

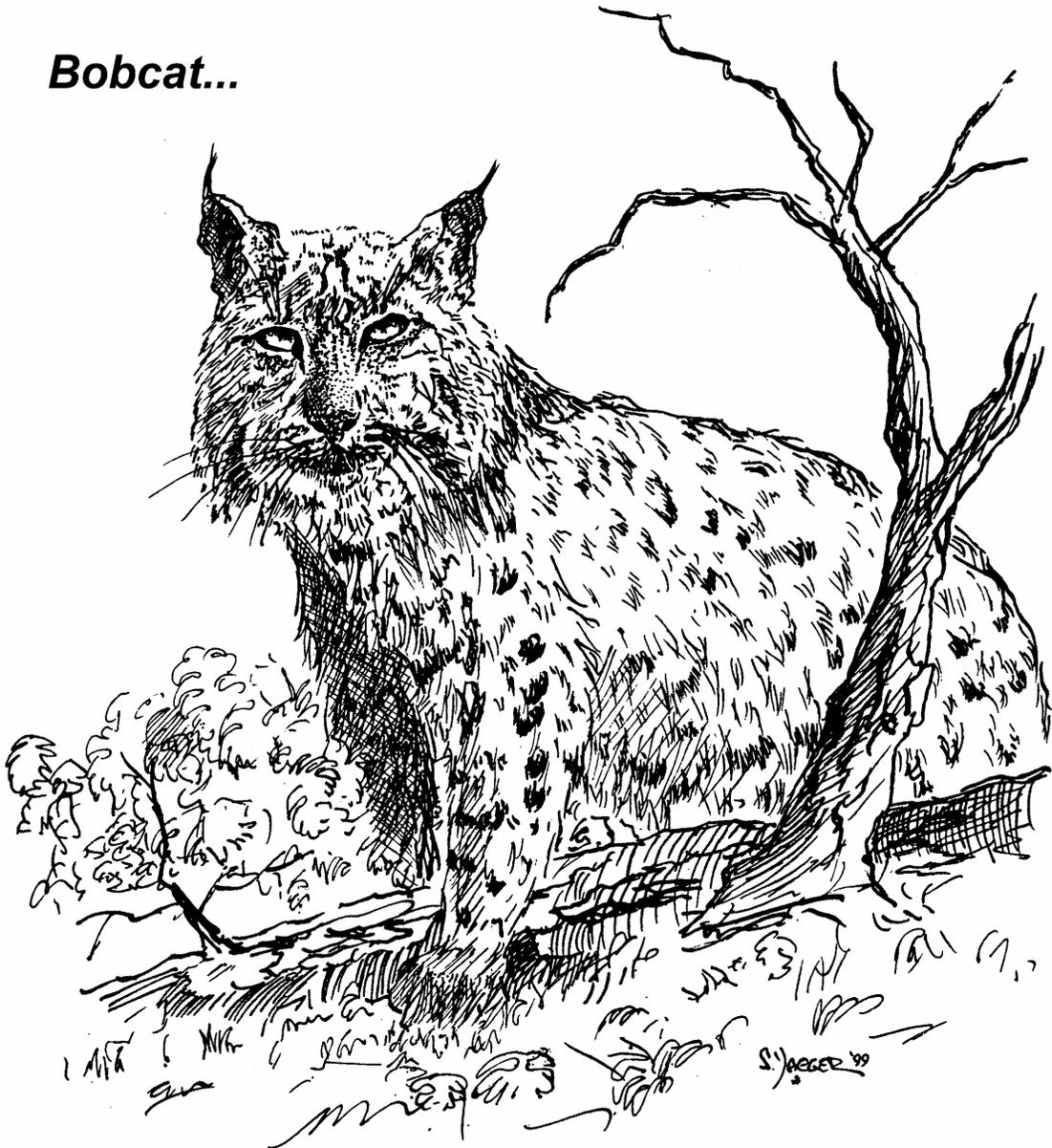
# ADAPTATION

A PUBLICATION OF THE NEW YORK BIOLOGY TEACHERS ASSOCIATION

VOLUME 22

2000-2001

**Bobcat...**



*“An Artist’s View” by Stephen Yaeger.....see page 3*

NEW YORK BIOLOGY  
TEACHERS ASSOCIATION  
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*Last Year's Executive Board,  
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NYBTA PROFILE

The **NEW YORK BIOLOGY TEACHERS ASSOCIATION** is a non-profit organization of professional biology and science educators in New York City and the metropolitan area. Founded in 1899, the Association is an affiliate of the **National Association of Biology Teachers (NABT)**, and a member organization of the **Science Council of New York City (SCONYC)**.

Through its programs and activities, NYBTA assists in the professional growth of those Biology teachers, who are working in our school systems, and provides a climate in which biology teachers can enjoy "doing science". Through publications and mailings, the organization hopes to voice the concerns of science educators in and around the city. NYBTA gives its membership opportunities to meet each other and share thoughts and ideas relative to all biology educators.

Some of the special services and programs of the Association are the following: **Executive Board; Monthly Meetings; Special Events; Annual Techniques Meeting; Otto Burgdorf Student Science Conference and Competition;** and the **Annual Awards Social**.

**Representatives** of NYBTA meet with their counterparts from the National Association of Biology Teachers, National Science Teachers Association, and the Science Teachers Association of New York State. In addition, as a member of the Science Council of New York City, NYBTA plays a major role in the city-wide science efforts that include the annual **SCONYC CONFERENCE** attended by hundreds of science teachers.

NYBTA is an organization that is different, educational, meaningful, and active. The New York Biology Teachers Association offers its members activities beyond their school, opportunities to exercise their creativity, and occasions to share and develop their expertise.

**STATEMENT OF IDENTIFICATION**

This year, **ADAPTATION** is the annual publication of the New York Biology Teachers Association, PO Box 360192, Brooklyn, New York 11236

# AN ARTIST'S VIEW

## Bobcat, *Lynx rufus*

by

Stephen S. Yaeger

The Bobcat is the commonest wild cat in North America reaching an adult size of 26 - 36 inches. The relatively short tail, which normally reaches a size of 5 inches, has a black tip ending in a small tuft of white. Its body fur varies from dark brown to light brown (the color may be a reddish brown in some individuals) with black streaks and spots. Its underside is white with a spotted belly and the ears sport small tufts of fur. It will adapt to a variety of habitats including canyon settings, forests, swamps, mountains, and chaparral with forest dwellers having the darkest coloration. Bobcats are often mistaken for the Lynx (*Lynx lynx*), but unlike the Bobcat the Lynx' spots are less obvious and the tip of its tail is completely black.

A good swimmer and climber, the Bobcat is a solitary animal and hunts in selected areas that are abundant in prey such as rabbits and hares which are its favorite food. In a pinch it will hunt and feed on almost any mammal it can catch and, too, any reptile or bird. It has been observed entering caves occupied by bats where it is able to catch them.

Denning sites such as caves, rocky ledges, hollow logs, underbrush or any well protected site is favored by the pregnant female. Her kittens, usually three, are normally born in the spring, but those individuals living in the southern part of their range may have a second litter later in the year.

*Stephen S. Yaeger is a retired biology teacher and a member of NYBTA. As a wildlife artist, Stephen has made significant contributions to the Association with his work featured in and on the cover of ADAPTATION, and in the NYBTA Calendar.*

# BASIC SKILLS IN SCIENCE (#65)

by  
DON ABRAMSON

## NUTS AND BOLTS

So you want to be a teacher (or you're new and need some help, or you've been teaching for awhile but your techniques and style don't seem to be as effective as they once were). You've taken umpteen Ed courses loaded with idealistic theory, but no one ever told you how to prevent a piece of chalk from screeching on the chalk board (Break the chalk to change the length of the vibrating column...) or how to remove an errant pigeon that has just flown into your classroom (Open the windows from the top, turn off the lights and then use the window pole to stir that avian adventurer into flight...). So here are some "Nuts and Bolts" ideas that I hope will be of use.

