Biological Sciences

ALUMNI NEWS

University of Missouri Columbia

Spring 1990

BIO LINES . . . .

Clair Kucera, MU Sesquicentennial Emeritus Professor

Students and Faculty Sweep Awards

Howard Hughes Medical Institute Awards MU $1 Million for Undergraduate Education

Improving Biology Student Advising and Counseling

Don Riddle becomes Molecular Biology Director

New Bio Faculty: Harrelson, Kirk and McClellan
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BIOLOGY ALUMNI NEWS

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Cover Illustration: Lefevre Hall (opened 1914) and Tucker Hall (opened 1969).
Greetings

One of the most enjoyable aspects of teaching is the opportunity to follow the progress and share the successes of your former students. Although all of us have been fortunate enough to retain contact with a few of our students, we have lost track of most. I assume you may also have lost track of your undergraduate colleagues. Two years ago we began publishing a yearly newsletter directed at our graduate (MA, PhD) alumni, and that has been a very successful venture. We have heard from a large number of those alumni and have been pleased to pass on news about them to their friends. Now we are ready to put the lessons we learned from our graduate alumni to work as we reintroduce ourselves to the hundreds of you who received an undergraduate degree in Botany, Zoology, Microbiology, Premedical Sciences or Biological Sciences at MU.

And that perhaps is a good place to start the introduction, since for many of you the Division of Biological Sciences is a new creature. Until 1971 we were individual departments of Botany and Zoology. At that point the faculty of those two departments, along with some faculty in the Department of Genetics, merged to form the new Division of Biological Sciences. The Microbiology Area Program, through which several others of you received your degree, is still alive and well with the active participation of members of both our faculty and faculty from Medical Microbiology and Veterinary Microbiology.

Over the years there has been a significant turnover in our faculty, not unlike that found on most vigorous campuses. Some faculty have retired (Professors Gowans, Breitenbach, Burdick, Wood, Dunn and Kucera were recently awarded Emeritus status) while others have moved to "greener" pastures (Professors Farish, Farmer, Agris, Sherman). Early issues of Biology Alumni News will let you know where your former professors are and what they are doing. We will also pass on information about your fellow undergraduate alumni. And of course, we will tell you about the Division, where we have been, where we are now, and where we hope to be in the future. For example, we just received a $1 million award from the Howard Hughes Medical Institute to improve undergraduate science education on this campus. We will tell you all about those plans.

We have also enclosed an Alumni History Questionnaire designed to let us find out where you are and what you have done since you left MU. Please return it. There is no penalty for a failure to reply - we won't take you off the contest mailing list - except that your friends won't get to hear about you in future newsletters. We have thought about you, and we have enjoyed your successes (when we have been fortunate enough to hear of them). Surveys like this, even though they seem impersonal, are the best way for us to quickly catch up on all the news we've missed.

Take care. We'll be back in touch.

Sincerely,

John David, Chairman
Students and Faculty Sweep the Awards

It was an exciting, challenging and very rewarding year for the Division. Our faculty, staff and students continued to grow professionally and bring distinction to themselves and to the Division.

In the research arena our faculty were extremely productive, publishing papers and books, editing symposia, serving on national grant review panels and on the editorial boards of leading journals in their fields. In an era of increasing competition for research funds, our faculty continued to prosper, receiving 23 new research grants totaling $1.5 million last year. Among the individual achievements, Carl Gerhardt received a prestigious 5-year National Institutes of Mental Health Research Scientist Development Award, Abraham Eisenstark was selected the 1989 Outstanding Scientist in Missouri by the Missouri Academy of Sciences, and Clair Kucera was honored as one of only ten MU Sesquicentennial Emeritus Professors for contributions to his profession and the University. Faculty devotion to teaching and service was recognized as Gerry Summers was elected Vice-President of the National Association of Biology Teachers and the Arts & Science Student Government awarded Joel Maruniak the Blue Chalk Award for Excellence in Undergraduate Advising.

As much as our faculty distinguished themselves, and as proud as we are of them, this was truly the "year of the student". Our graduate students presented 19 papers at national meetings. Bill Wadsworth won the Best Student Paper Award at the 26th Annual Meeting of the Society of Neurobiologists. Bart Sakh was a recipient of the American Society for Microbiology Raymond W. Farber Fellowship. Miguel Esteyez received both an American Society for Cell Biology Scholarship to the Marine Biological Laboratory in Woods Hole and a National Science Foundation Predoctoral Fellowship. Bill Cook received a National Science Foundation Postdoctoral Fellowship. Fifteen students completed their MA degree and five completed their PhDs in 1989.

