From the Chair:

Life in a university is constantly changing. Usually the flux is in students. Faculty members often remember what graduate or undergraduate students completed their degrees or which faculty member arrived or retired. This year, in particular, will be remembered because of the changes in faculty. Three faculty who distinguished themselves through teaching and research retired this year. Dr. Cecil McIntire retired in December and Drs. Richard Brewer and Joseph Engemann in April. They will be missed. The year will also be remembered for the first year of two new faculty: Dr. Silvia Rossbach and Dr. John Jellies; and the return of Dr. Richard Pippen from a three year administrative leave. The large number of retirements gave us the opportunity to search for new faculty. During this year we were able to search for and hire four new faculty, each of whom shows exceptional promise in both teaching and research. By this Fall, 50 percent of our faculty will have been at Western for less than seven years. These new faculty have brought a new outlook to the Department.

Change can also be measured in facilities. Last July and August staff and students packed up Wood Hall. Teaching laboratories were moved to temporary quarters in Hoekje and McCracken Halls for this year and next. This was a monumental task. Over thirty years of specimens, teaching aids, test-tubes, microscopes and old equipment had to be examined, and discarded or packed. Some of the materials are stored until the new facilities are ready and others were unpacked and ready for the Fall semester. Before Wood Hall was officially closed in September, a few of the students, staff and faculty who had spent many happy years in Wood Hall had a small party in the courtyard to commemorate the passing of an era. There is a sense of excitement in the Department about the new faculty and facilities. We can hardly wait until we can move into the remodeled Wood Hall in the Fall of 1997.

Leonard C. Ginsberg, Professor and Chair

(616) 387-5637
NEW SCIENCE BUILDING

The $45.6 million science building project is well underway. The project consists of the complete remodeling of Wood Hall and the building of a new research building connected to this teaching facility. Thirty-eight million dollars of the project came from the State; the remaining will be raised from private and corporate donations, federal grants and foundation funds. This year saw the completion of the design phase of the project and the beginning of the construction phase. Faculty and staff worked with the architects and WMU Campus Planning to complete the process of laboratory design. The research and teaching laboratories are designed in modules. This design not only saves money, but will provide more flexible use of the building in the years to come. If one investigator leaves, the lab can quickly be reconfigured for another scientist. The teaching labs are also designed with this concept. Also some modifications in benchwork were used for different departments. Specialized equipment facilities such as an Imaging Center, NMR, tissue culture and animal rooms were designed into the new science building. A new greenhouse and adjacent greenhouse research laboratory were designed for the retrofit. These facilities should provide state-of-the-art teaching and research laboratories for science.

The construction phase of the project officially began with ground breaking in October when the President unveiled the plans for the building. The construction actually began in mid August with removal of asbestos from Wood Hall. By the end of this Summer, demolition should be complete. The block walls, elevated floors and part of the north and south sides of the building will be removed. This will take the building back to a skeletal structure. The building will then be rebuilt with modern facilities that will hold the offices, and teaching labs for several science departments, including Biological Sciences. The retrofit will be completed for classes to begin the Fall of 1997. Construction of the new science research building will begin later this Summer to be completed before the Fall of 1998. Below is a diagram of part of one wing of the research building showing the basic lab module and support space.

NEW FACULTY

The Department is pleased to welcome four new faculty members, beginning in the Fall Semester of 1996.

Dr. Christine A. Byrd, Assistant Professor

Dr. Byrd received her Ph.D. from the Department of Molecular and Cellular Biology at the University of Arizona in 1992. Her Postdoctoral experience was at the University of Virginia in the area of Neural and Behavioral Development. During her postdoctoral studies she became an adjunct faculty at Piedmont Virginia Community College where she taught Anatomy.

The major emphasis of her research is the interactions that occur between the developing olfactory system and the central nervous system. The olfactory system is unique among sensory systems since it continually makes new connections with the brain throughout life. The major question that she is trying to answer is: "How do the axons of this system know what part of the brain to connect to, and what molecular factors are responsible for these interactions?". Her model system is the zebra fish, a well known developmental and genetic model.
**Dr. Bruce Bejcek, Assistant Professor**

Dr. Bejcek has received two B.S. degrees in Microbiology and Cellular and Molecular Biology from Michigan State University in 1977 and 1978. Dr. Bejcek received his Ph.D. in Cellular and Molecular Biology from St. Louis University in 1986. His Post-doctoral work was at The University of Minnesota.

