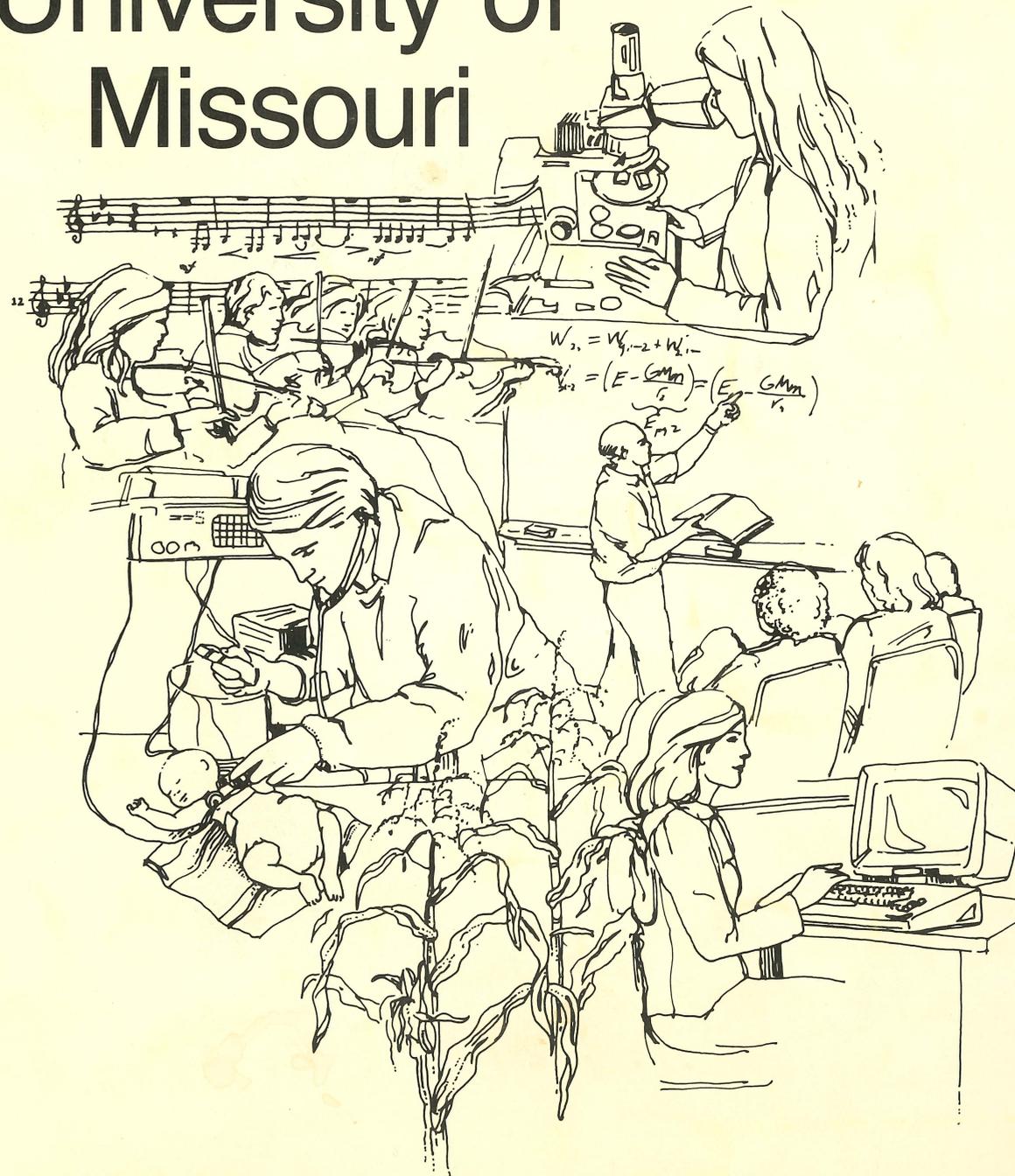


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President's Report
Impact '84

University of Missouri



President's Message

Nearly 150 years ago Missourians shared a dream: establish a great public university to benefit all the people of the state. Thanks to the dedication and hard work of many people over those years, what began as a vision is becoming a reality.

This report bears testimony to our progress toward the fulfillment of that dream. It describes but a few of the relationships between the state's premier public university and millions of Missourians—city dwellers and country folks, young and old, the robust and the ill.

The food we eat, the clothes we wear, the cars we drive, the doctors and nurses who care for us—in these and countless other areas Missourians benefit directly and immeasurably from their University.

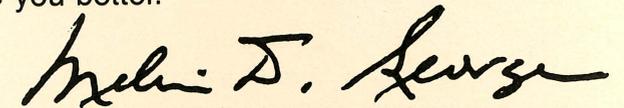
First, and foremost, our four diverse campuses provide affordable, accessible higher education and are open to all who can benefit from it. In keeping with the vision of the University's founders, it is a quality education, with many academic programs nationally, and internationally, acclaimed.

Intimately linked to teaching is the University's research mission. Indeed, the responsibility to generate new knowledge by carrying out significant research is a distinguishing feature of the University of Missouri. Many advances in agriculture, biological science, chemistry, engineering, health care, physics and veterinary medicine are the direct result of years of dedicated work by University researchers. Such work, plus other scholarly efforts which make our lives better, continues today and will make possible a brighter tomorrow.

But the University does not limit itself to these two missions; it also helps apply knowledge. An extension program that reaches into every sector of the state makes our expertise available to everyone. Indeed, the University's extension approach has shown the nation, and the world, how best to put information into the hands of those who can benefit from it, be they farmers, businessmen, physicians or homemakers.

The University likewise puts its knowledge and expertise to practical use through public service activities. For example, the University's hospital in Columbia treated more than 14,000 patients this year, while tens of thousands more Missourians received outpatient medical, optometric and dental care from our clinics in St. Louis, Kansas City, Columbia and outlying communities. Oftentimes the assistance provided would otherwise be unavailable or unaffordable.

In carrying out these missions, the University keeps before it the vision of what it can be if all of us are committed to even greater excellence. With the help of the people of Missouri we can make such visions reality and I believe we shall. Your support is needed, and certainly appreciated, as we strive to create a University that can serve you better.

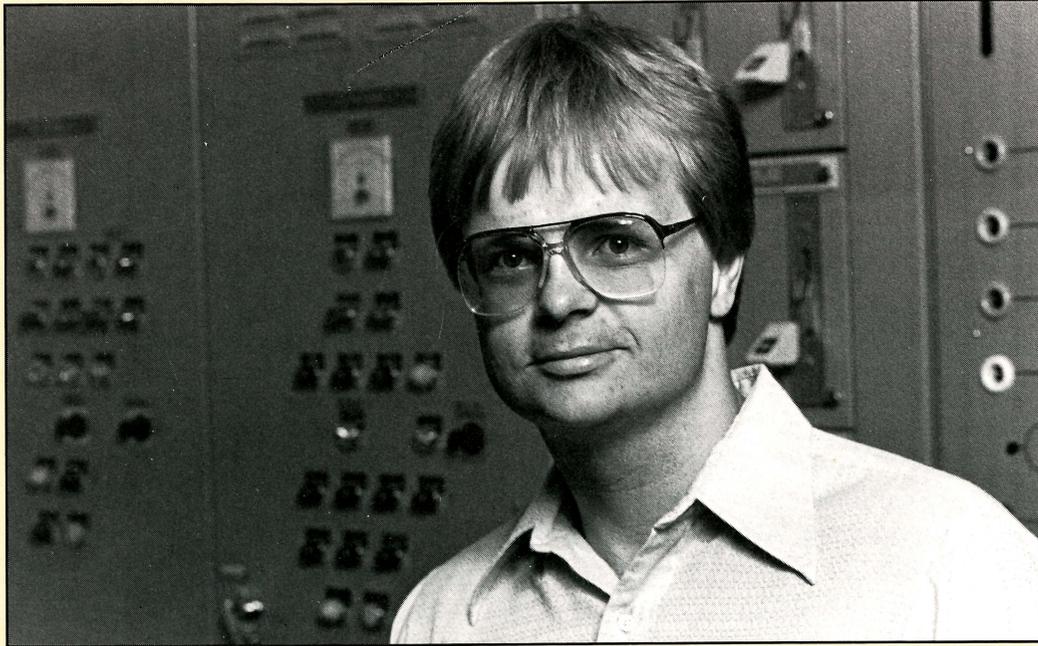


Melvin D. George
Interim President

Education

John Gates, UMR junior in electrical engineering

The addition of the Emerson Electric Machines and Drives Laboratory in the UMR electrical engineering department provides students with a valuable educational resource. It gives me an opportunity to use the latest in testing techniques while taking the power lab course. This



hands-on experience should prove to be very useful in my future career in private industry.

The equipment panels are clearly marked with such things as individual component names and voltage values. Descriptive diagrams also are included to indicate the function of each switch and connection. Separate on-off switches are provided for each part of the equipment and a master button is provided for immediate shutdown.

The equipment in the laboratory enables me to perform experiments in many different areas of the power field, and I am learning about such things as methods of power measurement, transformers, DC motors and alternators. Because of the nature of the equipment, experiments are performed quickly and efficiently. Data are read directly from the screen of a computer terminal,

making it possible to take in large amounts of information quickly. In addition, parts of an experiment can be programmed for computer control, allowing data to be taken automatically by the computer.

The equipment in the laboratory has been set up in several separate stations so that the class can be split into smaller groups. In this way, a group of four to five students can work at each station. Each member of the group is able to get significant hands-on experience with this equipment, and I feel that I learn more than I would in a larger group.

I feel fortunate that UMR is able to provide me with the opportunity to gain experience with this equipment, and I'm grateful to the companies that made this laboratory possible.

HELPING SMALL BUSINESS

There are many opportunities for new ventures in St. Charles County, the state's fastest-growing area, but many people don't know how to take advantage of them. To help would-be entrepreneurs, a UM extension business and industry specialist offers interested area residents a course on starting and managing a small business. More than 1,000 Missourians have participated in the past five years.

RINGING UP SALES

Sales professionals who enrolled in UM's Sales Institute program had the opportunity to acquire a wide range of new skills aimed at increasing their productivity. The evening and weekend classes featured nationally known sales training experts.

COMPUTERS ADDING UP

The UMC College of Business and Public Administration has added several interactive computer terminals for students and has acquired more microcomputers for teaching, research and administrative use. The college is also working to strengthen its ties with the business community, which is increasingly dependent on computers.

THE DIRECT APPROACH

UMKC is exposing students to the rapidly growing field of direct marketing. Experts predict that half of all retail sales by 1990 will result from direct marketing methods, and a \$570,000 grant from the Direct Marketing Education Foundation last year allowed UMKC's School of Business and Public Administration to create the nation's only university-based center for research in direct marketing.



Research

Tim Pilkington, *director, National Association of Trout Farmers*

When the trout association (which represents 300 rainbow trout farm operations throughout the United States) saw the need for a marketing study, we considered going to a national marketing firm. But then we thought, why make a national firm richer? We knew we could get high-quality work from the University of Missouri-Columbia and Dr. Carl Block in the College of Business and Public Administration. So why not help out the University and maybe fund the work of a graduate student as well?



We are a group of small businesses. A lot of them are “mom and pop” organizations that employ up to four people at the most. There is no way many of these farms could afford a marketing survey. As an association we joined together to fund the work being done by the University.

We knew we could raise more trout; we’d done very well on the production end, but we didn’t want to raise more fish until we raised the demand for what we’re selling.

(Trout farming, which began in this country as an industry in the 1940s, is a fairly young industry. It is estimated that national production of rainbow trout for consumption and for “fee” fishing is about 45 to 50 million pounds a year. Compared to the annual production of catfish, which was 137.5 million pounds in 1983, it was apparent to the trout association that the demand for trout needed to be increased.)

I think we’ve already received some valuable information from the survey. Dr. Block and his assistant designed a telephone survey and questioned 1,000 people in five major cities. He pointed out the need to know more about the circumstances surrounding trout consumption... to work to find out as much as we can about those who already eat trout and what affects their selection. If we increase the consumption of each person who eats trout by one trout a year, well that’s a lot of fish right there.

Actually, what we’ve found out so far is that we’re in a pretty good position. Trout has a good image. People think of it as a healthy food. We are learning some things that will put us in a better position.

After the study is completed we will be able to say to our customers, “Here is what the public says about trout.”

We won’t just be talking assumptions. We’ll have facts and figures made available by a University marketing survey.

SCANNER UP A POLE

A CAT scanner once owned by the UMC Hospital and Clinics is now being used to study wood utility poles for hidden damage. The device can see inside almost any object, but UMC nuclear engineering researchers are perhaps the first to use it for non-medical purposes. They hope to develop a portable version of the device that utility companies can use in the field. The CAT scanner was donated to the nuclear engineering department after the hospital acquired a more sophisticated machine.

PUTTING ON THE PRESSURE

Neutrons produced at the University’s Research Reactor can be used to probe through metal to reveal stresses in high-pressure pipe and fittings. Such studies help manufacturers produce pipe capable of withstanding the extremely high temperatures and pressures encountered in nuclear reactors and high-pressure boilers.

PUSH FOR PRODUCTIVITY

Stimulating the economy by improving the productivity of Missouri industry is the goal of a cooperative effort among the state’s economic development office, a labor/management task force, several industries and the University. UMR and UMC professors developed productivity and quality measures and are helping set enhancement goals and establish quality circles.

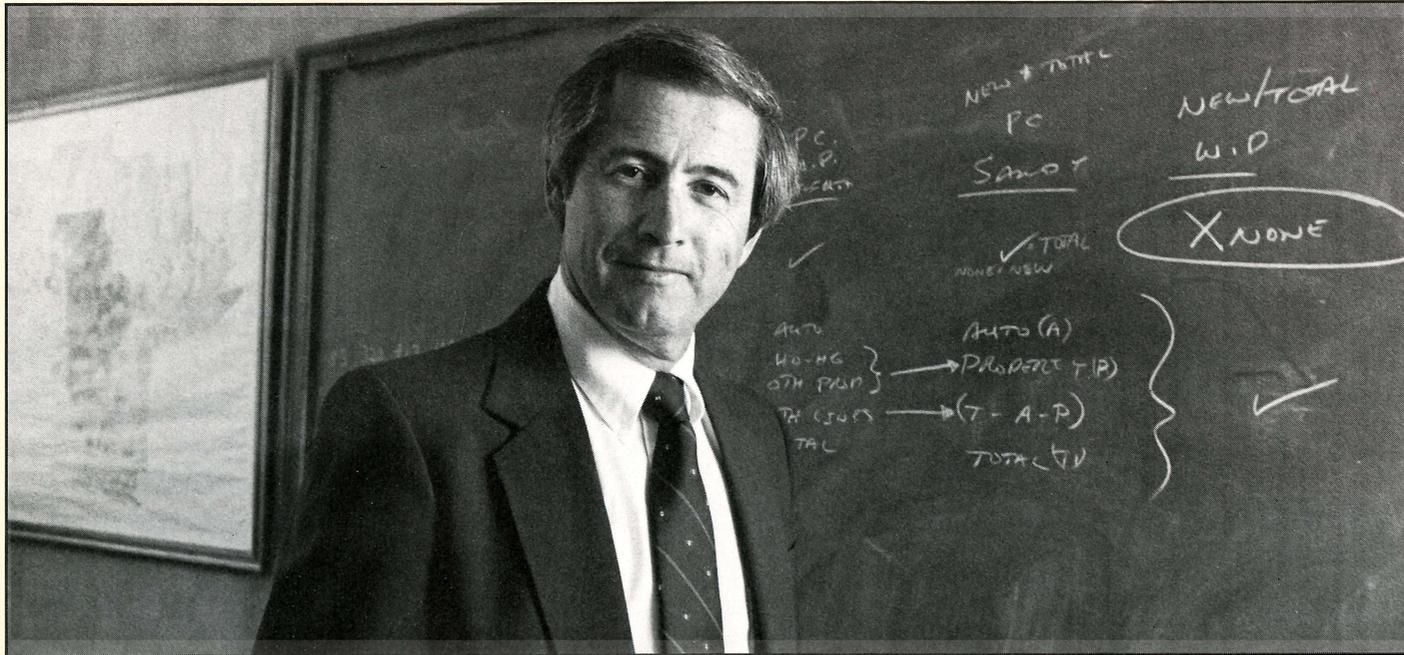
IMPROVING VOC-ED

UMC researchers are working with business, industry and government leaders seeking ways to guide the development of vocational education during the next decade. The project involves a study of the delivery system for vocational education in the state as it relates to labor market needs and fiscal resources. It was commissioned by the Missouri General Assembly and involves a 25-person advisory committee from business, industry, government and education.