Our undergraduates were perhaps even more distinguished. Miles Silman (Kirkwood, Mo.) and Rick Knowles (Sedalia, Mo.) graduated Summa Cum Laude. Miles, who was also recognized in Who's Who Among Students in American Colleges and Universities, won a National Science Foundation Predoctoral Fellowship to pursue graduate studies at Duke University. Rick, who also graduated with a Division of Biological Sciences Departmental Honors Degree, was initiated into Phi Beta Kappa and received a Phi Beta Kappa Scholarship.

Laurie Blevins (Independence, Mo.), Stephanie Frisbie (Cape Girardeau, Mo.) and Gena Kidd (Cape Girardeau, Mo.) graduated Magna Cum Laude. Laurie also received an MU General Honors Certificate, while Stephanie was recognized in Who's Who and graduated with a Departmental Honors Degree. Barbara Bartlett (Ballwin, Mo.) and Suzann Carson (Columbia, Mo.) graduated Cum Laude. Suzann

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1988-89 FACULTY AWARDS AND HONORS

MU Sesquicentennial Emeritus Professor
Claire Kucera

NIMH Research Scientist Development Award
Carl Gerhardt

1989 Missouri Academy of Sciences Outstanding Scientist in Missouri
Abraham Eisenstark

Vice President, National Association of Biology Teachers
Gerald Summers

Arts & Science Blue Chalk Award for Excellence
In Undergraduate Advising
Joel Maruniak
also received an MU General Honors Certificate.

Juniors Kirsten Carlson (Kansas City, Mo.), Kathryn Jones (Independence, Mo.), Timothy Lewis (Monroe City, Mo.) and Heidi Stallman (Columbia, Mo.) were selected as Phi Beta Kappa Distinguished Undergraduate Scholars. Kathryn, along with Milton Jackson Jr. (Kansas City, Mo.), received Arts & Science Quadrangle Scholarships.

Undergraduates Sharla Brown, (Independence, Mo.), Terri Carron (Bloomsdale, Mo.), John Christianson (Columbia, Mo.), Kirsten Carlson, Kathryn Jones and Elizabeth Ostermeyer (Ballwin, Mo.) were awarded the Arts & Science Scholarship for Special Academic Achievement. Senior Amy Heimberger (Rolla, Mo.) won the First Place Award for a student research presentation at the annual meeting of the Missouri Academy of Science.

It truly was a banner year. We congratulate all who won individual recognition, thank those who contributed in many other unheralded ways to the success of the Division and wish all continued success in 1990.

If you would like more information on the Division in general and 1988-89 in particular, we would be happy to send you our latest Annual Report. If you would like a copy, check the appropriate box on the Alumni History Questionnaire.

1988-89
UNDERGRADUATE AWARDS AND HONORS

Phi Beta Kappa
Rick Knowles

Phi Beta Kappa Distinguished Undergraduate Scholars
Kirsten Carlson • Kathryn Jones
Timothy Lewis • Heidi Stallman

National Science Foundation Predoctoral Fellowship
Miles Silman

Departmental Honors Degree
Stephanie Frisbie • Rick Knowles
Christian Schmidt

Arts & Science Scholarship for Special Academic Achievement
Sharla Brown • Terri Carron
John Christianson
Kirsten Carlson • Kathryn Jones
Elizabeth Ostermeyer

Arts & Science Quadrangle Scholarships
Kathryn Jones • Milton Jackson Jr.

First Place Award for Student Presentation
Missouri Academy of Science
Amy Heimberger

Elizabeth Ostermeyer and her faculty mentor, Associate Professor Steve Alexander, determine the sequence of a piece of cloned DNA.
Clair Kucera Honored As
MU Sesquicentennial Emeritus Professor

In this Sesquicentennial year, Clair Kucera was uniquely honored when he was selected as one of only ten MU Sesquicentennial Emeritus Professors. Clair is an internationally recognized authority on the ecology of tallgrass prairies, particularly with respect to primary biomass productivity and the effect of fire on the tallgrass ecosystem. He has published more than 60 articles in the most prestigious journals of the fields of plant ecology and plant systematics, including Ecology, the Torrey Botanical Bulletin, the American Journal of Botany, and the American Midlands Naturalist. Of his four books, The Grasses of Missouri has become a standard taxonomic treatise and The Challenge of Ecology has had two editions that were widely adopted; the second edition was translated into Spanish. Clair and Professor John Faaborg are currently writing a new ecology text for Prentice-Hall.

Clair's research topics include primary productivity; carbon and total organic material cycles; effects of burning, grazing, and other environmental factors on the ecosystem; arthropod and mammalian food chains; the function of microorganisms in the ecosystem; and geographic selection and photoperiod adaptations as well as hybridization and speciation in tallgrasses. As an Emeritus Professor, he is continuing his research on the decay processes of native prairie materials leading to the formation of soil humus.