1. The First Day: You're new in the building. Did you check to see where the faculty restrooms are? Have you matched up all your keys with where they fit? Have you figured out yet who the most important adults in the building are? No – it's not the principal or your immediate supervisor. It's actually the secretaries who will cover for you when your paperwork is overdue, scrounge scarce supplies for you (scotch tape and a stapler are premium items) and give you the nod when the district superintendent is about to set foot inside the building. Is your wallet or pocketbook safely locked and tucked away (versus the plaintiff cry, "But I only left it there for a second!")?

2. The First Day: The students arrive. After they fill out their Delaney cards,

you can assign them to seats alphabetically (recommended but not mandatory). Allow for physical limitations based upon a note from home. You might want to reverse the alphabet so that the W, X, Y and Z's get a chance to experience the "joys" of a front seat.

3. The First Week: What's the most important thing you can do in the first week? It's so obvious, or it should be. Learn their names! That's why assigned seats are so important. Make out a seating chart so you can move away from your desk. Call students by their names so that they become familiar and then, at the end of each period, cross off the ones where you can visualize a face to go with a name (... "Mom, that new teacher already knows my name!").

4. The Class Clown and the Quiet One: Did it ever occur to you that they are really two sides to the same coin? It has to do with wanting, needing and gaining your attention. Each student must be worked on privately, without an audience (... "Marie, may I see you a moment at the end of the period?").

5. Confrontations, Real or Potential: Remember, you're the adult. You don't have to protect your ego and "save face" (... "Hey, teach, why'd you send that note to my mother?").

6. Starting a lesson:

(a) *Review*: Isn't it reasonable for your students to want an idea about how this day's work relates to what has gone before?

(b) *Story Time*: I keep a biology history book near my desk as I plan lessons.

Did you know that...

...an accidentally discharged musket opened the door to an understanding of gastric functioning (Check out Dr. William Beaumont and his patient, Alexis St. Martin.)?

...Louie's wife was always complaining about the noise made by all those crazy dogs he kept in the basement (Check out the story of rabies.)?

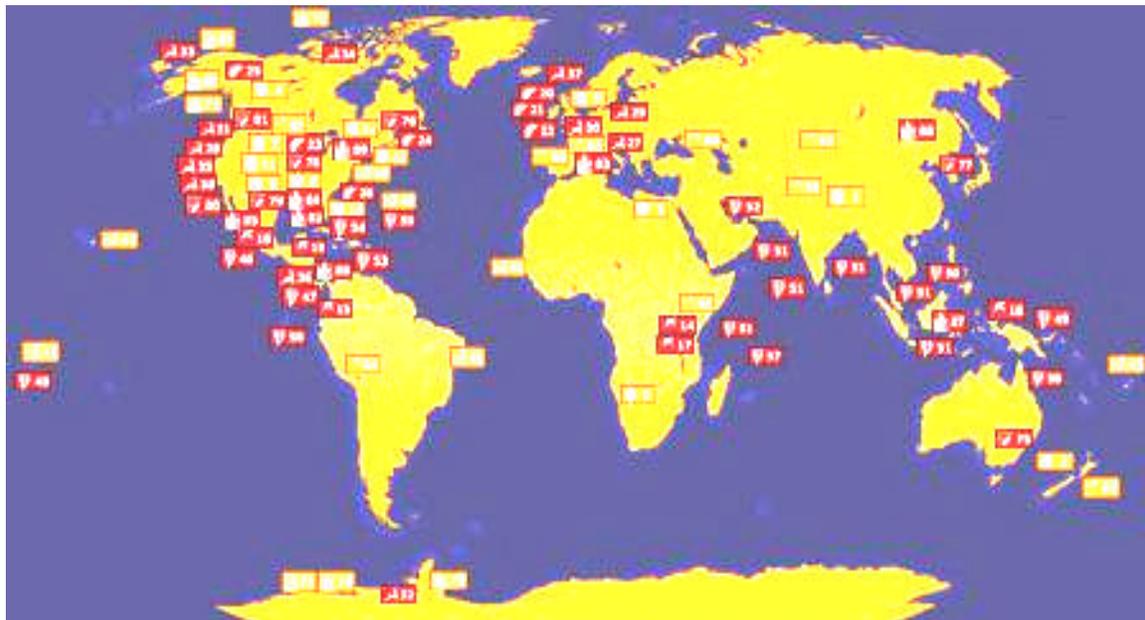
...people in the small Dutch town of Delft – in the 1600's – had to get used to Anton coming up to them on the street to ask them if he could get a scraping from their rotten teeth to look at under his lenses (Check out early microscope development.)?

7. Lunch: Sooner or later, dieting or not, you're going to end up in the teachers' cafeteria. Who do you sit with? Of course, if your supervisor extends an invitation to join him/her you don't have much choice. Otherwise, watch out for the old-timer whose main topic of conversation includes pension plan options and the latest union contract negotiations. Look for colleagues who share your teaching enthusiasms and will listen sympathetically on your down days.

In summary, if teaching is to be a respected profession, don't we have the responsibility to be professionals?

Don Abramson is a former N.Y.C. high school Assistant Principal and Chairman of Science. He is currently an adjunct lecturer in the Biology Department at Queens College, CUNY.

## THE U.C.S. GLOBAL WARMING MAP



<http://www.climatehotmap.org>

# **GUIDELINES FOR ADAPTATION**

## **Authors & Contributors**

- **WRITE AN ARTICLE OR SHORT REPORT ON A BIOLOGICAL TOPIC**
- **SUBMIT A RESEARCH REPORT OR LAB EXERCISE / DEMONSTRATION**
- **SEND IN PHOTOGRAPHS OF NATURE OR BIOTOPIC**
- **IF YOU CAN DRAW – SEND IN NATURE OR BIOLOGY SUBJECTS**
- **HAVE A COMMENTARY OR LETTER TO SHARE WITH MEMBERS**
- **INFORMATION ON EVENTS OF INTEREST TO ANNOUNCE / NOTE**

Articles, Reports, Exercises, Letters, Commentaries or Demos should be 1 – 5 pages including photos and / or diagrams (Longer features will also be considered for publication)

Photographs should be black / white or color and 3x5, 4x6, or 5x7

Authors and those submitting features or photos etc. should identify themselves with title, school affiliation, and brief job description

**All text submitted must be TYPED – DOUBLE-SPACED with 1” margins on standard 8.5 x 11 paper.** If possible, include the work identified on an IBM / PC formatted disk that can be read into WordPerfect for DOS or Windows, MS Word for Windows, MS Publisher or ASCII standard form.

Initial queries and proposals may be submitted to the editor’s snail-mail OR Email address (cleverpig@msn.com)

**Send to:**

*John Cunningham*  
**ADAPTATION Editor / NYBTA**  
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South Elliott Place & DeKalb Avenue  
Brooklyn, NY 11217

**...and consider joining the ADAPTATION committee!**

# **Evolving Debate**

## ***Conflict Widens Over Role of Religion In Public School Science Classes***

**by Steve Benen**

Church & State - October 1998

When the Arizona State Board of Education met in the summer of 1997 to update the state guidelines for science education, there was no reason to believe board members were about to immerse themselves in a bitter and divisive controversy.

Following procedure, the board assembled a group of experts to write and detail the science curriculum for the state. As is generally the case with science education, one of the categories was "life sciences," which dealt with courses such as biology.

But conflict erupted when the guidelines were unveiled and critics noted a glaring omission: the word "evolution" appeared nowhere in the document. It was later revealed that even before the experts could begin deliberations, some board members had made it clear that definitions of how species developed over time could not include term evolution.

Apparently, the omission was the culmination of efforts by members of the board who insisted the science guidelines reflect their personal religious beliefs and a literal interpretation of the Bible. One member, Janet Martin, insisted that "we're

Arizona and we do things Arizona's way. I personally do not believe that man was once a cell in the sea."

