not scientific, and could not legitimately be advocated in public schools.

Having seen the state’s opinion, some school board members believed the time had come to make the long-awaited decision about creationism in Weed Elementary School. “The letter is very clear: we have been violating state policy for the past fifteen years,” said the board president.

In a school board meeting on February 12 (Darwin’s birthday), the Weed school board “resolved” the issue of whether or not creationism could be taught at Weed Elementary School. Before a larger-than-usual audience divided approximately equally between creationism supporters and evolutionists, the board voted to refer the matter to the administrator and the classroom teacher. According to NCSE member Ken Goehring (who spearheaded the evolutionist position during the last year), a major contributor to the decision was Sachse’s strong letter and an oral opinion of the county counsel that the district should “follow the California Science Framework.” This latter document (see *Reports* 9(6):1) is a curriculum guide for teachers. It places evolution in a central position as one of the themes around which science instruction should be organized.

This decision did not satisfy the creationists, who wanted creationism mandated in the school. Although the principal goes to the same church as Rev. Sprunger, the teacher of the class is a well-trained biologist with no sympathies towards creation science. Goehring commented that he felt that the evolution side had won a victory, but that there would be concentrated pressure on the young teacher, who does not yet have tenure in the district. During the meeting, Rev. Sprunger commented that he was looking forward to “working with” the teacher to show him the science involved, and also that creationist Donald Chittick was coming to speak in the community during the spring. A Board member moved to support sending the teacher to attend workshops to “get more information” — but on advice of the Superintendent, amended his resolution “to get more information on the Science Framework.”

It is clear that the outcome in Weed would

“...the teaching of
'scientific' creationism is
pedagogically
inadvisable, and even
professionally
irresponsible.”

All supporters of the integrity of science education should be grateful to people like Goehring and Roesch, for it is only at the grassroots that the anti-evolutionists can be effectively countered.

have been very different had it not been for the diligence and attention of Ken Goehring and his colleague, Michael Roesch. They detected the incident, collected information, and followed the controversy for almost a full year before the recent resolution. NCSE was proud to work with these two men. People may forget that to hold different views in a small, homogeneous community can result in significant psychological and emotional pressure. Standing up for what is right is usually difficult. All supporters of the integrity of science education should be grateful to people like Goehring and Roesch, for it is only at the grassroots that the anti-evolutionists can be effectively countered.

Preston Cloud Dies at 78

Dr. Preston Cloud died January 16 in Santa Barbara, CA, where he was Professor Emeritus of Biogeology and Environmental Studies at UC Santa Barbara.

Since the 1960s Dr. Cloud was an active foe of "scientific" creationist claims, critiquing their claims in publications for teachers and the public while he urged his colleagues in academia to pay more attention to the new antievolutionism. Cloud's interests extended far beyond traditional limits, as illustrated by his job title and the title of his most recent book, *Oasis in Space: Earth History from the Beginning*, published in 1988 by W. W. Norton.

Comparing Peaches and Oranges?

An unidentified clipping reports that a student asked a librarian for help finding an assigned book, *Oranges and Peaches*. The retrieval system failed to locate such a title. Prodded for further information, the student recalled that it was by Charles — someone and was about evolution. Thus, they were able to locate for him a copy of *Origin of Species*.

While this is sort of funny, we say more power to the student for looking for the book, the librarian for deciphering the reference, and to the teacher for assigning original source material.

Morton, *continued from p.1*

statements from (among others) scientific societies in support of evolution as a scientific idea. I also sent a copy of the National Academy of Science's booklet, *Science and Creationism*, which expresses that august body's opinion that not only is evolution a vital part of modern science, but that scientific creationism has no scientific credibility.

I argued against the fairness argument (it is only "fair" to teach creationism when evolution is taught) as being relevant only if creationism is, indeed, scientific. I also cited a number of legal decisions, including the Supreme Court's, stating

Please be aware that if you introduce a creationism unit into your curriculum, you will be opposing considerable case law showing that creationism is not scientific, is religious, and as such, its teaching violates the first amendment.

I appreciate the problems elected officials have when faced with strong community sentiment over an issue, and tried to suggest a compromise that would satisfy an apparent need felt by many in the community for some reflection of religious sentiment in the curriculum. I suggested they introduce a unit on comparative views of origins in the social studies or history curriculum. I wrote:

The Judeo-Christian views (including the creationist view that the Bible should be taken literally, as well as the more common, non-literalist Protestant and Catholic views,) ancient Roman, Australian Aborigine, American Indian, Norse, and other origin stories could be introduced, compared and discussed. To avoid religious advocacy, it of course should be made clear to teachers that they are not to present any single view as true...."

NCSE members Ranse Traxler, Martin Nickels, and others in the Illinois CC network will keep us posted on developments from Morton.

Journal, continued from p. 1

role in the struggle to defend the integrity of science by analyzing the allegedly scientific arguments of the creationists. To have it cease publication would, in NCSE's opinion, be a blow to the movement. Our assumption of *C/E*'s publication will insure that this useful journal will now be published on a regular schedule, something with which its former publishers had difficulty.

For NCSE, it is an opportunity as well as a risk. NCSE expands its roles dramatically, almost doubling its size, but it also assumes the cost of producing the journal with no new income. But we think it is worth it.

The original publication of *C/E* was prompted by a need for a national source of news about attacks on evolution. When this role was assumed by the NCSE, the journal became more dedicated to publishing longer "resource" (and research) articles. NCSE's newsletter was originally entitled the *Creation/Evolution Newsletter*, which was changed in 1987 to *NCSE Reports*. The distinction between the two publications, one a newsletter and one a journal, was sometimes less clear, as the newsletter from time to time published journal-length articles, and the journal published occasional news pieces. Now, with both publications being produced by the same organization, the two functions will be made clearer, to the benefit of both readerships.

Until now, the journal has been produced on a basically volunteer basis — its editor Frederick Edwards, Philip Osmon, John Cole, and others tried to produce it essentially in their spare time. NCSE's acquisition of *C/E* will coordinate previously semi-separate missions for the two publications in advancing goals of evolution and general science education and opposition to anti-evolutionism.

Reports will be published quarterly and *C/E* will be published twice per year, so NCSE members/subscribers will continue to receive 6 "issues" per year. Two issues—the journal—will be much "fatter" (usually 56 pp), and *Reports* may be a bit slimmer in an attempt to balance out the costs and benefits of this new effort. Both NCSE members and journal subscribers received this issue of *NCSE*

Reports and issue XXVIII of *Creation/Evolution*.

Editing, printing and mailing costs escalate even without new undertakings. The newly integrated editorial system will allow a certain economy of scale.

However, a new minimum subscription/dues rate of \$18 per year is necessary. This rate is still cheaper than virtually any other organization's dues, and it is made necessary by escalating postage, editing and printing expenses as well as the increased service the Board thinks the journal acquisition will provide. There will be only one price, rather than separate member and subscriber rates.

We think all subscribers will be well-served by this move. Long-time NCSE members will receive not only the newsletter they anticipated, but a journal they will find stimulating and informative. Journal subscribers will not only receive *NCSE Reports*, but will again be assured of a regular publication schedule.

Cretaceous Chinese Bird: New Challenge to *Archaeopteryx*?

Kevin Padian

Last October many newspapers across the country carried the report of a new fossil bird from the Cretaceous of China. The new find is apparently very much like a full-blown bird of today in some respects, but it comes from the Early Cretaceous, perhaps 130 million years ago.

Archaeopteryx, the oldest known bird, comes from the Late Jurassic of Germany (about 140 million years ago), so the new Chinese find is not supposed to be much younger. But what do we really know about this discovery?