Clair's international reputation has led to invitations to speak and serve as a consultant across the globe, including: the Botanical Institute and Academy of Science, Brno, Czechoslovakia; Carolina Institute, University Karlovy, Prague; botanical and ecological institutes in England, Wales and Austria; tropical and botanical institutes in Costa Rica; the Seringetti Research Institute in Tanzania, Africa; and the Charles Darwin Research Institute of the Galapagos Islands. In 1978 Clair received the National Academy of Sciences East European Exchange Award. From 1971 to 1974 he served as Scientific Advisor in the Grassland Biome of the International Biological Programme.

Nationally, Clair has served on the editorial board of Ecology, the premiere scientific journal in his field, and on the National Science Foundation Ecology Panel. He is currently Technical Advisor to the Missouri chapter of the Nature Conservancy; has served as chairman of the Central States Section of the Botanical Society of America; edited The Proceedings of the 7th Annual North American Prairie Conference; regularly reviews grants for the National Science Foundation and the Department of Energy; and reviews journal manuscripts for Ecology, American Journal of Botany, and the Torrey Botanical Bulletin. Clair has been used as an expert reviewer by the Department of the Interior in the evaluation of proposals to establish National Landmarks and National Parks. He is a consultant to the Missouri Conservation Department, Missouri Department of Natural Resources and the Missouri Prairie Foundation.

Clair joined the MU faculty in 1950 and has remained in Columbia since he retired in 1987. The national recognition that the Division of Biological Sciences enjoys is due in large part to his varied contributions. In order to carry out a research program in tallgrass ecosystems, one needs a native tallgrass prairie. Clair identified a tract of native virgin prairie just east of Kingdom City, known as Tucker Prairie since 1852, when it was originally acquired by the Tucker family. This was the only large tract of native prairie remaining in Missouri north of the Missouri River. Recognizing the unique value of this prairie tract, not only to his own research but also to future generations, he single-handedly raised the money for its purchase by the University, and for the development of the research facilities housed there. The bulk of the funds for purchase and development of the research facilities came from a National Science Foundation grant written by and awarded to him in 1958. This was the first time that the National Science Foundation had ever awarded a grant for the purchase of land. Clair secured donations of the remainder of the funds necessary to purchase the prairie and construct the research station from the MU Alumni Achievement Fund, the Missouri Chapter of the Nature Conservancy and members of the Tucker family. Once the land was acquired, he designed the research station and has conducted research there ever since.

More research on grassland ecology has been conducted on this native Missouri prairie than any other in the Midwest. The prairie has provided an experimental background and presetlement model simulation for studies of diversity-stability relationships of population and community ecology carried out by Clair and colleagues inside and outside the University. A long-range
Fire program was initiated in 1958. Over 60 research papers on prairie ecology and soil formation at Tucker Prairie have appeared since 1958, written by Clair, his students and his colleagues. The prairie was an important research site for litter decomposition studies as part of the International Biological Programme of the 1970s and in 1978 the prairie was dedicated as a National Natural Landmark in the National Registry with the U.S. Department of Interior. Clair was Director of the research station until he retired from MU. Professor John Faaborg was appointed Director in 1987.

In addition to maintaining an internationally recognized research program, Clair taught a wide variety of courses including Ecology, Plant Geography, Plant Taxonomy and Basic Environmental Studies. Students from freshmen to graduates always enjoyed his classes and commented on his broad knowledge of plants, his enthusiasm for teaching and his genuine interest in his students. Although he maintained one of the heaviest teaching loads among biology faculty, he was always willing to devote as much time to a course as the students desired. He frequently led field excursions and easily conveyed his enthusiasm and knowledge of plants to his students.

Clair has served as mentor for 30 graduate students, 12 of them PhD candidates. Most of these graduates are active professional ecologists. From 1960-63 he was Chairman of the Department of Botany.

Always an active citizen of the University, Clair guided innumerable student, alumni, and Missouri citizen groups around Tucker Prairie, interpreting his studies for them. This public relations effort was not a part of his official University duties, but he did it, frequently on weekends, to spread his knowledge and love of the natural prairie system.

Clair is an individual who helped to establish an entire field of study on the international level and provided the University with tremendous leadership in his area of scholarship. It is because of people like him, dedicated to excellence in scholarship and teaching, that this University is a unique and outstanding institution. Surely no one was more deserving of recognition as a Sesquicentennial Professor.

An aerial view of Tucker Prairie, above, after a controlled burn, right.

A Little More History

In 1971 the independent departments of Botany and Zoology were united as a single unit in the Division of Biological Sciences within the College of Arts and Science. Only two years earlier, Tucker Hall had been formally dedicated as the new home of the Botany Department, and thus the Division of Biological Sciences found itself occupying both Tucker Hall and Lefevre Hall, which was dedicated in 1914. Many of you know Lefevre Hall as the previous home of both Botany and Zoology. Although Lefevre Hall has undergone some significant and sorely needed renovation in the last few years, we occupy essentially the same space today.

