

Dr. Robert Brugger



## Reactor chief predicts boom for facility

A decade after UM's research reactor "went critical," it has become the most powerful university reactor in the U.S.

Now the reactor has even more potential for research and applications. Last July, when the power was increased from 5 to 10 megawatts, the UM reactor pulled away from those at MIT and Ames (to yield a peak neutron flux—or flow—of  $6 \times 10^{14}$  neutrons/cm<sup>2</sup>sec).

Despite the high potential—and indeed partly because of it—the facility's director, Dr. Robert Brugger, believes an advocate is needed if the reactor's capabilities are to be utilized. Clearly, he intends to be that advocate, enthusiastically describing its high flux, design features and peripheral equipment, as well as the staff of experts in each of its various capabilities.

Brugger speaks, too, of the high-power reactor complex in Grenoble, which is receiving scientific attention for its wide use of neutrons to study properties of materials. Brugger visited this year-old reactor in December on the way to a conference in Vienna. French, German and British scientists have formed a nucleus of resident users at the Grenoble reactor quite distinct from the reactor staff. Attracted by the high flux ( $50 \times 10^{14}$  neutrons/cm<sup>2</sup>sec) and by the sophisticated peripheral equipment, these visiting scientists outnumber the staff two-to-one.

The Grenoble facility has quickly reached overload on requests for neutron work. Because many of the requests can be filled by reactors of lower neutron flux, the Grenoble facility is actually catalyzing use of intermediate-flux reactors in France and Germany. In turn, the intermediates are spreading neutron research into other scientific disciplines.

"UM's reactor is the equivalent of an intermediate-flux facility," Brugger says. "We have the capability to be a neutron scattering center. We have the potential demand for interdisciplinary work and need to build our equipment and personnel to the

required level. Yet we can also train those scientists who need neutron fluxes above ours and send them to use the high-flux reactors at Brookhaven or Oak Ridge."

At the UM reactor there are still facilities whose use can be increased. Three of its six beam ports (which allow streams of neutrons from the reactor core to be used for experiments) are not fully used. Expansion of several of the reactor's capabilities have been identified by Brugger for top-priority action. "Growing room" was designed into the facility, although financial stringencies have so far limited acquisition of enough peripheral equipment and leaders for all possible areas. Use also lags because applications for neutron radiation to nuclear areas takes time to be understood.

Also, under-use of some reactor capabilities has occurred because attention was focused on building up others. "Applications for neutron activation analysis and radioisotopes have developed broadly at the UM facility. These are now being capably led by Dr. David McKown and Dr. Michael Kay," Brugger observes. Still in need of in-house leaders to promote and manage their further development, he says, are the application of neutron diffraction, inelastic scattering, nuclear radiation and neutron radiography.

Full use of the facility, the reactor director says, will mean more extensive radiation services to the faculty and students of the four campuses, not to mention an enhanced national reputation in academic research circles.

That's a long-range goal. Right now Brugger's strategy calls for stepped-up education of UM faculties in wider uses of the reactor. "The physics departments aren't the only potential users of neutron radiation," he says. "Chemistry, engineering, biology, medicine and even some of the humanities have many present and future applications."

First in line for upgrading will be neutron-scattering capabilities. "Scattering is a method for detecting the fundamental properties of materials and therefore is vitally important to have for research," Brugger says.

"Virtually all of the advances engineers are trying to make in energy are limited by the failure of the materials used. All the practical applications hinge on understanding the behavior of materials and improving them."

Funding for the scattering center is currently being sought. "The AEC recently granted us \$75,000 toward next year's reactor fuel costs," says Don Alger, associate reactor director. "The agency had only \$400,000 for this purpose for all the university research reactors in the country. For the first time the AEC visited the reactors competing for the funds. Small reactors—or those which haven't developed their capabilities—were cut off fuel funds altogether. Thus, the AEC, as budgets get tighter, will support only those research reactors working hardest to develop their applications."

"The solutions to our present national problems are technical as well as social," Brugger says. "The presence of a sizable reactor at the University of Missouri is strong support for the State of Missouri as it licenses its first commercial nuclear power plant."

"This university can train the personnel needed to operate that plant. Missouri won't have to import engineers from other states. UM has a base of research and development in nuclear energy which will be an invaluable asset to the state in the years immediately ahead."

Where the action is—the reactor core, inside this tower, with catwalks for technicians. Control rods, which can modify or shut down the reactor as needed, rise like palisades from the core. Gauges monitoring the reactor's activity line the walls of the control room directly behind the core.



