Use of the Winogradsky Column to Demonstrate Biodegradation
Dorothy May, Park College

This closed microecosystem was developed by Sergei Winogradsky in 1877 to study a variety of soil microorganisms. The column, which can be a graduated cylinder or a large test tube, provides a gradient of oxygen, allowing for both aerobic and anaerobic life. Construction of the column involves layers of mud enriched with a sulfur source (CaSO4). The column can be observed weekly for succession of different bacterial populations.

Different columns can have the center of the mud layer packed with biodegradable and non-biodegradable materials as desired. Columns can be incubated for months and years as desired to show effects and non-effects of bacteria on various materials.

Teaching Biology to Nontraditional Students
Larry Padberg, Rockhurst College
Kathy Hunt, Henderson Community College

Increasingly, our biology classes are finding their way to off-campus sites and evening or weekend hours. As this occurs the mean age of the class population increases. Their experiences, both past and future are different from our more traditional student. Are the curriculum demands the same? Do we address different concepts and issues? Should our teaching methods be altered?

We will facilitate a participatory session to explore our ideas for teaching biology for the non-traditional student.

Writing In Biology Courses: Increasing Critical Thinking and Research Skills
Stu Jacobson, MacMurray College

Science is both a body of knowledge and a process; writing is an integral component of the scientific process. Various assignments, including lab reports, research papers, literature reviews, student research proposals and critiques will be described. The multiple draft process and other means of teaching writing also will be discussed. IT IS HOPED THAT THOSE ATTENDING WILL BRING IDEAS AND MATERIALS TO SHARE.

Restricting Animal Use In Science Classes
John Richard Schrock, Emporia State University

A summary of NABT, NSTA, California "opt-out" law and other restrictions that narrow or eliminate the science teacher's professional decision-making responsibilities. Review of major cases where students refused to dissect, current pressures on biological supply companies and efforts to curtail source of dissection materials, and quality of information disseminated about classroom experimentation and dissection.

The George Engelmann Mathematics and Science Institute - "Unifying Concepts In Science"
Charles Granger, Pamela Iverson and Kenneth Mares, University of Missouri - St. Louis

Administered by the University of Missouri - St. Louis, the Institute invites 50 rising high school juniors or seniors, in the upper 5% of their class, to a four-week summer enrichment experience. The unique philosophic framework and set of objectives enhance the students' knowledge of the scientific enterprise, allow them to use technical equipment and advanced laboratory techniques, and give them opportunities to develop technical writing and oral presentation skills, and other critical scientific leadership skills. The Institute uses the UM-St. Louis campus facilities augmented by weekly field trips and guest speakers from St. Louis business, industry, and government. One hundred-fifty greater St. Louis area students have successfully completed the Institute. All alumni are either in college or are planning to attend college. Of those attending college, 85% of their majors are directly related to mathematics, science, or engineering.
CONCURRENT SESSION II  
Oct. 18, 9:40 - 10:25 AM

General Education Biology  
Bill Brett, Indiana State University

Biology is presented not for biology's sake, but as a means to help the student better understand and hopefully make informed choices about major problems facing the human race. The problems are: (1) Environmental destruction/maintenance; (2) Population growth; (3) Nutritional inadequacy; (4) "Modern diseases"; and (5) Genetic engineering and supplemental tissues and organs. Social and ethical consequences of these "biological" topics are discussed. Students are required to relate the course material to presentations in various media.

The Communities of the Biological Crossroads (of America)  
Charles R. Maier, Wayne State College

The Nature Conservancy's Niobrara Valley Preserve is often called the "Biological Crossroads of the Nation". Six distinct plant communities -- Rocky Mountain pine, eastern deciduous, and northern boreal forests, and tall-grass, sandhills, and mixed prairies -- intermingle or occur within a mile of each other. This diverse habitat provides homes for an amazing variety of flora and fauna, including two federally protected endangered species. The 54,000 acre preserve is also one of the richest paleontological sites in the United States; over 80 species, including 16 previously unknown, have been taken from the preserve. This unique area provides an excellent outdoor classroom experience for a variety of biological courses for colleges in the midlands, including such studies as Geology, Ecology, Plant Communities, Vertebrate Zoology, Ornithology, and Mammalogy.