Extension and Public Service

WAR ON LIVER CANCER

Better ways to treat human liver cancer by using millions of tiny microspheres to deliver cancer-destroying radiation to that organ are being developed by researchers at UMC, UMR and the University's Research Reactor. The project, initially funded by UM Weldon Spring Fund grants, now has gained support from a radiopharmaceutical firm.



Vince Bartle, director of planning and research, Shelter Insurance Co.

Our company recently engaged the UMSL Center for Business and Industrial Studies to help us develop a marketing management information system. We felt that a computerized system was needed to enable us to better determine where the markets for our products were and what we could expect from those markets.

We worked with Doug Smith, director of the center, and John Blodgett of the Urban Information Center, using UMSL's resources to help determine how and where to do business more effectively. Doug and John have been extremely helpful and do an excellent job.

Even though Shelter's home office is located in Columbia, we use the center at UMSL effective-

ly. We are able to communicate with the center not only by phone and mail but, most importantly, through the University's computer facility.

In fact, computer programs developed for us by the center are directly transportable from the University's system to Shelter's computer system. I think that with UMSL's resources, and particularly Doug Smith's business acumen, it is evident that UMSL's Center for Business and Industrial Studies is not at all limited by geography or business discipline.

Presently, we are using the center for another project, one that should help us to better serve our existing policyholders. Needless to say, we are very pleased with the help from Doug Smith and the center and intend to continue our business research relationship into the future.

ATTRACTIVE MAGNET

The crystal structure of a new magnetic material that could result in cheaper, more efficient electric motors has been identified by a researcher at the University's Research Reactor. The new material could revolutionize the electric motor industry. General Motors researchers collaborated on the project.

MISSOURI EXECUTIVES

Some 800 people have participated in two dozen programs offered by the UMC College of Business and Public Administration's Institute for Executive Development. The institute was established just a year ago as an aid to Missouri executives.

TAKING STOCK IN AMERICA

More than 2,000 St. Louis area high school students learn how to buy and sell securities and analyze the market each year as they play "the stock market game" through the UMSL Center for Economic Education. The computer game simulates investments and compares investment strategies.

OVERSEAS MARKETS

A teleconference on international marketing hosted by UMR was distributed to campuses around the nation on the National University Teleconference Network. The teleconference explained how U.S. firms can find and use federal services and programs to compete effectively in overseas markets. Several firms and government agencies were represented in the teleconference.

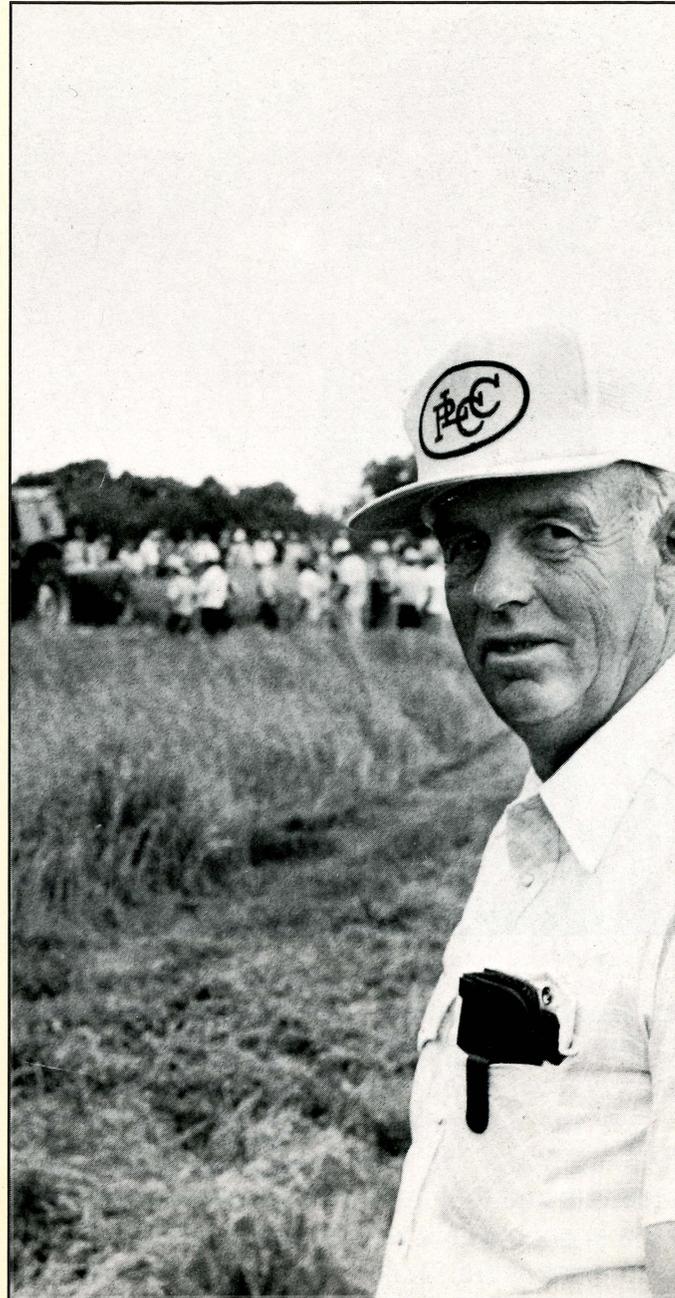
this year through the UMC College of Engineering's Continuing Engineering Education Program. The program not only brings new knowledge to the workplace, it provides faculty members with an inside view of industry, enriching their classroom teaching.

HELP FOR HOMEBUYERS

UMSL's continuing education-extension offers help to people interested in buying a home. A special course provides prospective buyers with information on area stability, market value, family utilization, income, credit approval and social environment.

ENGINEERING ON THE JOB

Specialized training programs were provided for employees at several firms



Tom Tweedie, Carrollton farmer

The Forage Systems Research Center is located out in a part of the state where forages and beef cattle are important parts of many local farming operations. Farmers can come here to research field days and machinery demonstrations, such as Hay Day, and pick up information from University researchers and extension specialists, from farm equipment manufacturer representatives and from other farmers.

(Hay Day offers Missouri farmers a program at the University's Forage Systems Research Center, the 1,200-acre center near Linneus. The center is a research unit of UMC's College of Agriculture.)

I'm a member of the center's advisory committee. My goal is to see that the center's research program is headed in a direction that will help area farmers. As a taxpayer I know it isn't possible for us to have all of the research centers over the state to provide all the information needed by the wide variety of farming operations we have in Missouri. We need to make sure we're getting the most from our tax dollar.

KEEPING UP

"Multiplan," "Random Access Memory" and "Data Base Management Systems" may not sound like words you'd hear on the farm. Yet students in the College of Agriculture are learning these terms and discovering how vital they are to their future

careers. Response to the college's computer course that emphasizes agricultural applications has been tremendous: 300 students enrolled in the course the second semester it was offered.

CITY TO THE FARM

Only about half of the students now in the College of Agriculture have farm backgrounds, a dramatic switch from the days when almost all ag students came from rural settings. The Department of Animal Sciences has started an internship program to help urban students gain valuable farming experience.

WORLD AS CLASSROOM

The world has been turned into a classroom for students in one UMC agriculture class. The agriculture travel course takes students on trips

throughout Central America, South America or Europe to show them agriculture in other countries firsthand. The trips include visits to farms, educational and research institutions, international agencies and agriculture-based industries.

STUDENT REPRESENTATIVES

High school students interested in agriculture find a valuable resource in UMC's agriculture students. Through the Student Representative Program, agriculture majors visit with high school students, as well as counselors, teachers and 4-H youth agents, to discuss UMC and College of Agriculture programs.



Dr. Stanley Johnson, UMC professor of economics, and **Dr. Abner Womack**, UMC associate professor of agricultural economics

At the agricultural policy institute on the UMC campus, we can evaluate current farm programs and their effect on farmers and the rest of the economy, and we can test proposed changes in agricultural policy to help politicians and other policy-makers determine which alternatives

look best.

Specifically, if the president announces the United States has just agreed to sell another 10 million metric tons of grain to Russia, we can put that information into our computer and make a pretty good estimate of what effect that will have on grain prices in the next few months.

Since the center was established, we've met with national and state commodity groups, farm

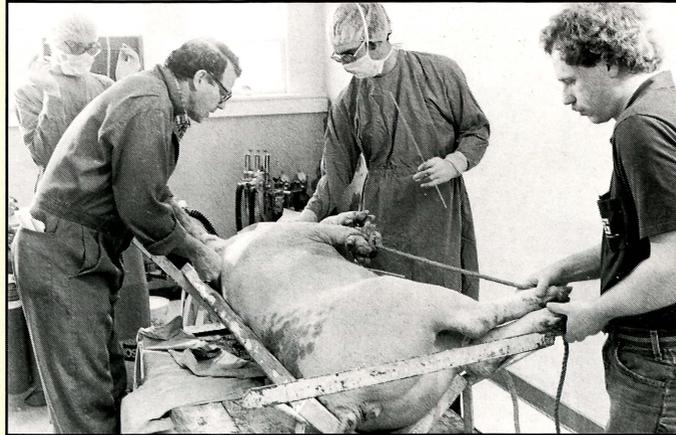
organizations, politicians and their staffs, farmers, bankers and others. We've listened to what they've had to say and added that information to our data base.

Our computer modeling system is being used to evaluate program options at least twice a year. These economic evaluations will be provided prior to major decisions regarding wheat programs in the spring and feed grain, cotton and rice programs in the fall of each year. The analyses will include implications for prices, farm income, foreign trade and government cost.

The computer modeling system will be available to policy-makers during the critical periods when provisions of future farm bills are being debated. Alternative scenarios designed to reflect implications of major farm proposals or modifications will be evaluated.

Agricultural policy and farm programs have been around more than 50 years and, like it or not, they're here to stay. Those affected by farm programs, especially farmers, are strong in their opinions and varied in their views. Many want strong government supports; others would just as soon the government got out of agriculture.

Testing these different views and potential policies on a computer is a relatively quick and painless way to get a good idea of the potential outcome of a farm program — no matter what it may be.



SUPER WHEATS

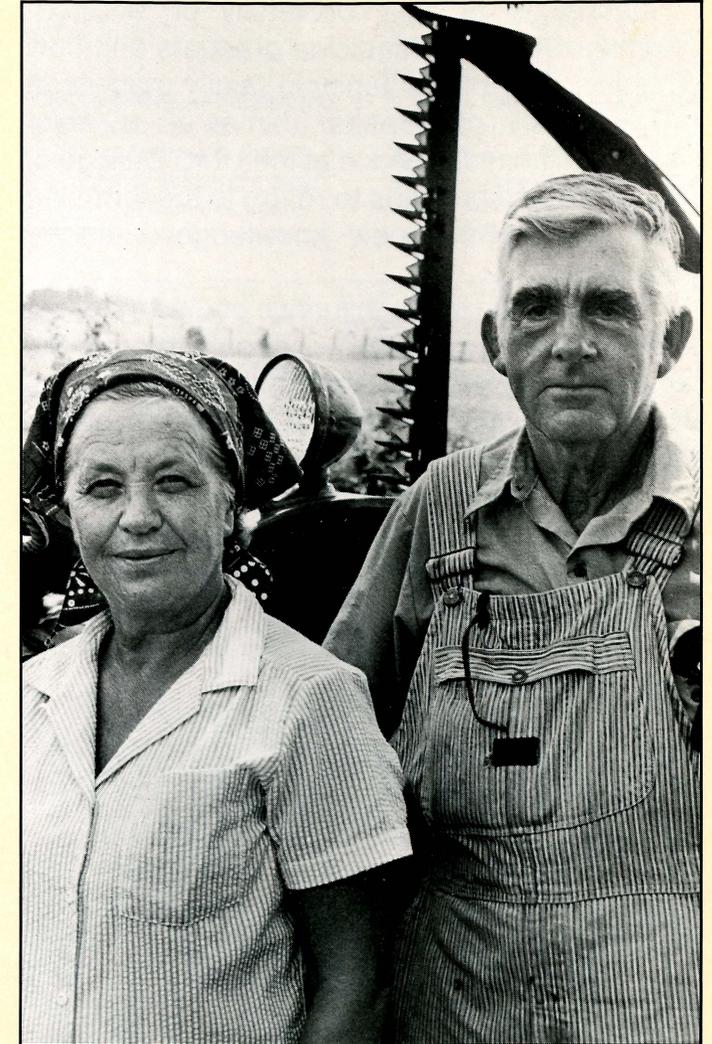
UMC is involved in research that could bring the nation closer to the development of "super wheats" that are hardy, disease resistant and drought tolerant, as well as being high yielding and high in protein.

AFTER MASH

UMC is helping beef producers make the most out of such byproducts as the mash left over after distilling alcohol or the effluent that remains after manure is turned into methane gas. Studies show calves and lambs fed distillers' wet grains perform just as well as those eating soybean oil meal.

NATIVE GRASSES

Modern farming practices destroyed much of Missouri's native grasses that once covered the state. Though crops and other grasses proved to be more profitable than the native varieties, their disappearance caused new problems. Erosion became a major problem and the new grasses introduced into the state did not grow well. The College of Agriculture is involved in a study to find out if the native grasses can be profitable to grow and if animals can take advantage of the maximum nutritive value of native grasses.



Lewis Wheeler, Hickory County farmer

My wife, Bernice, and I have farmed 955 acres near Quincy in Hickory County since 1948. And we have raised two sons here who have helped make our farm successful and who are now making us happy with their educational achievements.

Jeffrey is a 1982 University of Missouri-Columbia School of Medicine graduate and now in his last year of residency in family practice at the University of Kansas. James is a junior majoring in animal science at the UMC College of Agriculture and he plans to return to the farm and apply some of his new knowledge when he graduates.