It wasn't the first time Martin had tried to interject her personal religious beliefs into the public schools. She had previously written that schoolchildren in Arizona are being recruited as part of "Satan's scheme" to eliminate Christianity from our society and opined that Earth Day was to be held suspect because "Mother Earth" is a phrase used by those involved with "paganism and witchcraft."

This summer the controversy was sparked anew when the science standards were revised. In February, professors from Arizona's three state universities told the board that Arizona's students who graduate from public high schools without understanding the significance of biological evolution are at a competitive disadvantage at the university level. They added that people's religion is their own business but science classes must stick to evolutionary biology to best inform students.

In August, at the meeting to discuss possible revisions to the guidelines, the atmosphere bordered on outrageous, as people in attendance brought large stuffed gorillas, drawings of finches,

placards and creationist literature. After two heated hours of discussion, the board voted 6-3 to add the word "evolution" to the Arizona academic standards, effectively ending the matter for now.

Recognizing that the theory of evolution, developed by Charles Darwin in 1859 with the publication of "Origin of the Species," has been accepted scientific fact in the 20th century, one might perceive the Arizona controversy as an unusual anomaly, more expected in the 1890s than the 1990s. To the contrary, political and judicial arguments over the role of religion in science classes has been a mainstay in America for decades, and those fights continue to rage on right now.

By the summer of 1987, the legal part of the controversy seemed to have been settled. The U.S. Supreme Court, hearing *Edwards v. Aguillard*, ruled 7-2 that a Louisiana statute mandating the teaching of "creation science" alongside evolutionary biology violated the separation of church and state.

Writing for the majority, Justice William J. Brennan, held that the creationism statute violated the First Amendment "because it seeks to employ the symbolic and financial support of government to achieve a religious purpose."

This decision came 19 years after the High Court had ruled unanimously that a 1968 Arkansas law banning the teaching of evolution in public schools was also unconstitutional.

In that case, *Epperson v. Arkansas*, Justice Abe Fortas wrote, "Arkansas' law cannot be defended as an act of religious neutrality....The law's effort was confined to an attempt to blot out a

particular theory because of its supposed conflict with the Biblical account, literally read. Plainly, the law is contrary to the mandate of the First, and in violation of the Fourteenth, Amendments to the Constitution."

But those decisions failed to end the controversy over science education in public schools. What began with the 1925 conviction of teacher John T. Scopes in Dayton, Tenn., for violating the state's Butler Act, which made it unlawful to "teach any theory that denies the story of the Divine Creation of man as taught in the Bible," had culminated in decisive rulings from the Supreme Court. The law was clear: Public school science classes were to teach science, not religion.

Court clarity aside, attacking the teaching of evolution remains high on the agenda of the Religious Right.

As Eugenie Scott, executive director of the National Center for Science Education (NCSE) explains, "It was Andrew Jackson who said, 'The justices have made their decision, now let them try and enforce it.' Court decisions will not always matter at the classroom level. If a teacher is afraid to teach evolution, that teacher won't teach evolution. If teachers think they can get away with teaching a religiously based 'science,' some will try to get away with it."

Increasingly, one of the more common methods for undermining education about evolutionary biology is through state legislatures. In just the last year and a half, six state legislatures have considered legislation to either promote creationism or denigrate evolution in public schools. Religious Right activists approach the effort to get around court rulings on this issue in different ways,

but each is intended to impair lessons on evolution.

In the General Assembly of North Carolina, House Bill 511 would have forced the state Board of Education to "revise the Standard Course of Study in the science curriculum to reflect that evolution is taught as a scientific theory, not as a proven fact."

In Washington State, Senate Bill 6394 mandated that all science textbooks come with a notice stuck to them. This "Message from the Washington State Legislature" would have told students that "any statement about life's origins should be considered a theory, not fact."

In Georgia, the State House considered HB 1210. The bill would have instructed schools, when discussing "any theory of the origin of humans or other living things" to include "both scientific evidence supporting...and scientific evidence problematic for..." the theory being taught.

NCSE's Scott describes these attempts as little more than creative ways to try and get around the law. "Some measures actually call for the teaching of 'creation science,'" Scott said. "Those are easier to deal with because supporters [of these efforts] are told that they are risking a lawsuit that they are going to lose. But some efforts are done with more savvy, avoiding the 'c' word, instead using synonyms."

Scott explained one of the most common methods of attacking science is by suggesting the seemingly academic approach of evaluating evidence for and evidence against evolution. Supporters of this approach make the argument that their plan is "balanced" and intended to inform students of "both sides" of the issue.

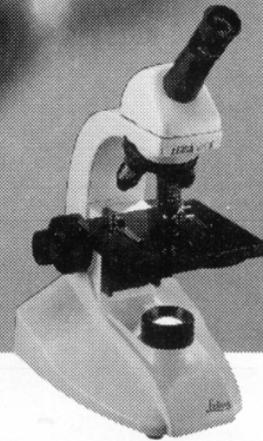
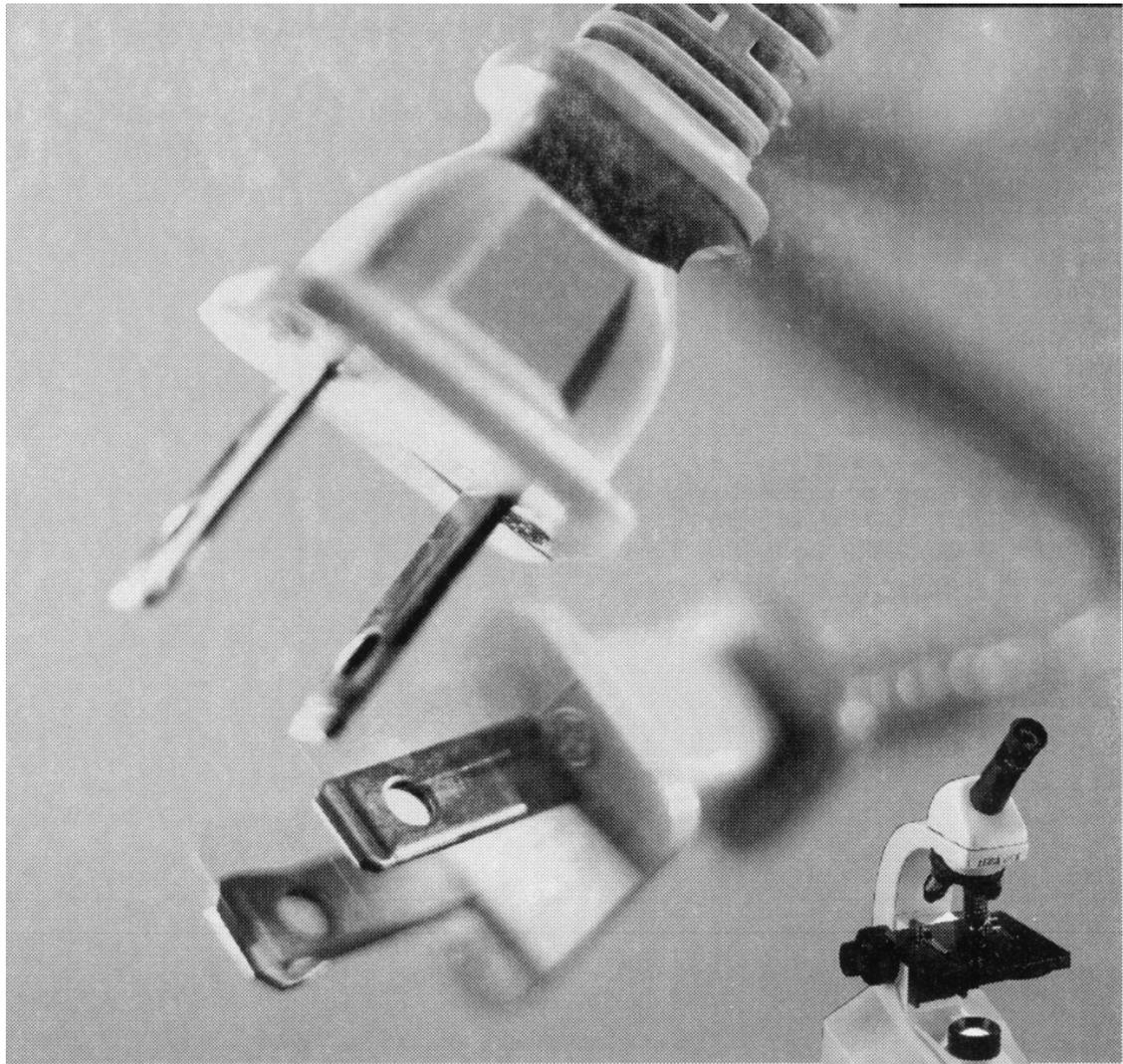
"A closer look at these efforts shows that they are the same as teaching creation science, and they're just pulling the wool over your eyes," Scott said. "They are another way to try and get around Edwards and the First Amendment's Establishment Clause."