A Trip to Monte Carlo: Using Random Numbers in Biology  
John P. Messick, Missouri So. State College

This presentation introduces the use of random numbers to enhance laboratory exercises and lectures in evolution, genetics, population ecology, and other biological phenomena which depend on underlying random processes. These random or so-called Monte Carlo techniques produce realistic results, stimulate student interest, and can be implemented on a microcomputer, hand calculator, or with the traditional methods of generating random numbers. The presentation minimizes mathematical theory and emphasizes practical applications which work.

Why Alternatives to Dissection Don't Work  
John Richard Schrock, Emporia State University

Computer simulations, videotapes, cloth frog dolls, anatomy models and external observation of humans and other animals are commonly touted as appropriate and sufficient alternatives to dissection. The inadequacies of these methods are classified: failure to truly interact, failure to test true, failure to provide real consequences, and failure to engage emotions. Real labwork is shown to be critical in providing students with "meaningfulness" of terms for structures and processes, confirmation of science concepts, recognition of where current concepts do not explain phenomena adequately, and insurance against cultural "Lysenkoism."

Galileo Reconsidered  
Laddie J. Bicak, Univ. of Nebraska at Kearney

In many instances, the reluctance of the scientific and lay communities to accept factual explanations of observable phenomena is based upon prejudice, jealousy, and an unwillingness to accept objective evidence. Because he endorsed the work of Copernicus and because he was arrogant and acerbic, Galileo alienated colleagues and challenged authority. Galileo ignored the admonition of the Catholic Church to cease teaching that the sun was the center of the solar system. And so it was that ultimately Galileo came before the Congregation of the Holy Office, the Inquisitors-General. Over the centuries many attempts were made to have the Church review the case of Galileo. Finally, in 1980, Pope John Paul II appointed a commission to review the condemnation of Galileo. In 1984, the Church admitted its mistake.

WORKSHOP SESSION I  
Oct. 18, 1:30 - 5:00 PM

Using Alternative Approaches to Biology Teaching and Assessing  
Leona C. Truchan, Alverno College

The current emphasis on creating the active learner and using cooperative learning techniques permeates the literature and professional meetings of K - 12 teachers of sciences. However, only recently is the effectiveness of the lecture and testing approaches at the college and university level being seriously questioned. This workshop
will have the participants experience, through a series of activities, multiple alternative strategies to the formal lecture in teaching and assessing biology. Some of these strategies will involve you in how to assist your students to be effective group members; how to use graphic descriptors as a focus aid in group work; how to measure the quality of the cooperative group activity; how to assist students to ask questions of one another; how to create assessments that reflect an alternative teaching strategy beyond the formal lecture. A packet of material will be provided for your further reflection and adaptation to your own classroom.

Computerized Data Acquisition in Physiology Laboratories
Marc M. Roy, Beloit College
In this workshop several common human and animal physiology experiments will be demonstrated, illustrating the ease of use and advantages of computerized data acquisition systems. Although computers are widely used at many colleges and universities, they are often used primarily as word processors. We have replaced chart recorders and oscilloscopes with Macintosh computers, each interfaced with a MacScope A/D converter, to collect, analyze, and graph data in physiology laboratories. This has reduced the amount of in-class time that students spend on learning how to use the equipment, and has increased their hands-on experimentation and problem solving time.

Immonoconjugates: An Emerging Biotechnology For Selective Delivery of Toxic Drugs to Diseased Organs or Tissues
Swapum Ghosh, Indiana State University
A major problem encountered in the treatment of such diseases as cancer or AIDS is the toxic side effects that result from systemic application of the drugs. Chemotherapy is thus a very painful experience, because the drugs used for treatment indiscriminately affect the well-being of all proliferating cells in the body.
In recent years, breakthroughs in biotechnology have brought significant changes in our concepts and capabilities. The concept of linking an active drug with a carrier molecule that has specific affinity for a target organ or cell and then of using such a conjugate as a magic bullet to destroy diseased areas of the body or metastasis, has generated strong enthusiasm in industry and academia. Preliminary success has brought along the need for trained personnel.

