

GET INVOLVED STAY INFORMED

Edited by Bob Rose



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Bob Rose

This is a testament to some of the positive reasons for belonging to a professional biology teacher's organization. In a largely rural state such as ours, it is common to find only one biology teacher in a school. Caught up in the daily demands of the classroom, the school, the community, and personal needs, it is not surprising that a biology teacher can suddenly discover that he or she is professionally stranded on a classroom island - isolated from biology teaching peers. Unfortunately, the same professional isolation can occur in a metropolitan school system with several biology teachers on the staff. In fact, teaching in a large school, with even larger class enrollments, can sometimes necessitate devoting an excessive amount of time just to keep the ship afloat. Involvement with other biology teachers, other teaching techniques, other teaching

trends, can inadvertently get lost in the tide.

Professional affiliation can enhance your effectiveness and your sense of worth. Belonging to the Kansas Association of Biology Teachers (KABT) will keep you in touch with your closest peers. The KABT offers regularly scheduled meetings, field trips, workshops, update seminars, and other activities designed to help you improve your craft. Three or four times each year you'll receive the KABT newsletter, which is recognized across the nation as one of the best of its kind. Not only does the newsletter bring ideas and information to you from other Kansas biology teachers, but, maybe just as importantly, it invites you to make contributions of your own. Getting some of your ideas into print and in front of other biology teachers is not only a healthy medium for professional growth

The present issue of the *Naturalist* is a result of a trip to the 50th meeting of the National Association of Biology Teachers sponsored by the Division of Biological Sciences, Emporia State University and the Kansas Association of Biology Teachers.

Bob Rose, biology teacher at Wichita Collegiate High School, collected and edited notes of activities from the various participants. Mr. Rose was author of "Raptors in Your Classroom," vol. 34, Nos. 3-4, April 1988, of the *Naturalist*.

Cover Photo: Pat Wakeman (left), President of KABT and Bob Rose (right), KABT Administrative Secretary stand in front of confiscated illegally imported tropical fish at the Shedd Aquarium, Chicago.

The Coleman Charitable Trust contributed \$250 toward the publication of this issue of the *Kansas School Naturalist*. Many thanks.

for you, but it adds strength to the profession at large. The camaraderie that KABTers have established has provided years of professional interchange and personal rewards for hundreds of Kansas biology teachers.

The KABT and the Division of Biological Sciences of Emporia State University are fully aware of the benefits of professional affiliation to individual biology teachers, their respective schools, and the biology profession. Thus, they co-sponsored a KABT contingent to attend the 50th anniversary convention of the National Association of Biology Teachers in Chicago, November 16-20, 1988. Twelve KABT members traveled to the convention together and participated in almost every kind of opportunity available to biology teachers for professional improvement. The remainder of this manuscript is a report on some of the activities that occurred at the national meeting of biology teachers. It is hoped that the evident value of this type of participation in the biology teaching profession will serve to recruit more biology teachers into their professional organizations. More importantly, the authors of these reports sincerely hope that biology teachers can use these reports to get administrative support to help them join and attend biology association functions in the future. The biology teaching profession needs your participation and you. Your school can only benefit from what you take from and what you can give to KABT and its national affiliate, NABT.

The accounts that follow have a double purpose. First, they exhibit the kinds of information you can acquire by

attending a national convention, in this case the 50th anniversary convention of NABT. Second, these are thumbnail sketches of some of the most up-to-date biology information and teaching techniques for biology teachers.

WORKSHOPS

Teachers often pick up on new techniques and lab activities by attending summer classes. However, national conventions offer scaled down versions of how-to courses in the form of workshops. Here are some examples:

#1. Contributions of Women Scientists: Developing User Friendly Activities with a Historical Perspective

The presenters for this workshop were drawn together from across the continent. They represented San Diego State University, the University of Northern Colorado, Kings High School in Cincinnati, and the AAAS in Washington, D.C.

Small groups tried to identify four women scientists from clues on 3" x 5" cards. The four women scientists were Sara Josephine Baker, Gery Cori, Rachel Carson, and Diane Fossey. After the initial exercise, the scientists were briefly profiled and the groups of participants worked on activities related to the research of the four scientists.

Suggested references to follow-up with included: (1) *Women Scientists from Antiquity to the Present: An Index*, by C. L. Herzenbery. 1986. West Cornwall, CT: Locust Hill Press. and (2) *Profiles of Pioneer Women Scientists*, by E. M. O'Hern. 1985. Washington, D.C.: Acropolis Books.