The new bird fossil, which does not yet have a name, was described in a talk by Dr. Paul Sereno of the University of Chicago, given at the annual meeting of the Society of Vertebrate Paleontology in Kansas last October. No scientific article has yet been published on the find, which is being researched by Dr. Sereno and a Chinese colleague, Cheng-gang Rao of

Archaeopteryx and its little dinosaur relatives show no obvious arboreal (tree-living) or perching specializations at all, so the new Chinese find is the earliest known bird with clear tree-living adaptations.

the Beijing Natural History Museum. But at the meeting I had the opportunity to study the new fossil bird and to discuss it with Dr. Sereno and other scientists. Here are some points of interest that have been publicly mentioned.

The specimen lacks a skull, so we don't know if it had teeth or not. Judging from other birds of the Jurassic and Cretaceous, it probably did, or perhaps had lost the top front (premaxillary) teeth, like some other forms. The new find is about the size of a sparrow, and it has a short tail, a backward-turned pubis, and a keeled breastbone. *Archaeopteryx*, compared to its dinosaurian relatives, had a tail of medium length, a pubis that was also turned backward (but it is uncertain how far), and no obvious keel on its sternum, which was not calcified in the known specimens. The last feature suggests that the new bird's flight power was considerable. Of great interest is that the new Chinese fossil has very large, curved foot claws, like living perching birds, but the foot claws of *Archaeopteryx* are less curved and smaller, like those of ground-dwelling birds. To some scientists, this suggests that the ability to live in trees was secondary in birds, and that therefore flight began from the ground up. What is also interesting is that *Archaeopteryx* and its little dinosaur relatives show no obvious arboreal

(tree-living) or perching specializations at all, so the new Chinese find is the earliest known bird with clear tree-living adaptations.

The tail of the new specimen is abbreviated, but not as much as in living birds. There are 8 or 9 free tail vertebrae, and then a series of them are fused together into a structure called the pygostyle, which is familiar to cooks as the Parson's nose of kitchen poultry.

Does the new Chinese bird throw a monkey wrench into the evolutionary works? Not at all. In fact, it was to be expected. Similar bird fossils from the Early Cretaceous were described just recently from Las Hoyas, Spain, with a similarly abbreviated tail and large foot claws, as well as a substantial shoulder girdle. These features are intermediate between those of *Archaeopteryx* and more derived (including living) birds, and so is its position in the geologic time column. At question mainly is the precise time assignment: Chinese stratigraphy is often difficult to correlate precisely with rock sequences known outside China, so we will have to wait to see the basis of the geologic data. But this new find gives us better preservation on some important features related to the evolution of arboreality and flight in birds.

FTE is enlisting a quiet army of amateur salespeople to get Pandas into public school biology classes.

Selling Pandas

Robert J. Schadewald

For about a year, the Foundation for Thought and Ethics (FTE) has been trying to get the creationist book *Of Pandas and People* into the public schools as a supplementary text. Scott Brande described how FTE, Houghton Publishing Company (the nominal publisher), and various religious activists tried to get it approved in Alabama (*NCSE Reports* 9(6):5, 10(1):8). Eugenie Scott has reviewed *Pandas* (*NCSE Reports* 10(1):16).

As John A. Thomas notes, FTE and Houghton Publishing have backed off (for now, at least) from pushing for statewide adoption in any state. (Texas, site of the next major statewide adoptions, does not adopt supplementary texts.) Instead, FTE is enlisting a quiet army of amateur salespeople to get *Pandas* into public school biology classes.

In a Dear Friend of the Foundation letter dated May 1990, FTE executive director Jon Buell wrote as follows:

[W]e are finding that the best approach to the local school system is through the biology teacher. Biology teachers are generally easy to contact, available for a meeting on short notice, and receptive. Experience has indicated that they are comfortable in making a decision to introduce a supplemental text with the review and approval of the school curriculum committee.

Buell appeals for volunteers for this quiet army, promising to send a Suggested Plan of Action and (if requested) an 18-minute video with the endorsements of a number of scientists, educators, and an authority on First Amendment law. (What genuine science book ever needed an endorsement from a lawyer?)

FTE anticipated (no doubt correctly) that some

of those anxious to convince biology teachers to use *Pandas* in public school science classes would not own a copy, so at least some received a loaner copy to show teachers. The sales packet also contained A Suggested Plan for Action, overheads, a presentation script, and suggested answers to possible objections. The suggested plan does not suggest that the amateur sales representative actually read the book, let alone understand anything about science.

The idea is for a parent or other activist to take the sales kit and make a pitch to a sympathetic biology teacher. The suggested pitch is the usual creationist hogwash, condensed and somewhat sanitized. The sales representative is coached to denigrate evolution, misrepresent its scientific status, and appeal for students to be taught other, equally plausible, scientific alternatives. Indeed, the sales script often resembles a tobacco company press release on the health effects of smoking. For example:

Because theories presented to support evolution are informed speculation at best, but not knowledge, there is an unavoidable coercive element in teaching this single view.

As with tobacco flackery, minority positions are offered without being identified as such. For example:

Recently published, *Of Pandas and People* has been acclaimed by scientists and science educators for its accuracy and clarity in presenting plausible, scientific alternatives to conventional evolutionary theories.

Funny, but *Pandas* has been acclaimed in these pages for its inaccuracy and obscurantism; it seems only creationists can find in it scientific alternatives to conventional evolutionary theories.

The script suggests five ways *Pandas* will benefit good science education. For example, it will supposedly help students learn to distinguish between science and pseudo-science. Although *Pandas* is eminently well suited for a course on pseudo-science, it has no place in a biology class.

After prepping the prospect, the sales representative shows the video made by leading scientists and science educators and legal authorities. Then questions are entertained. Effective sales training arms the sales rep with canned replies to the most common objections prospects will offer.

Generally, half a dozen canned replies will cover 95% of the objections prospects (who must think on their feet) will generate. Indeed, FTE offers exactly six examples. The third is particularly interesting:

They may bring up one or more mistakes in the book, loudly pronouncing them to be inexcusable or stupid errors that show the kind of 2nd rate, incompetent material that fills the book.

Any sales pro hearing such an objection would quickly ring up no sale and depart. (If the prospect knows the product and thinks it's garbage, you're dead.) Therefore, one suspects that the example is intended primarily to brace the amateur sales rep for the knowledgeable prospect. In any case, here is the suggested reply:

While there are errors in the book — as there are in the first printing of all books — none of them is major or affects, in any way, the fundamental arguments of the book. The publisher is producing an errata sheet until the 2nd printing comes out with corrections, and if you think you've found some he may not already have seen, I'll be glad to pass them on to him.

Assuming all goes well and the prospect is sold, who will pay for the books, and how? Some schools have discretionary funds. More likely, they would be paid for through *special appeals by PTA or other parent interest groups.* (italics added) The italicized passage seems to be an obvious code phrase for church groups.

The following scenario seems to be FTE's best hope:

- A local creationist activist finds a sympathetic biology teacher (perhaps a fellow member of his or her church) and makes the pitch.
- The teacher convinces the curriculum committee and/or administration to approve use of *Pandas* provided funding can be found from outside sources.
- A local church group purchases the books and donates them to the school.

How effective FTE's new sales campaign will be is anybody's guess. The quiet army does not have to be good to be effective — only numerous. And it is already out there fighting.

- Ed. Note: Next issue we will have a story on the application of this strategy in Oregon. Stay tuned.