Photo by Jim Horton

## Briefly

### Hiring freeze

The UM cabinet has agreed to an immediate freeze on filling new positions, existing vacancies or positions which become vacant.

The freeze reflects and anticipates financial problems and remains in effect until removed by direction of the president. Exceptions to the order must be approved by the chancellor and reported to the president.

### Student access

New federal guidelines on student access to educational records will be considered today by the University-wide Committee on the Confidentiality of Student Records. The new federal guidelines have been designed to meet most of the objections voiced by institutions of higher education.

Recommendations which will apply U-wide will be made by the committee to the UM president. *Spectrum* will publish the recommendations upon their approval by the president.

### Bond names curators

A physician, an automobile dealer and a farm bureau official have been appointed to the UM Board of Curators by Governor Bond. They are:

- Clyde R. (Dick) Johnston, 54, of Springfield, president of the Missouri Farm Bureau, UMC agriculture graduate of 1948 and active alumni.
- James Feltmann, 49, of Washington, 1949 UMR graduate in

### Answer service

The University's Industrial and Technical Referral Center handles about 1,000 requests for information annually from Missouri business and industry.

The center, which is administered by the UMC College of Engineering, draws on faculty expertise on all four campuses.

mechanical engineering.

• Wallace Stacey, 58, of Independence, 1943 bachelor's in medicine from UMC, M.D. from Washington University in 1945, active alumni member.

The new appointees, once confirmed by the Senate, would replace John Sam Williamson, Mrs. Avis Tucker and William Myers, whose six-year terms expired Jan. 1, 1975.

If the three are confirmed, the number of board members appointed by Bond would total seven of nine.

### Tax study

UMKC, UMC and University Extension are working with three other colleges, regional planning commissions and local governments in a study of various kinds of taxes and jurisdictions within a 14-county area of northwest Missouri.

The study is financed by a \$10,900 Title I grant from the Missouri Department of Community Affairs. The cooperating institutions are Tarkio College, Missouri Western State College and Northwest Missouri State University.

### Board meeting rescheduled

The date for the January meeting of the Board of Curators has been changed to Jan. 24. The meeting is to be held in St. Louis.

### Enrollment climbs

College and university enrollments rose to 10.2 million last fall, up 5.5 per cent from fall 1973.

Public institutions showed a 6.3 per cent gain, while enrollments in private schools were up 3 per cent, according to a report from the National Center for Educational Statistics.

## On the horizon: new process for smelting

Fittingly, a non-polluting lead-smelting process may emerge from Missouri, the state that produces 80 per cent of U.S. lead supplies.

And happily, Missouri's lead-smelting industry is cooperating fully with UMR researchers working on two new processes free from sulfur dioxide gas and lead-bearing dust particles.

"It's all a matter of economics," says Art Morris, UMR professor of metallurgical engineering. "With the conventional process, about 60 per cent of the sulfur dioxide gas is converted to sulfuric acid and removed. But not all smelters have acid plants. And particulate traps to catch the lead-bearing dust, while effective, are expensive.

"It's only a matter of time until state or federal governments will force the entire lead-smelting industry to control to very low levels of emissions. When that happens, smelters will have to add more equipment or choose other processes."

Morris is working on a high-temperature, one-step lead-smelting process. Two colleagues, Tom O'Keefe and Jim Johnson, respectively professors of metallurgical and chemical engineering, are investigating electrolysis. The National Science Foundation, under the program Research Applied to National Needs, has funded both studies for more than two years.

The Morris high-temperature process, all three researchers agree, is looking more promising than the electrolytic effort. O'Keefe says he and Johnson are having difficulty casting a current-conducting anode

Art Morris lowers sample into 1,100° - centigrade furnace.