#2. *Exploring with Wisconsin Fast Plants.*

Through slides, overhead displays, and hands-on materials, participants explored the potential classroom uses of the rapid-cycling *Brassic*s. For teachers who have heard about new innovations and equipment for the classroom, attending a workshop using that material can make the decision about whether to invest in it a lot easier.

There is now available to teachers a method of growing plants in a small area in a reduced period of time. Plants from the *Brassica* [mustard] family have been selectively bred for a variety of characteristics, including a reduced life cycle. These plants complete their life cycle in 35 days. Seeds germinate in 2-3 days, flower in 20-25 days, and produce mature seeds in 30-35 days. Plants are available with variations in physical characteristics such as flower color, plant size, and variegation. These plants can be used in activities ranging from general plant anatomy and physiology to genetics. And, because of the simple setup, they can be used in elementary through college classrooms. Teachers can now quickly demonstrate Mendel's principles of genetics without using the elusive fruit flies.

Wisconsin fast plants, as they are called, were developed in the plant pathology department of the University of Wisconsin, Madison. They are presently available from Carolina Biological Supply Company in kit form. There are two important requirements for growing these plants. First, artificial lighting must be supplied 24 hours a day, spaced from two to three inches above

the growing tips. Secondly, there must be a continuous supply of water. Both of these can be handled easily by purchasing materials locally or through supply houses.

#3. *Implementation of DNA Science in the Classroom: A Workshop in Laboratory and Instructional Procedures*

The DNA Literacy Program at Cold Spring Harbor laboratories offers a week-long hands-on workshop each semester for teachers at CSH or through the services of a traveling van called the Vector Lab. The new facility for the DNA Literacy Project includes a teaching laboratory/learning center with a library and computer simulation center. The goal of the project is to increase public understanding of the uses of DNA technology through teacher education and through the dissemination of teaching materials.

This mini-workshop introduced teachers to techniques and procedures used in DNA fingerprinting and restriction mapping. After incubating lambda phage DNA with three separate restriction enzymes (*EcoR*I, *Hind*III, and *Bam*H1) the products of the digestion were separated by agarose gel electrophoresis. The bands were labeled with ethidium bromide and visualized in UV light, and then photographed. Participants learned how to analyze such bands by figuring out restriction maps from several examples of data.

FIELD TRIPS

This convention offered 26 field trips, including nine full-day trips, 13 half-day trips, 3 night trips, and one

special tour/workshop of the Sargent-Welch Scientific Company's manufacturing, engineering, and distribution facility in Skokie, Illinois. Field trips are generally fee supported. This year's daytime trips ranged from \$5 to \$20. Following are some reports of trips KABTers attended.

Argonne National Laboratory

Because of the restricted nature of this facility, participants had to sign up ahead of time and show identification before entry was allowed into this full-day field trip. Teachers were invited to visit individual laboratories within the Argonne National Laboratory's Division of Biological, Environmental and Medical Research facilities. Scientists discussed their research activities and time was allowed for interaction between the teachers and staff scientists. General topics for the trip included: radiation toxicity, carcinogenesis, biophysics, and environmental sciences.

Shedd Aquarium

This half-day field trip was billed as a tour/workshop to introduce teachers to the intricacies of the largest aquarium in the world. The trip itself was divided into three parts: (1) The education curator of the aquarium discussed the role of aquariums and zoos as one of the last resorts for many endangered gene pools. She provided handouts, guidelines, and even a book to help teachers set up their own classroom aquaria and to make best use of them in their curricula. She spoke of lessons to teach tank chemistry, tank physics, tank ecology, and evolution. (2) An

Aquarium staff member shared his expertise on how to set up and maintain an aquarium. He answered numerous questions from the teachers, who seemed to have a plethora of individual aquarium problems. (3) Teachers were led on a behind-the-scenes tour of the operation of the aquarium. With any time left over teachers toured the aquarium along with other visitors that day and perused the bookshop.

GENERAL SESSIONS

Several general sessions were designed for large audiences to listen to experts. Following a lecture there was generally time allowed for some questions from teachers.

Bacteria as Living Organisms: Multicellularity and Responsiveness

James Shapiro, a researcher and author with laudable credentials, asked his audience to consider that bacteria, prokaryotic unicellular organisms, "spend most of their time as multicellular organisms." After assuring us that bacteria are essential for us [humans] to continue living, he presented evidence that colonies of bacteria exhibit division of labor, cellular differentiation within the colony, group activities, self-defense behaviors, and morphogenesis.