The suggested plan does not suggest that the amateur sales representative actually read the book, let alone understand anything about science.

t a p e s

symposium tapes

1989 Annual Meeting, Full Symposium <i>"Only a Theory": Presenting Evolution to the Public</i>	(2 tapes)	10.00
1988 Annual Meeting <i>Meeting the Challenge of Creationism</i>	(2 tapes)	10.00
<i>Teaching Evolutionary Theory</i>	(2 tapes)	10.00
1987 Annual Meeting, Full Symposium <i>Scientific Creationism: Facing Up to It!</i>	(3 tapes)	15.00
1988 AAAS Pacific Division Symposium <i>Communicating Evolution to the Public</i>	(3 tapes)	15.00
1982 AAAS Pacific Division Symposium <i>Evolutionists Confront Creationists</i>	each 4.00	
John Patterson, <i>Probability & Thermodynamics</i>		
Robert Root-Bernstein, <i>History & Philosophical Issues</i>		
Russell Doolittle, <i>Origin of Life</i>		
Brent Dalrymple, <i>Age of the Earth</i>		
Joel Cracraft, <i>Systematics & the Fossil Record</i>		
Vince Sarich, <i>Human Evolution</i>		
William Thwaites, <i>General Discussion & Questions</i>		

debate tapes

1977 Awbrey/Thwaites/Morris/Gish	(3 tapes)	15.00
1979 Milne/Gish	(2 tapes)	10.00
1982 Awbrey/Thwaites/Kofahl/Chui	(3 tapes)	15.00
1987 Fezer/Doughty	(2 tapes)	10.00
1988 Thwaites/Gish	(3 tapes)	15.00
1988 Saladin/Gish	(2 tapes)	10.00

lecture

1976 K. Mather, The Scopes Trial	(1 tape)	4.00
----------------------------------	----------	------

d e b a t e t r a n s c r i p t s

1984 Saladin/Gish (Evolution vs. Creationism)	6.75
1987 Duane T. Gish vs. George S. Bakken	2.50
1988 Saladin/Gish Debate II	7.50
1989 Zindler/Morris (Noah's Flood)	3.50
1990 Zindler/Gish	5.00

v i d e o t a p e

1989 AAPA Meeting - "Science Showdown"

10 day loan 15.00, Purchase 25.00

tape total _____

CA residents please add 7% tax _____

shipping _____

TOTAL _____

shipping costs:

1-3 tapes	\$1.25
4-5 tapes	\$1.75
6+ tapes	\$2.00

Name _____

Address _____

City/State/Zip _____

New Books!

The Creationist Movement in Modern America

Raymond A. Eve, and Francis B. Harrold

The authors draw on sociological theory to argue for the coherence — though not the scientific credibility — of the creationist viewpoint. The study carefully defines creationism, explores its historical background, and profiles its various factions.

Now Available with NCSE Discount!

Digging Dinosaurs

John R. Horner and James Gorman

Whether you "dig" dinosaurs or not, you will enjoy this personal account of one of the most important fossil discoveries of all time. From a fortuitous rock-shop discovery of a coffee can full of tiny dinosaur bones, Horner and his team, through insight, perseverance, and luck, have made discoveries that have changed our views of dinosaurs and their behavior.

T w o f o r C h i l d r e n !

The Evolution Book, The Science Book

by Sara Stein

Do you have children? Nephews or nieces, grandchildren, or even a neighbor kid you'd like to interest in science? These books will do it! Consider a copy for a teacher, or the school library, too. Written for ages 10-14. Solid science — and finally, a book about evolution that tells it straight! Good "hands-on" things to do, too.

New Debate Transcript!

Is Creationism Science?

Duane Gish vs Frank Zindler

A debate transcript from a radio show, 1/11/90. With copious explanatory notes. Great arguments and repartee! See Tape List, p. 12.

The Creation Science Controversy

Barry Price

Australian Barry Price analyzes the science and politics of creationism in a hard-hitting book that incorporates and supercedes his earlier *The Bumbling, Stumbling, Crumbling Theory of Creation Science*.

Evolution and the Myth of Creationism; A Basic Guide to the Facts in the Evolution Debate

Tim M. Berra

Berra presents both an accurate description of state-of-the-art evolutionary theory and an analysis of the arguments of the "scientific" creationists that will arm anyone — teacher or citizen — who needs to counter the creationists' claims.

And Finally... NCSE Bumperstickers!

"Evolutionists do it...with increasing complexity!" and/or
"Honk if you understand punctuated equilibria!" (a big hit with our biologists! Not many honks, though....)

quantity

Evolutionists do it... _____

Honk if you understand.... _____

Total ordered x 3.00 = _____

Name _____

Address _____

City/State/Zip _____

ORDER FORM

	LIST	MEMBERS
Appleman, <i>Norton Critical Edition Darwin</i>	11.95	9.55
NEW — Berra, <i>Evolution and the Myth of Creationism</i>	7.95	6.35
Birx, <i>Interpreting Evolution</i>	*29.95	24.00
Crypton (Hoffman), <i>Visitors from the Red Planet</i>	7.95	6.35
Dawkins, <i>The Blind Watchmaker</i>	7.95	6.35
Dietz and Holden, <i>Creation/Evolution Satiricon</i>	9.95	7.95
Ecker, <i>The Dictionary of Science and Creationism</i>	*32.95	26.35
Edey and Johanson, <i>Blueprints</i>	*19.95	15.95
NEW — Eve and Harrold, <i>The Creationist Movement in Modern America</i>	11.95	9.55
Godfrey, <i>Scientists Confront Creationism</i>	9.70	7.75
Gould, <i>Ever Since Darwin; The Panda's Thumb</i>	5.95	4.75
Gould, <i>Hen's Teeth and Horse's Toes</i>	6.95	5.55
Gould, <i>Flamingo's Smile</i>	8.95	7.15
Gould, <i>Wonderful Life</i>	*19.95	15.95
Harold and Eve, <i>Cult Archaeology and Creationism</i>	*20.00	16.00
Harris, <i>Agents of Chaos</i>	12.95	10.35
Henke, <i>Origin of Theses</i> (diskettes)	10.00	8.00
NEW — Horner, <i>Digging Dinosaurs</i>	*17.95	14.35
Larson, <i>Trial and Error</i> ,	9.95	7.95
Lewin, <i>In the Age of Mankind</i>	19.95	15.95
Lewin, <i>The Thread of Life</i>	*29.95	23.95
McCollister, ed., <i>Voices for Evolution</i>	5.00	4.00
McGowan, <i>In the Beginning... A Scientist Shows Why the Creationists Are Wrong</i>	16.95	13.55
McIver, <i>Anti-Evolution, An Annotated Bibliography</i>	*39.95	33.95
Montagu, <i>Science and Creationism</i>	14.95	11.95
Morris, <i>Biblical Basis for Modern Science</i>	*24.95	19.95
Morris, <i>Genesis Record</i>	*24.95	19.95
Morris, <i>The Long War Against God</i>	*21.95	17.55
NEW — Price, <i>The Creation Science Controversy</i>	9.95	7.95
Ruse, <i>But is it Science?</i>	*24.95	19.95
Ruse, <i>The Darwinian Paradigm</i>	*25.00	20.00
Smith, <i>Did Darwin Get it Right?</i>	*25.00	20.00
NEW — Stein, <i>The Evolution Book</i>	12.95	10.35
NEW — Stein, <i>The Science Book</i>	9.95	7.95
Strahler, <i>Science and Earth History, the Evolution/Creation Controversy</i> (see below for special shipping fee)	*41.95	33.55
UNESCO, <i>700 Science Experiments for Everyone</i>	*13.95	11.15
VanDiver, <i>Imprints of Time: The Art of Geology</i>	19.95	15.95
Van Till, Young, and Menninga, <i>Science Held Hostage</i>	9.95	7.95
Weinberg, ed., <i>Reviews of Thirty-One Creationist Books</i>	5.00	4.00
Willis, <i>The Hominid Gang</i>	*21.95	17.55

*cloth

Book subtotal _____

California residents add 7% sales tax _____

Shipping: 1.50 for one book _____

1.00 for each additional book _____

Strahler and Ecker books, please add 2.50 ea. _____

Foreign orders, we will invoice you shipping costs. _____

Shipping and Tax subtotal _____

TOTAL _____

Name _____

Address _____

City/State/Zip _____

Phone number _____

Make checks payable to NCSE, P.O. Box 9477, Berkeley, CA 94709

CC Update

No army of Scholars
rose to defend
Science from the
fundamentalist jihad.