The purpose of this presentation is to convince ourselves that the training for such personnel is available in our colleges. The basic knowledge of biology and chemistry can be harnessed to understand the principles involved in the preparation of these "magic bullets."
Antibodies that bind to tissue or organ-specific antigens are the natural choice as the carrier molecules for drug delivery. Various approaches are available for conjugating antibodies to drugs, i.e., to prepare immunoconjugates. We will demonstrate one or two examples.

CONCURRENT SESSION III
Oct. 19, 8:30 - 9:30 AM

Burnout: Causes, Preventions and Interventions
Judy Brett, Hamilton Center (Indiana)
Many helping professions, including teaching, lend themselves to the syndrome labelled burnout. Recent financial exigencies in 37 of the 50 states predict difficult times for institutions of higher education. These conditions are certain to increase the intensity and incidence of burnout among teachers. By learning to recognize early indicators of this debilitating condition, teachers have the opportunity to take preventive and/or corrective measures. The presenters will discuss indicators and corrective measures with the participants. Some members of AMCBT may recall that Judy and Bill made a similar presentation in 1981. Perhaps 1991 is an appropriate year for a refresh-

AIDS
Susan Speece, Anderson University
By the time we convene the AMCBT convention in Kansas City, it is likely that there will be more than 185,000 documented cases of full-blown AIDS having been recorded in the U.S. since 1981. While the rate of new cases is slowing somewhat in some populations, there are other populations where the incidence rates are increasing at an alarming rate.
Treatment methodologies now allow many persons with AIDS and those who are HIV+ but have not yet developed AIDS to lead reasonably normal lives.
By understanding where the research is going, we may be better able to help our students deal with this disease and make appropriate choices in their lives.
Teaching the Differences Between Science and Religion: Creationism and Evolutionary Theory
Malcolm Levin, Sangamon State University

Understanding the differences in methods of knowing in science and religion is the single most important criterion in defusing the controversy over the teaching of evolutionary theory in biology. Misconceptions that teachers, parents, and students may have regarding the teaching of evolutionary theory frequently arise from a failure to make such distinctions. Additionally, the accusation that we teach evolution as dogma can readily be defused when the nature of scientific theory is clearly defined and presented to students. Presentation will focus on these and other aspects of the controversy.

Roundtable Discussion on Outreach to High Schools
Ann Larson, Sangamon State University
Leona Truchan, Alverno College

1. How to create liaison relationships with the high school teachers of biology?
2. How to impact on the high school student to interest them in careers in the sciences?
3. How to create viable partnerships with high school districts, universities/colleges, and industry to improve science education?

Each panelist will address these questions from her perspective and share her experience in working with the high school teachers and/or students.

Reproductive Biology in General Courses: Are We Missing the Point?
Robert Powell, Avila College
Shirley J. Charde, Avila College

Reproduction is listed by nearly all general biology texts as one of the key characteristics of life. Treatment of the topic, however, is nearly always limited to cellular activities or to the mechanics of the process as it is applicable to higher vertebrates. We suggest a broader approach is not only desirable, but essential in order to provide students (both majors and non-majors) with necessary insights into the relevance of biology to real life.

We suggest a unit to immediately follow cellular functions. This unit encompasses a cost-benefit analysis comparing asexual and sexual modes of reproduction and various alternatives allowed by the latter. Students will see evolutionary and life history applications.

Enzymes Get Things Done: A Demonstration
Richard P. Keeling, Emporia State University

A classroom demonstration (to be performed by the instructor) that compares the efficiency of the thermal activation of the hydrolysis of urea with that of the enzyme-catalyzed reaction (urease) and, also, compares the efficiency of an inorganic catalyst (ferric chloride) with that of an enzyme (catalase) in the degradation of hydrogen peroxide. The latter reaction is performed in a special (but simple) chamber that yields a very visual and dramatic effect.