A few copies of a very interesting and informative booklet, A History of Biological Sciences at the University of Missouri-Columbia, are still available. This history, written by Barbara Holland in 1977, covers the rise of biology on the Columbia campus from its inception as a distinct discipline in 1891, in the administration of President R. H. Jesse, through 1977. If you would like a copy, please check the appropriate box on the Alumni History Questionnaire.
Howard Hughes Medical Institute Awards MU $1 Million to Support Undergraduate Science Education

In response to a nationwide dramatic decline in the number of students interested in careers in science, the Howard Hughes Medical Institute last year announced its intention to invest $60 million in undergraduate science education. MU was one of only 101 educational institutions invited to apply for these grant funds. Last summer we learned that the proposal written by the Division of Biological Sciences, in collaboration with the departments of Biochemistry, Chemistry, Physics, and Curriculum and Instruction, was funded for 5 years at a total of $1 million. MU is one of only 51 universities nationwide to receive this prestigious grant.

MU's comprehensive program includes three major components: (1) Undergraduate Student Development; (2) Undergraduate Curricular Development and Integration; and (3) Secondary School Outreach (High School Faculty Renewal and Development).

Approximately $400,000 of grant funds is targeted for undergraduate student development, matched by an equal contribution from the University. We are introducing an integrated program of Undergraduate Research Internships for both the academic year and the summer. These Internships will provide undergraduates an intensive research experience on a project jointly designed by a faculty member and the student. Our undergraduates will initially work as part of a small research team, always including the faculty mentor and typically also including one or more graduate students, technicians and occasionally a postdoctoral fellow. As students progress in the program they will achieve increasing independence. The opportunity to work on an ongoing research problem under the guidance of a research scientist previously has been only rarely available at the undergraduate level.

Associate Professor George Smith with, from left to right, students Kathryn Thornton, Blaine Easley, Dexue Sun and Kelly Hornaday in the Molecular Biology Laboratory.

Summer Research Interns also will participate in Honors Seminars on the Philosophy and Ethics of Science and Methods of Scientific Inquiry. Interns can choose to work with faculty members in Biochemistry, Biology, Chemistry or Physics. They receive a stipend of $1,000 for the academic year and $1,500 for the summer.

To increase the opportunity for talented and academically qualified juniors and seniors to gain teaching experience in undergraduate laboratories, the Program is providing 20 Hughes Undergraduate Teaching Assistantships with a stipend of $500 per semester. A special training program has been developed for Hughes Teaching Assistants, and they receive continued advice and support from select outstanding graduate teaching assistants and faculty.

More than $500,000 of the grant and University funding is being used to enhance existing undergraduate courses and develop new junior-senior level laboratories with an investigative, participatory emphasis and exposure to modern methodology and techniques. One such course, Molecular Biology Laboratory, was offered for the first time this fall by Associate Professor George Smith. This two-credit course provided students hands-on experience with molecular biological and recombinant DNA techniques in an experimental lab setting. A second new course, Techniques in Neurobiology, is currently being designed by Assistant Professors Mark Kirk, Allan Harrelson and Andy McClellan and should be ready for winter semester 1991. Grant funds will be used to purchase state-of-the-art equipment so that students in Techniques in Neurobiology can utilize computer-based data acquisition from sophisticated physiological instrumentation to measure electrical events underlying neural and muscular processes. Finally, a new section of Genetics is planned for fall semester 1990. Using computer-simulated genetic experiments, students will be able to explore the effects of dominance and recessiveness, multifactorial inheritance, gene interaction and mutation at one of 20 new Macintosh computer workstations purchased for this course.

Faculty and staff associated with the MU Hughes Program are very excited about these new opportunities for undergraduates.

Hughes Intern Terri Carron
Student Advising and Counseling in the Division

Even though we were justifiably proud that Associate Professor Joel Maruniak was honored with the Arts & Science Student Government Blue Chalk Award for Excellence in Undergraduate Advising, with over 700 undergraduate majors and premeds and 80 graduate students, we knew that our faculty were simply spread too thin. It was therefore, with a feeling of real accomplishment and major progress in the advising arena, that this fall we hired Linda Blockus as Senior Academic Advisor in the Division and Program Coordinator for the Hughes Program.

Linda completed her AB in Biology at Dartmouth College and her EdM in Higher Education Administration at Boston University. For the past two and one-half years she was the Academic Administrator for the Biology Department at Boston University, with responsibility for managing undergraduate and graduate advising, graduate admissions and aid programs, preparation of promotional materials for the department and course scheduling.

In her role as Senior Academic Advisor, Linda has responsibility for managing our undergraduate advising and counseling program, serving as liaison with the Beta Beta Beta Honor Society and producing promotional materials for the Honors program, and Division in general. In the future, she will assume increasing responsibility for our alumni relations and development program.