Fighting Creationism in the Popular Press

Bradley T. Lepper

[W]e shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender.

Winston Churchill

Early in the autumn of 1990, several local newspapers in Licking County, Ohio carried a prominent advertisement for a seminar entitled "Human Origins: Scientific Evidence for Creation." The seminar was sponsored by the First Presbyterian Church of Newark, but all sessions were advertised as free and open to the public. The advertisement lamented that only one view of human origins is currently taught in our public schools and colleges. It concluded with the names of 183 fellow workers, friends, and scientists who believe that the data from the world around us fits [sic] the creation model for origins better than the theory of evolution.

In spite of the fact that this was clearly a church-sponsored program, there was a remarkable absence of explicit references to either God or the Bible in the advertisement (there was one reference to the story of Noah). The so-called scientists consisted of five men with Ph.D.'s (3 Chemical Engineers, 1 Chemist, and 1 Polymer Chemist, and six men with Masters degrees (2 Chemical Engineers, 1 Ceramic Engineer, 1 Plastic Engineer, 1 with a degree in Engineering Physics, and 1 with an M.S. in Geology & Mineralogy). In addition, there were 30 individuals with either a B.A. or B.S. (only three of these were in fields relating to biology), 3 Science Lab Tech[nicians], and 2 Registered Nurses.

I regarded this document as a particularly flagrant abuse of what Lastrucci has termed the "halo prestige" of academic credentials. In other words, these alleged scientists were exploiting the tendency of individuals to extend a person's prestige from one field to another but unrelated field of accomplishment (Lastrucci 1986:20). I indicated this in a letter to the editors of the *Newark Advocate* and the

Granville Booster and pointed out that no serious scientist with a graduate degree in anthropology, archaeology, paleontology, or related fields accepts the so-called creation model for human origins as legitimate science (Lepper 1990a, 1990b). Referring to NCSE's *Voices for Evolution*, I also was able to quote the official anti-creationist position of the United Presbyterian Church in the U.S.A.

My purpose in writing these letters was primarily educational, but I had no illusions that my comments might convert anyone committed to creationism. I hoped that my statement might influence the open-minded or, at least, alarm complacent supporters of quality science education. However, even if I had known that the arguments would persuade no one I still would have written the letters. I simply could not, in good conscience, allow fundamentalist Christian dogma to parade around unchallenged in the purloined trappings of Science.

As a result of my letter a local biologist, a self-employed professional not affiliated with the local universities, attempted to organize a concerted response to the creationist threat to education in Licking County. He drafted a letter to the editors of the local papers detailing the manifold inadequacies of the creation model relative to evolutionary theory and circulated it among a cross-section of scientists from the local institution of higher learning. His intent was to have the letter signed by a large segment of the local legitimate scientific community.

Incredibly, only one other scientist was willing to sign the letter. There were an almost endless variety of excuses given for not signing. One young, untenured, Ph.D. proclaimed confidently that letters to the editor were a foolish waste of a scientist's time. After all, there are much more effective ways to combat creationism. (Unfortunately, the young doctor declined to divulge the details of his super-duper, sure-fire method for ridding a community of pesky creationists.)

An alternative rationale for doing nothing was offered by a jaded department chairman. The town belongs to the troglodytes. There are no open minds down there and writing letters to the editor would be, to coin a scriptural metaphor,

casting pearls before swine. If the benighted sought enlightenment, let them come to the Ivory Tower. The newspapers were an inappropriate forum for an academic.

So no letter was sent. No army of scholars rose to defend Science from the fundamentalist jihad. I was disappointed, but stubbornly refused to abandon the town to the troglodytes. The newspapers may be the wrong forum for an academic debate, but what my colleagues seemed to misunderstand was that this was no academic debate. Moreover, we hadn't been given the opportunity to choose the forum. The creationist assault on science in Licking County began in the newspapers, so that is where I would meet them.

And, ultimately, a victory of sorts was achieved, thanks to the fanatical blunderings of overly-zealous supporters of creationism and the timely support of a big gun from out of town. The initial creationist response to my letters was a slick appeal to academic freedom and fairness. This letter, although authored by Bruce Malone, a local resident, reeked of the pseudo-sophistication of the Institute for Creation Research:

Science thrives in an open atmosphere where all viewpoints are considered, not when one view is considered sacred and other viewpoints are censored and ridiculed.... A list of hundreds if not thousands of scientists could be provided [in support of creationism]. But this is not, nor should it be, a popularity contest. The history of science has shown us repeatedly that it is not the most popular theory which is always correct (Malone 1990).

Fortunately, to the consternation of Malone, Joe Tatsak, a local Baptist minister, also chose to respond to my criticism of creationism:

...since when do you need an academic degree in evolutionary biology to know that evolution is wrong? I do not have a degree in criminology, but I know that crime is wrong. ...if we are to judge by Dr. Lepper's criteria, then Dr. Lepper needs to retract his comments. ...he doesn't have a degree in theology,

religion, or the Bible... [and therefore cannot] claim to be an expert in the creation theory (Tatsak 1990a and 1990b).

Tatsak also claimed that numerous scientists accepted the creation model. He listed a few Bible-believing scientists with earned degrees, who are members of the Institute for Creation Research. The list included Dr. Clark Wissler, curator-in-chief of the anthropological section of the American Museum of Natural History.

In my response, I pointed out that since Clark Wissler had died in 1947 he could not be a member of the ICR (founded in 1970). More over, if I required a degree in theology, religion, or the Bible in order to criticize creationism, then it must, indeed, be entirely a religious program and have nothing to do with science (Lepper 1990c and 1990d).

I was curious about Tatsak's reference to Wissler. Where had he gotten the idea that Wissler was a creationist? I called the American Museum of Natural History and put the question to their Department of Anthropology. Ian Tattersall, Chairman, responded with letters to both the *Advocate* and *Granville Booster* stating that "...there is no evidence that Dr. Wissler ever supported creationism" (Tattersall 1990a, 1990b). Tattersall's letter had an immediate impact. Eric Anderson, Managing Editor of the *Newark Advocate*, printed the letter in his Sunday column along with the following announcement:

This is the second letter from someone backing creationism that has had a serious factual error. Therefore, effective immediately, all letters about creationism must be accompanied by supporting documentation or citations that verify any claims made in those letters. This is not being done to inconvenience these letter writers, but this newspaper has an obligation to ensure accuracy. Two strikes means we have to raise the standards (Anderson 1990a).

Anderson followed this up with an editorial strongly criticizing creationists:

Either creationists are being disingenuous or they've failed to understand the scientific method.... While I have problems with evolution, I have even more problems with

The newspapers may be the wrong forum for an academic debate, but what my colleagues seemed to misunderstand was that this was no academic debate.

Either creationists
are being
disingenuous or
they've failed to
understand the
scientific method....

people who utter the right words but ignore their meanings. Creationism's backers would be better off arguing on religious or philosophical grounds because their scientific reasoning is sadly flawed (Anderson 1991.)

Initially the public only saw the subtly crafted pseudoscientific facade of creationism put forward by the unctuous minions of the ICR. However, my letters flushed out the zealous fanatics and exposed the religious core of the creationist movement. The initial creationist advertisement never even mentioned God. Their most recent letter condemns evolutionists to hellfire and damnation (Tatsak 1990c). The creationists' reliance on bald-faced lies and distortions of the truth was exposed and a conscientious newspaper editor acted on their utter lack of credibility.