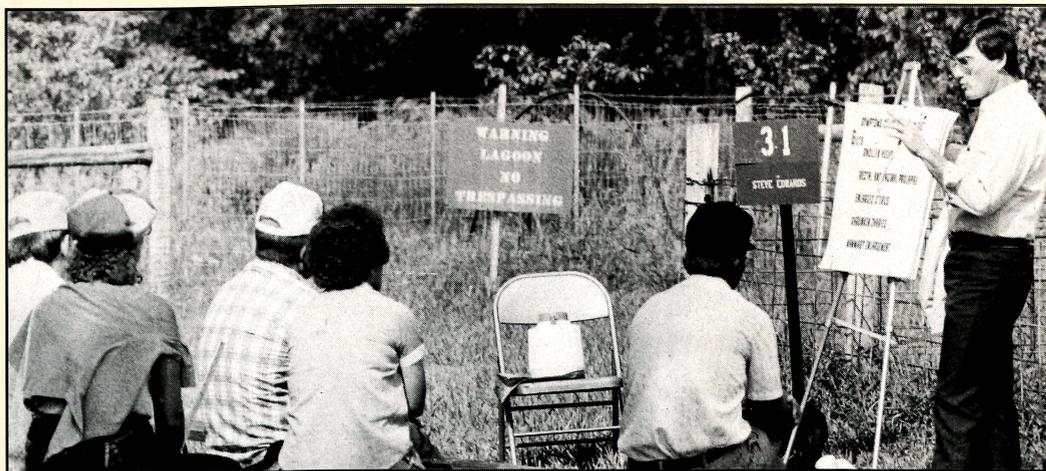
We're proud of the influence of the University of Missouri on our family — not only through the campus education our sons have received but also through the off-campus programs of the Missouri Cooperative Extension Service.

I have served several terms on the Hickory County Extension Council and Bernice is a charter member of her extension homemakers club — Friendly Circle. She has also been active with the Hickory County Missouri Extension Homemakers Association Council.

We have always tried to encourage our sons and give them responsibility. They earned their own money here on the farm. And Bernice, especially, has encouraged them in their education. While they went through school here she watched their progress carefully. She used to be an elementary teacher at Weaubleau.

I guess I've had a lot of respect for the University of Missouri since I had Jim Halsey as a vocational agriculture teacher at Weaubleau High School in the early '40s. He was a University of Missouri product and a good one.

Our farm has been used for several Missouri Cooperative Extension Service events over the years. We have 20 acres of native prairie and recently we have been involved in a fescue-



removal test plot.

John Hubbard, an extension agronomy specialist from Stockton, has helped us with many of our farm problems — insect control, herbicides and brush problems.

I feel extension is on the right track with specialized agents but there are lots of hobby farmers mixed in with those of us who make our sole living on the farm. Questions from them need answers, too, but it takes time to deal with everybody. I would like to see more specialists added, but I know funds are scarce.

We used to have a diversified operation on our farm when we had the boys here. We raised our own feed and we had about everything, including poultry. But now we are specializing in a feedlot operation.

James will be eager to apply some of his new knowledge when he returns. We may not go back to the diversification we used to have, but I'm sure James will help us make some good changes.

HELPING THE FARM FAMILY

It's becoming more and more difficult for young farm families to enter today's complex world of agriculture. Lower commodity prices, higher interest rates and rising production costs have created barriers difficult to overcome. Thanks to the Family Farm Development Program offered through the Missouri Cooperative Extension Service, farm families are learning to acquire and use resources vital to successful farming. The program teaches families to maintain a complete set of farm records, to develop long-range farm business plans and to establish priorities.

HIGH-TECH FARMING

State and area extension specialists are teaming up to help farmers operate more efficiently by using a personal computer. Members of one team have developed a computer program to analyze and balance a horse ration and to identify potential nutritional problems. Another computer program provides updated fertilizer recommendations using soil test information, past crop and fertility records and future plans.

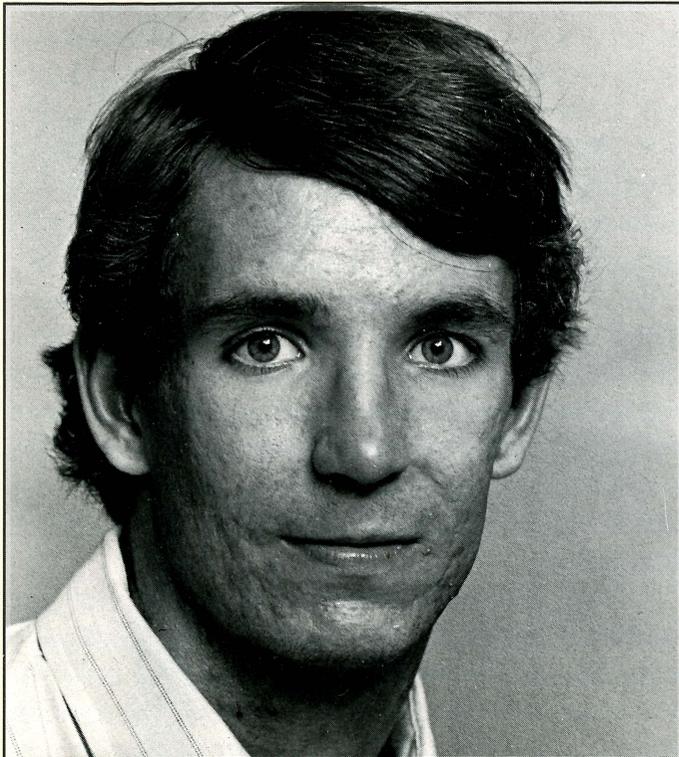
SOYBEAN HANDBOOK

Soybeans, the No. 1 Missouri cash crop, are responsible for more than \$1 billion in gross profits each year. To help farmers grow this crop more efficiently, UMC College of Agriculture faculty members helped write an 86-page reference manual, "The Missouri Soybean Handbook" which offers recommendations for the control of pests and marketing of soybeans, as well as soybean use for animal and human consumption.

Education

Brian Ruhmann, vice president, UMR Student Council

I recently had the opportunity to participate in the Central Arkansas Model United Nations through the UMR Student Council. The Model United Nations was a two-day role-playing exercise with participants representing member countries. UMR's five-member delegation represented the country of Uganda. I served as the Ugandan ambassador and occupied a seat on the U.N. Security Council. I feel the experience helped me to improve my interpersonal skills and ultimately will help me in my work with Student Council and in many other situations.



The conference allowed me and other team members to use negotiating, public speaking and problem-solving techniques in realistic situations. Each delegation had to present its country's positions on certain issues to several committees and the U.N. General Assembly. Problem-solving and organizational abilities were particularly important to the Ugandan delegation because of an informational vacuum facing the country and its position in the world community. Consequently, our delegation had to piece together information gathered from many sources before formulating policy.

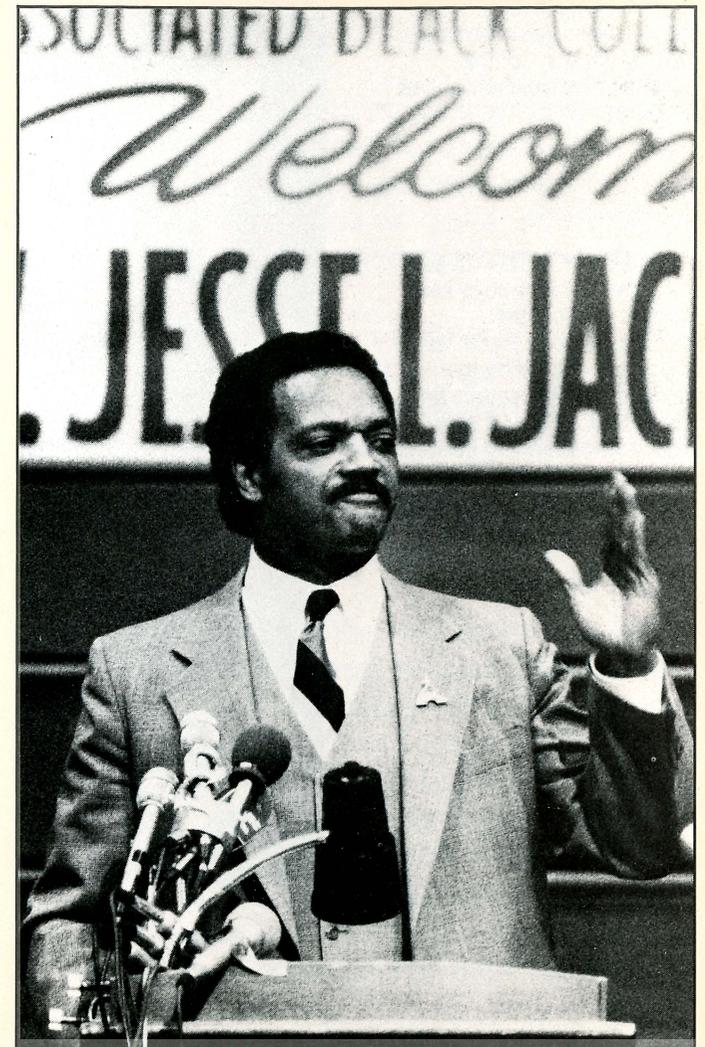
Negotiating techniques were important in getting our resolutions passed, first by a committee and then by the General Assembly. The most important of these resolutions was one dealing with the establishment of a world food surplus "bank," a vitally important organization for many developing nations. Our delegation received an award from the Social, Humanitarian and Cultural Committee for our work on this resolution.

All of the UMR Student Council members who participated in the Model United Nations benefited from the experience by improving our leadership abilities.

REMEMBERING A PRESIDENT

UM continues to encourage interest in the life and career of Missouri's most famous governmental figure, President Harry S. Truman.

During the celebration of the centennial of Truman's birth, the UMKC College of Arts and Sciences sponsored a six-part lecture series on the man from Independence, featuring authors of biographical works, friends and former members of his administration.



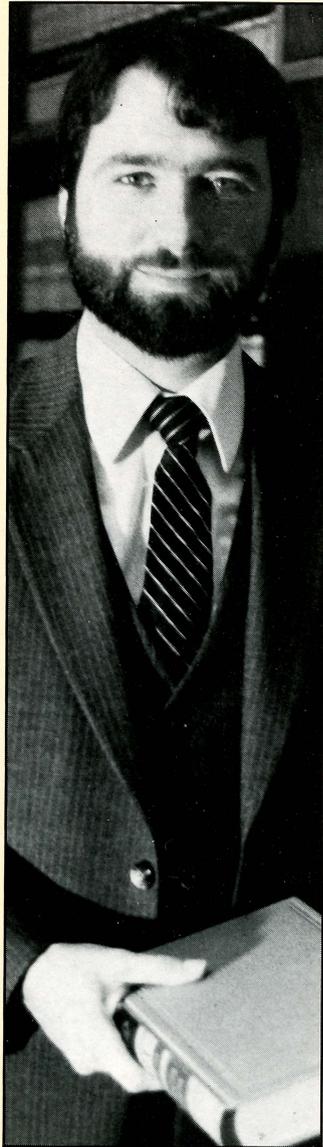
Research

DISSEMINATING KNOWLEDGE

The latest ideas to benefit the legal profession continue to flow from UM to members of the profession. UMKC law professors edit "The Urban Lawyer," a national publication of the American Bar Association, and "The Law Library Journal" of the American Association of Law Libraries.

KEEPING UP WITH THE LAW

Missouri attorneys keep abreast of the latest developments in law through programs offered by the University of Missouri's law schools at UMC and UMKC. This year continuing education programs focused on securities, tax and corporate law and federal estate planning.



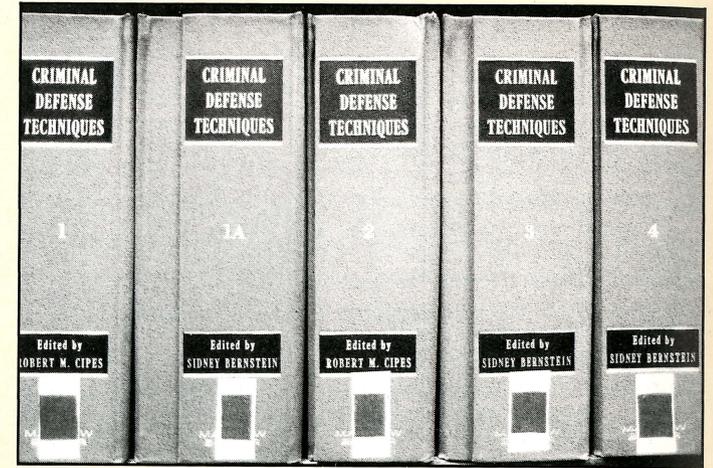
Ed. Payton, editor, Winter '84 Law Review, UMKC

Each semester a law review editorial board is established at the UMKC School of Law to formulate ideas for the focus of the quarterly law review issues. I was a member of the board for the Winter '84 Law Review, and though we knew there were several areas of interest to the practicing attorneys of Missouri and Kansas, we realized the best possibility for research was right in our own backyard.

There had been some research, although not extensive, into the implications of the July 1981 Hyatt Regency hotel disaster litigation, but we felt an obligation to explore further the most important legal event in our area in recent years. There was a sense of responsibility to the people involved so that if future cases of this kind occur there would be a greater understanding of how the court system works.

The editorial board took a different approach by including legal research done at the law school in addition to research done by students who studied the procedural steps of the litigation — a very tedious, involved process. We learned where to go for information and the proper procedures to be used. One of our writers was a law student with a journalism background who reviewed every article written about the tragedy, watched hours of videotaped news reports, interviewed reporters who had covered the story and spoke with attorneys and other members of the judiciary who had contacts with the media — a unique approach for a law review but a very important part of our work.

We also explored the psychological effects



of the tragedy on the victims, their families and witnesses. We worked with a counseling center in Johnson County, doing follow-up studies of people directly involved in the disaster and learning of the lingering aftereffects.

Throughout our research, we tried to keep in mind the goal of the legal process: to compensate the victims and bring about justice. For this reason we made an empirical study of the victims. How were they served by the legal system? What can the courts and attorneys do to improve the relationship between the clients and their representatives? After close analysis, we found most clients were satisfied with the results of the litigation, but disappointed by what they perceived to be a lack of communication with their attorneys.

The review provided us with a full range of research opportunities. I think the greatest carry-over benefit for me was in learning not only how to research a specific area but also how to utilize related and available data to complete the picture.