Ultimately, legislators usually see through the thinly veiled veneer of these legislative attempts, and the bills fail. However, on occasion, creation supporters take their case to local areas where they find more success and their efforts become school board policy.

For example, the Alabama State Board of Education established a policy in the winter of 1995 requiring that an anti-evolution message be inserted in public school biology textbooks. The "Alabama Insert," as it came to be known, told students that "no one was present when life first appeared on earth. Therefore, any statement about life's origins should be considered as theory, not fact."

In pushing these measures, the Religious Right and its allies in state legislatures hope to exploit public confusion that exists in the public mind over the word "theory." Generally, theories involve conjecture and guesswork, and as such, when people hear the phrase "theory of evolution," they perceive it to be less than definitive.

But a theory can also be well proven and scientifically established — the theory of gravity is an example. In an attempt to assist educators and parents in explaining this and other common misunderstandings of biology, the National Academy of Sciences (NAS) recently published a book titled *Teaching About Evolution and the Nature of Science*. Among the many



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areas covered by the book, the NAS details the scientific use of the word "theory," and how it differs from general use.

"The theory of evolution explains how life on earth has changed," the book explains. "In scientific terms, 'theory' does not mean 'guess' or 'hunch' as it does in every day usage. Scientific theories are explanations of natural phenomena built up logically from testable observations and hypotheses. Biological evolution is the best scientific explanation we have for the enormous range of observations about the living world...Scientists can also use the word 'fact' to mean something that has been tested or observed so many times that there is no longer a compelling reason to keep testing or looking for examples. The occurrence of evolution in this sense is a fact. Scientists no longer question whether descent with modification occurred because the evidence supporting the idea is so strong."

Despite scientists' attempts to clarify the details of the debate, evidence suggests that the Religious Right's continued drive to call evolution into question may be working.

In one of the first studies of its kind, University of Cincinnati public opinion researcher George Bishop compared Americans' beliefs about evolution with other countries. In results released in August and published in *The Washington Times*, Bishop found a plurality of Americans accept creationism over evolution.

His research showed about 45 percent of Americans believe that God created humans "pretty much in [their] present form at one time within the last 10,000

years," 40 percent believed humans evolved but that God guided the process, and 10 percent believe that humans developed over millions of years from less advanced forms of life but that God had no part in the process. Bishop noted that respondents in England, Germany, Norway, Russia and the Netherlands all ranked "significant lower" than U.S. respondents in their support for the literal scriptural version of human development.

"We don't stack up very well as a nation," Bishop told *The Times*. "Religious belief tends to be inversely correlated with what most scientists would say is simple fact."

Perhaps bolstered by these results, Religious Right activists continue to try to force religion into public school science classes — despite court rulings that would suggest that the cause is a losing one.

From its headquarters in El Cerrito, Calif., the National Center for Science Education tracks and monitors these efforts nationwide. In 1997 the NCSE was consulted or actively involved in 57 incidents in 25 states and two at the national level. The previous year was even higher with 67 incidents in 28 states, plus three at the national level. Scott noted that election years tend to be even more active for her organization, because "many politicians have to appeal to a conservative base and can do so with this issue."

1998 would appear to be consistent that trend. According to Molleen Matsumura, the NCSE's network project director, the organization has already monitored 40 incidents through the end of August, which translates to over one controversy every week and suggests

that this year will be even worse than last year.

Describing the current state of the controversy, Scott said, "We're running fast as we can just to stay in place. We are running flat out. One doesn't want to sound alarmist, but we may even be slipping back."

Numerous Religious Right leaders have jumped on the anti-evolution bandwagon. Generally, groups such as the Christian Coalition, Focus on the Family and D. James Kennedy's Coral Ridge Ministries all are active in attacks on science. Phyllis Schlafly's Eagle Forum, a Religious Right group headquartered in Alton, Ill., has also taken a high profile in its anti-evolution efforts.

It was the Eagle Forum which was not only involved with the anti-evolution "warning labels" for Alabama science textbooks but also established a letter writing campaign in Texas to influence the state board of education textbook adoption policy. Eagle Forum activists encouraged the selection of books that had the least amount of information on biological evolution.

Joining these Religious Right groups, a number of right-wing critics of evolution have joined the crusade. They include political pundits such as Irving Kristol, William F. Buckley, Jr. and Robert Bork. In particular, Philip Johnson, professor of law at University of California, Berkeley, has perhaps taken on the highest profile and most active schedule of those attempting to advance an anti-evolution agenda. In addition to an appearance on PBS' "Firing Line" alongside Buckley, Johnson has written creationist arguments for Focus on the Family publications and authored two anti-

evolution books, *Defeating Darwinism by Opening Minds* and *Darwin on Trial*. In fact, to help persuade members of the Alabama State Board of Education, the Eagle Forum presented each member of the board with a video of Johnson's arguments against the teaching of evolution.

Furthermore, there are organizations that work exclusively to promote creationism and defame evolution in public schools. Groups such as the Institute for Creation Research are extremely active, providing books, filmstrips, and other materials to schools to help raise acceptance of "creation science."

The Institute is a ministry with a specific fundamentalist agenda. Institute President John D. Morris writes in the organization's literature that acceptance of evolution undermines religious belief. "Our world, our church, our schools, our society, need the truth of creation more than ever," Morris explains. "We see the wrong thinking of evolution having produced devastating results in every realm. Our passion at the Institute for Creation Research is to see science return to its rightful God-glorifying position, and see creation recognized as a strength by the body of Christ; supporting Scripture, answering questions, satisfying doubts and removing road blocks to the Gospel."

Additionally, the Institute for Creation Research has founded a graduate school. As they explain it, the school exists to "train students in scientific research and teaching skills, preparing effective warriors for the faith."

Robert Simonds, who heads Citizens for Excellence in Education, another Religious Right group that has targeted public schools in general and evolution

in specific for aggressive attack, has said that teaching evolution will hurt students until their "faith in God is permanently crippled or it dies."

Simonds goes so far as to declare that evolution's existence in school curricula "wears on a child's mind until faith in God and Biblical principles simply breaks down and becomes extinct." Simonds then concludes, "Satan has then won!"

But many defenders of evolution point out that there need be no conflict between science and religion. Religious leaders and groups ranging from Pope John Paul II to practically every mainline Protestant denomination see no inherent contradiction between a divine purpose for the universe and the scientific data for evolution. (Several statements from faith groups supporting evolution appear in the NCSE's book *Voices for Evolution*.)

Nevertheless, the attack on evolution goes on. The combination of powerful national Religious Right groups working with grassroots activists makes for a dangerous combination.

When asked who represents the single biggest opponent in the continuing evolution controversies, Scott explains, "There's not a single target. We're dealing with a grassroots effort with people who find evolution inherently wrong. Information may be produced at the national level, but it lands on fertile soil.

"The more serious concern is 15 years down the road with people like Philip Johnson who are attempting to present these materials at a university level," Scott continued. "In science departments, these [ideas] are going nowhere. But in social science,

philosophy, and humanities, books like Darwin's *Black Box* by [evolution critic] Michael Behe are appearing.