Using a combination of film clippings, slides, and VHS tape segments, he exhibited how individual bacteria and bacteria in groups respond differently to the same stimuli. Dr. Shapiro mentioned a variety of mechanisms that function in the eukaryotic cell that also operate in prokaryotes to make the genome responsive to environmental change, e.g., transposable elements, gene splicing,

overlapping sequences of coding, and regulatory sequences.

Perhaps the most challenging proposal from Dr. Shapiro was to our ideas of evolution. He maintained that, in some bacteria, "DNA changes do not occur by accident." [In other words, they are not Darwinian.] While talking about bacteria evolving [developing] resistance to antibiotic chemicals he pointed out that antibiotic resistance is a multicellular phenomenon, where resistance plasmids can be moved around within a colony. These plasmids are capable of directing a wide variety of chemical activities, including "site-specific recombination" of DNA molecules. This apparent manipulation of DNA is important. If Dr. Shapiro is interpreting what he describes accurately, then, as he says, "we're going to have to have a very dramatic change in our thinking about genetics and evolution in general."

INSTANT UPDATES

Instant update sessions allow teachers to listen to practicing scientists share their latest findings. Not only does this "update" the teacher, but it often stimulates after-session debates and gives teachers ideas to share with their students.

The Mechanisms of Memory was presented by Dr. John Disterhoft, Northwestern University Medical School.

Dr. Disterhoft presented evidence that a specific layer of neurons within the hippocampus function as a storage area for the transfer of short term memory into long term memory. The hippocampus receives projections from the parietal cortex. The changes in the

neurons of the CA 1 region of the hippocampus are post-synaptic. Conditioning experiments with rabbits demonstrate that the action potential hyperpolarization is reduced in CA 1 neurons from conditioned animals as compared to controls. Evidence suggests [but does not prove] that this effect is caused by a decreased calcium ion-mediated potassium ion current flow. What is actually changing during learning seems to be potassium ion flow. The region of the hippocampus that receives the projections from the parietal lobe does not demonstrate a reduction in hyperpolarization indicating that the CA 1 region is the transition zone in the storage of short term memory.

SYMPOSIUM

The National Academy of Sciences' Study on High School Biology Education

This was a panel discussion on the future of high school biology education. It was lead by Walter G. Rosen (National Academy of Sciences, Washington, D.C.) and Evelyn E. Handler (Brandeis University, Waltham, MA). After an initial period of panel discussion, the audience generated most of the conversation. Many in the audience had participated in National Science Foundation Institutes of a few decades back. NSF attendees considered those institutes very valuable and would like to see their return. Such institutes could address some of the current problems (see below).

Some of the important issues which were exchanged between panel members and the audience included . . .

1. A primary purpose of biology

teachers must be to teach students how to think [logically], and this takes time. Lack of funding and time limitations within class periods results in pulling back from laboratory experiences. This, in turn, lowers motivation in students. Not only do the students need the experiences of laboratory work, but so do the teachers. There is a real need to involve teachers in doing real research themselves. [A teacher training program which does not require an original research project from the future teacher is delinquent and contributes to the general lack of research and logical thinking that is missing in the high school biology curriculum.]

2. Teacher training programs must increase their effectiveness in preparing elementary teachers to teach science. In order to adequately prepare citizens for our increasingly technological society we must increase the time devoted to K-12 science, from the less than 5% presently being taught to at least 20% in an enhanced educational program. Not everyone in the audience agreed that this was as big an obstacle as the need to enlighten administrators about the genuine need for increased science instruction, especially in the elementary grades. [Kansans who attend the annual spring KATS KAMP, sponsored by our state affiliate to the National Science Teachers Association, will agree that we have plenty of competent elementary teachers eager to teach science. What we lack is administrative support to do it. Which leads to the next item.]

3. The mandate of state and federal level testing may be leading us into teaching toward the tests. This was

generally perceived as an undesirable situation. Biology (and science) curriculum should be internally generated by practicing biology educators and researchers. There is a perceived gap between the practice and the administration of biology curriculum. We may be doing an adequate job of preparing students for the science professions, but failing to adequately [scientifically] educate the students going into non-scientific careers. There is a need to turn around this situation of leading students through biology courses which are designed to meet test standards, but may not be keyed to their future careers, nor even to their geographical regions. This can lead to heated arguments about who's in charge of biology education.