As Program Coordinator, Linda has staff responsibility for the Undergraduate Biological Sciences Education Initiative Program recently funded by the Howard Hughes Medical Institute. In this context she promotes and administers the undergraduate research internship program, actively recruits minorities in the sciences, works with the campus Minority Achievement Program to provide special services, and promotes and administers the outreach programs for secondary school science teachers.

Beta Beta Beta Grants Charter to Local MU Chapter

The Beta Beta Beta (or Tri Beta) Honor Society is a national undergraduate organization dedicated to improving the understanding and appreciation of biology through scientific research. The Society, founded in 1922, has 320 chapters and a membership of more than 100,000. On November 7, twenty charter members were initiated into the new Pi Eta chapter at MU. Officers for 1989-90 are: President, Kathy Peacock (Florissant, Mo.); Vice-President, Lori Pennington (Excelsior Springs, Mo.); and Treasurer, Mark Smith (Monroe City, Mo.).

All chapters are expected to provide student services, service to the academic community, and service to the general public. The local Pi Eta chapter: (1) provides Peer Advising for biology majors; (2) provides a Lab Assistant Employment Service; (3) sponsors talks by local and visiting faculty, including this semester a speaker from the Missouri Department of Conservation; (4) sponsors an annual auction of biological artifacts as a fund-raiser; and (5) sponsors tours of especially interesting or unique research facilities, this semester including historic Sanborn Field.
Molecular Biology Program Gets New Director

One of the major revolutions in modern biology has been the dramatic increase in technology that has allowed us to begin to understand biological phenomena at the level of individual molecules. A whole new subdiscipline of biology has arisen, Molecular Biology, which involves the analysis of the structure and assembly of complex biological systems by studying the chemistry and physics of their molecular and macromolecular constituents. Recognizing both the importance of this new approach to biological problems and the inherent interdisciplinary nature of this kind of research, faculty in the departments of Biological Sciences, Biochemistry, Medical Microbiology and Veterinary Microbiology initiated the development of the MU Molecular Biology Program in 1985. The goals of this campus-wide program, funded by a specific appropriation from the State Legislature, are (1) to promote basic research on the genetics and molecular biology of animal, plant and microbial systems, emphasizing problems of fundamental significance to medicine, agriculture and energy development, and (2) to stimulate new forms of interdisciplinary research and new teaching programs among the biologically related sciences by integrating research and scholarly activities among multiple divisions and departments at MU.

The Program elected to focus initially on four research areas that require the application of molecular methods to fundamental questions in biology: (1) development and aging; (2) resistance to disease; (3) biological energy conservation and (4) environmental improvement. These areas share a common technology, and a common goal of understanding the genetic and cellular processes that underlie important biological phenomena in animals, plants and microorganisms.

The Molecular Biology Program has developed and funded three technical facilities on the Columbia campus: (1) a Protein Sequencing Center; (2) a Cell and Immunobiology Facility; and (3) an Oligonucleotide Synthesis Center. In addition, the program funds predoctoral and postdoctoral fellowships and sponsors visiting scientists, technical workshops and an annual Molecular Biology Week.

Administered initially by a steering committee, this campuswide program began last spring to search for a permanent Director to manage, coordinate and promote its increasing activities. In August our own Don Riddle, Interim Director of the MU Molecular Biology Program for the past year, was appointed permanent Director of the Program by Dr. Judson Sheridan, Vice Provost for Research and Dean of the Graduate School.

Professor Riddle received his BA in Chemistry and Biological Sciences in 1968 from the University of California-Davis, a PhD in Genetics in 1971 from the University of California-Berkeley and held postdoctoral positions at the Medical Research Council Laboratory of Molecular Biology in Cambridge, England, and in the Department of Biological Sciences at the University of California-Santa Barbara before coming to MU in 1975. In 1987 he won the Chancellor's Award for Outstanding Faculty Research and Creative Activity in the Biological Sciences.

Don's research has contributed greatly to our understanding of the way genes interact with each other in animal development. He played an instrumental role in developing the "genetic map" for the nematode, a worm commonly used as a research model. The map, which shows the locations of all known genes on each of the creature's chromosomes, is essential to research being conducted in over 80 labs worldwide.

Don has served on the editorial board of Developmental Genetics and as the Associate Editor of The Journal of Nematology. His research program has been supported by the National Science Foundation and the National Institutes of Health. His research is currently supported by three separate research grants.

Professor Don Riddle and graduate student Miguel Estevez use video microscopy to study movement of mutant nematodes.

Dr. Sam Araghi directs the Protein Microsequencing Lab.
New Faculty

We were delighted to welcome three new faculty members this year!

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Allan Harrelson completed his undergraduate degree at Reed College and his PhD at Rockefeller University before moving to the University of California-Berkeley as a postdoctoral fellow. As a graduate student, Allan defined the mechanism whereby adrenal steroids regulate the hippocampus, the primary steroid target in the brain. He also provided the first biochemical evidence that the hippocampus may be sexually differentiated.

