I.1. Cooperative Field Studies:  
A Practical Approach to Biology  
Norm Jensen and Ethel Stanley; Millikin University, 1184 West Main, Decatur, IL 62522  
A short video presentation will be followed by discussion of Field Methods, a summer course for Elementary Ed. majors, and Investigating Lake and Wetland Ecology, a new summer '92 high school outreach workshop with Illinois Power field biologists. Both will be presented as successful examples emphasizing the practical and cooperative nature of biology. Oral Presentation.

I.2. Teaching Sexual  
Differentiation in Undergraduate Biology Classes  
Marc M. Roy; Beloit College, 700 College St., Beloit, WI 53511  
There are many controversial issues surrounding discussions of sexual differentiation of human and nonhuman animals. These tend to revolve around differentiation of behavior, cognitive abilities, and gender identity. In this presentation, I will present and critique some of the data, interpretations, and misconceptions from studies in this area. I will also discuss the teaching of sexual differentiation. Participants are encouraged to bring ideas and materials that they use in teaching these subjects. Oral Presentation.

I.3. Teaching Cell Biology Labs  
From an Inquiry Approach  
Susan P. Speece; Anderson University, 1100 E. 5th St., Anderson, In 46012  
Most of us became excited about biology because of the process of curiosity and discovery, yet we rarely teach biology that way. We offer lecture/discussion and cookbook labs. Where is the excitement and discovery?

Cell Biology at Anderson University has been revamped and there is considerably more discussion and the labs are approached from an inquiry basis. We begin with a major concept to be investigated, ask questions about the concept that the students wish to explore and then propose procedures that will attempt to answer the questions. Oral Presentation.

I.4 Perspectives on Teaching:  
Ecology and Field Biology  
Malcolm Levin (Sangamon State University, Department of Environmental Study, Springfield, IL 62794-9243), Norman Jensen (Millikin University), Wallace Weber (Southwest Missouri State), Richard Wilson (Rockhurst College), & Sr. Jeanene Yackey (Fontbonne College)  
Panelists will make presentation that focus on what we believe are significant content areas and skills to be acquired by students in ecology and field biology. Panelists will address how we integrate these components into our respective ecology and field biology courses and laboratories. — Two, back-to-back, 45-minute time slots will be used for this oral presentation.

I.5. Fractal Dimensions and Biological Levels of Organization  
Normon Woldow; Maryville University, St. Louis, MO 63124  
Fractal mathematics corresponds well with Odum's levels of biological organization. One of Mandelbrot's definitions of the fractal dimension can help interpret the complexity of life and its unity with nonliving systems. Modern mathematics can help our students avoid the crude oversimplifications of physicalism and vitalism, increasing the philosophical rigor of biology at all levels from the molecular to the ecological. Oral Presentation with Poster summary.
I.6. Alternative Teaching Methods in the Vertebrate Physiology Lab: One Classroom Example and a Round Table Discussion

Tom Davis; Department of Biology, Loras College, Dubuque, IA 52004 0178

The session leader will present several successful methods he has used in the laboratory periods of his vertebrate physiology course for majors. About one half of the session will involve participants in a sample classroom exercise the objective of which will be to develop their biological knowledge regarding euthanasia. Additional teaching methods considered will include (1) discussion of other controversial, ethical topics, (2) critical analysis of a published article, (3) design of an experiment to test kidney function, and (4) additional discussion of lecture material. The second half of the presentation will be a round table discussion with all participants to exchange ideas and suggest alternative teaching methods that have been used successfully in vertebrate physiology laboratory. Oral Presentation.

I.2 Using Science Fiction Films to Teach Science

Edward S. Kos; Department of Biology, Rockhurst College, Kansas City, MO 64110

Many of our students, and a large portion of the general public harbor an enormous amount of misinformation about science. Years ago most of this was obtained from printed matter, today it comes from films and TV. What persists is the notion that if it's in the media it is correct. It is possible to use materials containing "bad" science and teach good science. This presentation will look at a concept that was developed at Temple University and has slowly been spreading. Examples will be presented and experiences discussed. Oral Presentation.