"Professors will teach with these books," she added, "providing a subtext of science, or history of science, but the professors may lack the science background to present all of the information in context, explaining that this may be an interesting social conflict, but not that the science is wrong. "As a result," Scott concluded, "bright, educated college graduates will leave universities believing that something is wrong with evolution. These people will be voting for school board, or running for school board, or even state or national office because that's what educated people do. If we have our leaders believing that evolution is a 'theory in crisis,' then we have an even bigger problem than Bob Simonds and the Religious Right."

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### **TWO NEW COLUMNS!**

#### ***A CALL FOR ARTICLES***

Starting with our next issue (Fall 2000) *ADAPTATION* will offer two new opportunities for membership to share ideas & experiences with your colleagues:

1. "Veterans Column": A forum for long-time teachers to speak their peace about emerging issues in Biological Education.
2. "No Surprise": Teachers! Here's your chance to praise students, colleagues (and even administrators!) for the seemingly amazing things they do for the furtherance of solid understandings about the "living environment. Please follow *Guidelines* on pg. 4

# NABT AFFILATES CORNER

by

Thomas O'Brien

I looked forward to the 1999 National Association of Biology Teachers' Convention. It was held October 27-30, 1999 at the Tarrant County Convention Center located in the beautiful historic downtown district of Fort Worth, Texas. That year's convention theme was "Biology a Century of Discovery."

The 1998 National Association of Biology Teachers 1998 Convention and Exhibition was held at Reno, Nevada, November 4 thru 7, 1998. This convention was a blueprint for professional growth for all those in attendance. There was a wealth of activities with provided us with opportunities to share insights and experiences with our colleagues from across the nation and to develop new networks with individuals representing various sections, middle schools to four year colleges.

The convention central theme was the topic of evolution. The Society for the Study of Evolution sponsored a symposium and two pioneers in evolution education, Susan Epperson and Don Aguillard shared their experiences in court battles that shaped

the modern teaching of evolution. There were many hands-on workshops and special activities from the newest hands-on biotechnology activities, content updates in Neurobiology, and strategies for using multimedia technology.

Of special interest to field biologists were the field trips to Reno/Lake Tahoe attractions. One trip to Pyramid Lake provided a stop at the State of Nevada's Wild Horse Corrals. Another, allowed us to enjoy a guided walk through the beautiful Oxbow area on the banks of the Truchee River. A highlight of the field trips was a trip into the Sierra's to Lake Tahoe. On our return, seventy biologists in two chartered buses were snowed in at Donner's Summit in a blizzard for six hours. Snow plows arrived and we finally reached the hotel at 9:00pm. at the conclusion of the Awards Banquet. All those attending stood and applauded us as we haggard by the ordeal entered the banquet hall. The organizers were good enough to arrange for meals for us. This was an experience to tell your friends and colleagues about.

Dr. O'Brien's writing is as prolific as the energy he gives to his profession. This issue features four articles he submitted to ADAPTATION during the period of time in which the torch was passed from Dr. Anthony DeFina to the present editor. In recognition of Dr. O'Brien's dedication to the student body of Nassau Community College and for his accomplishments as an educator and administrator, he received NCC's *Distinguished Educators Award* in October of 1999. Dr. DeFina, an equally tireless and dedicated teacher, recently accepted an A.P. Science post at Wayne Hills High School, and remains active in NYBTA as an at-large member of the executive board and NYBTA's main link to class *Aves*.

-Ed.

# **National Association of Biology Teachers**

by  
**Tom O'Brien, Ed.D.**

We joined other colleagues, biologist and life science educators representing all grade levels (K-College) at the National Association of Biology Teachers Annual convention, October 25-28, 2000 in Orlando, Florida. This year's convention focused on many exciting workshops, special events, and field trips that utilize many of Orlando's world class attractions. Some of these included the Kennedy Space Center, Bush Gardens, Cypress Gardens, Silver Springs, and Orlando Science Center. The convention has attracted more than 120 exhibitors, publishers, software developers, environmental groups, government agencies, and classroom and laboratory service companies. Workshops featured hands-on

experiences which participants could incorporate into their classrooms.

There were a number of special functions and events which were scheduled for two-year and community college educators. A two-year breakfast (7:15am - 8:15am) was scheduled on Thursday, October 26 and Awards Dinner (6:00pm - 8:30pm) also on Thursday, October 26, 2000. The two-year college section was well attended attracting 300-400 hundred colleagues from colleges across the United States and Canada. New York Teachers is an affiliate of the National Association.

For more information contact (800) 406-0775.

## **WHO IS THIS RETIRED TEACHER?**



# Do You Have the Backbone For This?



**By Kathleen Nolan, Ph.D.**

*This was a Comparative Vertebrate Anatomy course offered last year at the American Museum of Natural History. Kathleen A. Nolan, Ph.D. Assistant Professor, St. Francis College, Brooklyn, NY 11201, Visiting Scientist in the Molecular Systematics Laboratory at the American Museum of Natural History*

Most students were still sleeping. On a very cold morning, just two days after Christmas, 1999, fourteen New York City public high school students decided to brave the fatigue and the weather and get on the subway.

They voluntarily attended a week-long program "Do You Have the Backbone for This?" at the American Museum of Natural History. The students met for two and a half hours each day and participated in a variety of activities related to learning about comparative vertebrate anatomy.

The program commenced with the construction of family trees. There was great diversity among the students (biodiversity!), and four were born in countries other than

the U.S.: the Ukraine, Poland, the Czech Republic, and China. The students (and the instructors!) had relatives and ancestors from Ireland, France, Pakistan, Costa Rica, Mexico, Puerto Rico, Poland, the Czech Republic, the Ukraine, Guyana, and African countries. The students were allowed to make the trees any way in which they wanted to, presented the information in front of the class, and next were introduced to the concept of cladograms. A cladogram is a type of family tree used for all living things that are designed by systematists, the scientists who try to classify organisms by figuring out who is related to whom. When the class was asked, "How do you know that these people are related to you?" one student answered, "We can check the DNA." I assented and added, "But before the technology became available to do that, people kept, and are still keeping records such as birth certificates. However, animals do not have these, so, we look at morphology, and, more recently, DNA, to try to find relationships among them."

Each student pulled a piece of paper that in duplicate from a hat that indicated an animal group that she or he would read and learn about in the Hall of Vertebrate Evolution. After a brief introductory movie about the hall, the students went to work, clipboards in hand. They were amazed at the variety and complexity of vertebrates presented. Many huge specimens, including a placoderm, shark jaw and tortoise, were hanging from the ceiling. The students jotted down information about their assigned exhibit, and even made drawings. They also discovered the interactive computers. After a brief foray into one of the dinosaur halls to check on Tyrannosaurus rex, we went back to the classroom. Everyone made a brief presentation of their findings in front of their newly-made acquaintances.

On Tuesday the students learned a little more about vertebrate skeletal structures and were introduced to the idea of homologous structures. They were asked to hold their arms in the same manner in which they would if they were chickens, and were told that their arms essentially contained the same bones as those found in a chicken wing. (Some of the carpal and metacarpal bones are fused and wings do not have the phalanges that humans have---although they do have a little "thumb"!) The students were then given a Tissue Description Chart on which they were to jot down later descriptions of the various tissues they would encounter, including: color, texture, and function. I asked them a few rudimentary questions such as, "How does one distinguish a ligament from a tendon?" Then we "dug in" and dissected the wings. The students donned gloves first, were warned not to put their hands in their mouths without washing them off after the dissection, and were told of the perils of Salmonella. They proceeded, using scissors and by pulling with their fingers, to take the skin off. Everyone observed the appearance

and texture of skin, (and "bumps" where feathers were), adipose tissue (FAT), nerves, blood vessels, fascia, muscles, tendons, ligaments, bone, and articular cartilage. The students pulled the muscles to simulate muscle contraction, and were amazed when a part distant from the muscle moved! This exercise was well-received, and the students enjoyed filling out the Tissue Description Chart. They were then treated to roasted chicken, as it was getting near lunch time, and we saved bones as we ate for a comparison to the skeleton of a pigeon model on display. The "keeled sternum" particularly fascinated them.