Allan’s long term research goal is to discover how the brain is "wired together" during embryonic development (that is, how the right brain cells are hooked up to one another). He has elected to take a molecular and cellular experimental approach by identifying and cloning genes that are expressed in individual nerve cells and that cause those nerves to form the proper connections. For technical reasons he uses two invertebrate animal species, grasshoppers and fruit flies, as model systems. Allan also hopes to determine how nerve cells regenerate and whether faulty nerve connections cause specific nervous system diseases such as epilepsy. Allan arrived in April 1989. He will teach Developmental Neurobiology and help establish Techniques in Neurobiology.

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Andrew McClellan received his BS and MS from the University of Maine, and his PhD from Case Western Reserve University. As a postdoctoral fellow at the Karolinska Institutet in Stockholm, Andy was introduced to the lamprey, a primitive vertebrate, as a model system and focused on the initiation of swimming in the isolated lamprey spinal cord. These studies suggested that excitatory amino acids play an important role in the initiation of locomotion.

Andy is interested in the mechanism by which neural networks in the brain and spinal cord control movement, particularly locomotor behavior in the lamprey. His laboratory uses primarily neurophysiological techniques, but also anatomical and pharmacological methods, to investigate two areas of motor control. One study involves the organization of "command" networks in the brain that activate the spinal cord to initiate locomotor behavior. Current and future interests involve determining the properties of neurons within the network, the connection pattern between neurons, and the computer modeling of these networks. His other study also involves the lamprey, because this is one of the few vertebrates whose spinal cord can regenerate following spinal cord injury. Current and future interests involve determination of the timetable of regeneration, the extent to which regeneration is complete, and the mechanisms which allow nerve cells to regenerate following injury. Andy joined us in January 1990. He will teach Vertebrate Physiology and help establish Techniques in Neurobiology.

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Mark Kirk received his BS from Southwest Missouri State University and his PhD from Rice University. Mark moved into the world of the marine invertebrate *Aplysia*, a sea slug, as a postdoctoral fellow at Stanford University, where he identified changes in ionic currents induced by a neuropeptide. He accepted an Assistant Professorship at Boston University in 1986, where he continued to study the effects of hormones on basic cellular properties and the consequences those effects have on organizing an animal's behavior.

Mark’s long-term research goals are to understand how the central nervous system regulates simple behaviors and to establish the principles of remodeling of neuronal connections in terms of the underlying biophysical and biochemical mechanisms of neuronal interactions. Mark joined us in August 1989. He will teach Neuroethology and help establish Techniques in Neurobiology.
Stephen Alexander (Associate Professor; PhD, Brandeis University, 1976). Research: Molecular biology and morphogenesis in cellular slime molds. Teaching: Developmental Biology; Cellular Basis of Development.

Felix Breden (Associate Professor; PhD, University of Chicago, 1982). Research: Population genetics, ecology and the role of population structure in the evolution of social behavior. Teaching: Ecology; Population Biology; Evolution.

James Carrel (Associate Professor; PhD, Cornell University, 1971). Research: Chemical ecology and ecophysiology of terrestrial arthropods. Teaching: Animal Communication; Community Biology; Basic Environmental Studies.

Linda Chapman (Associate Professor; PhD, University of California - Los Angeles, 1965). Research: Cell biology and mechanisms of recombination in bacteria. Teaching: Cell Physiology; Microbiology; Advanced Bacteriology.

Karen Cone (Assistant Professor; PhD, Duke University, 1984). Research: Regulation of gene expression in higher plants. Teaching: Genetics; Eukaryotic Gene Regulation.

Billy Cumble (Professor; PhD, University of Texas, 1960). Research: Plant anatomy and developmental biology. Teaching: General Biology; Botany; Plant Anatomy; Plant Morphogenesis.

John David (Associate Professor; PhD, Vanderbilt University, 1969). Research: Plasma membrane structure and function in skeletal muscle development. Teaching: Developmental Biology; Genetics.

Roger deRoos (Professor; PhD, University of California-Berkeley, 1961). Research: Comparative endocrinology; hormonal controls on energy sources. Teaching: Microscopic Anatomy; Comparative Endocrinology.

Abraham Eisenstadt (Professor; PhD, University of Illinois, 1948). Research: Bacterial and phage genetics; genes regulating response to oxidative stresses. Teaching: Microbial Genetics; Genetics and Human Affairs; General Biology.

John Faaborg (Professor; PhD, Princeton University, 1975). Research: Avian ecology and behavior. Teaching: Ecology; Community Biology; Avian Ecology; General Biology.

Carl Gerhardt (Professor; PhD, University of Texas-Austin, 1970). Research: Neural mechanisms of sound pattern recognition in frogs; sexual selection and speciation in frogs. Teaching: General Biology; Animal Communication.