Extension and Public Service

RESOLVING DISPUTES

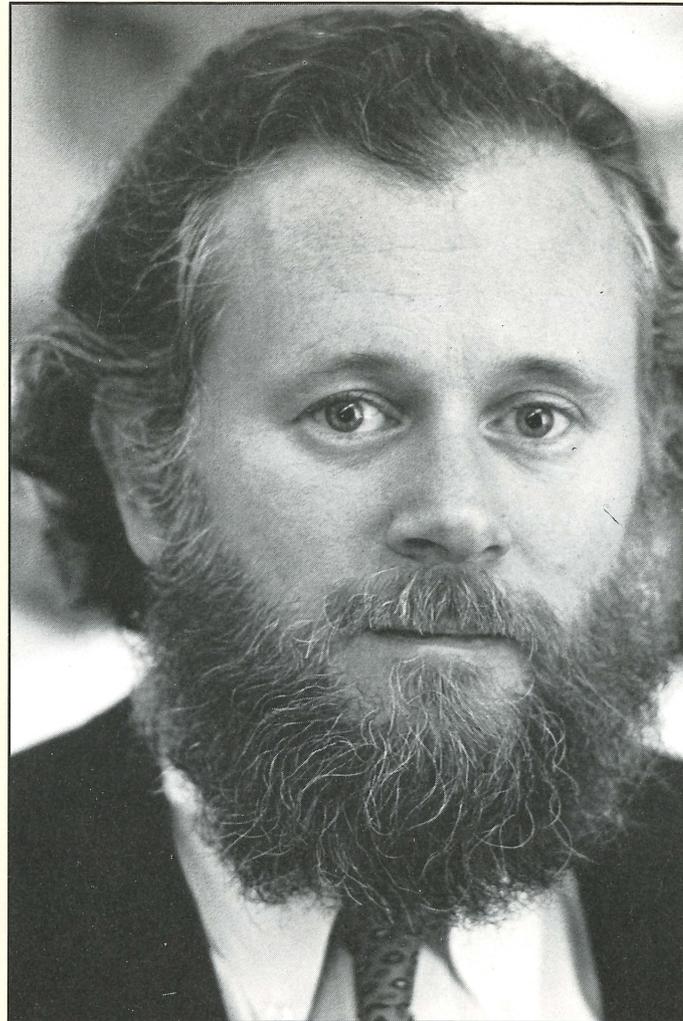
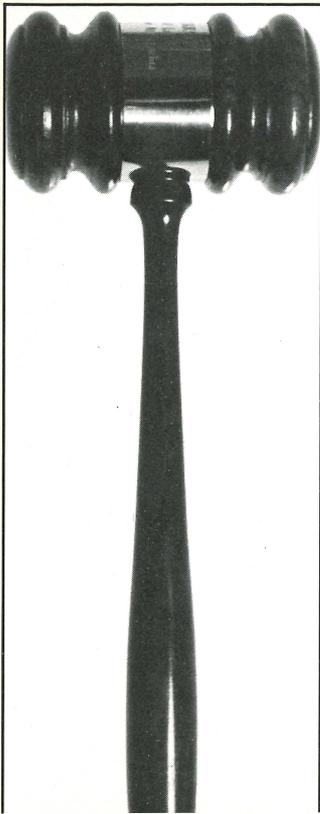
New ways of settling disputes without going to court are being developed by a new Center for the Study of Dispute Resolution in the UMC School of Law. This new research and training activity has the potential to improve the administration of justice and ease the burden on the court system by developing methods of arbitration, mediation and negotiation. Ideas developed by the center will be shared with the legal community through UMC's semiannual "Journal for Dispute Resolution."

SOLVING CONFLICTS

Research to improve the understanding and practice of dispute resolution will be the goal of a new Conflict Clinic Inc., which will have its major offices at UMSL. The not-for-profit corporation will conduct joint studies with Harvard's Program on Negotiation and other major universities to improve ways to resolve disputes in conflicts of significant public interest in the United States and around the world.

COMING TO TERMS

A more economical way of settling civil suits may be facilitated by research being conducted by a UMC College of Business and Public Administration professor and a Michigan attorney. They are surveying the effective and ethical techniques used by attorneys in settlement negotiations and the mediation efforts of judges. The findings of these studies are being shared with lawyers and judges throughout the country.



Dr. Donald Phares, UMSL professor of economics and director, Center for Metropolitan Studies

Legislators across the country are taking a hard look at tax reform and the effect it will have on their states. To date, my research on taxation has been used in more than 25 states; I have been directly involved in 10 states. Most recently,

I completed a comprehensive study for the New York State Legislature and am now working on one for Hawaii.

One important role I see as an academic is to work with organizations and individuals who determine policy. This can be done in a variety of ways. Often I'm asked to provide data or expertise. Or, I may be asked to present a workshop or seminar for a group of individuals who are interested in public policy.

In Missouri, legislators are interested in seeing hard data. They want to compare proposed tax reform with what has happened in other states. Often I'm asked to testify at senate or house hearings or to offer suggestions on specific legislation.

Through the UMSL Center for Metropolitan Studies, I've also been working with Confluence, a broad-based citizens organization of more than 750 members. They have begun an in-depth study of sales taxation in St. Louis County, specifically regarding the implications of annexation and incorporation on the distribution of sales tax revenues.

As a member of the Missouri State House Interim Committee on Health Care Cost Containment, I listened to testimony and helped to recommend legislation which is now pending. Last year I also worked with the Missouri Arts Council and helped them review alternative methods of allocating funds to organizations.

It's important that the University is able to provide this type of expertise to our government's leaders. They need to have an informed basis on which to make policy.

Education

ELECTRONIC LEGAL AID

Attorneys and other officers of the court have a new service available to them, thanks to the law library at the UMC School of Law. The library is now transmitting full text pages, including manuscripts and graphs, to patrons through telephone lines using a facsimile machine. The library has also added a second computer-based legal research service to serve the legal community.

other agencies. The UMC institute provides the only in-service programs for training law enforcement agencies in criminal investigation in non-metropolitan areas of Missouri.

HELPING LAWYERS HELP

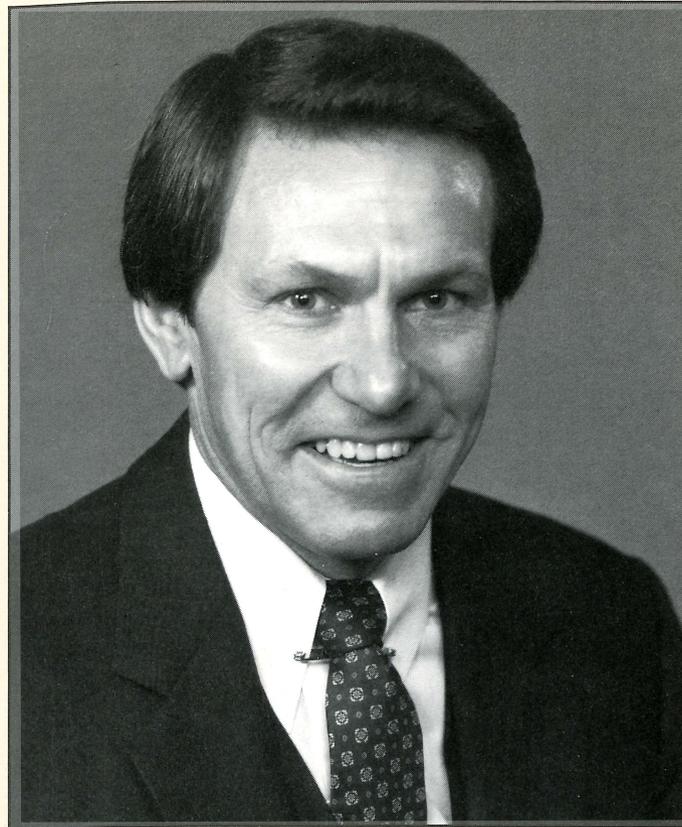
Special help for attorneys representing elderly Missourians has come from a UMC School of Law professor who is producing a third edition of a manual for lawyers entitled "The Law of the Elderly."

REINFORCING THE LAW

In-service training was provided by UMC's Law Enforcement Training Institute for law enforcement officers from six federal agencies, 33 state agencies, 43 county sheriff's departments, 110 municipal police departments, five fire departments and 17

SMALL CLAIMS HELP

Help for small businesses in using the small claims court system was provided by UM-Rolla in a training course beamed to the campus as part of a nationwide teleconferencing system via satellite.



Lloyd Reuss, *UMR alumnus and vice president and group executive in charge of Chevrolet-Pontiac-GM of Canada Group, General Motors Corp.*

Work performed on the shop floor in the future will be dramatically different from today because of robotics. Job descriptions also will call for more employees with the educational and technical skills necessary to understand, operate and maintain the sophisticated systems and machines that will produce uniformly higher-quality products at more competitive prices.

Presently, there is a lag between industry's needs and the number of people able to design, build, install and operate robotic equipment, and it will take time for normal employment supply-and-demand patterns to adjust. But the manner in which UMR and other educational institutions are responding to meet this need is remarkable.

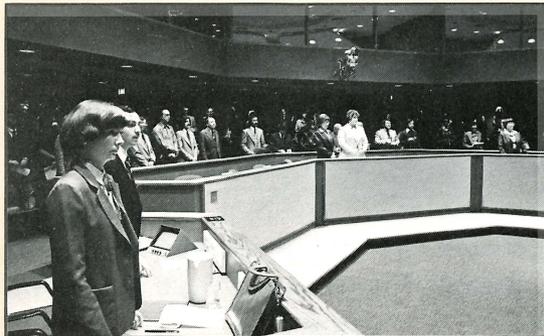
Paralleling the efforts of educators is retraining within an industry or company. This is a priority of both labor and management in addition to federal, state and local agencies. This retraining also requires trained personnel to upgrade others' skills.

Greater attention is being focused on upgrading employees' skills rather than replacing individuals with the ones having more training. The intent is better use of all employees, and advancing technology and competitive pressures are moving industry rapidly in that direction.

Looking back at any major technological change, there has been concern about worker displacement. However, the system adjusts. People return to their old jobs or obtain retraining and return to work because their company has regained profitability or become more competitive.

In a retrospective view of our country, despite changes in industry over the past few years, more people than ever are employed in the United States.

The net effect, then, of technological advancement such as robotics is progress to the whole economy and the people in it. The net effect of refusing to implement technological improvements is obviously the loss of business and the loss of jobs.



Research



MONUMENT FOR THE AGES

Students at UMR, which uses some of the most advanced technology in the country in its instruction, are being exposed to the wonders of an ancient form of technology through a partial replica of England's 4,000-year-old megalith Stonehenge. The original Stonehenge represents one of the world's oldest and most sophisticated astronomical computers. UMR's replica was built with funds and materials donated specifically for the project.

COMPUTER ENGINEERING

In response to rapidly growing demand, UMC's

College of Engineering recently launched the state's first degree program to train computer engineers. Only 17 universities in the country offer accredited computer engineering degrees. UMC's program trains students to use computer theory in solving engineering problems.

GETTING FLEXIBLE

Computer-controlled "flexible manufacturing systems" that allow factories to produce high-quality goods more efficiently and economically are the wave of the future. To prepare its graduates to work with these systems, UMR has established the Institute for Flexible Manufacturing and Industrial Automation. Many firms are already using, or planning to acquire, such technology, an

outgrowth of factory automation efforts begun in the 1950s.

SHAPING THE FUTURE

Take \$3.2 million, add five years of work by UMC's College of Engineering and the result is a computer network that will benefit engineering students and faculty. Eventually every classroom and laboratory in the college will have access to the computer network, which uses three super-mini computers. The network will be especially useful in the fast-growing field of computer-aided design and manufacturing. As such computers become faster and more sophisticated, they will be given an object's proposed size and use, then will automatically select the optimum design, literally determining the shape of things to come.

INSTITUTE ADDS UP

Mathematics has an impact on virtually every field of science and technology. To promote research directed toward solving important mathematical problems of an interdisciplinary nature, UMR has established an Institute of Applied Mathematics.

A VOTE OF CONFIDENCE

IBM has presented the University with a state-of-the-art computer-aided design/computer-aided manufacturing system to be used by UMR and UMC. The University was one of only 20 institutions in the nation chosen to receive the equipment, which includes a host computer and 77 terminals. Many other firms that recognize their success or failure rests in large measure on the quality of the engineers available have recently given modern equipment to the University's engineering programs.

OVERSEAS DEGREES

Ten engineers employed by ARAMCO in Saudi Arabia were able to complete their master's degrees in engineering management through a joint agreement between UMR and the ARAMCO Career Development Program.



Dr. Rona L. Hirschberg, *UMKC associate professor of biology and medicine*, and Dr. Ronald A. MacQuarrie, *UMKC associate professor of chemistry and medicine*

The solutions to scientific problems are becoming increasingly dependent on the existence of a coordinated team of dedicated and well-trained researchers. At UMKC, we have spent the past year assembling a group of researchers with experience in the areas of biochemistry, genetics and microbiology who can cooperate on common scientific investigations and who will form a nucleus for further faculty growth. Although the work being done by these scientists is not easily classified by the traditional names of scientific disciplines, it may be broadly categorized as molecular biology. All of the individuals involved share the use of recombinant DNA techniques, which have opened many new opportunities for understanding living systems.

During the past year we have initiated re-

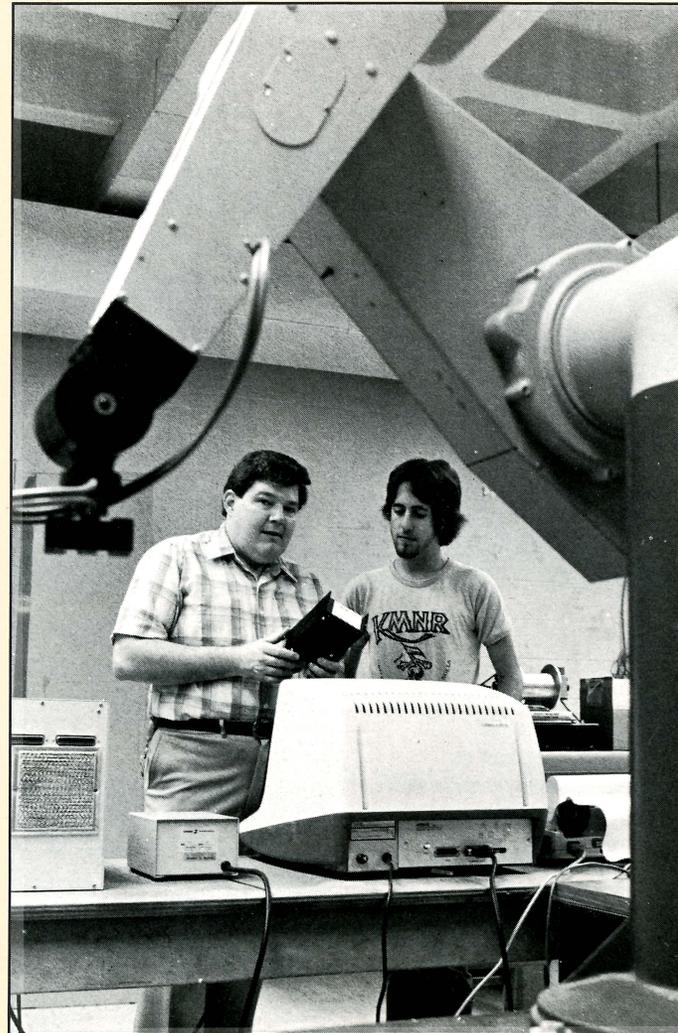
search projects and equipped laboratories for use by numerous life-science investigators. Scientific progress has been made on two major problems in molecular biology. In one, we are attempting to explain the mechanisms of control of biological nitrogen fixation, which could potentially increase agricultural productivity while reducing dependence on fossil fuels now being used to produce fertilizer chemically.

A second project has focused on developing general procedures for the design and production of enzymes with specific and predetermined catalytic properties. The ability to produce new enzymes has many potential applications in the fields of medical genetics, food technology and industrial production.

Our future plans for the project include establishing a tissue culture laboratory for the study of intact animal and human cells, the addition of other researchers and the acquisition of federal funding to expand and continue the project. These activities eventually will lead us toward establishing a School of Basic Life Sciences on the UMKC campus. This school will bring together life scientists from throughout the campus and help coordinate teaching and research activities in anatomy, biochemistry, microbiology, physiology and related disciplines. The school also will provide scientists from the community an opportunity to become more fully involved in research and teaching at UMKC.