Wednesday and Thursday were our Sus scrofa fetal pig dissection days. Students are always amazed at the length of the small intestines (as long as the height of a basketball player!), which they were careful to separate from the mesentery. I mentioned that the fetus is already producing fecal waste (meconium), and, if a human baby's meconium "leaked" into the amniotic space during childbirth, and, by chance, got into the mother's blood supply, this could be very dangerous. Most students don't know what the function of the umbilical cord or what a placenta is, so they were informed about how these structures work.

When the group began to tire of the dissection on Wednesday, we took a walk through the Hall of Primates, and the scholars later made presentations on their favorite primate family.

On Thursday, they became more adventurous and wanted to break into the skull of the pigs for a closer look at the brains. (This is when you can tell if someone has the capacity to be a surgeon, or will be relegated to hacker status!) Some even attempted to remove the eye intact, a difficult feat indeed! As the class wearied of the dissection on Thursday, I pulled out long-sleeved white T-shirts for them, and diagrams of human skeletons from anatomy

books. I gave them pencils, and they drew their skeletons on their shirts. I had done mine the night before and was wearing it (of course!) so the scientists-turned-artists were able to use me as a model.

They finished their shirts on Friday, and went over the pencil lines with Sharpie black marking pens. I recommend going over the drawing heavily, as mine has faded with washing. The last thing on our agenda in the classroom was the tweezing apart of owl pellets---I recommend breaking them up--four students to a pellet (a bargain at \$2 apiece)---which I finally got to do after hearing how wonderful this exercise was for many years! This was fascinating---I didn't

realize that the bones, including intact skulls, would be so small!

One young lady was very enterprising and asked if she and others could get special tickets to see the live butterflies on display in the museum. The director of our program, Jay Holmes, said, "No problem!" so that is where a lot of students were on Y2 K eve. The closing of the course included lots of group pictures with everyone wearing the same uniform--their skeleton shirts.

The students who completed this course certainly "had the backbone to take this course" and wore them home as well!

## **A BRIGHT FUTURE FOR PECONIC ESTUARY**

**by Tom O'Brien, Ed.D.**

A restoration plan of Peconic Bay and nearby marine and fresh water habitats is on schedule. The future of the region has been enhanced by a number of crucial steps taken by the Federal Environmental Protection Agency (EPA). This is in sharp contrast to just 15 years ago when the estuary of more than 110,000 acres of land and 121,000 acres of water, and its watershed encompassing both surface water and ground water contributing areas was threatened by pollution, over development, and over use.

In recent years, much attention has been centered on the severe environmental degradation of the bays and water ways on the east end of Long Island, New York. One of the last great natural treasures, Peconic Estuary and surrounding habitats have survived the onslaught of many years of ground water contaminates, and surface water and storm water runoff laden with

pathogens, toxic chemicals, and excessive nutrients threatening extensive damage to this region. Until February 1987, when the National Estuary Program (NEP) came into existence, east end residents and commercial fisherman thought there was little hope for these habitats, living resources, water and sediment quality, and land use. For example, the brown tide had nearly destroyed the entire scallop industry seriously impacting the economy of the region.

More recently in September 1992, the EPA designated the Peconic Estuary as an "Estuary of National Significance." This action paved the way and was vital for federal funding a study leading to a plan for the implementation of the Peconic Estuary Program. Current plans are for a release of a comprehensive conservation and management plan for the region by August

2000 and implementation to start soon there after.

The Peconic Estuary Program has been the result of a vision of many various stakeholders: citizens and environmental groups, business and industries, academic institutions, and local, state, and federal governments. Its aim is to upgrade the water quality, habitats, and increase the productivity of endangered, threatened or economically important species and restore the diversity and quality of ecological communities of the Peconic Estuary.

Focus of the management plan will be on six aspects of the study. They are (a) brown tide, (b) nutrients, (c) habitat and living resources, (d) pathogens, (e) toxic chemicals, and (f) public education and outreach. Most prominent of these aspects and the issue that prompted the establishment of study groups, emergence of business and citizens groups, and most significantly a reaction of the commercial shell fishing industry, was the brown tide. Brown tide blooms started appearing in the summer of 1985 in the Peconic Bay. The presence of the bloom caused by the marine phytoplankton (microalgae) Aureococcus anophagefferens is a serious problem for bay scallops, and also but to a lesser degree hard shell clams, finfish, and eel grass. Blooms of microorganisms are not new to scientist but the brown tide is unlike other algae blooms in that this phytoplankton has an accelerated reproductive cycle resulting in dense cell concentrations and the blooms persist longer than usual. Also what was not clear was the reason for its sudden appearance and unknown cause(s). The research was focused on various aspects of the brown tide hoping to unlock its mysteries. As a result, the national media attention triggered and funded studies on many fronts which

resulted in discovering and documenting other problems threatening the region such as the Pine Barrens development and land use resulting in the conservation movement.

What is considered by some a more significant result of these studies was the development and establishment of the National Estuary Program. As a result of national media attention and the concerns raised by local congressman and government officials, Congress recognized the importance of preserving estuaries such as Peconic and amended the Clean Water Act establishing the NEP in 1987. The purpose of the amendment was to develop a watershed-based comprehensive management plan for National Estuaries threatened by pollution. Currently there are 28 estuaries in the program. The Peconic Estuary Management Program will serve as a model for future studies. If interested in learning more about the Peconic Estuary Management Program and future plans, contact the Public Participation Office at (516) 765-1766.



**RETIREMENT ADVICE FROM  
THOSE IN THE KNOW: LAY  
BACK – TAKE IT EASY – LET  
THE YOUNG FOLKS SHELL  
OUT ALL THE ENERGY**

# THE GLOBE PROGRAM



by **Amelia Anderson**

Students at Franklin Knight Lane High School are joining an international network of young people taking scientific measurements of Earth systems and sharing their observations with other students and scientists around the world using state of the art technology.

Franklin Knight Lane High School is joining the Global Learning and Observations to Benefit the Environment (GLOBE) Program, an international science and education partnership. GLOBE students are contributing to a better understanding of the planet by making regular observations at thousands of locations around the world and sharing their information via the Internet.

Mrs. Amelia Anderson attended a workshop with GLOBE scientists and educators for instruction on the measurement procedures and the GLOBE computer technology system.

## **“EVERYTHING IS POSSIBLE”**

Students will select a study site near the school where they will take regular

measurements of various atmospheric, hydrological, biological and geological features. The students will then send their findings via the Internet to a GLOBE data processing facility. Their data will then be combined with the input from other GLOBE schools around the world and with other science sources, such as satellite imagery, to create dynamic, on line images of the Earth. The GLOBE student data is available to the general public on the World Wide Web at <http://www.globe.gov>.

The GLOBE program is jointly funded and coordinated by the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the National Science Foundation, the Environmental Protection Agency, and the U.S. Departments of State and Education. The local support for GLOBE activities is being provided by Queens College.

For more information, contact Mrs. Amelia Anderson (718) 647-2100, extension 3470.

# The West Nile Debacle

by  
Tom O'Brien, Ed.D.

The headline read “Nassau Spraying in Doubt,” one of many newspaper articles appearing in Newsday during the summer of 1999. After many days of confusion, dissemination of misinformation, frustration, legal haggling, and a court injunction, would Nassau County finally be able to take appropriate action and attack a disease spreading mosquito? Already there were 56 confirmed cases of West Nile Encephalitis in New York City and the Metropolitan Area. This was strong evidence that West Nile Virus had penetrated Nassau County. There were also confirmed reports of finding at least 500 dead birds, mostly crows, some geese and pigeons infected with the virus. This caused a New York State Health Department official to declare this situation a “Public Health Threat.” Why wasn’t this matter resolved early on? There was evidence to support the need to take some action.