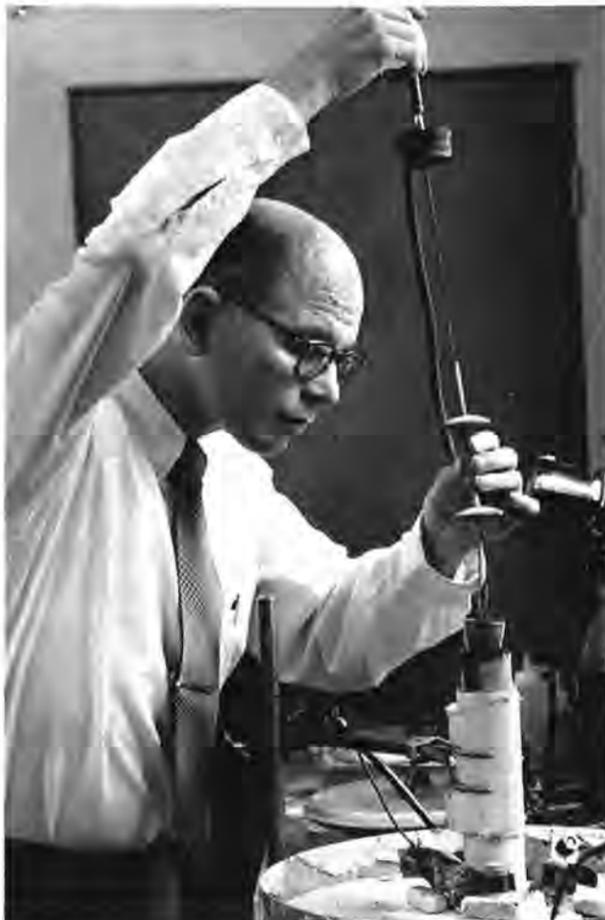


Photo by Ernie Gutierrez

from finely divided lead sulfide. A second obstacle: elemental sulfur, remaining at the anode as the ionized lead moves to the cathode, is proving difficult to remove, thus slowing the electrolytic process.

By contrast, the Morris process is far enough along that he's about ready to begin negotiations with the Missouri lead-smelting industry to test the process on a large scale.

The new single-step process would also be cheaper than the conventional two-step procedure, which first removes sulfur in a roasting action, followed by a lead-extracting blast furnace. Environmental protection is assured by a closed smelting furnace as opposed to the entirely open conventional process.

"We take concentrated lead sulfide from the mill and add metallic iron as a reducing agent, which grabs off the sulfur," Morris says. "Since no gases are emitted in the process, a closed furnace can be used. The end products are molten lead, which is tapped off for further refining, molten matte (an impure mixture of iron, copper and zinc sulfides) and a very small amount of slag.

"To increase the efficiency of the lead recovery, a flux of oxygen is added at the beginning of the process. We are seeking a patent on the flux since the amount and the manner of adding it is critical."

The use of iron as a reducing agent for lead is centuries-old knowledge, Morris says, but about 40 per cent of the lead escaped recovery. Thus, inefficiency rendered such a reducing agent unattractive. His oxygen flux has changed all that.

Questions being answered in the small-scale furnace Morris uses: How much lead escapes recovery? What's the best temperature for maximum recovery? How long should the process go on? And, of course, what kind and how much flux is needed? "In fact," Morris says, "most of our time has been spent in perfecting the flux."

If the copper and zinc can be removed from the matte, Morris says, the lead-smelting industry will certainly be interested. The cheapest grade of scrap iron seems to work adequately in the reduction process. Thus, industrial costs for this ingredient can be kept quite low.

As the smelting industry takes an active hand in large-scale testing, Morris says, some parts of the process may need more laboratory investigation before commercial costs can be assigned to it.

But for the present, Morris is cheerfully optimistic that economics speak loudly in its favor: junk or recycled iron as a reducing agent, only one furnace for cheaper capital and labor costs and no damage to the air we breathe.

—Margaret Kraeuchi

## R & D boom forecast

"The next decade will see this country allotting a greater percentage of money than ever before to civilian-directed research and development efforts," predicts Dr. Raymond L. Bisplinghoff, UMR chancellor.

Dr. Bisplinghoff, former deputy director of the National Science Foundation, made that comment at a meeting of the Rolla chapter of Sigma Xi, scientific research society.

"The largest source of these research and development funds will continue to be the federal government," he said. "However, increasing amounts of money are even now being contributed by industry and local and state governments.

"Traditionally, the major portion of R & D funds have been expended on military or militarily allied projects. Large sums were infused into R & D efforts for atomic research and another large sum was added to space R & D at the time Sputnik was launched. While much of the research and development effort in atomic energy and space projects has resulted in peaceful applications, the motivation and many of the products are militarily oriented.

"The past few years have seen the beginning of a swing to support R & D in what I call civilian areas," the chancellor continued. "Social pressures in the fields of increased population, decreasing mineral and energy resources and worldwide food deficiency will increase at a rapid rate. And the basic problems in these fields will be solved primarily by the science and engineering community."

"A major policy decision the government will need to make in implementing development of the civilian R & D solutions provided by engineers and scientists is one of management. Up to now, there has been one major customer for federal R & D—the government.

"Solutions to these new civilian problems will have many 'customers'—not just one. They are individual citizens of this and all other countries. A

whole new management concept for civilian R & D will need to be evolved.