Anderson's editorials in the *Advocate* are an enormous public relations defeat for creationists. Without my letters to the editor there would not even have been a battle.

A local clergyman has advised me that the seminar "Human Origins: Scientific Evidence for Creation" is a canned program put out by the Institute for Creation Research. You might expect to see it appearing in your community soon.

This essay was not intended as an exercise in self-aggrandizement. My purpose has been to show that letters to the editor are not a foolish waste of time. They can be

an effective weapon in the fight against creationism. The creationist program is based on ignorance and calculated deception. The more light which can be thrown onto their activities the better.

Even one persistent critic can successfully challenge the creationist paper tiger.

References

- Anderson, Eric 1990a 1990 elections proved polls can be accurate. *The Advocate* 11 November 1990.
- _____. 1990b We've repealed law of gravity. *The Advocate* 25 November 1990.
- Lastrucci, Carlo L. 1986 *The Scientific Approach: basic principles of the scientific method*. Schenkman Books, Cambridge, Mass.
- Lepper, B. T. 1990a Takes exception to church advertisement. *Granville Booster* 1 October 1990.
- _____. 1990b Who are these scientists? *The Advocate* 10 October 1990.
- _____. 1990c Author sticks to his guns. *Granville Booster* 29 October 1990.
- _____. 1990d Serious scientists don't accept creation. *The Advocate* 30 October 1990.
- Malone, Bruce 1990 Letter on human origins creates more thoughts. *Granville Booster* 8 Oct 1990
- Tatsak, Joe 1990a Church member responds to criticism. *Granville Booster* 15 October 1990.
- _____. 1990b Pastor disputes evolution. *The Advocate* 17 October 1990.
- _____. 1990c Pastor defends position. *Granville Booster* 26 November 1990.
- Tattersall, Ian 1990a New York response. *Granville Booster* 19 November 1990.
- _____. 1990b Claim disputed. *The Advocate* 25 November 1990.

Iowa-Nebraska CC Conference

"The Future of Science: Its Nature and Teaching" is the symposium to be held March 23, 1991 at Durham Science Center, U of Nebraska, Omaha. Sponsored by the Iowa CC, the U of Nebraska, Creighton U Biology Department, Omaha Education Association, Council Bluffs EA, and the Iowa State EA, the day-long meeting is open to the public. NCSE is providing materials for registrants. Tickets are \$5 in advance, \$6 at door.

Speakers include Gail Shroyer and William M. Harris of Kansas State U, Michael Zimmerman of Oberlin College, Harry Nickla of Creighton U, Nebraska State Senator Ronald Withem, and Iowa State Representative Brent Siegrist.

WV "Balanced Treatment" Bill

Karl Fezer reports that essentially the same "balanced treatment" bill that has been introduced in several states since 1986 was filed again in West Virginia in January 1991. H.B. 2241 provides "that both creation science and evolution science be taught in the public schools on an equal basis without reference to any religious concepts." The bill's definitions resemble those of Arkansas Act 590 overturned in federal court in 1982. (Send NCSE an SASE for a copy of this historic decision.) We will watch to verify that, as in previous years in WV, no action is taken on the bill. According to Fezer, H.B. 2344, concerned with disposal of dead poultry, seems to have a much better chance of passage.

Further information about the symposium is available from:

William A. Forsee
4942 Greene Avenue,
Omaha, NE 68157
Office: 712/328-6481

Articles, Books, Etc.

This section briefly notes publications of interest without necessarily endorsing or criticizing them. Copies of some are indicated as available for nominal charges or by sending an SASE with your request to the **NCSE Resource Center, P.O. Box 9477, Berkeley, CA 94709-0477.**

Bower, Bruce. 1991. "True Believers: The thinking person may favor gullibility over skepticism." *Science News* 139:14-15, 5 January 1991.

Bower summarizes recent and forthcoming research articles suggesting that the mind is not a blank slate awaiting education in a logical way, but rather that it has a predisposition to believe what it is told by authorities, even if the supposed truths are simplistic or unlikely. Research by psychologist Daniel T. Gilbert and colleagues is summarized from the October *Journal of Personality and Social Psychology* and the March 1991 *American Psychologist*.

"People are credulous creatures who find it very easy to believe and very difficult to doubt," says Gilbert.

Gibbons, Ann. 1991. "Looking for the father of us all." *Science* 251:378-380, 25 January 1991.

After finding Mitochondrial Eve, scientists are looking for the common male ancestor of *H. sapiens* by examining genes on the Y chromosome. Available from NCSE with SASE.

Horgan, John. 1991. "In the Beginning..." *Scientific American*, February, pp. 116-125.

A good review of current evidence and competing theories by a S/A staff writer.

Kerr, R.A. 1991. "Dinosaurs and friends snuffed out?" *Science* 251:160-162, 11 January, 1991.

A report on new paleontological research alleging that dinosaurs were still thriving just before an asteroid impact, not dwindling away towards extinction with or without a catastrophe. Available from NCSE with a SASE.

Lederman, Leon M. 1991. *Science: The end of the frontier?* 20 page booklet, supplement to *Science*; available from the American Association for the Advancement of Science, 1333 H. Street NW, Washington, DC 20005.

The new president of AAAS reports on the current state of American science and science education, particularly at upper levels, and what he sees as a grim future unless there is massive improvement in financial support and university morale.

McKim, Patrick, n.d. "The Reality of Evolution," manuscript. Why scientists conclude that evolution took place.

Detailed consideration of the patterns of similarities and differences that characterize animals. 12 pp. Available for \$1.75 from NCSE.

SimEarth — the Living Planet. Macintosh computer program simulating evolution on our planet. Primates don't have to produce the dominant species — try spiders! Looks like fun. \$69.95

Mitman, Gregg. 1990. "Evolution as Gospel: William Patten, the language of democracy, and the Great War." *Isis* 81:446-463.

The misuses of Darwin to justify World War I contributed significantly to the appeal of anti-evolutionism. Patten was a leader in the attempt to exalt biologists as social theorists.

1990. *Science as a Way of Knowing VIII: Neurobiology and Behavior*. Published by the American Society of Zoologists, 1990. Send a check for \$2.25 (postage and handling) made out to ASZ to John A. Moore, Biology, University of California, Riverside, Riverside, CA 92521.

Moore, John A. 1990. *Science as a Way of Knowing, vol. VII: A Conceptual Framework for Biology, Parts I, II, and III*. Published by the American Society of Zoologists, 1990. \$2.25 from ASZ. See above address.

Overbye, Dennis. 1991. *Lonely Hearts of the Cosmos: The Scientific Quest for the Secret of the Universe*. Harper Collins, NY. A well-reviewed book which humanizes the arcane world of cosmology and cosmogenesis. One reviewer wrote that it explains the work and career of Stephen Hawking better than Hawking's own *A Brief History of Time*.

Resources

Rediscovering Alexandria, Science, Technology and the Churches Proceedings of a Symposium at the 1990 AAAS meetings, sponsored by the Presbyterian Church. Papers by Langdon Gilkey, Robert J. Russell, others. Make checks for \$5 to UCBHM (United Church Board for Homeland Ministries), 475 Riverside Drive, 10th Floor, NY, NY 10115.

Sonleitner, Frank. 1989. *An Evolutionist Goes to the Creationist Movies: a Critique of the Creationist Film Series "Origins."* 73 pages of incisive analysis of what is wrong with creation science and why. Available for \$8 from NCSE.

Spencer, Frank. 1990a. *Piltdown: A Scientific Forgery*. Natural History Museum Publications and Oxford University Press, NY. xxvi + 272 pp, \$24.95.