Information on research interests and current projects is available in the 1988-89 Annual Report. To receive a copy, please check the appropriate box on the Alumni History Questionnaire.

Miriam Golomb (Associate Professor; PhD, University of California-Berkeley, 1974). Research: RNA polymerase II structure and genetics; regulation of transcription in nematodes. Teaching: Genetics and Human Affairs; Genetics.

Arthur Harrison, Jr. (Professor; PhD, University of Maryland, 1952). Research: Bacterial phylogeny and ecology; ribosome function. Teaching: Microbiology; General Biology; Bacterial Systematics.

Donald Hazelwood (Associate Professor; PhD, Washington State University, 1961). Research: Invertebrate biology; ecology, physiology and reproduction. Teaching: Invertebrate Zoology; Zoology; Marine Biology.

Philip Jen (Professor; PhD, Washington University-St. Louis, 1974). Research: Sound localization, auditory neurophysiology, developmental neurobiology. Teaching: Sensory Physiology; Developmental Neurobiology; Introduction to Neurobiology.

Joel Maruniak (Associate Professor; PhD, University of Texas-Austin, 1977). Research: Vertebrate chemoreception. Teaching: Vertebrate Physiology; General Biology.

Dan Mertz (Professor; PhD, University of Texas-Austin, 1960). Research: Plant improvement through somatic hybridization. Teaching: Botany; Plant Physiology; Plant Growth and Development.

Dean Metter (Professor; PhD, University of Idaho, 1963). Research: Variation and divergence of populations of amphibians and reptiles. Teaching: Comparative Anatomy; Zoology; Herpetology.

Donald Miles (Professor; PhD, Indiana University, 1967). Research: Genetics and photosynthesis. Teaching: Cell Biology; Photosynthesis; Plant Physiology.

Kathleen Newton (Associate Professor; PhD, Indiana University, 1980). Research: Interactions among the three genomes of plant cells; nuclear, mitochondrial and chloroplast. Teaching: Advanced Cell Biology; Advanced Plant Genetics.

Thomas Phillips (Assistant Professor; PhD, Northwestern University, 1982). Research: Intestinal cell biology, differentiation, cancer biology. Teaching: Advanced Microscopic Techniques; Advanced Cell Biology.

Donald Riddle (Professor; PhD, University of California-Berkeley, 1971). Research: Developmental genetics, behavior and molecular genetics of the nematode C. elegans. Teaching: Developmental Genetics; Genetics; Genetics Laboratory.

Richard Sage (Assistant Professor; PhD, University of Texas-Austin, 1974). Research: Genetic organization of animal populations; structure and maintenance of hybrid zones in frogs and mice. Teaching: Community Biology; Evolution.

George Smith (Associate Professor; PhD, Harvard University, 1970). Research: Filamentous fusion phage biology and molecular genetics. Teaching: Molecular Biology Laboratory; Genetics.

William Stark (Professor; PhD, University of Wisconsin, 1973). Research: Visual receptor function in fruit flies and man. Teaching: General Biology; Sensory Physiology.
Current Faculty

Gerald Summers (Associate Professor; PhD, University of Illinois, 1981). Research: Invertebrate ecology. Teaching: General Biology; General Biology Laboratory; Speciation; Evolution.

John Twente (Associate Professor; PhD, University of Michigan, 1954). Research: Physiological, behavioral, ecological and physical phenomena governing hibernation of bats. Teaching: General Biology; Physiological Ecology.

Frederick vom Saal (Professor; PhD, Rutgers University, 1976). Research: Sexual differentiation, maternal-fetal physiology, hormones and behavior. Teaching: General Biology; Mammalian Reproductive Biology.

John Walker (Assistant Professor; PhD, University of Georgia, 1985). Research: Mechanisms regulating plant gene expression by environmental and developmental signals. Teaching: Molecular Biology; Plant Molecular Biology.

Richard Wang (Professor; PhD, University of Colorado, 1968). Research: Mechanisms of autoimmunity; cell cycle controls. Teaching: Cell Culture Techniques; Mammalian Cell Genetics.

David Worcester (Associate Professor; PhD, Harvard University, 1971). Research: Structure and properties of biological membranes and membrane components. Teaching: Biology of Macromolecules; Cell Biology.

Historic Paintings Restored

In the process of renovating portions of Lefevre Hall two years ago, we cleaned out the attic. You wouldn’t believe some of the stuff that was uncovered! Well, maybe some of you would. We almost called in the archaeologists. Located in the process were four oil paintings by Charles Schwartz (AB, 1938, Zoology; MA, 1940, Wildlife) which he completed in 1937. These beautiful paintings by the noted wildlife illustrator, one of which is reproduced above, have been completely restored and now proudly hang in the main hallway of Lefevre Hall.