Worldviews: A Needed Change
Keith Blackmore, Highland Community College

I will open the session with a few remarks which reflect my perspectives and concerns, followed by a 25 minute video on paradigms which I find thought provoking. After the video presentation I invite all attendees to share their views on the topic.

CONCURRENT SESSION IV
OCT. 19, 9:45 - 10:45 AM

Preparing for a Career in Physical Therapy
Neil Baird, Millikin University

Many students who have an interest in science and an interest in helping people to combine the two into a career in physical therapy. Department of Labor projections indicate a need for 50 - 100% more physical therapists in the next 10 years. Work settings for Physical Therapists include hospitals, home health care programs, private practice clinics, rehabilitation centers, schools, nursing homes, and industry. Specialties within PT include pediatrics, geriatrics, orthopedic medicine, neurology, cardiology, and sports medicine.

The American Physical Therapy Association's goal of making the master's degree the entry requirement by 1990 is gradually being realized as more clinical schools expand their programs. Programs vary from school to school. Some programs still offer the bachelor's degree and can be completed in four to five years. The master's degree programs generally take at least six years to complete. Most clinical schools accept transfer students who have taken their pre-PT work at some other school.

Admission requirements to the clinical schools vary but usually require a year of physics, a year of chemistry, at least a year of biology plus anatomy and physiology, college algebra and trigonom-
etry, statistics and several psychology courses. Being able to document hours of exposure to the profession in the form of volunteer work, observing, or internships is also very important.

A fairly strong GPA is required to enter most clinical programs because the competition is keen and because the coursework is rigorous.

Financial aid is available through guaranteed student loans, Easter Seals, AMBUCS, Elks, local hospitals who might provide money in exchange for service later, and other sources. Starting salaries range from $25,000 to $30,000 depending upon the location.

In conclusion, there are many good reasons for choosing PT as a profession. Many therapists claim that the close contact with the patients is very fulfilling.

From Food Webs to Restriction Maps
John Jungck, Beloit College

For several years I have been presenting a series of elementary class presentations in biomathematics. This year I will illustrate how graph theory, especially interval graphs and circular arc graphs, can be used to simplify the analysis of food webs. Besides simplifying food web analysis, several new theoretical questions about the structure and energy utilization in food chains will be raised. In particular, what if the the "n" in n-dimensional niche space has a value of one? Does this strongly modify research in ecology? Then I will illustrate how the same mathematical technique used to explore food webs can be usefully employed in sequencing DNA, RNA, and proteins, doing complementation and deletion mapping, and in restriction mapping. Note: No college level mathematics is required to understand this talk.

A Team-taught Course in Bioethics
Elaine Chapman, Illinois College

A team-taught course in bioethics was developed by a biology professor and a philosophy professor. The three-hour course is cross-listed in both departments and fulfills general education requirements in either philosophy or a non-lab science. Field trips to a hospital and nursing home, a simulated intensive care unit, and guest speakers from health professions have added the dimension of realism to the course. The team of instructors provides information and leadership to the course from their respective areas of expertise.

PRESIDENTIAL ADDRESS:
OCT. 19, 11:00 AM

"Teaching Biology, Making Biology"
John Jungck, Beloit College

While many argue that teaching is a form of research because of the challenge of dealing with new students each year in novel problem solving situations and of integrating and evaluating much primary literature, few have taken the position that biology is "made" by teaching practices. I will defend the strong thesis that what we educators of biology decide is biology curriculum, what counts as biological knowledge (i.e., is worth teaching), the labs that we choose, the textbooks we adopt, the syllabi that we develop, and the kinds of people that we hire from graduate schools not only have a strong influence on what is biology, but are actually determinative of "biology." Please appreciate the contribution you make not only to your students, but to your discipline as well.