4. The importance of the textbook was discussed. There was a general acknowledgement that the textbooks are improving. For those teachers who do not, or can not, attend workshops, institutes, and conventions, the textbook is the primary mode for them to improve their own biology instructional strategies. Updated textbooks serve to inform teachers of the current status of biology education, to some extent. Modern publishing technology is allowing editors to get up-to-date information in front of teachers several years sooner than was previously possible.

5. A problem needing to be solved right away is inadequate funding. Despite all the "good, new things out there" most teachers can't buy them. Some mechanism needs to be found which will get teachers more purchasing power to acquire new equipment, supplies, and

materials to allow for innovation in the teaching and learning of science.

It is evident that attending a symposium such as this one allows a teacher to participate in important discussions with other professionals from across the nation. The problems, and sometimes solutions, which are common throughout the country can be isolated and confirmed in just this type of interchange. A teacher can relay to his or her own school some of the national concerns and emphasize the appropriateness of the same concerns locally.

The Biology of the Future Confronts the Biology of the Past, by Everett Mendelson, Department of the History of Science, Harvard University.

Mendelson began his review of twentieth century biology by focusing on two quite different voices which have carried through the last half of the century. Francis Crick's strong reductionist position proclaimed optimistically, in 1964, that all biology could ultimately be explained in terms of physics and chemistry. Rachel Carson's more passionate, though fatalistic, tone shown through in her 1962 book, *Silent Spring*. She alerted the world to the impending environmental problems which would face us all, even the non-scientists, in the very near future. Mendelson, quoting from the 1942, *Seashore*, reminded us that "we live in a scientific age but only a few have the knowledge of science."

Tracing the roots to these two strands of contemporary biology even further back to the turn of the century, Mendelson reminded us that in 1903

evolution was thought of in terms of gene mutation. Darwin's theory of natural selection had been eclipsed by the work of molecular biologists and geneticists who thought characteristics were to species as atoms were to molecules.

On the other hand, turn of the century naturalists John Burroughs and John Muir were advocating conservationism and grappling with biological problems in holistic fashions. Anti-urban, anti-modern, anti-industry, anti-reductionism marked the beginning of what would later blossom as environmentalism.

Halfway through the century biologists were using mechanistic and materialistic models to guide their research. Three-fourths through the century \$30 billion had been spent on genetic engineering. Today, as we are on the threshold of the 21st century, the organismic [holistic] view of biology is struggling. Our degree of control over biological technology has not kept up with the questions that need to be answered before we rush forward. What we teach our students today about the history of biology, about the legacy of science, will determine the social and political values they impose on the future of biology.

PAPER SESSIONS

Paper sessions generally consist of two or three 20 minute lectures from NABT members. Usually a collection of related papers are presented within the same room during a period of one to one and a half hours. Presenters include high school teachers, college

professors, other educators, and anybody with interesting topics to present to biology teachers. Typical sessions include slide shows, overhead transparencies, VHS taped segments, handouts, and other standard lecture paraphernalia and techniques. Presenters are seldom hesitant to take a definite stand on a position and use this opportunity to promote their personal and professional opinions.

The following three papers are examples.

Should You Debate a Creationist, by Alfred R. Martin, Illinois Benedictine College, Lisle, IL.

Mr. Martin (not a creationist) is "interested in creationists the same way physicians are interested in cancer." He has made it a personal crusade to attend as many creationist events as possible. And, thus, feels he has a good understanding of the creationist position. Debates between creationists and evolutionists are usually initiated by the creationist faction. Debates generated in this fashion have some common characteristics and exhibit some predictable stages.

First, the title of the debate will pit an evolution "model" against a "creation" model. An agreement must be made that only scientific facts will be allowed. Thus, Mr. Martin contends, an agreement to debate is a concession by the evolutionist from the beginning and sets up a no-win situation. As Mr. Martin points out, debate is only rhetoric. Truth is not a requisite component, though there is often a perceived winner (and loser) in any debate.

Creationists often begin a debate with distorted, if not selective, facts and put the evolutionist on the defensive to explain these often disjointed facts at the outset. Thus, having been put on the defensive, the evolutionist has lost to default. Regardless of the arguments that follow, there will always be distribution of creationist materials at the end. In this way the whole function has served to promote the creationist platform and may or may not result in any dissemination (not to mention understanding) of scientific evidence for evolution.