Distinguished Alumni Awards

Although we have lost track of most of you we take pride in the honors bestowed on two of your fellow alumni, Dr. Herschel Roman and Dr. Diane Brukardt.

Dr. Herschel Roman, Professor of Genetics at the University of Washington, was awarded an honorary Doctor of Science degree at the MU spring commencement ceremonies. Dr. Roman was an alumnus of MU and a pioneer and leading investigator in yeast genetics. Professor Roman’s honors included membership in the National Academy of Sciences, presidency of the Genetics Society of America, and an honorary DSc from the University of Paris. Dr. Roman died July 2, 1989.

Dr. Diane Brukardt received the A & S Distinguished Alumni Award at the A & S Banquet last spring. Dr. Brukardt received her AB in Biology (Phi Beta Kappa) from MU in 1950, a BS in Medicine from MU in 1952 and her MD from Harvard in 1954. She returned to MU to become the first woman resident at the MU Medical School, an Instructor in Medicine, a member of the staff at the Student Health Service, and since 1980 has been the Director of the Student Health Service. Dr. Brukardt has served as President of the MU chapters of Phi Beta Kappa, American Association of University Women and Mortar Board. She is a member of the American College of Physicians and the American Society of Internal Medicine.
News from Your Fellow Alumni

Well, here's the problem... Until you return your Alumni History Questionnaires this space is going to be pretty empty. Please send your questionnaire back today so that this section occupies several pages in the next Alumni News. It only takes a minute!

1930-39

Frank E. Levenberg (AB, Biology and Chemistry, 1939) of Coconut Creek, Florida, just retired from practice as Chief of the Pediatric Clinic at Flushing Hospital and Medical Center in Flushing, New York.

Frederick C. Robbins (AB, Zoology, 1936) was the 1987 recipient of the Abraham Flexner Award for Distinguished Service to Medical Education. A Nobel laureate who helped cultivate the pox virus, Dr. Robbins was president of the Institute of Medicine of the National Academy of Sciences from 1980-85.

1950-59

Dennis C. Drake (AB, Zoology, 1954; BS, Medicine, 1955; MD, 1957) is in private practice in Larkspur, Ca and is a staff anesthesiologist at Marine General Hospital and Ross Hospital.

Joseph E. Hecker (AB, Zoology, 1951; BS, Medicine, 1955; MD, 1957) is a family-practice physician affiliated with the Kniebert Clinic in Poplar Bluff, Mo.

1960-69

John C. Hagan, III (AB, Zoology, 1965) of Kansas City has received national recognition for his medical research. His article published in Ophthalmic Surgery was chosen as one of the year's best clinical studies by the Yearbook of Ophthalmology 1988, and a second article has been selected for inclusion in a medical textbook. Hagan is Chief of Surgery at North Kansas City Hospital and Director of the Midwest Eye Institute of Kansas City Inc.


Ronald Swinford (AB, 1969, Zoology; MD, 1978) is Assistant Professor of Medicine at East Tennessee State University in Johnson City. He was previously in private practice in Cape Girardeau, Mo.

Donald L. Wehmeyer (AB, Zoology, 1967; MD, 1971) is a plastic surgeon in Abilene, Texas. He worked on the staff for the World Boy Scout Jamboree held in Australia in 1988.

1970-79

John Frederick Best (AB, Biology, 1973; MD, 1977) is a Fellow of the American College of Cardiology. He is currently in private practice with the Smith-Glynn-Calloway Clinic in Springfield, Mo. He was President of the Kansas Affiliate of the American Heart Association and an Instructor in Medicine at the University of Kansas Medical Center.

Bill Lodwick (AB, 1971, Zoology; MS, 1978, Counseling Psychology; MD, 1988) received his degree in Zoology in 1971. After serving as a psychiatric aid for four years, he returned to MU to obtain an MS in Counseling Psychology in 1978. After five years as a youth counselor in Columbia at the Front Door and Daybreak, Bill entered Medical School at MU in 1984. After completing his MD, Bill entered the psychiatric residency program at the University of Michigan.

William K. Rosen (AB, Zoology, 1972; MD, 1977) is a family physician in private practice in Springfield, Mo., a member of the Medical Directors Board, and head of the family-practice section at Lester E. Cox Hospital.

Michael Thornsberry (AB, 1978, Biology; MD, 1983) completed an externship in England and Wales in 1985. He has a private family medicine practice in Owensville, Mo.

In Memoriam

Howard Rusk (AB, Zoology, 1923; DS, 1947) for whom the University's Rusk Rehabilitation Center is named, gave the first Rusk Lecture at the School of Medicine in September, 1988. Dr. Rusk pioneered rehabilitative techniques for servicemen during World War II and founded the Institute of Rehabilitative Medicine at New York University Medical Center. Dr. Rusk passed away in November, 1989.

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