A major issue of concern was the fact that Federal, State, and local health officers waited and delayed the spraying. Many Nassau County residents were upset that it took so long for the County Health Department to come to the realization that encephalitis was affecting many people. Residents felt that the problem had spread and was out of control because it went ignored for so long. However, the delay continued because a major controversy developed over what type of spray should be used. In Nassau County, officials were deciding whether to use Anvil or Malathion. They had hoped that they would be able to determine which would have fewer health risks for residents. However, the decision

was not made quickly enough. The spraying just got pushed back again and again, and the disease began to spread.

Moreover, people were concerned that aerial spraying, especially on the south shore of Long Island would cause harm to the marine life. Many area residents who did not want the spraying to occur, were hoping that the cold weather would delay the spraying indefinitely. What residents did not know was that if the county was unable to spray, the potential for the mosquitoes to return in the spring would be greater.

Interestingly, as fast as this issue appeared in the daily newspaper, radio and TV, it disappeared. Apparently, there seems to be little concern for the future. The West Nile incident on Long Island and nearby communities during the summer of 1999 should have been a wake up call. This incident demonstrates that the county was not prepared. Is the county prepared to deal with an invasion of another unknown and/or more serious and unfamiliar disease? There was a lack of planning and coordination. Was this just a tip of the iceberg? Could this be repeated next summer?

A consensus of various media and public relations experts feel that most residents, politicians, and government officials were not sure about what course of action would be the most effective measure. One that would have the least impact on the environment. The primary reason for this problem was the result of lack and depth of conceptual understanding of those aspects of the issues. This was a complex issue that

required input from individuals trained in ecological and environmental sciences. As a result, there was a lack of determination and confidence about the subject by individuals in leadership roles. Delays occurred primarily because of insufficient data and research. Residents were confused and frustrated by the contradictory statements from various public officials.

A number of departments and support personnel with the responsibility to provide input on environmental and health issues have been cut over the years, for lack of funding. Year to year public officials bridged budget gaps by eliminating staff believing that they were expendable. The 1999 summer West Nile debacle was a result of understaffed Federal, State, and Local agencies and departments. What remains is a staff that was over burdened

and over taxed and had little or no time to study carefully the situation. They are concerned with the immediate demands of the day to day upkeep of the department. They are more tactical in nature reacting to each crisis, and very little planning and policy development goes on.

Hopefully, this event has provided an opportunity to reexamine our short comings and realize that the environment plays an important role. We are vulnerable to attack by another invasion of a disease in the environmental setting. We should urge the media to rekindle the urgency for public officials to act appropriately. A plan must be developed. Input from environmental experts along with others is needed to safeguard our fragile environment and ecosystems.

## **A MESSAGE FROM THE PRESIDENT Norman Cohn**

I have always admired the role of the leader, president or director of any group or organization asking myself, "What do we all admire about the person who is put in charge of a group of individuals?" What are the attributes of a successful leader? As the new President of the New York Teachers Biology Association I want to direct our membership into preparing ourselves into the profession that can assist the new teacher, established teacher and people interested in the field of Biology education to meeting the new requirements and standards as outlined

by the New York State Department of Education.

I want every teacher to believe in themselves and know they are doing the best possible job in their individual school. The new standards have outlined the goals that are obtainable but have to be addressed to the students who are reading at grade level, some who are of honor quality and the new immigrant who has problems understanding and writing the English language. Students with personal problems, family responsibilities, tragedy in their past and

present lives are some factors that are woven into the path toward a high school diploma. We struggle with these challenges on a daily basis. How do some teachers seem to meet these challenges? What is their key to success?

An issue I must address with everyone is SAFETY in the laboratory and classroom environment. Every science classroom and lab must be equipped with a fire extinguisher; fire blanket, first aid kit with instructions, and an eye wash station. Does your room meet the OSHA, PESH, Fire Department codes and regulations? Should all Science teachers be trained in first-aid, know how to use a fire extinguisher and fire blanket if this equipment is required in the science classroom and laboratory? Should the Board of Education require every Science teacher be C.P.R./First-aid certified?

Let's look at reality. With every student required to take Regents Science courses how can we maintain a safe environment if the teacher is not given the proper training and equipment? What are the legal consequences of the science teacher who has a first-aid kit but never took a first-aid course? How many teachers know how to identify and respond to emergencies involving difficulty breathing, bleeding, burns, unconsciousness, or the need for C.P.R.?

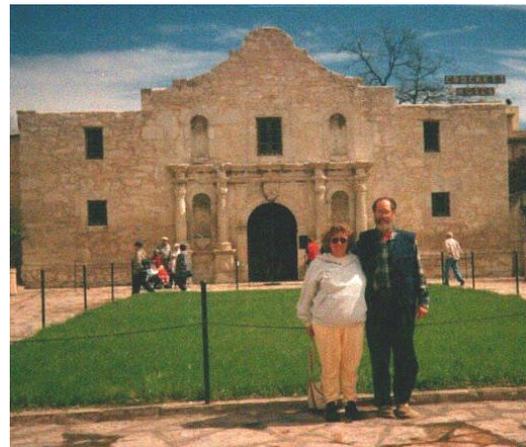
I never had an accident or a student getting hurt in my class or lab. Can it happen in the future? Will I be prepared?

I am now looking into the future. My students will mature into scientific literate adults that will be able to make the right decisions for themselves and their children. I hope to be part of the

process that can feel the Biology I have studied, taught and applied will contribute to a better environment and life for all of us. Let's make the New York Biology Teacher Association into a model of people who have a passion for teaching science and can establish their presence as a positive experience in all the minds of their present and future students.

Wishing all a healthy, happy year with no more threats to our lives, cities, or health. Let us look forward to preparing ourselves and students for a self-fulfilling, productive future.

### **WHAT ARE THESE TWO RETIRED TEACHERS REMEMBERING?**



**A STATEMENT OF SUPPORT  
FOR THE KANSAS BOARD OF EDUCATION'S DECISION TO  
ADOPT NEW SCIENCE STANDARDS FOR  
K-12 STUDENTS IN KANSAS**

Feb.14,2001

Our organizations join together to applaud the Kansas State Board of Education for its courageous decision to overturn the actions of the previous Board and reinstate the study of the origins of life and the cosmos to the state science standards.\* We commend the members of the team that prepared the science standards both for their collective decision to disavow the revised standards that were accepted by the previous board and for their continued work to prepare the latest version that the Board of Education has just adopted. We especially applaud the actions of the citizens of Kansas, who debated the previous Board's decision and then elected members to the Board who had declared publicly their intention to reinstate these critical scientific ideas to their science standards.

Students in Kansas once again will have the opportunities to explore and understand what have become important foundations of modern life, earth, and physical sciences and will be better prepared to be productive members of our increasingly scientific and technological world.

Our examination of the recently approved science standards has convinced us that this document embraces modern science and is consistent with national efforts to improve science education. These standards can and should serve as a model for other states that are

considering revising their own standards. We are pleased and enthusiastic in now granting copyright permission to reference or use text from our documents in the Kansas Science Education Standards.

Mary Good, Bruce Alberts,  
Arthur Eisenkraft

American Association for the  
Advancement of Science  
National Academy of Sciences  
National Science Teachers Association  
Council of the National Academy of  
Sciences

*\*By way of background, we provide this recap of the matter:*

On September 23, 1999 the Presidents of the American Association for the Advancement of Science and the National Science Teachers Association, and the Chair of the National Research Council issued a joint statement denying the Kansas State Board of Education copyright permission to reference or use text from our documents in Kansas' revised science standards. Our decision was based on the previous Board's decision to approve science standards from which topics related to the origins and evolution of the cosmos, earth, and life on earth had been removed or substantively revised. A copy of that statement is appended.