The financial support for this scientific networking reflects the broad interest in research at UMKC. Initial funding of \$130,000 came from the Research Assistance Act, the far-reaching legisla-

tion investment of the Missouri General Assembly in scientific research. In line with the requirement of the act that every dollar invested by taxpayers be matched by two dollars from the private sector, the Victor E. Speas Foundation of Kansas City donated \$260,000 to our project.



RUST NEVER SLEEPS

Everyone is familiar with rust, but relatively little is known about preventing it and other forms of corrosion. But chemistry and physics professors at UMC hope to gain a better understanding of corrosion and ways to prevent it. The team's efforts could help reduce the millions of dollars of damage caused by corrosion every year.

CALMING WIND'S ENERGY

Wind power is a pollution-free way to produce energy, but the approach is not without its problems. A UMKC physics professor hopes to reduce the vibration level of wind generator rotors and to perfect a safe, reliable method to shut them down when wind speeds become excessive, prolonging the lifetime of wind energy equipment and making this method of generating electricity even more economically attractive.

DESTROYING DIOXIN

At least three dozen sites in Missouri are contaminated with dioxin, a highly toxic substance blamed for a number of health problems. University researchers are

working with the state's Department of Natural Resources to evaluate ways of eliminating the dioxin threat and stabilizing already-contaminated sites.

KANSAS GAS

The discovery of naturally occurring hydrogen-rich gas deposits in the Flint Hills of central Kansas has presented geoscientists from UMKC and the University of Kansas with a fascinating research question: What is the genesis of this hydrogen seldom found in such large concentrations? Even when present, hydrogen usually seeps through earth and rock to escape into the atmosphere. Though tests to determine the source of the gas are still preliminary, the scientists believe the gas may be coming from within the earth's mantle beneath the crust. The research could have far-reaching implications for energy producers.

BRIDGE SAFETY

With help from a grant from the Missouri Highway and Transportation Commission, a UMC engineering professor is studying specific ways to improve the safety of two-girder highway bridges while lowering maintenance cost. The potential value of the

Extension and Public Service

results for sponsoring states and the rest of the country is substantial: There are 4,000 to 5,000 such bridges in service now, most about 20 years old. Key object of the study will be a 70-foot-long full-scale section of a collapsed I-70 viaduct bridge, which will be moved to the UMC campus and reassembled for testing.

RADIOACTIVITY RESEARCH

During the 1950s, 9,000 tons of residue from uranium ore processing were disposed of in the West Lake landfill in St. Louis County. Two UMC engineering professors are investigating possible radioactive contamination in the area and evaluating alternatives for remedial action.

PINPOINTING POLLUTION

The Environmental Protection Agency is betting that plants can be a useful ally in testing for hazardous substances. The EPA has given the University's Environmental Trace Substances Research Center a \$210,000 grant to evaluate how toxic chemicals affect seed germination and plant development. UM researchers believe plants may be a cheaper and more sensitive measure of toxicity than animals and insects.



Dr. Donald D. Myers, director, UMR Center for Technological Development

UMR's Center for Technological Development was created to recruit technical entrepreneurs interested in starting technology-based companies in Missouri. It provides a central location for sharing information, equipment and ideas. Entrepreneurs can get assistance from the center in commercializing their ideas, applying for grants and acquiring the necessary business licenses.

When we learned that Talema Electronics, a West German computer parts firm, was seeking a site for its first U.S. facility, the center moved quickly to assist the company in filing incorporation papers and obtaining a loan from the Division of Commerce and Economic Development.

The center served as a go-between for the state of Missouri and Talema, which manufactures transformers for computers. The business was already established in West Germany and all we had to do was help with legal and financial matters. The company also received assistance in locating in Rolla from the Rolla Area Chamber of Commerce and the Missouri state office in Dusseldorf, West Germany.

UMR was chosen as the location for the center because of its technological resources. Talema picked Rolla because of those resources and because it can serve 45 percent of U.S. industry within two days by highway transportation for both purchases and deliveries.

ENCOURAGING TECHNOLOGY

Four innovation centers to promote, assist and coordinate new ideas from universities, corporations and individuals for high-technology products and services have received first-year funding from the Missouri Corporation for Science and Technology. The centers are located in Kansas City, Columbia, Rolla and St. Louis. Don Myers, associate professor of engineering management at UMR, heads the corporation.

OLD MAN RIVER

UMSL's Center for Metropolitan Studies helped focus public attention on the Mississippi River system and its relationship to St. Louis through a six-part series entitled "St. Louis and the River: The Next 20 Years." The series attracted good attendance and considerable praise for increasing the public's understanding of the river.

THIS WOMBAT IS A BLAST

Removing unspent explosives from missiles is a tricky task. But a new robot being developed by UMR's Rock Mechanics and Explosives Research Center

should make the job easier and safer. WOMBAT, or Waterjet Ordnance and Missile Blastcleaner with Automatic Tellurometry, being developed for the Naval Weapons Center, will wash explosives out of missiles.

UMR TO THE RESCUE

Even under the best of circumstances, mining is risky business. That's why being prepared to carry out underground rescues is so important. UMR, in conjunction with the U.S. Department of Labor's Mine Safety and Health Administration, hosts annual mine rescue contests at its experimental mine. Teams of mining professionals and students participate.

HELPING OUT

Students in the UMR chapter of the American Society of Civil Engineers made life a little easier for handicapped children in Rolla when they designed and built equipment for residents of the Gingerbread House, a home for severely handicapped youngsters.

Education



Sue Ann Wood, news editor, *St. Louis Post-Dispatch*

Those of us who were college women in the early 1950s had only one acceptable goal in life: marriage and motherhood. We might prepare for a career like teaching or nursing, but to pursue only if we should fail to marry.

That is, unless we were in the University of

Missouri School of Journalism. There, society's expectations for women did not prevail. We were expected to be preparing seriously for a lifetime career in journalism.

The women who were in J-School in 1950-1952 were very much a minority, but we were a determined bunch. Most of us, like our male counterparts, wanted to be newspaper reporters, and nobody told us that was an unrealistic goal.

Clutching our journalism degrees, we 1952 graduates went out into the job market and most of us found jobs. I applied to the St. Petersburg (Fla.) Times, whose editor had a singular lack of sex discrimination in his hiring policy. He asked me if I could write a headline. Of course I could, thanks to my J-School training. He put me to work on the copy desk — something few big city newspapers let their women employees do.

When I left Florida and returned to my native Missouri, I joined the news staff of the St. Louis Globe-Democrat as a reporter. I later was the first woman to hold the job of night city editor in St. Louis. Following that were positions as city editor, assistant managing editor and managing editor.

By now, the 1950s novelty of women as reporters and editors on a major metropolitan newspaper has become 1980s commonplace. Women have long since proven they can hold any job in the world of journalism.

One young woman more recently asked me how come I, "a '50s person," had managed to escape the traditional style for a newspaper career. The answer was simple: I went to the University of Missouri School of Journalism.



ELECTRONIC CAMPUS

Recent advances in communications technology may one day make UMR an "electronic campus" that sends and receives educational information via communications satellite. The campus is already active in a telecommunication consortium involving dozens of universities, and UMR is now developing course material for use by the new all-videotape National Technological University.

JOURNALISM FOR ALL

Nine minority alumni of the UMC School of Journalism, the world's oldest, returned to campus to address minority concerns in journalism. The workshop, "Black Journalists in the 1980s: Problems and Progress," provided an overview of the role of blacks in journalism and also was part of the school's 75th anniversary celebration.

MOVE OVER, JOHNNY

Watching television is one thing, but producing a TV program is quite another, as participants in UMSL's

Research

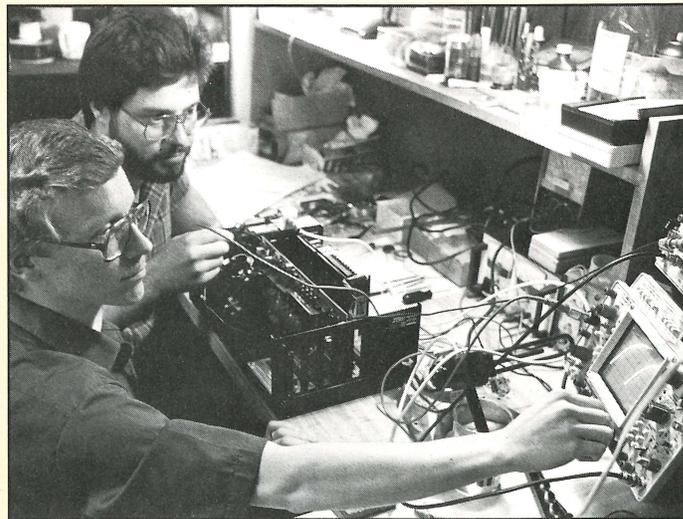
Continuing Education-Extension video production workshops learn. The two-month course provides hands-on experience with TV studio cameras, microphones, sound mixers and other equipment. UMSL is the site of a cable television community access studio.

SEARCH FOR KNOWLEDGE

A tremendous amount of information is available from computerized data bases, but the difficulty lies in learning how to use them. UMC's School of Library and Informational Science faculty members are working on a special program that helps students learn how to do on-line searches, a skill that will serve them well in today's information-intensive world.

SUMMER CAMP OF THE 80s

More than 100 students age 6 through 16 received hands-on training in summer computer camps and workshops offered by UMSL Continuing Education-Extension. Depending on their age and expertise, the youths were exposed to everything from simple entertainment and education applications to computer graphics and advanced programming.



David Richards, UMR graduate student in electrical engineering

I am developing the computer system for an ultrasound medical diagnostic system as an applied project for my master's degree in electrical engineering. The project, which is being developed by UMR's electrical engineering department and Kelley Development Corp. of Rolla under the Missouri Research Assistance Act, will provide surgeons with high-quality video images of internal parts of the body on the screen of a computer terminal. In addition, it will permit surgeons to employ digital signal processing with the data it gathers to improve the quality of the image presented on the screen.

Working on this project has provided me with a unique opportunity to develop professionally while in graduate school. I have been able to work closely with UMR electrical engineering

faculty members and employees of Kelley Development and I have benefited greatly from these experiences in terms of knowledge and insight gained.

Solving problems in a business environment has been both challenging and rewarding. I have learned that in such an environment, the easiest way may not always be the best way and that factors such as material costs, product availability and assembly must be considered along with function.

The project has continuously pushed me and the other persons involved with it toward — and beyond — the cutting edge of state-of-the-art technology. We already have solved several problems in the field of real-time ultrasonic imaging and anticipate that we will solve others before the project is completed.

In conclusion, my work on this project has been gratifying from both educational and personal standpoints. I feel I have enhanced my education through this opportunity to apply what I have learned in the classroom. It also gives me a sense of satisfaction to see my work bear fruit in a medical diagnostic system that will improve the quality of medical service and ultimately help to stimulate the economy of the state by providing employment opportunities.

WRITING RIGHT

Employers often complain that today's high school graduates lack fundamental writing skills. So UMSL's Gateway Writing Project has been showing St. Louis area teachers how to improve students' writing skills. Now UMSL has received two \$5,000 gifts to develop a program to integrate microcomputers into the curriculum.

ARTIFICIAL INTELLIGENCE

Computing, long concerned primarily with the speedy processing of numbers, is rapidly becoming more oriented toward human-like reasoning and logic, or "artificial intelligence." To expedite teaching and research activities in that area, UMR has established an Institute for Artificial Intelligence. Members will be drawn from several fields, including philosophy.

Extension and Public Service



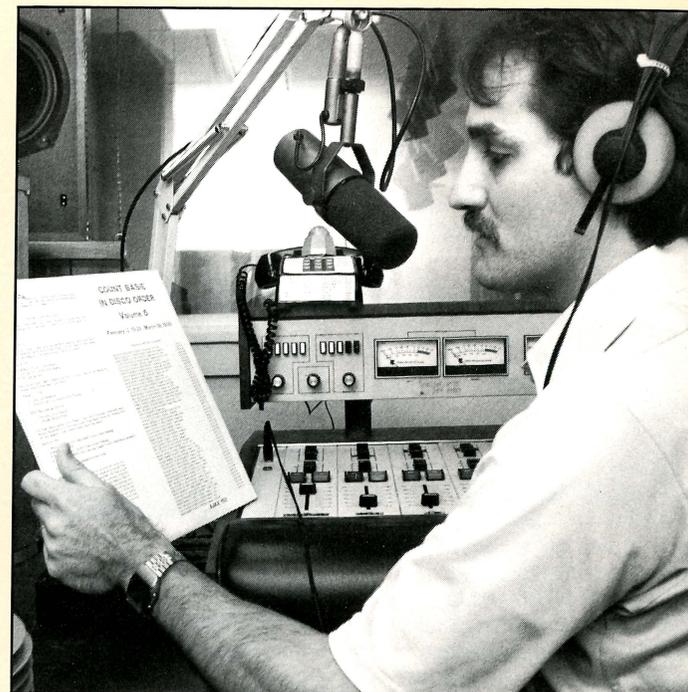
Dr. Betty Burnett, *St. Louis free-lance writer*

I used the Western Historical Manuscript Collection at UMSL to do research for my dissertation on the Metropolitan Church Federation, 1909-1969. I recently completed the requirements for my Ph.D. in American studies from St. Louis University.

(The Western Historical Manuscript Collection at UMSL is part of the four-campus joint collection with the State Historical Society of Missouri. The collection is open to faculty and staff, scholars from other colleges and universities, and the public.)

I used the UMSL collection instead of the library at St. Louis University because it was the only place in the city that had the materials I needed. The collection was convenient and easy to use, because the core of the material was all in one place. Anne Kenney, associate director of the Western Historical Manuscript Collection; Pat Adams, senior manuscript specialist; and the whole staff were wonderful. I was very pleased with their work and their willingness to help me find the materials I needed.

In addition to the help Anne and Pat gave me, they seemed interested in the project I was working on. This psychological support was as important to the completion of my dissertation as the material from the UMSL collection was.



BIG LENDER

Libraries are not only places where scholars and members of the community go to find information. Information also goes from the libraries to wherever it is needed. UMC libraries have more than 2.5 million microform titles, the ninth largest collection in the United States, and this year lent more than 22,000 items on interlibrary loan, making them 26th in the nation in volume of interlibrary lending.

COMPUTER OUTREACH

Some 100 microcomputers are in offices around the state to help extension personnel better serve their clientele. Dozens of computer programs are being developed in agriculture, home economics, 4-H, community development and continuing education. Computerization will help extension staff provide educational programs to farmers, families and businesses throughout Missouri.

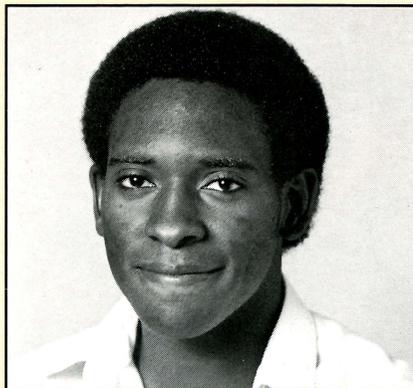
Education

SPANISH DRAMAS TO UMC

UMC libraries are aiding scholars worldwide who are interested in the "Siglo de Oro," the golden age of Spanish literature, a period that in many ways parallels the Shakespearean age of England's literary history. UMC has been awarded \$68,230 to catalog a collection of 3,900 titles from the era. The catalog will be entered into the OCLC, a national on-line bibliographic data base.