Mr. Martin clearly states that it is not wise to debate a creationist. He suggests that instead, you (1) speak unopposed, especially after a creationist has passed through your community, (2) attend school board meetings and advocate the teaching of science, (3) join a committee of correspondence concerned with the issue, and (4) write letters to the editor of your local newspapers supporting the scientific "model" of evolution.

Evolution and the Church Today, by Neil M. Baird, Millikin University, Decatur, IL.

Mr. Baird maintained that "students come to us with a hazy understanding of science, evolution in particular, and religion." Representing a religious viewpoint he maintained that, "there are very valid religious reasons for objecting to equal time" treatment of evolution and creationism in the science curriculum. His paper dealt extensively with delineating the separate domains of science and religion in our lives.

As an interpretive biblical scholar,

he reviewed the period of 1500+ years in which the Bible was written by its several authors. That books of the Bible have intermittently been "voted in" and "voted out" are important to understanding the role of the book in our changing cultures. He affirmed that the Bible was certainly inspired, but noted that it was not guaranteed to be "inerrant." Quoting a famous [and maligned] scientist, Galileo, he reminded us that "the Bible shows us how to go to heaven, not how the heavens go."

There are three kinds of creationists. "Quick" creationists maintain that all plants, all animals, the earth, and the universe were created once and for all during a literal six day creation week. Thus, the earth is relatively young, between 6,000 to 10,000 years old. Bishop Usher calculated that the earth was created in 4004 B.C. "Progressive" creationists allow that there may have been many separate but direct creative acts by God through time. There may have been some microevolution (changes within "kinds"), but no macroevolution giving rise to different groups of organisms. They accept the idea of a very old earth. "Gradual" creationists accept that God created the universe, the earth, the first organisms. Then, he turned over the process of creating new species to the mechanisms of evolution. They easily accept the idea of a very old earth. This viewpoint is similar to the theistic evolution position. Theistic evolution maintains that God created the universe. He established and works through natural laws which govern much of the activity in the natural world. God

relinquishes some direct control in this process. There are different views as to the amount of control relinquished and when control is turned over to natural laws.

Some Characteristics of Science not Satisfied by "Creation Science"

1. Science explains observed phenomena by referring to natural law.
2. Science is testable.
3. Science is potentially falsifiable.
4. Science is subject to revision. It is self-correcting.
5. Science is tentative. It is the best working explanation in the present.
6. Science findings are repeatable and universal. It is knowable by other scientists elsewhere.
7. Scientific conclusions are evaluated by scientific peers and then published in refereed journals.

"Creation Science" fails to meet any of the above criteria for legitimate science.

This paper session was so popular that there were not enough handouts to go around. However, the presenter passed around a sign-up sheet and agreed to mail copies of his overhead transparencies and handouts to anyone who asked for them. Thus, some KABTers subsequently received copies of the "Presbyterian Statement on Evolution and Creationism," Jewish "Statement on Understanding Creation in Genesis," a "Statement on Scripture and Science" made by Pope John Paul II, and a "Partial Bibliography on Creationism and Evolution." Needless to say, all of the above are used in support of the valid religious reasons not

to include "creation science" in the biology curriculum.

Human Evolution in the Biology Classroom, by Professor Martin K. Nickels, Illinois State University.

Dr. Nickels, a physical anthropologist (trained at Kansas University) maintains that not only should evolution be taught in the secondary schools, but you should begin your unit of study with human evolution, "the single best example of organic evolution." He proposed to show teachers how to accomplish this in a non-threatening manner.

Acknowledging the innate controversy within this unit, he believes you should start with human evolution because students will be fascinated and you can use the lesson to investigate "what is the evidence for organic evolution" and "what is the evidence for evolution in general?"

Accordingly, we are short-changing students if we don't get them to understand what they object to. Professor Nickels offers fossils as the best starting point. He flatly states that "... the fossils are there. They must be explained whether you believe in evolution or not."

Using his outlined handout titled, "Principle Phases of Human (Hominid) Evolution," he reviewed human evolutionary history, as it is currently perceived. He then proceeded to introduce teachers to a unit of human evolution using fossils. The Los Angeles public school district has organized a unit of study called the "Stones and Bones Project." The package includes a complete set of Student Lab

Anthropology Prints and a set of skull casts, including human, chimpanzee, and gorilla skulls.