II.3. Investigation Driven Microbiology

Frank Pascoe; College of St. Francis, Joliet, Il 60435

In an effort to avoid teaching microbiology techniques in the disconnected, "cook-book" fashion so common in published laboratory manuals, I have developed an approach which allows the students to learn basic microbiology laboratory skills in the context of individual and group investigations (e.g., "Getting to know your body bacteria"). The emphasis in this approach is to involve the students in open-ended investigations rather than weekly exercises which simply demonstrate what is already known. By engaging the students in a process which seeks to answer meaningful questions the students learn the role of the techniques in the scientific process as well as practicing the technique. My presentation will include specifics of course design. Oral Presentation

II.5 So You Think YOU Know What Time it is — Teaching Chronobiology in the Laboratory
Kathleen M. Marr; Biology Department, Lakeland College, Sheboygan, WI 53082-0359

Natural, endogenous rhythms have been demonstrated in many laboratory animals. Physiology courses often are limited to anatomical demonstrations or ablation experiments that emphasize functional relationships. Here, pseudopregnancy in rodents has been used as a model system for an experimental model in biological rhythms and regulation thereof in instructional undergraduate settings. Model systems, protocols and animal care and maintenance are incorporated into this exercise. Oral Presentation.

II.6. Restricting Animal Use in Science Classes — Chapter II
John Richard Schrock; Emporia State University, Emporia KS, 66801

This update on current challenges to laboratory dissection and animal experimentation in education includes background on the recent U.S.D.A. regulations that drastically limit the supply of cats used in dissection in undergraduate anatomy and physiology classes. While various organizations are effectively defending animal use in research and other areas, there is no machinery in place to effectively advocate and defend animal use in education. Oral Presentation.

III.1. Limitations of Quantification in Biomedical Sciences
Richard J. Stevens; University of Wisconsin - Green Bay, Green Bay, WI 54311

The need for careful teaching of limitations of quantitative methods as applied to human phenomena in biomedical and biobehavioral sciences is considered. A partial analysis of the limited and selective nature of statistics is presented. Statistics is a valuable tool in science. However, statistical methods require a bias in information selected for simple, recurrent, common phenomena and a bias against, individual complex qualitative phenomena. The latter group of phenomena are highly significant to human health and behavior. Thus, quantitative methods tend to de-value human experiences and to ignore information of significant concern to individual cases. Thus, biology teaching must have more serious concern for divergence of individual experiences from statistical models than physical sciences.

Examples are given from public health, such as Raeye’s disease, diagnostic related groups (DRGs), contaminants in food supply, and views of human sub-populations. The focus of this presentation is the need for greater clarity and caution in teaching of quantitative findings in biological sciences. Oral Presentation.

III.2. Identification of Common Birds
Neil B. Schanker; William Rainey Harper College, Palatine, IL 60067

This slide show will illustrate about 70 of the most often seen bird species of the Chicago area. The more obvious field identification marks will be emphasized. This program is appropriate for beginners although experienced birders might also pick up some identification tips. Oral Presentation.

III.3. Biology as Part of a Women’s Studies Program
Jacqueline Scholar; Bellevue College, Bellevue, NE 68005

A course called Biology of Women was developed by a biology professor for the Women’s Studies Department. The 3-hr. course is cross-listed in both departments and fulfills upper division and general education requirements. This course has become very popular with non-science majors of both sexes. It is intensive and focuses on topics such as anatomy, physiology, nutrition, drug use, diseases, and disorders relative to women. Writing is an integral part of the class. The benefits and problems of such a course will be discussed. Oral Presentation.
III.4. Promoting Science as a Process to Elementary Education Majors in a Biology Department Laboratory Course.
Rudolph Prins and Barbara Kacer; Department of Biology and Teacher Education, respectively, Western Kentucky University, Bowling Green, KY 42101
An Introduction to Biology course for Elementary Education Majors only was introduced into the Biology curriculum in the Fall of 1991 to meet increasing enrollment demands of this major and to separate these students from the biology-track students. The laboratory operation is innovative and the particulars will be discussed in this presentation. As part of the course students are required to complete three major research projects and at least three mini-projects. For the major projects students had to propose, design, implement, and report on their research as a team. Mini-projects could be done as part of a team or individually. The mini-projects were based on observations kept in a log of events that were observed to occur in an aquarium and terrarium that the team had maintained for about 10 weeks. A final report, based upon observations accumulated in the log, is also required by each student. Oral Presentation.