PUTTING THE BYTE ON

A new digital signal processing laboratory for applied research on a variety of electronic systems has been established at UMR, thanks to funding from the McDonnell Douglas Foundation. The contribution, made under the Missouri Research Assistance Act, will provide a sophisticated laboratory for the design and development of digital signal processors for radar, communication and control systems and robotic vision systems.



Mel Clark, Year 4, UMKC School of Medicine

You grow up fast when you're a student in UMKC's six-year medical school. I had taken a lot of math and science in high school because I decided in the ninth grade I wanted to be a physician like my father. I knew I was intellectually capable of handling the studies but it was a big step going from high school to medical school.

I guess it also was a big step for the University in 1971 when its administrators decided to go against the traditional way of educating doctors and accept students right out of high school. Everything was new and experimental then. Now statistics show UMKC's graduates do even better than the average on those all-important medical boards. And a lot of traditional schools are studying us now and adopting some of our ideas.

I'm confident my classmates and I are going to be good doctors, totally involved with our patients and our communities. A lot of the credit for that will go to the docents who act as both physicians and teachers and make all the difference in our education.

We really start working closely with our docents when we are third-year students, although we are assigned to docents from the first day of our medical education, and over the next six years we develop a very special relationship with them. They're the best possible role models. We watch them on rounds treating patients and teaching us at the same time. We listen as they help us plan our medical school program. And when we're discouraged or scared, we know we can turn to them as we would to our parents and they'll be there.

We also get aid from the academic advisers in the College of Arts and Sciences. Since we have to complete all requirements for a bachelor of arts degree while we are working for that M.D., we need good counseling.

Of course, during these six years we look at everything as prospective doctors, and what we see is a medical school totally involved in the health of the city.

We see that very clearly during Year 1 when we begin a relationship with a community hospital through one of our introductory courses. Then in the summer after Year 1, we start working at those same hospitals and the variety of ways we serve patients helps us understand how hospitals interact with the people of the community and how our medical school interacts with those hospitals.

We need to see this big picture if we are going to be good doctors and the medical school makes sure we continually focus on that big picture.

ACCELERATED INSTRUCTION

Top high school students in four Kansas City area school districts take accelerated courses in physics and higher mathematics at an institute conducted by UMKC and the school districts. "By joining the talents, resources and technologies of these four school districts and UMKC, an educational program of exceptional quality is being developed," says George Russell, UMKC chancellor.

DRUG USE AND ABUSE

The UMKC School of Pharmacy is helping people understand what many consider to be the most significant societal problem in America — the use and abuse of drugs and alcohol. A five-week seminar featured experts who described in lay terms the facts of substance abuse. The school is also involved in an ongoing series of substance abuse programs throughout the state.

Research



FIRST CLASS
UMSL's School of Optometry reached an important milestone with the graduation of its first optometry class. The School of Optometry was founded in 1980 and has more than 110 students enrolled in its four-year program.

Dr. John L. Fletcher, UMR professor and chairman of psychology

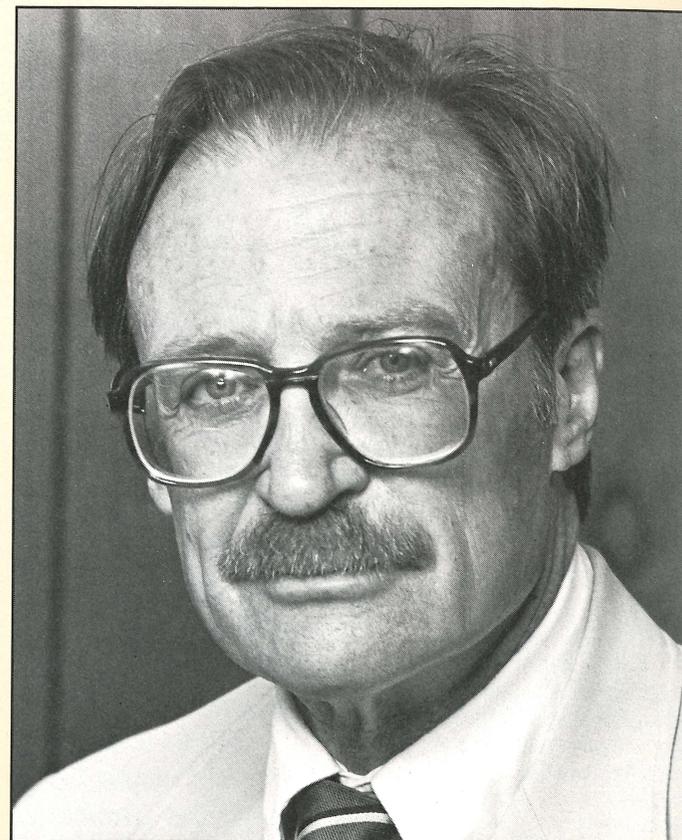
When hearing problems develop, high-frequency hearing is affected first and is particularly susceptible to noise, drugs and trauma. I collaborated on a project with Dr. Marion Downs of the Department of Otolaryngology, University of Colorado Medical School, which studied how protective measures could be taken in time to prevent hearing loss.

Our study of 100 students followed the students for 10 years, from second through 12th grades. It took into consideration family histories, medical histories, hobbies, noise exposure — everything that might possibly affect hearing. Students were tested each year and pertinent information brought up to date.

There are no established standards for hearing at high-frequency levels. This study indicated standards of what to expect from normal people so that we will be able to recognize departures from the norm.

Our data showed that disease — frequent or chronic middle ear infections — was the most common cause of high-frequency hearing loss among the children, with noise a close second. We also found that certain drugs, such as some used for kidney disease, can cause a complete lack of hearing. If the patient's high-frequency hearing is monitored, a developing problem can be spotted three months before it would show up in normal tests.

High-frequency testing also has been shown to be a useful monitor for people regularly ex-



posed to high noise levels. This might be in a job environment or sports, such as target shooting or riding motorcycles, or involvement with loud music. It may show that some sort of ear protection, such as helmets or ear plugs, should be worn when participating in these activities.

Our findings have special implications for industry. High-frequency testing may be important as an indicator in some jobs, such as flying airplanes, where it is necessary to listen to signals with high-frequency components.

COPING WITH CHILDBIRTH

Improved methods of dealing with the pain of childbirth are being developed and refined by researchers at the UMC School of Nursing. Two coping strategies, combined with the progressive relaxation component of the Lamaze childbirth method, are being taught to pregnant women in special classes conducted by UMC obstetrical nurses.



REDUCING INFECTIONS

UMC School of Nursing research may help reduce some types of hospital-acquired infections. The research identified possible sources of infection from a new type of cardiac output monitor used in intensive care units. The firm that manufactures the monitor has incorporated UMC's suggestions into a revised version of the device.

BETWEEN BLOOD AND BRAIN

UMC researchers are studying a new drug that may lead to an inexpensive and safe method of diagnosing many brain disorders, including strokes, seizures, multiple sclerosis and Alzheimer's disease. Researchers have found that by combining a radioactive drug already used to create images of the heart and other organs with propylene amine oxime they can form a substance that would readily pass through the blood-brain barrier, which prevents most foreign substances from

entering the brain. The rights to the drug were recently purchased by one of the world's largest drug manufacturers.

GENETIC REGISTRY

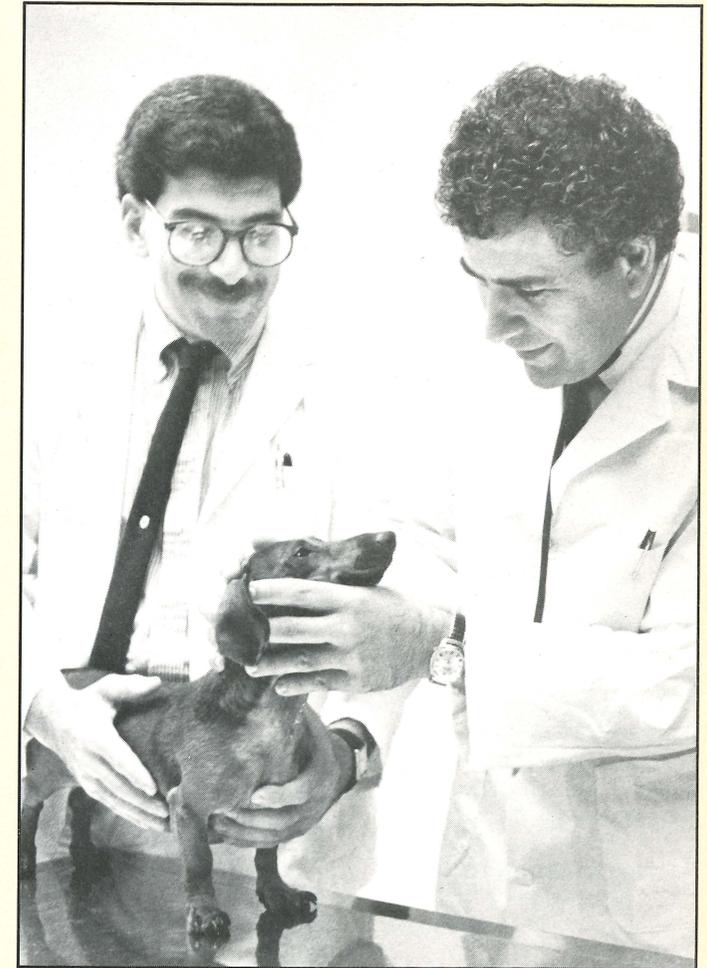
The UMC School of Medicine is one of five institutions in the United States working on a computerized registry of cytogenetics and phenylketonuria. The registry will serve as an especially valuable resource for physicians treating patients with rare conditions.

CANCER CLUES

A revolutionary approach to the treatment of malignant melanoma, an often fatal cancer, is being tested by two UMKC School of Medicine researchers. In initial trials the researchers found that postsurgical immunotherapy stimulates the body to attack cancer cells and is very effective in preventing cancer from recurring.

NEW CANCER RISK FACTOR

Low levels of selenium may create an increased risk of cancer, suggests preliminary research conducted with the help of the University's Research Reactor. Studies include the analysis of selenium levels in toenails, which serve as a long-range dietary marker of the body's mineral balance.



Dr. M.J. Bojrab, UMC professor of veterinary medicine

The UMC College of Veterinary Medicine's small animal clinic is sort of a "Mayo Clinic for Pets" in this region.

Veterinarians send their most difficult cases to us because we have an expert team of cardi-

Education

ologists, ophthalmologists, orthopaedic surgeons, anesthesiologists, radiologists and others.

We perform an average of nine operations a day and have performed surgery on everything from dogs and cats to snakes and birds. One of our biggest challenges was to put a plate on the broken leg of a 152-pound lion.

Since 1971, more than 152,000 animals have been treated, and patients have come to us from all parts of the country. We have a large local clientele, too, because people recognize the special care their animals get here. Our students virtually live with the animals, monitoring them 24 hours a day and exhibiting a great deal of compassion and empathy.

As a teaching hospital, our clinic is open daily except Sunday, and we have 24-hour emergency care. We strive to be responsive to the special needs of our patients and the people who bring them here.



FREE DENTAL CARE

Students at four Kansas City inner-city schools are given free dental care through a program offered by UMKC's Department of Pediatric Dentistry. During the past year, 1,170 children received complete dental care at the school's Lowrey Clinic. School of Dentistry faculty and students also volunteer their services at Leavenworth Prison.

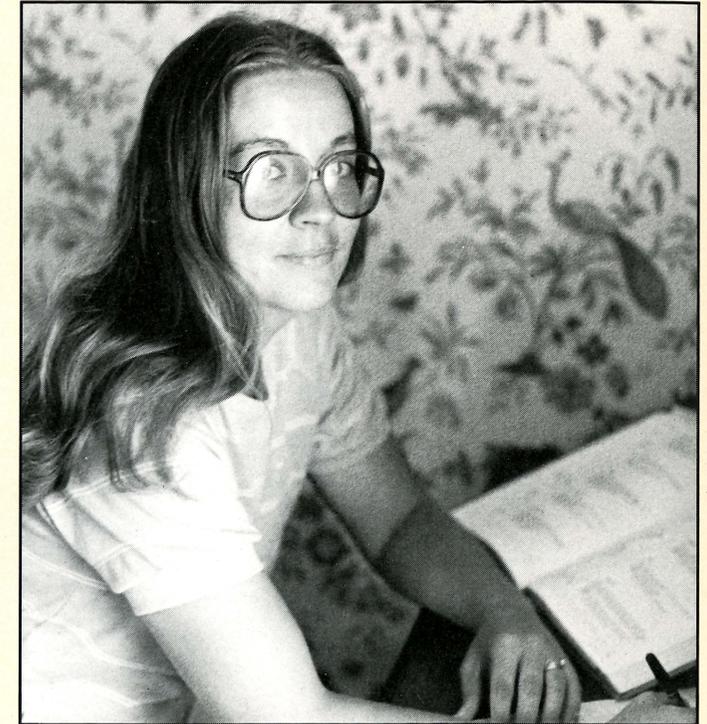
LIFESAVING "BALLOON"

Lives are being extended — and saved — thanks to a new non-surgical heart repair

technique developed by a UMC physician. The procedure, which has been performed on a number of Missouri youngsters, involves inserting a tiny balloon-like device into the heart through blood vessels, then briefly inflating the balloon to open a blocked heart valve. The procedure, which is now being taught to doctors around the nation, is safer, faster and cheaper than surgical methods traditionally used.

OPTOMETRY OUTREACH

Thanks to a gift to UMSL of the 5,118-square-foot Optometric Center of St. Louis, mid-town residents have ready access to the School of Optometry's largest outreach facility. The center will not only provide low-cost care to many St. Louisans, it serves as a teaching clinic for fourth-year UMSL optometry students, providing them with valuable professional experience.



Faye Edwards, *teacher's aide, Montgomery City public school*

I love teaching disabled children. Learning means so much to them. But if it hadn't been for a University of Missouri program that allowed me to take classes at home, I don't think I would have gotten the chance to have a career in education.

I've wanted to be a teacher as long as I can remember. I was close to my grandmother, who taught most of her life. She helped me understand how important and enjoyable working with children can be. Yet my prospects of becoming a teacher were pretty dim. I dropped out of college at 18. I had just gotten married and getting used

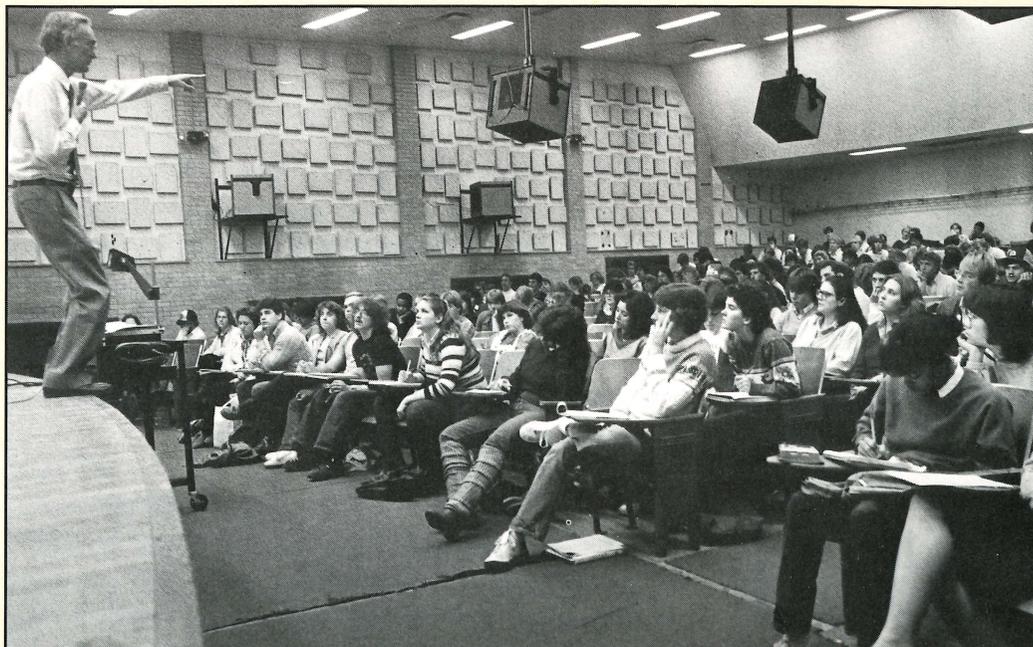
to both college and married life proved to be too much.