"I feel the universities of this country can be particularly valuable in the new research and development areas," Dr. Bisplinghoff said. "The institutions of higher education have the necessary talent available in a variety of disciplines and are accustomed to working on interdisciplinary projects. This type of approach is what it is going to take for civilian R & D."

## English—the gift of God

The number of colleges and universities having no foreign language requirements, neither for admission nor graduation, has increased significantly since 1970-71, according to a survey by the Association of Departments of Foreign Languages.

Of the 1,206 institutions surveyed four years ago, 221, or 18.3 per cent, had no foreign language requirements. This year, in a survey of 987 institutions, 335, or 36 per cent, were found to have no foreign language requirements.

According to Richard I. Brod, head of the association, nearly 90 per cent of the B.A.-granting colleges in 1965-66 had degree requirements in foreign languages. By 1970-71, he said, that number had dropped to 76.7 per cent, and, by 1974-75, to 56 per cent.

## Rolla widens program

About 50 UMC graduate students are enrolled in courses on the Rolla campus leading to a master's degree in elementary education.

The program is directed by the UMC College of Education and coordinated by UMC and UMR extension divisions.

The courses were set up in response to interest expressed by school teachers in the Rolla area.

## Feedback

### A modest proposal

I greatly appreciate and recommend to all the methods suggested by Mr. Jack Hamilton (*Spectrum*, Dec. 6) for saving paper and thus expense to our financially stricken University. However, I think that with even less effort much greater savings may be made.

How about not sending the pink envelopes and their duplicated contents in the first place? How about not loading the faculty with a plethora of unwanted papers and forms? Not only are these measures more radical than those suggested by Mr. Hamilton but they are even less painful, bordering on pleasurable, in fact.

Perhaps the most attractive saving of all, however, would be to publish my letter in the next and last edition of *Spectrum*.

GORDON KIMBER  
Professor of Agronomy  
UMC

Adhering admirably to Mr. Hamilton's prescriptions, Professor Kimber typed the above letter in the margin of his copy of *Spectrum* and sent it to us in a rumpled envelope bearing evidence of at least 10 earlier mailings.

While we respect Professor Kimber for his conscientious efforts to conserve and economize, and while we share his aversion to "unwanted papers and forms," whatever they may be, we are deeply grieved by his concluding comment—that our demise would constitute perhaps "the most attractive saving of all."

Whether we attribute this unkind cut to genuine antipathy, a morbid sense of humor or merely an Englishman's love of hyperbole, we find in his note both consolation and encouragement. For after all, even if Professor Kimber does condemn *Spectrum* as being superfluous, we may judge from his comments that he is nevertheless reading it.

The Editor

## Two wrongs etc.

Institutions of higher education may hire the best-qualified person for any position "without regard to race, sex or ethnicity," according to a memo from Peter E. Holmes, director of HEW's Office for Civil Rights.

The memo, which was mailed to the heads of

2,800 institutions, says: "The college or university, not the federal government, is to say what constitutes qualification for any particular position. No single appointment will be objected to where those not appointed are less well-qualified than the candidate actually

selected."

According to Holmes, the memo was intended to quell the "public furor" and "widespread misapprehension" with respect to affirmative-action recruitment and hiring programs and to explain more clearly the hiring

obligations of institutions that are subject to a federal executive order requiring affirmative action by federal contract-holders who previously have discriminated in the hiring of women and minority-group members.

"A major purpose of the affirmative provisions of

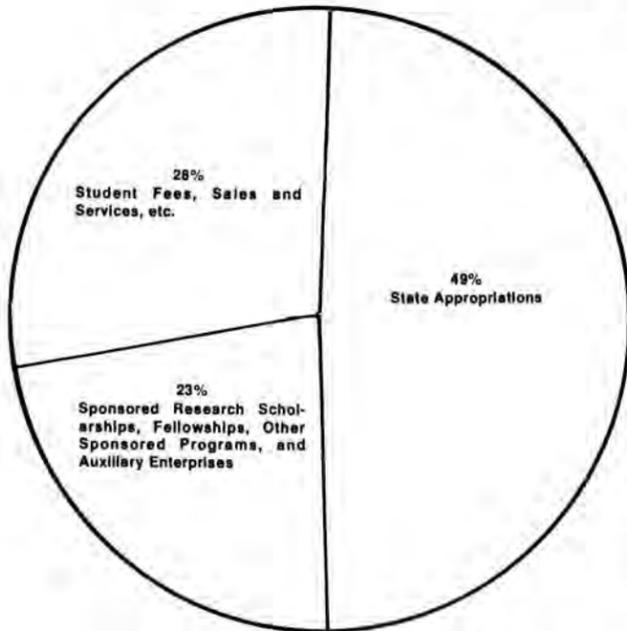
the executive order," the memo says, "is to broaden the pool of applicants so that women and minorities will be considered for employment along with all other applicants. . . ."