_____. 1990b. *The Piltdown Papers 1908-1955; The Correspondence and Other Documents Relating to the Piltdown Forgery*. Natural History Museum and Oxford University Press, NY xii + 282 pp, \$65.00.

Both Spencer books are (favorably) reviewed in *Science* 250:1162-1163, 23 September 1990 by Christopher Chippendale of Cambridge who finds the issue of guilt still unresolved and probably unresolvable, although there is no question that fraud was involved.

Creationist Astronomy

In our last issue it was asked rhetorically whether the geocentrist Tychonian Society might change its name. It already had done so, more or less. The *Bulletin of the Tychonian Society* is now *The Biblical Astronomer*, although the sponsor retains the Tychonian Society name. The latest issue suggests a slight desire to distance itself from "scientific" creationism while continuing its advocacy of geocentrism and its version of Biblical science. It invites contributions but "will not publish anything that is at all critical of the Hebrew Masoretic text, the Greek Textus Receptus, or any Reformation translation based on those two text types." Tychonians have little respect for flat earthers, and vice versa.

Tracking Those Incredible Creationists

Natural Selection by the Numbers

Frank J. Sonleitner

In an article entitled "Natural Selection for Computers" that appeared in *Science News* (136(22): 346-348; 25 November 1989) Ivars Peterson reports on the technique of using genetic algorithms to design jet engines and integrated circuit chips, scheduling work in a busy machine shop, operating gas-pipeline pumping stations and recognizing patterns. The technique, pioneered by computer scientist John H. Holland at the University of Michigan, simulates the mechanism of Darwinian evolution, involving mating, genetic recombination, reproduction, selection, and even mutation.

Random variations on the specifications for a device are encoded on chromosomes of individuals. The computer evaluates the properties of each individual and the "fitter" ones are allowed to mate; genetic combination of chromosomes and even crossing-over takes place, and a new generation of individuals is produced. Thus each new generation is created from the best pieces of the previous one. This approach efficiently and rapidly zeros in on the best design or solution to the problem. Mutation operations are often introduced to keep the process from getting stuck at a sub-optimal answer because of a poor choice of starting configurations.

David E. Goldberg, an engineer at the University of Alabama and author of the book, *Genetic Algorithms in Search, Optimization, and Machine Learning* (1989, Addison-Wesley) reports that genetic algorithms work in lots of different problems but there is still room for improvement by incorporating artificial analogues of other evolutionary and genetic mechanisms. Creationists always claim that evolution can't possibly work. Yet here are engineers (no less!) using evolution to design things! Incorporate

The Biblical Astronomer
Dr. Gerardus D. Bouw, ed.
4527 Wetzel Avenue
Cleveland, OH 44109

The publication is free, but contributions are appreciated.

that into the Argument from Design and get theistic evolution.

How is it that creationists invariably produce mathematical calculations that purport to show that evolution is impossible while the mathematical models of population geneticists, modern micro-computer simulation programs and the genetic algorithms method of the engineers all show the opposite "that evolution works!" Why the difference?

The bare bones process of evolution by mutation and natural selection contains four major elements:

1. Mutation
2. Reproduction
3. Genetic recombination (sexual and other mechanisms)
4. Natural selection

When all four of these elements are included in a mathematical model or computer simulation program of evolution, it works (Dawkins, 1986; 1989a and b). The typical creationist endeavor along these lines, however, only considers one of these elements, namely mutation (Bliss, 1976; Morris, 1974). Thus from the biological point of view, their calculations assume that all the mutations of some new trait or new species, arise simultaneously or in sequence in a single individual. The occurrence, anywhere along the line, of a single deleterious mutation negates the entire endeavor. This, of course, is not evolution, but instantaneous creation by purely random processes.

For evolution to occur the other three elements are necessary. In a population, the occurrence of a lethal mutation affects only the individual possessing it. Reproduction by normal individuals replace those killed by lethal mutations and conserve what evolutionary "progress" has been made. Deleterious mutations may be passed on to offspring but are eventually weeded out by natural selection. On the other hand, favorable mutations spread through the population under the action of natural selection. Finally, genetic recombination ensures that favorable mutations arising in different individuals will eventually be combined in descendant generations.

All the major taxonomic groups of

eucaryote organisms have sexual genetic recombination. This is in addition to whatever asexual reproduction a group may possess. Those instances where sex is absent are apparently secondary losses. A variety of phenomena (transduction, etc.) bring about genetic recombination in procaryotes. Recombination results in genetic diversity and the developmental systems of eucaryotes have mechanisms (e.g: induction) for coordinating the production of a functional individual from diverse genetic messages. These mechanisms can also accommodate mutations that do not produce too drastic a change.

References:

- Bliss, R. B. 1976. *Origins Two Models Evolution Creation*. Creation-Life Pub. San Diego. (See pp. 47-49).
- Dawkins, R. 1986. *The Blind Watchmaker*. W.W. Norton & Co.
- Dewdney, A. K. 1989a. "Computer Recreations. Simulated Evolution: wherein bugs learn to hunt bacteria." *Scientific American* 260(5):123-154 (May).
- _____, 1989b. "Computer Recreations." *Scientific American* 261(3):180-183 (Sep). (See p. 183).
- Morris, H. M. (Editor) 1974. *Scientific Creationism*. Creation- Life Pub. San Diego. (See pp. 59-69).

USING OUR ORGINS

Francis Graham in Pittsburgh has noted that "the Masterbooks Catalog, after repeatedly extolling the virtues of Christian education over 'destructive humanistic' education and offering [its ICR products as a panacea]" repeatedly misspells "origins" as "orgins." (e.g., "Orgins: Free with purchase of Good Science Package," "Orgins: Creation or Evolution," by Richard Bliss.)

It may be that ICR is in fact offering ORGANS to customers, in keeping with their churchly orientation. Perhaps they are offering odd animal parts (which show no sign of having evolved) for biology labs. Or they may be misspelling "origins," as Graham suspects.

In any case, we do have to sympathize, having committed more than one typographic error ourselves (although we hope not so, um, strategically). Believers in "intelligent design" for everything have never been involved in publishing.

The ICR and Odd Animal Parts (?)

Keeping Tabs

According to Different Calendars, the Year 1991 is (Variously):

5995	Bishop Usher
5752	Jewish
4689	Chinese
7501	Byzantine
4.5 billion (+/-)	NCSE
135	Philip Gosse

Modern Creationism and the Ghost of Gosse

Robert J. Schadewald

Two years before Charles Darwin published *On the Origin of Species*, another respected British naturalist addressed several related questions. Philip Henry Gosse was a creationist concerned with the ascendancy of uniformitarian geology and the seeming impossibility of reconciling the rich and sequential fossil record with a recent special creation. In *Omphalos: An Attempt to Untie the Geological Knot* (London: Van Voorst, 1857), Gosse solved an ancient theological problem. Adam, he declared, had a navel (*omphalos* in Greek).

Just as Adam was created with a navel, so also was the newly created world endowed with innumerable marks of a history that never happened. The geologic column and its troublesome fossils were part of the world's navel. Gosse couched his theory in terms of cyclic time and theological necessity. Anticipating the skeptic's objection that his theory would justify creation only yesterday, he boldly confronted the argument (p. 351):

Let us suppose that this present year 1857 had been the particular epoch in the projected life-history of the world, which the Creator selected as the era of its actual beginning. At His fiat it appears; but in what condition? Its actual condition at this moment: whatever is now existent would appear, precisely as it does appear. There would be cities filled with swarms of men; there would be houses half-built; castles fallen into ruins; pictures on artists' easels just sketched in; wardrobes filled with half-worn garments; ships sailing over the sea; marks of birds' footsteps on the mud; skeletons whitening the desert sands; human bodies in every stage of decay in the burial-grounds. These and millions of other traces of the past would be found, because they are found in the world now; they belong to the present age of the world; and if it pleased God to call

into existence this globe at this epoch of its life-history, the whole of which lay like a map before His infinite mind, it would certainly have presented all these phenomena; not to puzzle the philosopher, but because they are inseparable from the condition of the world at the selected moment of irruption into its history; because they constitute its condition; they make it what it is.