Dr. Bejcek's research is in the area of cancer biology, primarily on the processes by which cancers are initiated, maintained and progress. These studies involve the use of cellular and molecular techniques to investigate the involvement of a variety of proteins and genes in tumor formation and control of cell growth.

**Dr. David N. Karowe, Associate Professor**

Dr. David Karowe received his B.A. in Biology from Harvard University and his M.A. and Ph.D. from the University of Michigan. He has had several post-doctoral experiences including an NATO Postdoctoral Fellowship in the Department of Entomology at Wageningen Agricultural University in the Netherlands and a research scientist position in the Department of Biology at the University of Michigan. Following his postdoctoral experience, he was an Assistant Professor in the Department of Biology at Virginia Commonwealth University. He is also currently the Co-director of the Research Experience for Undergraduate Program, University of Michigan Biological Station, Pellston, Michigan.

Dr. Karowe is a chemical ecologist, whose research focuses on how increasing carbon dioxide levels may affect the interaction between plants and insects. The man-made sources have long interested ecologists. Dr. Karowe has developed a model to study these effects and is a well known leader in this field. Dr. Karowe's research is funded by the National Science Foundation and the U.S. Department of Agriculture.

**Dr. John M. Spitsbergen, Assistant Professor**

Dr. John M. Spitsbergen received his M.S. in 1986 in Interdepartmental Biology (Engineering Department) and his Ph.D. in Pharmacology/Toxicology and Neuroscience in 1991 from Michigan State University. His postdoctoral work was at the University of Virginia in the Department of Neuroscience.

Dr. Spitsbergen has published extensively in the area of Neurotoxicology. His current research examines the role of nerve growth factor in disorders such as hypertension and changes in nerve innervation of the bladder that can result in alteration of urine flow in adult males with prostate enlargement.

**FACULTY UPDATES**

**Dr. Elwood Ehrle Receives Excellence Award**

Dr. Elwood Ehrle, professor, was recognized for his superior classroom skills with a 1995 Alumni Teaching Excellence Award. Dr. Ehrle was honored at WMU's 16th Annual Academic Convocation on October 17. In addition to a plaque, Dr. Ehrle received $2,000 cash award and $2,000 added to his base salary. Dr. Ehrle was nominated for the award as a result of his "infectious enthusiasm" for the subject matter he teaches (plant biology, botany, environmental biology, bryology). Dr. Ehrle also received the 1996 Distinguished Service Award of the Michigan Botanical Club. He was elected the President of the Kalamazoo Chapter of Sigma Xi, the National Honors Society for Scientific Research.

**Dr. Richard Brewer Retires**

Dr. Richard Brewer received his Ph.D. in 1959 from the University of Illinois in the field of Zoology and he joined the Western Michigan University faculty as an assistant professor during the same year. Dr. Brewer has served as the major advisor for many graduate students and has published more than 60 articles in his area of expertise. Most impressive is his publications of several major books on ornithology including the "Atlas of Breeding Birds of Michigan". As an educator, Dr. Brewer has excelled in the teaching of ecology. His textbook, "The Science of Ecology" published by Saunders College Publishing is one of the premier ecology texts used by numerous colleges and universities. Dr. Brewer has been a strong advocate for restoring and maintaining biological habitats and he has served as President of the Board of Trustees of the Kalamazoo Nature Center.

Dr. Brewer will leave the University in order to pursue his writing and research interests. We will miss Dr. Brewer’s contributions to the department and we wish him well with his future projects and endeavors.

**Dr. Joseph Engemann Retires**

Dr. Joseph Engemann received his Ph.D. in 1963 from Michigan State University in the field of Zoology. He joined the Western Michigan University faculty as an instructor in 1960. He has served as the major advisor for at least 14 masters and Ph.D. students. He has also published frequently in his area of expertise. His textbook on invertebrate biology, published by Macmillan, was used by many colleges and universities. He expects to do
research and writing in the areas of evolution, aquatic invertebrates and creativity.

NEW STAFF POSITION

Christopher D. Jackson joined the Department in February as greenhouse manager. Chris received his masters degree from the Biology Department at Western in 1994 and has several years experience in the greenhouse bedding plant industry. Chris was also a research associate at the Kalamazoo Nature Center and a Pest Inspector for the USDA. Chris’s main task will be to coordinate the increasing teaching and research activities of the greenhouse and to plan for the new, much larger greenhouse that is part of the new science building. Larry Yarger, former greenhouse manager, left for Viet Nam in January as part of his missionary work.