III.5. Bioethics: What are They and how can we Teach the Concept of Ethics
Terry L. Derting; Department of Biology, Beloit College, Beloit, WI 53511
Ethical issues in biology are becoming more numerous and complex. Accordingly, course offerings on ethical issues have risen dramatically in the past decade. Typically, such courses expose students to a variety of biological issues, addressing them from several viewpoints. Although students gain an understanding of the complexity of such issues, they frequently fail to grasp a meaningful understanding of what constitutes an ethic itself. I will discuss methods of teaching that facilitate student comprehension of, and personal identification with, the concept of "an ethic" within the framework of biology. Oral Presentation.

III.6. The Physiology of Human Aging
William J. Buckley; St. Xavier University, Chicago, IL 60655
As human life expectancy increases, there is a need for better understanding of age-related biological changes. Information on aging is now incorporated into introductory as well as advanced biology courses. An overview of the aging process and suggestions of ways to modify aging will be presented.

IV.1. Characteristics of Scholarship for Teaching - Scholars
Richard J. Stevens; University of Wisconsin - Green Bay, Green Bay, WI 54311
Numerous calls have been made urging college faculty to focus more on quality of college teaching. However, research, scholarship, and grantsmanship pressure frequently detract time and effort from teaching. A particular conflict with teaching is a requirement for research publications in scholarly journals without which quality teaching professors may not be promoted or retained.
This presentation focuses upon defining an additional area of scholarly endeavor, the teaching-scholar, which is more compatible with teaching loads at many colleges and universities, and which can also be used to judge quality of scholarship for promotion and tenure. Characteristics of scholarship closely tied to classroom teaching include keeping up to date, communicating scholarly findings, research for new information and generation of new syntheses all of which satisfy the concerns which keep scholarship as a promotion requirement at many colleges and universities. The presentation argues that adoption of standards for scholarship which included teaching-scholarship, in addition to laboratory research scholarship, is necessary for improvement in quality of college science teaching. Oral Presentation.

IV.2. Identification of Birds of Prey
Nell B. Schanker; William Rainey Harper College, Palatine, IL 60067
This slide show will illustrate about 25 raptor species seen in Illinois. We will learn to differentiate falcons, accipiters, buteos, eagles,
vultures, and owls. The more obvious field identification marks will be emphasized. Oral Presentation.

**IV.3. Attitudes in Science — Could You Survive in Beirut?**

*John Richard Schrock; Emporia State University, Emporia KS, 66801*

Among current "critical thinking" and "science decision-making" educational fads are teaching strategies that lead students to premature speculation and also confuse science with socialization. A brief exercise is used to clarify the universality of science, and 20 additional science attitudes are summarized including: empiricism, determinism, parsimony, scientific manipulation, skepticism, precision, respect for paradigm, loyalty to reality, awareness of assumptions, quantification, tolerance limits to knowledge, etc. Oral Presentation.

**IV.4. Addressing the Attrition Rate in Entering Science, Math and Engineering — What can our Campuses do about it?**

*Richard E. Wilson and Anita Salem; Rockhurst College, Kansas City, MO 64110*

Examination of the data shows attrition in science, math, and engineering is highest at grades 6, 11 and 13. Rockhurst has inaugurated a program across the sciences to initially answer Shiela Tobias's charge [Their not dumb, their different] to alleviate the loss on our campus at the rising sophomore level, and have a five year plan to help area precollegiate units upgrade and address the problem at their level. Data showing the scope of the national and local problem will be presented, a short description of our program and plan, and some time for the exchange of ideas among the participants will be provided. Oral Presentation.

**IV.5. AIDS: A Laboratory Approach**

*John R. Jungck and Marion Field Fass; Beloit College, Beloit, WI 53511*

We have taught (2X) a Biological Issues course on AIDS as a laboratory experience that counts towards the college-wide distribution requirements. We will share our lab write-ups and briefly outline what we do in each lab. Exercises include condom testing (with a focus on experimental design and hypothesis testing), two labs on microbiology (microscopic examination of pathogens associated with secondary infections in AIDS patients, Koch's postulates, serial dilution, and replica plating with and without an antibiotic), phylogenetic systematics of HIV sequences and inferences about source of infection (the Florida dentist case), statistical and geographic analysis of morbidity data, epidemiological modelling, human variation analysis, risk analysis, nutrition, action of drugs, selective permeability, a group AIDS educational outreach project, and a library research exercise on patient education. We will discuss more about the impact of these experiences on the students than the technical details of specific experiments because we were impressed with the student reactions and the activities that they constructed. Oral Presentation.