Poor Gosse! He expected acclamation, but *Omphalos* was greeted by hoots of derision. Carried to its logical conclusion, the absurdity of Gosse's argument is obvious.

Among modern creationists, Henry Morris is most notable for his own version of *omphalos*, which he hotly defends against those who point out it makes the creator a deceiver. As he wrote on p. 238 of *The Genesis Flood* (coauthored by John C. Whitcomb):

This sort of reasoning, though it often has been propounded, is entirely unworthy of fair-minded, reasonable men, especially scientists! It is essentially an affirmation of atheism, a denial of the possibility of a real Creation. If God actually created anything at all, even the simplest atoms, those atoms or other creations would necessarily have an appearance of some age. There could be no genuine creation of any kind, without an initial appearance of age inherent in it. It would still be possible to interpret the newly created matter in terms of some kind of previous evolutionary history. And if God could create atomic stuff with the appearance of age "in other words, if God exists!" then there is no reason why He could not, in full conformity with His character of Truth, create a whole universe full-grown.

Presumably, the *ad hominem*s about fairness and rationality, the shrieks about atheism, and the exclamation points are supposed to compensate for the bankruptcy of Morris's argument. Contrary to his assertions, atoms have no appearance of age. A given hydrogen atom, for example, could be a relic of the Big Bang or the remains of a neutron that decayed seconds ago. Indeed, if the

universe as we know it exploded forth from a compact state (a singularity, quantum fluctuation, false vacuum, or whatever) some 15 billion years ago, it created no false history, because time as we know it (and therefore history) began with the event. Furthermore, the Big Bang apparently wrote part of the true history of the universe, "not a super-natural lie," upon the universe's very fabric. Theistic evolutionists therefore have real creation without the omphalos problem. Unlike Morris, Gosse recognized that the real problem is apparent history (not apparent age). His solution was to declare the apparent history an artifact of special creation. That is, he insisted that the geological observations be given a theological rather than a naturalistic interpretation. Such omphalos thinking is the mainstay of modern creationism.

The most audacious exponent of omphalos is Robert V. Gentry, who makes Henry Morris look conservative. Gentry claims that the histories (event sequences)

associated with granitic rock bodies are false. Despite the evidence of intrusion "chilled margins, crosscutting relationships, country rock inclusions" granites were created in place. Their appearance of having crystallized from a melt is likewise divine deception.

More sophisticated creationists will roll their eyes toward the heavens when asked about Gentry's geological claims. Moments later they will offer a precisely analogous argument, some version of Intelligent Design, to explain away the evidence that life as we know it results from descent with modification from a common ancestor.

Thus is modern creationism haunted by the ghost of Gosse. Those who deny the existence of his specter are merely whistling in the dark.

Creationism Explains the Giraffe

Frank Sonleitner

One can learn a lot of strange and wonderful things reading the creationist literature. For example, according to *Of Pandas and People* by Davis and Kenyon (see page 69), discoveries have been made that question evolutionists' belief that the giraffe's long neck functions for browsing in trees. Fossil giraffes are found side by side with fossils of sheep, which are grazers; female giraffes are shorter than males; and giraffes in zoos are observed to eat grass. Giraffes really use their long necks to reach the ground! This inane idea is quoted almost word for word (but not cited) from Taylor (1983, page 40). Taylor was a science writer and his book contains a number of other unbelievably incorrect facts.

But why do giraffes have long legs? Was it a whim of the intelligent designer? Certainly it is not so that they can run fast. Top running speed of a full-grown giraffe is only about 35 mph. Almost all the antelope that share the African savannas with the giraffe can run faster! So this explanation for the giraffe's long neck begs the question "why do they have long legs?"

Creationists seem to have a penchant for explanations devoid of information content. Furthermore, if the function of the long neck is really to reach the ground, the intelligent designer did not do a very intelligent job of designing. The giraffe's neck is not quite long enough to reach the ground! To do so, a giraffe must assume an awkward posture with its forelegs spread out and/or bent. The purpose of the giraffe's neck is also mentioned on page 12, which also has a photograph documenting the giraffe's difficulty in reaching the ground to drink. In this case, I think the text is funnier than the Far Side cartoon about giraffe evolution printed on page 13 of *Of Pandas and People*! For all you ever want to know about giraffes, and to convince yourself that they really are browsers, see Dagg and Foster (1976).

References

- Dagg, A. I. and J. B. Foster 1976. *The Giraffe: its biology, behavior, and ecology*. Van Nostrand Reinhold Company.
- Taylor, G. R. 1983 *The Great Evolution Mystery*. Harper and Row, New York.

...if the function of the long neck is really to reach the ground, the intelligent designer did not do a very intelligent job of designing.

PSEUDOGENES — A PROBLEM FOR CREATIONISTS

Thomas H. Jukes

Pseudogenes are nonfunctional genes that closely resemble genes that are active in coding for proteins. They are formed during evolution and may arise in two ways. First, a duplicate copy of a gene may have mutated so that it is no longer functional but still remains in the DNA at a location close to the working genes. The second way is that a messenger RNA molecule may be copied as a DNA sequence by the enzyme reverse transcriptase. This enzyme substitutes deoxyribonucleotides for ribonucleotides, thus "making DNA out of RNA." This DNA is then incorporated into the DNA of the cell nucleus and is termed a processed pseudogene.

In both cases, the pseudogene accumulates mutations, and is also subject to the deletion and insertion of nucleotides, so that it has been described as a "rusting, decaying hulk," still recognizable, but not translatable into a usable protein. For example, the arrangement of alpha hemoglobin genes on the human chromosome 16 is two pseudogenes followed by two alpha genes. On chromosome 11, there is a pseudo beta hemoglobin gene followed by the delta and beta genes.

I have not heard of a creationist explanation for pseudogenes. I suppose one could argue that they have been placed in DNA to deceive non-believers into accepting evolution. But I prefer the scientific theory.

For more explanations of pseudogenes and other such matters, I recommend *Molecular Biology of the Gene*, 4th ed., by Watson and coworkers (Benjamin Cummings, Menlo Park, CA, 1987), and *Genes IV*, by Benjamin Lewin (Oxford University Press, NY, 1990).

Editor's note: The specific problems pseudogenes pose for scientific creationism are examined in more detail by Edward Max in his 1986 Creation/Evolution (19:34-46) article, "Plagiarized

Errors and Molecular Genetics." In brief, many pseudogenes are shared between species, and since they are eccentric, specialized, useless errors, common ancestry and thus common inheritance seems to be the only reasonable scenario to explain their appearance in several different species.)

Anti-Evolution Group Demonstrates Mathematical Ability

In the November/December 1990 *Education Newsline*, the newsletter of the National Association of Christian Educators (NACE), an anonymous author laments the press treatment of teenage girls' sexual promiscuity. (*Ed. note: What about boys?*) Quoting Alan Guttmacher Institute figures from 1982 to 1988, the article laments, "For girls between 15 and 17, the percent {having sex} climbed from 32 percent to 38 percent over the same period. Not mentioned in major educational media reports is the fact that 46.8 percent of teenage girls age 15 to 19 and 52 percent of girls 15 to 17 have abstained from sexual activity." The last time we checked, 38% and 52% added up to 90%, which makes one wonder what the missing 10% of girls were doing. We hope this is not typical of creationist mathematics, though such losses may explain their lack of data supporting the sudden creation of the universe.