Unlike 19th century biology teachers, you have a wealth of scientific literature to support your teaching of evolution. Indeed, the last 50 years have revolutionized the thinking about evolution. Dr. Nickel's handout, "Recent Books Dealing with Human Evolution," contains references with discoveries as recent as 1980, 1981, 1983, 1985, and 1986.

AIDS IN AMERICAN SOCIETY

A special feature of this year's NABT convention included nine sessions dealing with the AIDS phenomenon. These sessions were spread throughout the schedule and every teacher could have attended at least one. Sessions were lead by panels of expert scientists, technicians, and educators.

Medical opinion indicates that AIDS will remain a health emergency for many years to come. A cure is not in sight, and effective control poses a challenge, both to the medical profession and to society as a whole. This is a biological, technological, and societal issue.

Session 7: Biological Results of AIDS Research. Issue #2, The Prospects for an AIDS vaccine

The presenter for this topic was Dr. Wayne C. Koch, National Institute of Allergy and Infectious Disease. Some obstacles to the development of a successful vaccine for the aids virus include:

1. We do not know what constitutes protective immunity against HIV.
2. The genetic variability of HIV is great.

The envelope antigens especially show a high rate of mutation.

3. HIV shows cell to cell transmission. A vaccine may need to activate NK and/or T₂ cells.

4. We have no animal model. The chimpanzee can be infected, but does not present symptoms. The Macaque monkey becomes infected with a virus similar to HIV called SIV and most animals die within six months.

5. Vaccines do not protect against the initial infection. The initial infection alters the immune system.

Challenges in Testing Protocol

1. *Recruitment.* For phase I, 250 low risk potential volunteers were contacted. Of these, only 14 have been vaccinated with the vaccine made from gp 120 envelope antigen. Of the 50+ individuals that both volunteered and passed the initial screening, including the ELISA screen, all but the final 14 showed some unusual bands on the Western Blot. While these did not indicate HIV exposure, they had to be eliminated from the test group because the significance of the banding is unknown.

2. A successful vaccine will result in seroconversion in the volunteers. The NIH contacted all the life and health insurance companies in the USA and secured an agreement to honor a special ID card to be given to the volunteers indicating their participation in the test. Confidentiality is a major concern that is trying to be protected.

3. *Ethics.* Difficulties in balancing ethical counseling of volunteers with efficacy data in phase 3 will occur. A very large group of volunteers will be required for phase 3, as the counseling of volunteers

must educate and encourage them to avoid high risk behaviors. At the same time experience indicates that a percentage of volunteers will disregard such counseling and will engage in high risk activities.

Current efforts in producing vaccine include (1) recombinant DNA produced gp 120 (2) recombinant DNA gp 120 gene in vaccinia virus, (3) recombinant DNA gp 120-vaccinia virus infected autologous cells, and (4) gp 120 depleted killed virus (gamma irradiated).

Other topics covered in different AIDS sessions included: HIV infection and the Religious Response, National Trends in the AIDS Epidemic, Historical Parallels Between Tuberculosis and AIDS, The HIV in Relation to Koch's Postulates, AIDS and Adolescent Health-A Nationwide View, The Psychology of Mass Disease: From Leprosy to AIDS, Ethics and AIDS, Preventing AIDS Through Education, New Developments in Retroviral Testing, AIDS and the Bureaucracy, and many other topics.

SPONSORED EVENTS

Several events during the convention were sponsored by agencies, businesses, or institutions which had vested interests in biology teachers. The most popular event for KABTers was sponsored by Chemical Waste Management, Inc., who held an evening meal and reception for 250 biology educators at the Museum of Science and Industry. They also arranged for the educators to see the Omnimax film, "The Dream is Alive." This special feature took us through the astronaut's training program, the excitement of lift-off, and the journey in

space around our planet Earth. After the reception everyone had time to view the permanent exhibit and showing of "Managing Urban Waste." It was an exciting and educational evening for the twelve educators from Kansas, for which we thank Chemical Waste Management, Inc.

Exhibitors

For some participants, the highlight of the convention is visiting the exhibitors' booths. More than 80 exhibitors displayed their wares and causes in the Grand Ballroom. Teachers not only were able to peruse the most modern hardware available to them, but were able to talk to textbook editors and authors in person. They manipulated gadgets, tested computer programs, compared microscopes and videomicroscopy equipment, picked up free posters, free catalogs, and on and on. Fortunately the exhibits were open all day, every day. Nobody could make it to all of the booths in one visit. KABTers came home with literally bags of new books, new posters, and other materials to help them teach.