TEACHING

Dr. Alexander Enyedi has developed a new course for teachers of grades 6-12 entitled “Teaching Biological Concepts Using Tiny Plants” (BIOS 602). The course is part of the Summer program of Science Workshops and Courses designed for K-12 teachers which is offered by WMU’s Center for Science Education. The courses are designed to help teachers improve the quality of science education in their schools. Dr. Enyedi will encourage teachers to use Rapid-cycling Brassica plants as “hands-on” tools to explore important biological concepts such as growth and development, reproduction, simple genetics, physiology and ecology.

Dr. Cindy Hoorn has been interested in the use of multimedia in teaching for some time. She has utilized computer conferencing as a means to encourage student participation in the learning process, and has actively encouraged the use of a variety of electronic resources by her students outside of the classroom. However, the variety of materials available for teaching biology has increased exponentially and Dr. Hoorn believes that proper use of these may improve the understanding of difficult concepts in the classroom as well. For the past year, she has been attending meetings and conferences, assembling information, and preparing lectures in a computerized presentation format using Microsoft’s PowerPoint to take advantage of more of these materials in the teaching of BIOS 240, a human physiology course designed for non-majors. Although she initially had to wait for access to an appropriately equipped classroom, this Winter she began teaching physiology in what she calls a “primitive multimedia style”. With the help of the newly developed Instructional Technology Center on campus, she hopes to improve the quality of her multimedia offerings in the coming year by including animation, video and sound in her presentation package.

As a consequence of this interest in the use of technology in teaching, Dr. Hoorn was also invited by the local chapter of Sigma Xi to respond to their keynote speaker, Dr. Lance Query, Dean of University Libraries, when he spoke on “Paradigms Lost, Paradigms Regained: Learning, Teaching and Technology in Higher Education” last Winter. As she states in her response, “...one important benefit of the new technology, even if used in a very limited way, is that it has great potential to open up higher education to a larger segment of the population. For those who are visual learners, never before has there been a wider array of visual tools and materials available for teaching. For those who need to work with the material themselves or who need a little more time to assimilate information, new technologies allow students to ask questions and seek out information in their own way and at their own pace. Learning can occur more naturally and in a non-linear fashion, enabling a greater variety of student types to succeed.” As the necessary equipment and materials become more accessible and as the infrastructure is put in place to ensure time and assistance in learning to work with the new technology, it seems likely that we will be seeing more and more application of it in our science classrooms.

RESEARCH

BETTER BACTERIA

Dr. Silvia Rossbach’s groups’ research interests include the interactions between microorganisms and plants, and how microorganisms respond to changes in the environment.

Many beneficial microorganisms are known, including plant-growth promoting bacteria, nitrogen-fixing organisms, and microorganisms involved in remediation of polluted environments. However, experiments have shown that microorganisms applied to the field are rarely able to compete against the already present, indigenous microflora. In collaboration with Frans de Bruijn (Michigan State University), we are developing a marker system to monitor microorganisms in the soil, and moreover, to create a so-called “biased rhizosphere” to select beneficial microorganisms close to plant roots.
For this purpose, we are using the nutritional mediator rhizopine. Rhizopine is an unusual compound, which can only be degraded by bacteria harboring rhizopine catabolism genes. Since the soil is considered to be a rather nutrient-poor environment, bacteria endowed with the ability to use rhizopine as a sole carbon and nitrogen source should gain a selective advantage. We intend to combine plants excreting rhizopine into their rhizosphere with bacteria able to use rhizopine as a substrate, and we will study whether rhizopine proficient bacteria will gain a competitive advantage. This system can promote the selection of beneficial microorganisms in the rhizosphere. Rhizopine, in fact, is an inositol derivative, and we could show that inositol catabolism genes are playing an essential role in rhizopine degradation. Mark Galbraith’s research for his Master’s thesis involves the detailed characterization of the catabolic genes which enable microorganisms to degrade rhizopine. This characterization will aid in the construction of the marker system based on rhizopine degradation.

**CREST**

In 1994, the University awarded a Center of Excellence Award designated as the *Center for Research in Environmental Signal Transduction* (CREST), to nine faculty members from the Departments of Biological Sciences and Chemistry. The Center has become a focus for research within these departments and has been very beneficial in recruiting graduate students and new faculty. There are currently 13 faculty involved.