More Biblical Math

We haven't seen it yet, but a new book is being advertised by the Religious Right as an alternative to evolution and a new way to teach math. It further illustrates something NCSE has long argued: it is not just biology that is under attack.

Mathematics: Is God Silent? is advertised as "a new piece of solid evidence in court challenging the uniqueness of a Christian education, where math is often viewed as one subject which cannot be taught from a distinctly Biblical perspective." The ad appeared in *The Chaldee Report*, the publication of a Christian Reconstructionist group advocating the application of Christian, Biblical law to American Society.

Teaching New Science Teachers How to Advocate Evolution

Brian R. Shmaefsky

Next to social pressures and political administrators, the biggest factor preventing science teachers from teaching evolution in public schools is their own inability to defend scientific findings. Informal interviews with new and experienced science teachers in south Kansas, Oklahoma, and north Texas show that many teachers cannot distinguish between scientific and religious beliefs. They consider religious beliefs equal in logic, objectivity, and rationality to scientific views. Much of this results from the teacher's religious beliefs, but a large part is due to improper science training.

During evolution/creation confrontations with students, many teachers prefer to downplay rather than defend the strength of scientific theory and inquiry because they feel inadequate in their understanding of evolution and scientific ideas. Many knew that science is not just a series of random observations and stagnant facts, but unfortunately they still viewed science as a set of conclusions based upon a consensus of scientists. They saw empiricism as one scientific activity rather than the rational edifice of science. This perception of science leaves teachers inadequately prepared to deal with even weak attacks against scientific foundations. The teachers were taught science as if it were a story, like a Sunday school lesson. Consequently, they developed only a superficial acceptance of scientific findings. How can teachers be expected to defend science when nothing in their education elevates scientific views above religious dogmas?

What can be done during a teacher's preservice and continuing education to better prepare them for the evolutionism/creationism debate? Here are some of the better suggestions gleaned from the teachers I interviewed:

- "Involve teachers in research projects that help develop an intuitive sense of scientific ideology." Properly performed research teaches the power and limitations of scientific enquiry. It also shows that scientific arguments about models and protocol do not indicate weakness in the foundation of science.
- "Develop courses that teach argumentative styles appropriate to science-versus-religion debates." Objective debating requires training to avert unconvincing and insulting arguments. Teachers must learn to defend their point of view without affronting the students. These techniques can also be used by teachers to train students in rational thinking skills.
- "Teach evolution in a logical, empirical manner and not as a series of facts and events." Tangible modern-day examples of evolution are crucial for solidifying evolutionary evidence. Simple laboratory experiments showing morphological and physiological population shifts in bacteria and yeast are as strong as Galapagos Island diversity.
- "Analyze and discuss teachers' attitudes toward science's ramifications for social and religious beliefs." The weakest link in teaching evolution is the teacher's interpretation of nature and reality. Students generally perceive the teacher as the omniscient science expert. If the teacher infuses religious beliefs into the realm of science, students will accept the resultant pseudoscience as actual science. Such perversions of science should be discouraged from entering the classroom.

Of course, teachers with strong religious convictions running counter to science perceive no problem of misrepresentation with their pseudoscientific (and semiexistential) proselytizing. Teachers open to evolutionary thought want to be more effective at presenting evolution and scientific thinking. Unfortunately, even the most highly prepared teachers are powerless if the school's and community's social climates prohibit students from learning untainted science.

How can teachers be expected to defend science when nothing in their education elevates scientific views above religious dogmas?

11:1

Editor

John R. Cole, Ph.D.
Water Resources Research
Center
University of Massachusetts
Amherst, MA 01003
413-545-2842

Supporters

Isaac Asimov, *Boston U.*
Francisco J. Ayala, *UC/Irvine*
Stephen G. Brush, *U. MD*
Johnnetta B. Cole, *Spelman*
Bruce Collier, *U. Alberta*
Joel Cracraft, *U. IL*
Richard E. Dickerson, *UCLA*
Robert S. Dietz, *AZ State U.*
Robert H. Dott, *U. WI*
James D. Ebert, *Ches. Inst. of Johns Hopkins*
Niles Eldredge, *A.M.N.H.*
Larry D. Farrell, *ID State U.*
Milton Fingerman, *Tulane*
Douglas J. Futuyma, *SUNY/SB*
James A. Gavan, *U. MO*
Stephen J. Gould, *Harvard*
Donald Hornig, *Harvard*
Duane E. Jeffery, *Brigham Young*
Donald Johanson, *Inst. Hum. Origins*
Thomas H. Jukes, *UC/Berkeley*
Patricia Kelley, *U. MS*
Philip Kitcher, *UCSD*
Richard C. Lewontin, *Harvard*
Paul MacCreedy, *AeroVironment, Inc.*
Kenneth Miller, *Brown*
John A. Moore, *UC/Riverside*
David Morrison, *NASA/Ames*
Dorothy Nelkin, *Cornell*
William S. Pollitzer, *U. NC*
Joseph E. Rall, *N.I.H.*
Michael Ruse, *U. Guelph*
Carl Sagan, *Cornell*
James W. Skehan, S.J., *Weston Observatory*
Frank Sonleitner, *U. OK*
Tim D. White, *UC/Berkeley*

A nonprofit, tax-exempt corporation

Affiliated with the American
Association for the Advancement
of Science and the National
Science Teachers Association

President

Robert J. Schadowald
3204 Parkwood Drive
Burnsville, MN 55337

Officers and Directors

Robert J. Schadowald, *President*
John R. Cole, *Past President*
Jack B. Friedman, *Secretary-Treasurer*
Frederick Edwards, *Director*
Wayne A. Moyer, *Director*
Kevin Padian, *Director*
Alvin G. Lazen, *Director*
Laurie Godfrey, *Director*
Ronnie J. Hastings, *Director*
Eugenie C. Scott, *Executive Director*

National Center for Science Education Reports

Membership and Subscription Rates

Membership in the National Center for Science Education Brings You:

- One year's subscription to *NCSE Reports*: 4 issues
- One year's subscription to *Creation/Evolution Journal*: 2 issues
- 15-20% discount on NCSE books
- Participation in NCSE's diverse efforts to promote and defend the integrity of science education

	US Addresses	Foreign	Foreign Air
One year NCSE membership	\$18	\$24	\$28
Tax deductible contribution to NCSE			
Back issues			
NCSE Reports / C/E Newsletter (Vols 1-10, \$3 per issue, \$18 per volume)			
C/E Journal (1 - 9, \$5 per issue; 10 or more, \$4 per issue; complete set, \$60)			
TOTAL ENCLOSED			

Name _____
Address _____
City _____ State _____ Zip _____

Send checks to NCSE, P.O. Box 9477, Berkeley, CA 94709

NCSE Reports sent bulk mail in US, first class to Canada and Mexico, and surface mail overseas.

Are you a Scientist? _____
Are you a Teacher? _____

_____ Please check if you object
to your name being given to
other nonprofit organizations.

Subscriber information

Estimated fair market value of newsletter:
\$10. NCSE is tax-exempt under Federal
IRS Code Section 501(c) (3) and the
corresponding provisions of the California
law. Amounts paid to NCSE are tax
deductible to the extent permitted by law.
Missing Issues - If your issue fails to arrive
or is badly damaged in transit, send us the
date of the issue, and we will rush you a
replacement.

Moving to a New Address - Let us know of
your new address as early as possible and
we will update your subscription
accordingly. Please allow 4 weeks for an
address change.

Please mail all correspondence about your
subscription to the following:

NCSE
P.O. Box 9477
Berkeley, CA 94709
(415) 843-3393