Our response to the actions by the majority of members of the Board of Education was one of many voices of protest that arose from the education

and scientific communities. Those protests emphasized that studying the origins and evolution of the physical and biological universe has long been an accepted and respected component of scientific investigation. Based on compelling evidence, the overwhelming majority of scientists and science educators accept evolution as the most reasonable explanation for the current diversity of life on earth and the set of processes that has led to this diversity. Scientists and theologians also agree

that scientific and religious explanations for the evolution of the earth and life on this planet are not incompatible. By removing critical and well-accepted scientific explanations for the origins and changes in the living and physical worlds from the state science standards, students in Kansas would have been denied opportunities to explore and understand what have become important foundations of modern life, earth, and physical sciences.

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## **IS THERE LIFE AFTER TEACHING? THE CONTINUING SAGA OF SARAH AND ALLEN ROLNICK**



Jan 5, 1999  
Hi!

It is cold here in Miami Beach, but it expected to warm up tomorrow. We spent the past two weeks in the keys. We got our scuba certification in Key Largo and scubaed the coral reef. We were joined by Jennifer, Beryl, and Daniel who also completed the open water part of our scuba training which began in October in Lynbrook, NY [except for Dan who did all of his scuba stuff in Raleigh, NC and just scubaed around while the rest of us were being certified]. The weather was warmer then, around 80 degrees by day and the low 70s by night. We went to Key West to welcome in the New Year and watched the 'giant conch'

drop on the roof of Sloppy Joe's Saloon. The crowd was pressing, but unlike Times Square, many revelers wore shorts and many were drinking. What appears to be a tradition there: Champagne bottles were popped at the stroke of midnight by many in the cheering throng.

We brought the girls to MIA on Saturday for the flight home and on Monday brought Danny to MIA for the flight back to Raleigh, NC to pick up his car for the drive back to Atlanta, GA where he is finishing up at GA Tech.

While in the area we visited the Everglades and Big Cypress Swamp. We saw a wonderful assortment of tropical plants and animals. At a wild bird sanctuary on Key Largo, the staff gave us the opportunity to hand-feed fish to pelicans, cormorants, and egrets. We also had the opportunity to go on 'road-kill' patrol with a ranger at the state park.

March 17, 1999  
Hi, y'all!

We had rain and cold weather leaving Tyler, Texas heading east and for the next three days. We holed up in a casino on the Red River through Shreveport, La. The van, of course, stayed in the parking lot where we

were allowed to spend the night. Casino security told us that we could stay the week at no charge. We felt that we couldn't afford to stay there that long.

In the last letter, we mentioned up scale restaurants in Dallas. Up scale usually refers to restaurants whose portions are sparse for cost.

Our definition of 'up scale' referred to restaurants that provided a tablecloth. Over time we have had to modify our definition to include those restaurants that use Kraft paper to cover their tables. Our current definition of 'up scale' refers to those restaurants in which one places the order directly to a person and not shouting into a clown's mouth.

We visit a lot of zoos and you're probably wondering why we visit so many - aren't the animals all the same? Visiting a zoo is like playing golf: you have a good walk. But at a zoo, no one is keeping score, you aren't pressed to hurry by those wanting to play through, and you often get a chance to feed some goats. Also, the wait is shorter.

We spent some time in the Caldwell Zoo in Tyler, Texas; a small zoo. The most popular animals are found in all large zoos, but smaller zoos often display regional animals which big zoos don't have. Not only are we interested in seeing different and unusual animals, but we also like to see the creative ways

in which they are exhibited. [Of course the Bronx Zoo is the best (with the Milwaukee and San Diego Zoos in 2nd & 3rd.) and some zoos are so small that if the animal gets sick or dies, they have to close the zoo.]] For example:

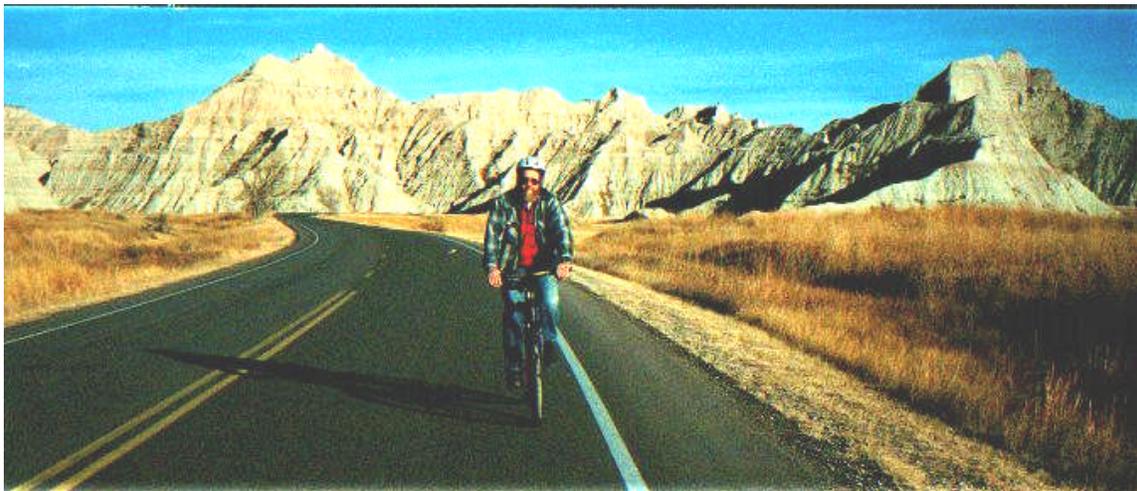
The Texas Zoo in Victoria displays only Texas animals.

The Omaha Zoo has the best penguin enclosure. Their tiger exhibit building is top notch, too.

The St. Louis Zoo has the original Victorian buildings from the 1876 Centennial Fair. The insides have been artfully redone. It is the best-looking zoo that we've visited.

The Caldwell Zoo in Tyler has the best-designed African Veldt that we've seen anywhere. Using artificial streams and hidden dry moats, lions, elephants, giraffe, cranes, and antelope appear to be together on the plain. But there is more: On the edge of the veldt a 'stream' turns against a glass wall. Through the glass one can see the fish in the 'stream' and the wading birds along the shore (separated from the other animals by another glass wall). While there we also visited the petting zoo. Sarah likes to feed the goats. I almost got into trouble for feeding the cats; I tried to feed them to the alligators.

We didn't do everything in Texas; we saved some things for another time.



NEW YORK BIOLOGY  
TEACHERS ASSOCIATION  
*Founded 1899*

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The **NEW YORK BIOLOGY TEACHERS ASSOCIATION** is a non-profit organization of professional biology and science educators in New York City and the metropolitan area. Founded in 1899, the Association is an affiliate of the **National Association of Biology Teachers (NABT)**, and a member organization of the **Science Council of New York City (SCONYC)**.

Through its programs and activities, NYBTA assists in the professional growth of those Biology teachers, who are working in our school systems, and provides a climate in which biology teachers can enjoy "doing science". Through publications and mailings, the organization hopes to voice the concerns of science educators in and around the city. NYBTA gives its membership opportunities to meet each other and share thoughts and ideas relative to all biology educators.

Some of the special services and programs of the Association are the following: **Executive Board; Monthly Meetings; Special Events; Annual Techniques Meeting; Otto Burgdorf Student Science Conference and Competition;** and the **Annual Awards Social**.

**Representatives** of NYBTA meet with their counterparts from the National Association of Biology Teachers, National Science Teachers Association, and the Science Teachers Association of New York State. In addition, as a member of the Science Council of New York City, NYBTA plays a major role in the city wide science efforts that include the annual **SCONYC CONFERENCE** attended by hundreds of science teachers.

NYBTA is an organization that is different, educational, meaningful, and active. The New York Biology Teachers Association offers its members activities beyond their school, opportunities to exercise their creativity, and occasions to share and develop their expertise.

**STATEMENT OF IDENTIFICATION**

This year, **ADAPTATION** is the annual publication of the New York Biology Teachers Association, PO Box 360192, Brooklyn, New York 11236

# ADAPTATION

A PUBLICATION OF THE NEW YORK BIOLOGY TEACHERS ASSOCIATION

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