A goal of the group is to initiate studies in the area of signal transduction, the study of how biological molecules or chemical agents initiate action within the cell. This signal transduction plays an important role in the cause of human diseases such as cancer, alcoholism, cardiovascular disease and stroke. These cascades also initiate problems associated with environmental exposure to ozone and other stresses. Plants and insects have similar signal transduction systems that help them cope with environmental stress.

The group has spawned a number of projects particularly in the role of heavy metal ions on cells. Dr. Gyula Ficsor, Professor of Biological Sciences, has examined the role of cadmium in chromosome damage. Cadmium is a metal ion found in many products, particularly cigarettes. He has found that cadmium itself did not cause chromosome damage, but if mice were exposed to a chemical that causes chromosome damage, cadmium greatly enhanced the amount of damage. This might explain why the mild mutagens found in cigarette smoke may cause extensive chromosome damage and cancer in humans. He is collaborating on this project with Dr. David Reinhold of the Chemistry Department, graduate students Stephanie Blazina, Kevin Block, and Sue Lentz and four undergraduate students.

In 1995-96 CREST members have applied for $3.9 million in federal grants. The University funding for this group also supported 10 undergraduate research fellowships and eight graduate research fellowships to work on CREST related projects. The primary goal of CREST is to develop a collaborative research atmosphere. The first two years of the project have already demonstrated the importance of collaboration to the faculty and students.

*The above is a gel electrophoresis of DNA used in the molecular characterization of the rhizopine catabolism genes by transposon mutagenesis.*

Moreover, we are also interested in studying how bacteria can cope with adverse environmental conditions. Mainly due to improper waste management techniques, toxic concentrations of heavy metals have accumulated in soil and water. Marsha Kukuk, conducting research for her Honor's thesis, started to identify genes which are expressed in the soil bacterium *Pseudomonas fluorescens* after it has been exposed to elevated levels of the toxic metals mercury and cadmium. The identification and characterization of genes involved in the adaptation of microorganisms to environmental stress will help to advance approaches in bioremediation.
GRADUATE STUDENT PRESENTATIONS

The following students have been involved in preparing and presenting posters and possibly manuscripts about their work. These students have presented their work in the following manner:

Graduate student Ali Jazayeri (Major Professor: Dr. Karim Essani) presented his poster on Effects of Neonatal Immune Activation: Relevance to Developmental Models of Schizophrenia twice at the Society for Neurosciences meetings. The first presentation was in November of 1995 at the National meeting in San Diego, California, and the second presentation took place at the Michigan Chapter meeting of the Society in May of 1996 at Michigan State University. The manuscript resulting from Ali’s research is now under preparation for publication in the Journal of Neurosciences.

Graduate student Bina Garimella (Major Professor: Dr. Karim Essani) also presented her poster at the May meeting of the Society for Neurosciences at Michigan State University. Her poster entitled Effects of Selective D4 Dopamine Antagonist on Amphetamine induced C-Fos and NGF1-A mRNA Expression, will be presented again at this year’s National meeting of the Society for Neurosciences in November of 1996 in Washington D.C.

Graduate student Mini Paulose (Major Professor: Dr. Karim Essani) will be presenting her poster entitled Selective Inhibition of TNF-alpha Induced Cell Adhesion Molecule Gene Expression by Tanabax Virus, at the American Society for Virology’s 15th Annual meeting. This will take place at the University of Western Ontario on July 13-17, 1996.

GRANTS

The following faculty members received grants during the 1995-96 academic year:

Dr. Bruce Bejcek, Assistant Professor of Biological Sciences, has been named the recipient of a five-year First Independent Research Support and Transition (FIRST) award from the National Institute of Health. Funding for the first year of Bejcek’s work will total $91,350.00 His research will focus on oncogenes—genes that, for reasons not yet understood, are inappropriately activated, leading to uncontrolled cell growth.

Dr. Alexander Enyedi, Assistant Professor, has received funding from the Asgrow Seed Company to investigate transgenic tomatoes ($7600) 1996.

Dr. Leonard Ginsberg, Professor, received funding from Pharmacia & Upjohn under a contract for the isolation of microsomes. Funding for Dr. Ginsberg’s work will total $68,310 received in 1996.