I went into farming with my husband and had two children. I was happy with my life, but there was a part of me that never quit wanting to be a teacher.

Then a few years ago I came across an advertisement for UM's College-At-Home program in our local newspaper. The ad said the program would allow me to take courses at home at my own pace. That really appealed to me. We lived more than an hour away from the closest UM campus, and my youngest son wasn't in school yet. I also wondered if I could handle college work after being away from it for so long. College-At-Home seemed an ideal way to overcome those problems.

I took two courses the first semester and was hooked. A year later — after my son was in school and after I had proven to myself that I was college material — I enrolled full time in the College of Education at the University of Missouri-Columbia. I was able to graduate two years later by taking about 19 hours a semester. I've been teaching since and loving every minute of it.

I wonder sometimes what I would be doing now if I hadn't seen that ad. I don't think I would have gone back to school without College-At-Home. It made all the difference for me.



MATH COUNTS

UMC and UMR faculty are helping students throughout the state learn about the importance of math through a statewide MATHCOUNTS competition. The contests involve teams of seventh and eighth graders facing off in fast-paced oral math ciphering exams as well as written tests. UM faculty members serve as MATHCOUNTS staff, helping organize and conduct the competition.

NUCLEAR EDUCATION

More than two dozen Missouri high school teachers participated in a workshop on nuclear science and engineering at UMC. Sponsored by the extension division and Union Electric, the course covered the basics of nuclear science and its application to such nuclear energy systems as light water reactors.

EARLY LEARNING

Each year UMSL's Crucial Early Years Conference reaches more than 500 parents, teachers, administrators, social workers and teacher education students. Featured speakers have included "Sesame Street's" Loretta Long, Bob Keeshan (Capt. Kangaroo), pediatrician Lendon Smith and noted author David Elkind. The conference is sponsored in cooperation with the Ferguson-Florissant School District.

JUNIOR SCIENTISTS

Career options in science, engineering and mathematics were explored by 275 top high school students during UMSL's Missouri Junior Science and Engineering Symposium. Area corporations, as well as UMSL faculty members, participated in the program, which attracted twice as many high school students and teachers than could be accommodated.

ATTENTION TO THE GIFTED

Academically gifted high school students need special attention, too. UMC will host a three-week pilot program, beginning next year, for 300 of the state's brightest young people. The Missouri Scholars Academy will allow students to participate in intensive academic activities as well as personal development programs.

Research



Dolores Vermont, Ed.D. 1984, UMSL

During my years as a high school chemistry teacher, I found that no matter what strategy I used to teach certain material, some students simply didn't learn it. The five years I spent working on my doctorate at UMSL gave me the opportunity to sit down over a long period and really delve into learning theory.

My research gave me insight into what I, as a teacher, can do to help the student who has trouble learning. It also gave me the skills I will

need to do more research.

The project I did for my dissertation compared three different strategies for teaching a basic concept in chemistry, using methods that were based on different theories of learning.

Basically, I found no significant difference in how the students responded to the three different methods. That led me to conclude that there may be other factors, such as the students' prior misconceptions about the subject, that affect their personal learning strategies. I'm planning to do additional research in this area.

I earned a master's in education in 1971 and a M.S. in chemistry in 1979, both at UMSL, while I continued to teach full time in high school. I thought about working on my doctorate at another university, but I soon discovered that no other library in St. Louis had the depth of research materials in my field that the UMSL library has.

Sometimes students ask, "Why are you teaching?" They seem to think that a job in education is not as important as one in business or industry.

I think of all the times I have asked a scientist why he or she chose a particular field, only to have them mention an influential teacher. If you make an impression on your students, you're with them into adulthood.

I teach because I want whatever work I do to be a contribution that reaches beyond the present time. And I enjoy educational research because of the intellectual challenge involved in reviewing the literature, planning the experimental design and putting together the results.

BEHAVIOR DISORDERS

School-age youngsters with behavior problems often end up in mental care or correctional facilities — or on the street — because teachers do not know how to deal with such problems. Researchers at the UMC College of Education have studied the problem and suggested ways schools can respond. Besides being good for the youngsters, dealing effectively with behavior problems is also less expensive than the alternatives.

CURRICULUM DEVELOPMENT

Saudi Arabia, an ancient culture in the midst of a technological revolution, desperately needs trained workers to help in its national development. UMC's College of Education has created a curriculum development project to prepare Saudi technicians to deal with modern technology.

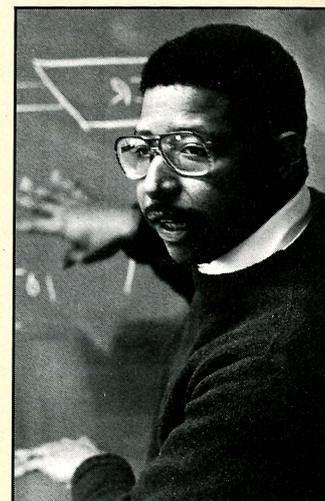
PLATO PHILOSOPHY

Four PLATO microcomputer systems, donated to UMR by the Control Data Corp., are being used to study how computer-based infor-

mation delivery systems can be incorporated into undergraduate education. The study compares lectures to computer-delivered instruction.

CHILDREN, COMPUTERS

A project by UMKC researchers could help educators understand when best to introduce children to computers and robots as learning tools. Preschool-age children have been introduced to TOPO the robot, a mobile extension of a personal computer, to determine whether experiences with computers and robots increase the children's readiness for learning.



Extension and Public Service



Dr. Robert Henley, superintendent, Independence Public Schools

A little more than a year ago UMKC's Chancellor George Russell contacted me and several other superintendents of schools in the Kansas City metropolitan area to determine how we could work together to improve elementary and secondary education. He said he was particularly interested in the quality of instruction in mathematics and science. Out of these discussions came the Mathematics and Physics Institute on UMKC's Truman campus.

What we're developing is a program structure unlike anything offered anywhere else in the country. The program, though designed for high school students, doesn't compromise the University's academic standards. It provides students with the structure of a high school campus with high school and University faculty sharing the instructional responsibilities. Together, high school and University faculty have planned the course-

work, selected the texts and ordered the materials. A collegial relationship has developed as high school faculty share insights into the teaching of younger students, while the University provides state-of-the-art resources and visiting world-class scientists.

Even the most affluent school district could not offer a program of this caliber. A single school district does not have the critical mass of talented students and, by definition, wouldn't have a faculty as specialized as a university faculty.

It can be difficult to get the creative, talented people in a university and a school district together. The paperwork can be so overwhelming the people who really can make an idea grow and prosper never get to it. But UMKC Academic Affairs Vice Chancellor Eugene Trani was able to get the problem down to the people level, to commandeer some of the University's resources and make it happen.

This is not just a one-way street. I see benefits for the University, too. We will be introducing some of the brightest students from the metropolitan area to UMKC. And we hope to reinforce the entire system by having a tutorial program for students who have problems with scientific or mathematic concepts, better preparing them for university study.

We really do have a program here that will benefit each partner. When you talk about collaboration among a university and several school districts, a mutual benefit offers the best — and the most durable — exchange.



KEEPING UP TO DATE

Good educators must stay up-to-date, but their busy schedules make that difficult. The UMKC School of Education does its part by offering courses for educators at a variety of convenient times and locations in the Kansas City area.

TEACHING IN THAILAND

UMC's College of Education continues to work closely with Thailand's Prince of Songkla University to upgrade that institution's faculty and programs. UMC and PSU faculty exchange visits and a recent doctoral degree recipient from UMC is developing adult/continuing

education programs in Thailand. So far, 15 PSU education professors have come to UMC for graduate study.

ECONOMICS OF ENERGY

Energy is always among major American concerns. Work at UMR reflects that. A member of the UMR economics department has written a book on residential energy demand. Also, faculty members are conducting a study that compares the economics of a coal slurry pipeline to that of an all coal-carrying "unit train."

Education



Larry A. Belger, vice president, *Belger Cartage Inc.*, and vice president, *UMKC Gallery of Art Board of Directors*

I think the only way to develop an understanding and appreciation of art is to be exposed to it in all its forms. For Kansas City art lovers, UMKC's small but influential Gallery of Art provides unique aesthetic and educational experiences.

The gallery brings together the works of talented, contemporary artists, not only painters, photographers, ceramists and sculptors, but architects, musicians and fashion designers who have made contributions to the art community. The gallery offers a chance to view works by emerging as well as established artists. And because it is located on the University campus, these artists can mingle with faculty and staff

involved in all University disciplines especially, of course, the performing arts and the humanities. This cross-pollination provides many different kinds of people with the opportunity to be part of unique and diverse artistic exchanges.

Since the gallery is mainly state-supported, its budget is meager. However, some of last year's exhibitions and catalogs received national awards in competition with such major institutions as the Hirshorn Museum, the Whitney Museum and the Museum of Modern Art. Also selected as one of the best in the country by both the American Institute of Graphics and the American Museum Association was the gallery's catalog for the well-known painter of balanced stripes, Gene Davis, whose exhibition of new works was an exciting event at UMKC last winter. A lot of care and attention went into that exhibit and it was

noticed far beyond the state lines of Missouri.

In addition, the University was presented an award from the Council for the Advancement and Support of Education for the catalog, "A Personal View/Selections" from the Joan Mannheimer Ceramic Collection." This 1983 exhibition coincided with the International Ceramic Symposium of the Institute of Ceramic History held in October at the Nelson/Atkins Museum. The UMKC gallery chose to complement the large "Ceramic Echoes" show at the Nelson with a smaller, personal exhibition of 45 ceramic pieces from the Mannheimer private collection.

Last December the gallery had a chance to offer lovers of Chinese art an exhibition of the paintings of China's most celebrated painter, Wu Zuoren, and his wife, Xiao Shufang. Wu was on campus as the 1983-84 Edgar Snow Visiting Professor and this exhibition and catalog were among the highlights of UMKC's 50th anniversary celebration.

The gallery has its own style, based on confidence and a quest for the best. It is a style that competes successfully with other institutions many times larger, which are the established leaders in the art world.

Much of this success and national acclaim can be attributed to Craig Subler, our gallery director, who selects, curates, designs and guides each exhibit.

Research

ARCHITECTURAL HERITAGE

UMC in cooperation with other groups helped Missourians explore the architectural heritage of their state through a short course entitled "Town Puzzles: Putting the Pieces Together." The course examined the architectural heritage of 20 Missouri towns.



PULLING TOGETHER

Never before have the people and countries of the world been more interdependent. And never before has the need for strong international education been so great. In response, UMKC continues to expand its programs of international exchange to promote understanding among the world's cultures. The Edgar Snow Visiting Professor Program, which brings outstanding scholars from the People's Republic of China to UMKC, is one example of this effort to improve understanding among cultures.

ORALLY SPEAKING

UMC is on its way to becoming a national and international center for studies in oral literature. The Missouri Oral Literature Symposium, sponsored by the Department of English, this year attracted scholars from Harvard University, Chicago, St. Louis and Berkeley. Plans are under way to host an oral literature symposium regularly, complementing the new scholarly journal, "Oral Tradition," published by UMC.



Sgt. Frank Burkhead, director, Missouri State Highway Patrol Criminal Laboratory Division

We've used Dr. Sam Stout, director of the Human Skeletal Remains Identification Laboratory and an associate professor of anthropology at the University of Missouri-Columbia, for several cases in the forensic science field, and I know other departments around the state have sent him bones to find out whether they're human or animal and for identification.

He's done a very fine job aiding and assisting law enforcement agencies in the state of Missouri.

For example, he was instrumental in identifying a little girl in northwest Missouri who had been missing for more than two years.

A farm boy in the west part of the state found a half-buried skull; his father reported it to the Missouri State Highway Patrol. We sent the remains to Dr. Stout, who was able to determine the child's approximate age — about 9. He also said the child was probably a Caucasian, due to the shape of the nasal cavity. There were no permanent teeth for the front incisors, next to the permanent teeth — that's a predominantly female trait.

He needed head X-rays, however, to make a positive identification, and at first, we couldn't locate any. So we sent the remains, at Dr. Stout's suggestion, to a laboratory in Colorado for facial reconstruction. Later, we did find X-rays and a positive identification was made.

It's good to have Dr. Stout as a consultant on cases. It's useful, too, that he's here in the state and located so close to our office.

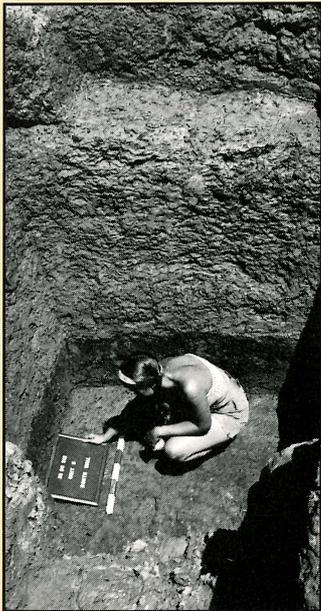
People are always digging up something and finding bones, and some structures may look human. It takes someone with Dr. Stout's expertise to identify the remains.

His information can change the course of a case.

Extension and Public Service

HISTORICAL SLEUTHING

For about a century, the supposed remains of Spanish conquistador Francisco Pizarro have been displayed in a chapel in Lima, Peru, a city Pizarro founded nearly 500 years ago. In 1977, bones believed to be Pizarro's were found in the same chapel. A few of those bones came to the University where UMC researchers, with the use of nuclear testing done by the UM Research Reactor, helped confirm the identity of the remains. The real remains will be put on display in Lima, which celebrates its 450th anniversary next year.