Banquet

Every convention has its summary banquet with keynote speaker. This year's speaker was Nobel laureate Dr. James Watson. He surprised nearly everyone in speaking not on DNA, but about his life, and offering some advice. He recalled some of his memories of growing up in Chicago and tried to analyze "why he had grown up so odd." He grew up with the idea that books were great and people who had lots of

money were not, an attitude which he still holds today.

Thought he does not consider himself a competitive person he revealed an anecdotal story about his sense of self esteem. After receiving the Nobel Prize, he expected that his employer, Harvard University, would give him a pay raise. They did not and his dean did not even offer him tenure. To which Watson informed the dean that he was only a minor character [in Watson's life] and proceeded to leave Harvard for a more rewarding career as director of the Cold Springs Harbor Research Laboratory.

Watson is a strong advocate of reductionism and is seeking governmental approval of the human genome project, which he proposes to complete within fifteen years.

Summary

The trip to Chicago was much more than a long ride in a Ford van. Bringing biology teachers together in this way leads to inevitable discussions and conversations with merit of their own. Following a lively discussion about the uses, problems, and solutions associated with using the video camera and television in microbiology labs, one teacher was overheard saying that "This is one of the best reasons for having a trip like this."

Other conversations enlightened teachers to the wide discrepancies in class period lengths in Kansas schools. Some teachers were truly angered that administrators would want to reduce their class period from 57 minutes to 54 minutes, and the same teachers were shocked to discover that at least one

teacher deals with a 40 minute class period. One school is talking about experimenting with teaching only one subject at a time (i.e., biology all day long for three and a half weeks, followed by math all day long for three and a half weeks, and so on), while another teacher revealed that she had already taught some biology courses from a similar format.

One positive ancillary aspect of attending conventions has little to do with business. The KABT group availed itself of some self-guided tours of the Windy City; touring the lakeshore drive at night, seeking out the Field Museum of Natural History, and even proving they weren't all old fogies, by standing in line at the Hard Rock Cafe - Chicago to purchase the teenage symbol of acceptance, a Hard Rock sweatshirt. Some exercised a more civilized pursuit of culture and ventured into the traveling exhibit of French artist Paul Gauguin.

KABT Takes a Look Back at 50 Years of Biology Education

A look back over the list of NABT past presidents, has to make Kansans very proud. Of the 50 past presidents the following five are from Kansas: 1942, Homer A. "Steve" Stephens; 1957, John Breukelman; 1964, Ted F. Andrews; 1977, Jack L. Carter; and most recently, 1980, Stanley D. Roth. All five Kansans were either graduates or professors from Emporia State University, which speaks

well for that institution in producing outstanding educators in the biological sciences. It should come as no surprise that ESU has maintained close and longstanding ties with the KABT and NABT.

Dr. Gaylen Neufeld, chairman of the ESU Division of Biological Sciences, and Bob Rose, Administrative Secretary of the KABT, worked long and hard to arrange for this Kansas contingency to attend the 50th anniversary convention of KABT and to produce this issue of the *Naturalist*. Both ESU and KABT want to encourage every Kansas biology teacher to become affiliated with the KABT and to attend future state and national conventions, not only as participants, but as presenters and presiders. Please copy and complete the KABT application form on the back page of this issue and join KABT and your biology teaching peers today.

Participants

The following KABT members (and spouses) participated in this convention trip and many contributed summary reports for this issue of the *Naturalist*. Sister Susan Chase, Robert Chatham, Paul Jantzen, Ed Judd, Susan Judd, Harry McDonald, Richard Miller, Gaylen Neufeld, Bob Rose, Janet Roth, Stan Roth, Pat Wakeman.

Lynda Swander met the group in Chicago and submitted a report on her own.

Kansas School Naturalist
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KABT Membership Application

_____ KABT regular member, \$8.00 / \$15.00 2 years

_____ NABT regular member (optional), \$32.00

Name _____

Address _____

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Note: KABT retains \$1.00 of each NABT membership paid through the KABT. Make check for the total amount of membership(s) payable to KABT. Mail application to: Bob Rose, Administrative Secretary, KABT, Wichita Collegiate School, 9115 E. 13th St., Wichita, KS 67206.