Dr. Cindy Hoorn, Assistant Professor, D.V.M., received funding from the National Institutes of Health through an Academic Research Enhancement Award in order to continue her research on Environmental Toxicants and Endothelial Function; ($75,000.00) 1995-1998.

Dr. William Jackson, Professor, received funding from the National Institutes of Health for his continuation of research in the Control of Microvascular Function of Oxygen; ($112,951.00) 1995-1996. Dr. Jackson also received funding from the National Institutes of Health, National Research Service Award, Senior Postdoctoral Fellowship, for his continuing work with K+ Channels and Arteriolar Hyperpolarization ($5,389.00).

Dr. John Jellies, Assistant Professor, received funding from the National Science Foundation for his research in Segment- and Target- Related Embryogenesis of Identified Motor Neurons ($90,800.00). Dr. Jellies also received the Alfred P. Sloan Foundation Fellowship Award of unobligated funds ($21,128.80).

Dr. Silvia Rosbach, Assistant Professor, received funding from Western Michigan University’s Faculty Research and Creative Activities Support Fund for her work with Bacterial Response to Metal Stress ($5,000.00).
STUDENT HONORS AND AWARDS

The following eleven students were recognized at the departmental spring luncheon as outstanding students in WMU's Department of Biological Sciences.

- **Kristen M. Snyder** --- Recipient of the Distinguished Pre-professional Student in Biological Sciences Award. This award is given to the student deemed by faculty to be the outstanding biology or biomedical sciences major in a pre-professional curriculum. ($100).

- **Theresa M. Mau** --- Recipient of the Frank Hinds Zoology Award which is granted annually to an outstanding sophomore or junior biological sciences major with a minimum grade point average of 3.5 ($250).

- **Kimberly A. Langley** --- Recipient of the Margaret Thomas DuMond Award ($500) which is given to an upper-class biology or biomedical sciences major who has demonstrated outstanding potential for a career in Secondary Education teaching of biological sciences. Winter Semester 1996.

- **Phill L. Peters (Fall Semester 1995) and Duane D. McKenna (Winter Semester 1996)** --- Recipients of the Hazel Wirick Scholarship ($1,000.00). This award is given by the Kalamazoo Garden Council to an upper-class biology major with a project in the area of botany or ecology.

- **Mark A. Lombard** --- Recipient of the Distinguished Biomedical Sciences Graduate Student Award ($100) which is given to a student who has completed the requirements for a master of arts degree in biomedical sciences within the last year and who has shown outstanding research productivity.

- **Phill L. Peters** --- Recipient of the Distinguished Biology Graduate Student Award ($100). This award is given to a student who has completed the requirements for a master of arts degree in biology within the last year and who has shown outstanding research productivity.

- **Peggy A. Zeeb** --- Recipient of the Distinguished Senior in Biology Award ($100) which is given to an outstanding senior biology major with a minimum grade point average of 3.5.

- **Jodi Leja** --- Recipient of the Distinguished Senior in Biomedical Sciences Award ($100) which is given to an outstanding senior biomedical sciences major with a minimum grade point average of 3.5.

- **Jason L. Leduc** --- Recipient of the Presidential Scholar in Biological Sciences Award ($100)

- **Mini Paulose** --- Recipient of the Department Graduate Research and Creative Scholar Award (given by the Graduate College).

**Deaths**

**Dr. Edwin Steen, Professor of Biology emeritus** passed away November 11, 1995. Dr. Steen joined the faculty when the institution was called Western State Teachers College. In 1964 he was named head of the Biology Department, a position he held until he retired.

**Dr. Leo C. Vander Beek, Professor of Biology emeritus** passed away February 22, 1996. Dr. Vander Beek was a faculty member in the Department for 32 years before he retired in 1988.

---

**Visit us in Cyberspace**

Visit our new World Wide Web Site for more information about the Department. You can reach the University Web site at www.wmich.edu and the Biological Sciences Web site at www.wmich.edu/bios.

There you will find detailed information about our program and research. You can even email us with comments. If you want to see how we use the WWW in teaching visit www.wmich.edu/bios150. There you will find the Web site for our introductory Cell and Molecular biology course along with links to interesting biology web sites across the globe. Please use your email address to send us a message or even apply on-line for our graduate program. We look forward to your comments.
New Science Building and Attached Renovated Wood Hall

Department of Biological Sciences
Western Michigan University
Kalamazoo, Michigan 49008-3999