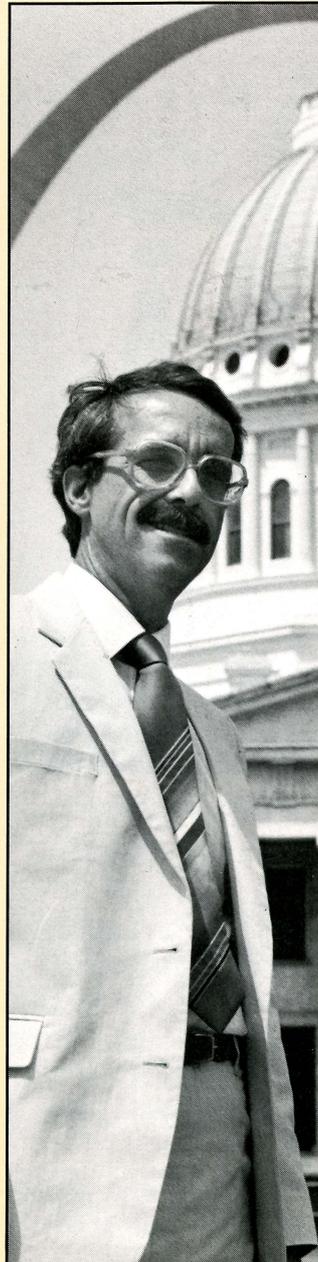


NEW NINTH

Musical history may have been made when the UMKC Conservatory of Music orchestra and the UMKC civic chorus performed Beethoven's famous "Ninth Symphony" in a tempo conductor Glenn Block contends Beethoven had in mind when he wrote it. Block's theory is based on research showing conductors have made inaccurate interpretations of tempo, phrasing and execution since the symphony was written in 1824.

HELP FOR STEPFAMILIES

The bad image given stepfamilies by the story of Cinderella lingers, although it is estimated that 15 percent of today's families have stepchildren living in the household. UMC College of Home Economics research in stepfamily relations, perceptions and media images results in recommendations to help family counselors, who are often unprepared to handle the complexity of stepfamily relations. Along with the research, UMC offers the only graduate course in the nation on remarriage and stepfamilies.



Norman Linville, *editor of children's resources, Christian Board of Publication, St. Louis*

For the past two years, I've attended the UMSL Storytelling Festival on a weekday when area children come to listen.

I enjoy watching the kids become so wrapped up in the stories. It also gives me the opportunity of seeing different kinds of telling techniques.

I enjoy listening to tellers as they repeat the theme of the story to the children by focusing on a common line. The classes are always prepared by their teachers to listen and I think the tellers pick up on this. The tellers will encourage involvement by organizing the story so the children can participate by repeating the one line at various points in the story.

I'm sure the children learn a great deal at the Storytelling Festival. The stories develop an active relationship between the teller and the hearer. This personal interaction is better than TV or movies because the children don't lose interest as fast and they remember much longer.

Personal stories about family history and local history provide the children with the opportunity to discover their own worth and identity.

PRESERVING THE PAST

Some of the state's richest documentary heritage is being preserved, thanks to the Western Historical Manuscript Collection. Thousands of items that may have otherwise been lost have been rescued by using paper conservation techniques to ensure that aging documents are preserved for generations to come.

TRUMAN STUDIED HERE

Even in the Kansas City area, many people did not realize former President Harry S. Truman studied for two years at UMKC's law school, known at the time as the Kansas City School of Law. However, an exhibition at UMKC changed that. Among the items displayed were copies of the late president's grades and his photo from the school's yearbook.

CULTURED NEIGHBOR

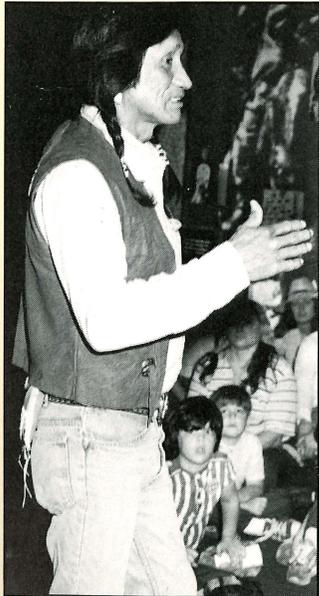
Thanks to cooperative agreements with arts organizations in the metropolitan area, UMKC sponsored nearly 1,000 plays, concerts, exhibits and other programs during the year, contributing to the community's cultural environment. Highlights included more than 300

Fiscal Situation

concerts and recitals produced by the Conservatory of Music and the Festival of Music of and About Black People, which highlights Black History Month.

GERMANS IN ST. LOUIS

"Mit Feder und Hammer: The German Experience in St. Louis," an exhibit about St. Louis' German heritage, was shown in the capitol and several other Missouri locations before being sent to Europe for exhibits in Stuttgart and other West German cities. The exhibit was prepared by members of the UMSL history faculty.



ARTS BY THE HANDICAPPED

Handicapped persons are often excluded from participating in visual and performing arts because of their disabilities, but UMSL is changing that. With a \$12,800 grant, the campus will hold an arts festival for the handicapped.

CULTURAL EXCHANGE

The United States and the People's Republic of China were brought a little closer together this year when about 200 million Chinese viewed a UMKC production of the Chinese play "The Family" on Chinese television. The play, which was directed by Ying Ruo Cheng when he was at UMKC in 1982 as an Edgar Snow Visiting Professor, featured the performances of UMKC graduate students. Before the showing last spring, the play — which depicts the struggle between tradition and new beliefs just prior to the Chinese Revolution—was banned in China.

The University of Missouri is one of the state's largest operations in terms of annual revenues and expenditures, which amount to more than a half billion dollars.

With its campuses in Columbia, Kansas City, Rolla and St. Louis, its agricultural research facilities throughout the state and its cooperative extension offices located in each county, the University is clearly a statewide operation. Estimated replacement cost of the University's large and complex physical plant: \$1.3 billion.

About 75 percent of the University's annual expenditures go to educational activity — instruction, research, public service, academic support, student services, scholarships and fellowships, institutional support and operation and maintenance of the plant. The remaining budget is for operation of the hospital and clinics (15 percent) and for operation of auxiliary enterprises (10 percent).

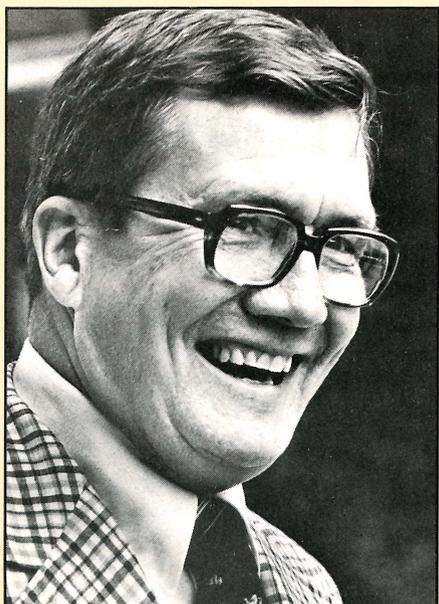
Money to operate the University comes from the state (about 37 percent of the University's total annual revenues), from tuition and fees paid by students (17 percent), from the federal gov-

ernment (9 percent) and from private gifts (4 percent). The balance comes from auxiliary enterprises, investments and hospital fees.

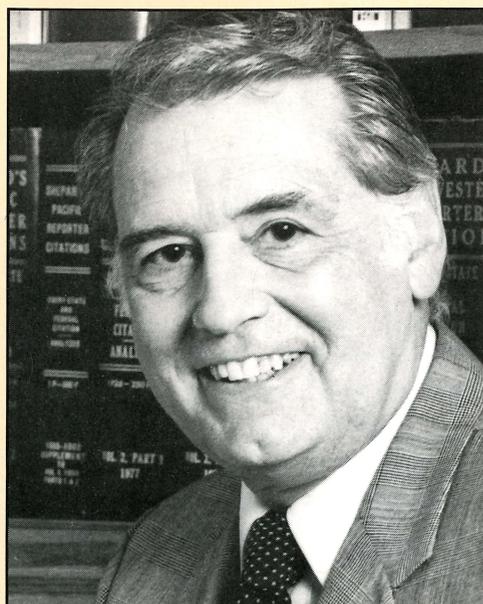
The mix of revenues has changed significantly in recent years. The proportion of state support for operation of University programs has decreased from 46.5 to 37 percent because of nearly level state support since 1980-81, state withholding of appropriations due to revenue shortfalls and inflation during that time. The shrinking share of state funding has produced growing pressures for the University to increase the portion of revenues derived from other sources. Revenues from students have risen from 13 to 17 percent during that period.

The University of Missouri is a major force in the state, whether judged by the size of its fiscal operation or the products it offers the state — men and women who are the future leaders of this state, new knowledge and services for all its citizens. When those factors are combined, the University's importance to the state takes on monumental proportions.

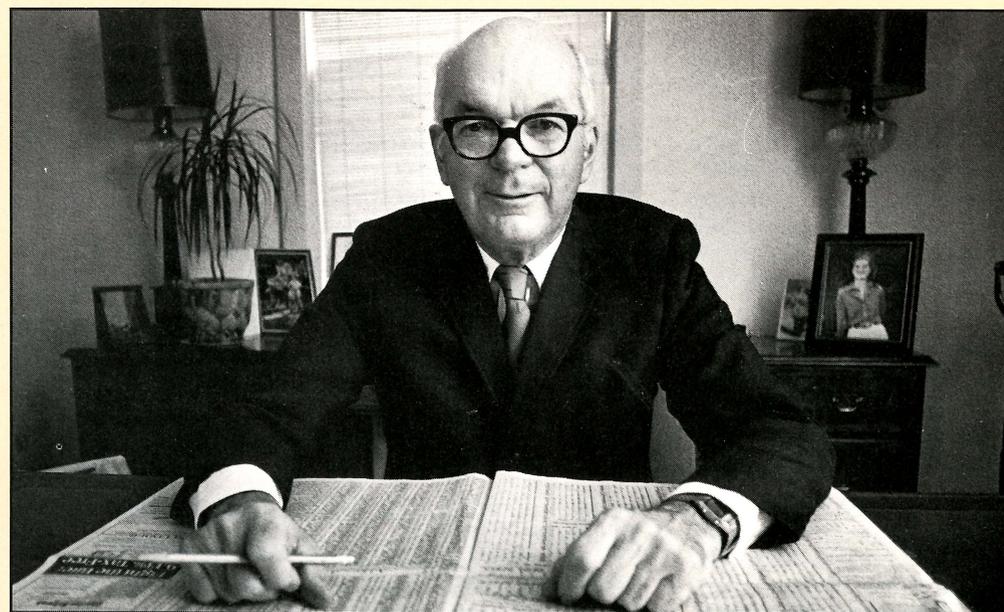
Board of Curators



David W. Lewis
St. Joseph
banker



W.H. "Bert" Bates
Kansas City
attorney



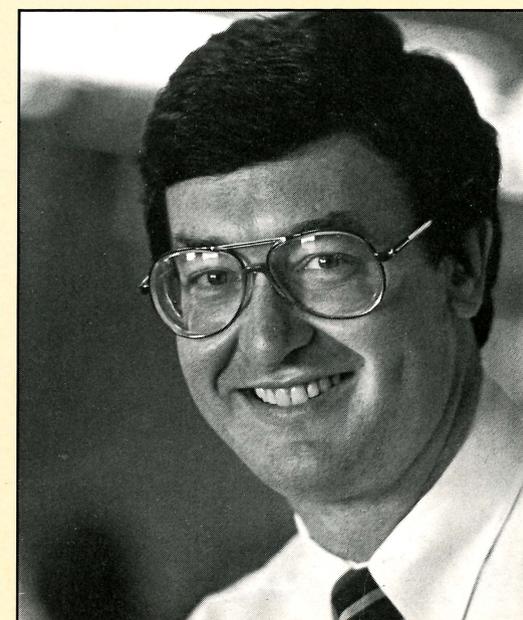
Tom K. Smith Jr.
Ladue
business executive, retiree



Jeanne V. Epple
Columbia
homemaker, volunteer
30 Impact

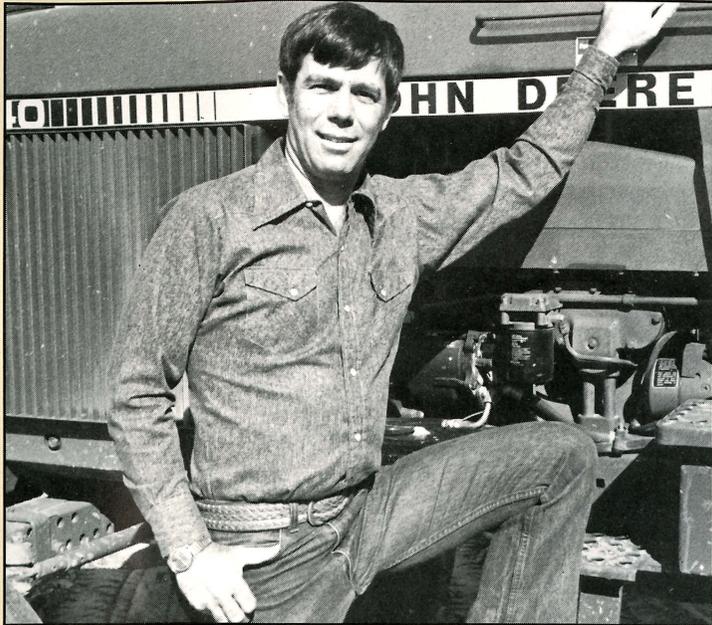


James S. Anderson
Springfield
business executive, engineer



Doug Russell
Lebanon
business executive

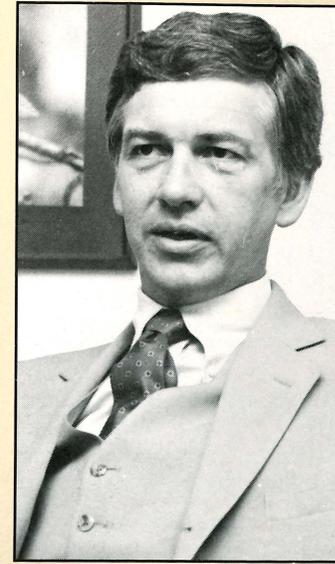
General Officers



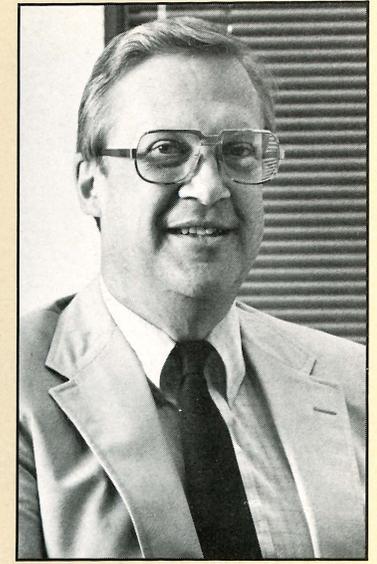
Charles E. Kruse
Dexter
farmer



Melvin D. George
Interim President



James R. Buchholz
Vice President,
Administrative Affairs



Richard L. Wallace
Acting Vice President,
Academic Affairs



Marian O. Oldham
St. Louis
homemaker, realtor



William G. Cocos Jr.
St. Louis
plumbing contractor



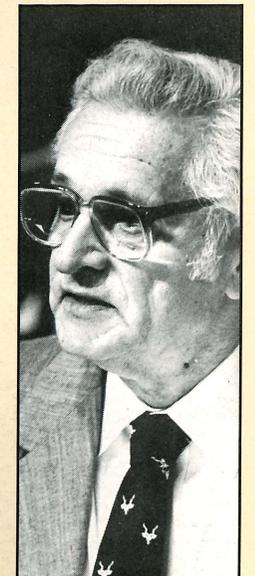
George A. Russell
Chancellor,
Kansas City campus



Barbara S. Uehling
Chancellor,
Columbia campus



Joseph M. Marchello
Chancellor,
Rolla campus



Arnold B. Grobman
Chancellor,
St. Louis campus

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