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**W.1. Teaching About Human Population Growth in Introductory Biology Courses**

*Wallace R. Weber and Barbara K. Newman; Dept. of Biology and Dept. of Biomedical Sciences respectively, Southwest Missouri State University, Springfield, MO 65804-0095*

This workshop will include topics on exponential growth, carrying capacity, population growth and environmental cost, and sustainability. Ideas as to how these topics may be introduced and activities illustrating these concepts will be presented. Videos, books, and other publications useful in teaching these concepts also will be emphasized. Time will be allotted for discussion of other ideas from the participants, as well as the pros and cons of this sometimes controversial topic. Workshop.

**W.2. Simulated ABO and Rh Blood Typing Activity**

*Rick Higheberger; Ward's Natural Science, 1745 Ellendale, Northbrook, IL 60065*

Using a simulated blood product, we will count red and white blood cells, perform blood smears and explore Rh typing. In addi-
tion, numerous new Macintosh products are now available. Workshop.

W.3. Does Writing about Biology Enhance Learning: Practical Aspects
Randy Moore; Wright State University, Dayton, OH 45435 [with Marc Roy, Beloit College, & Robert Wallace, Ripon College]
One of us (RM) studied how different kinds of writing - instruction affect how students learn about biology. One group of students were required to write essays, but received no feedback or instruction about how to write-to-learn. These students scored no better on exams than did students who did no writing. However, another group received instruction in the principles of writing-to-learn; these students scored significantly higher on exams than did students in either of the other groups (i.e., those who did no writing or who had writing assignments but no instruction in how to write-to-learn). These results indicate that (1) merely writing about biology does not ensure that students learn about biology, and (2) students who understand how to use writing as a tool for learning can use writing to learn biology. The workshop participants will discuss the relevance of these data to writing assignments and writing programs such as writing - across the curriculum (WAC). Synopses of two WAC programs with long track records of success (Beloit and Ripon) will be presented. All participants are encouraged to bring their ideas of what works and what doesn’t. Workshop.

P.1. Measuring Changes in Environmental Values
Phyllis Kingsbury; Drake University, Des Moines, IA 50311
Pre-test/Post-test comparisons were examined to see if an environmental course for general students influenced environmental values. Ten questions were created with alternative answers based on Miller’s “Four Levels of Environmental Awareness”. Slight improvements were observed which was attributed to the open enrollment and the attractiveness of the course to students with already formed environmental interests. Poster Session.

P.2. Videotape Introductions to Biology Labs
Elizabeth R. Juergensmeyer; Judson College, Elgin, IL 60123
I have developed a series of videotapes coordinated in the laboratories in Principles of Biology, with the objectives of (1) stimulating interest in the week’s topic, and (2) demonstrating techniques and materials for that specific laboratory. These videos were prepared with relatively inexpensive equipment and were designed specifically for the course taught at Judson College. Video, Poster Session.

P.3. Fractal Dimensions and Biological Levels of Organization
See I.5.
Norman Woldow; Maryville University, St. Louis, MO 63124
Oral Presentation, with Poster summary.

P.4. An Interdisciplinary Research Course in Biochemistry and Cell Biology: Evolution Toward an Integrated Theme
Margaret E. Stevens; Ripon College, Ripon, WI 54971
Through a Instrumentation and Laboratory Improvement grant from the National Science Foundation, Ripon College was able to purchase equipment to update a laboratory course in biochemistry and cell and molecular biology. The project goal is to offer a research experience while teaching students widely used techniques such as cell culture, electrophoresis, gradient centrifugation, radioisotope labeling, and chromatography. Team taught by faculty in the Biology and Chemistry Departments, the course consists of a series of class exercises built around a common theme and culminating in an independent research project. The basic exercises have been developed, and this year’s theme simulates a research program investigating the characteristics of a single enzyme. A future goal is to incorporate recombinant DNA technology into the same unified approach. Poster Session.