"It has been suggested that a position might be designated on the basis of race or sex in

order to meet an employment goal. This would be in violation of the nondiscrimination provisions of the executive order."



# University faces financial crisis as state holds purse strings taut



	Budget 1974-75	Request 1975-76
<b>INCOME</b>		
General Operating Budget:		
• State Appropriations	\$113,151,987	\$133,169,069
• Student fees, Sales and Services, Federal Appropriations and Other Sources	66,847,288	68,200,407
Total General Operating	\$179,999,275	\$201,369,476
Restricted Funds:		
• Sponsored Research	\$ 16,414,589	\$ 16,900,000
• Other Sponsored Programs	12,413,939	12,975,000
• Scholarships & Fellowships	1,938,988	1,972,000
Total Restricted Funds	\$ 30,767,516	\$ 31,847,000
Total Education and General	\$210,766,791	\$233,216,476
Auxiliary Enterprises	22,364,051	22,697,200
<b>TOTAL INCOME</b>	<b>\$233,130,842</b>	<b>\$255,913,676</b>
<b>EXPENDITURES</b>		
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Next in the sequence of steps toward 1975-76 appropriations for the University are hearings before the House and Senate appropriations committees. They're expected in the next two or three months.

The committees will have before them Gov. Christopher S. Bond's recommendations. His recommendations follow in time and substance the figures suggested by the state Coordinating Board for Higher Education.

The board, meeting in Columbia on Nov. 15, suggested \$6.3 million more in state appropriations for operations for the University in 1975-76. The UM request is for \$20 million more than was appropriated for fiscal 1974-75. And UM officials say almost \$17 million of the \$20 million can be attributed to rising costs.

For capital improvements, the University requested \$16 million. The coordinating board suggested \$5 million.

Several members of the coordinating board—a nine-member board appointed by the governor following passage last year of the state government reorganization act—have said they believe higher education needs more. But they allocated within operating and capital figures indicated by the Office of the Governor.

Governor Bond, at a Dec. 10 hearing, said he, too, would like to be able to propose more for higher education. But he insisted that revenue sources are limited.

While estimates of state revenue reserve and anticipated receipts vary, the fact is that Missouri ranks relatively low among the states in appropriations for higher education. Fall 1973 comparisons show Missouri 29th in appropriations per student enrolled, 42nd in appropriations per capita population, 43rd per \$1,000 of personal income.

At the Dec. 10 hearing, UM President C. Brice Ratchford not only questioned the validity of calculations used by the coordinating board in reaching the operations appropriation figure suggested for the University, he also said, "If our fair share is in fact \$6.3 million, then every other state agency is in trouble, and someone needs to look at the level and quality of services that will result and whether this is what the people of the state want, or whether they would prefer another alternative."

Missouri's relatively low status in appropriations for higher education, a reluctance to increase tax rates or to add new tax sources, a less than optimistic near-term economic forecast, no sign of rescue from Washington and the impact of inflation combine for a dim outlook.

University officials hope the General Assembly will improve on the appropriations figures recommended by the governor and the coordinating board. But total revenue is finite, and the state constitution prohibits deficit financing.

When the UM appropriations request was prepared last fall, the University paralleled guidelines suggested in the "Priority Budget and Program Manual," issued by the governor. State agencies were instructed to request a 7 per cent cost-of-living increase and 1 per cent for merit. While the University traditionally does not make across-the-board salary increases, the University did request a total 8 per cent increase in funds available for salaries and wages.

The instructions issued by the governor carried the prophetic note, "This 7 per cent amount is for planning purposes only and may be altered at a later date." It was. In December, the Office of the Governor announced that a deteriorating revenue forecast made necessary a revision: the 7 per cent would become 6 per cent.

But the \$6.3 million suggested for the University by the coordinating board would not provide for even a 5 per cent increase in salaries and wages, if all the money were used solely for that purpose. And all of it could not be used for salary adjustments, since

## Budget books

Copies of UM's budget requests for the coming year and last year's financial report are available in the four campus's libraries.

Publications on reserve:

- 1975-76 Appropriations Request, Operating and Capital

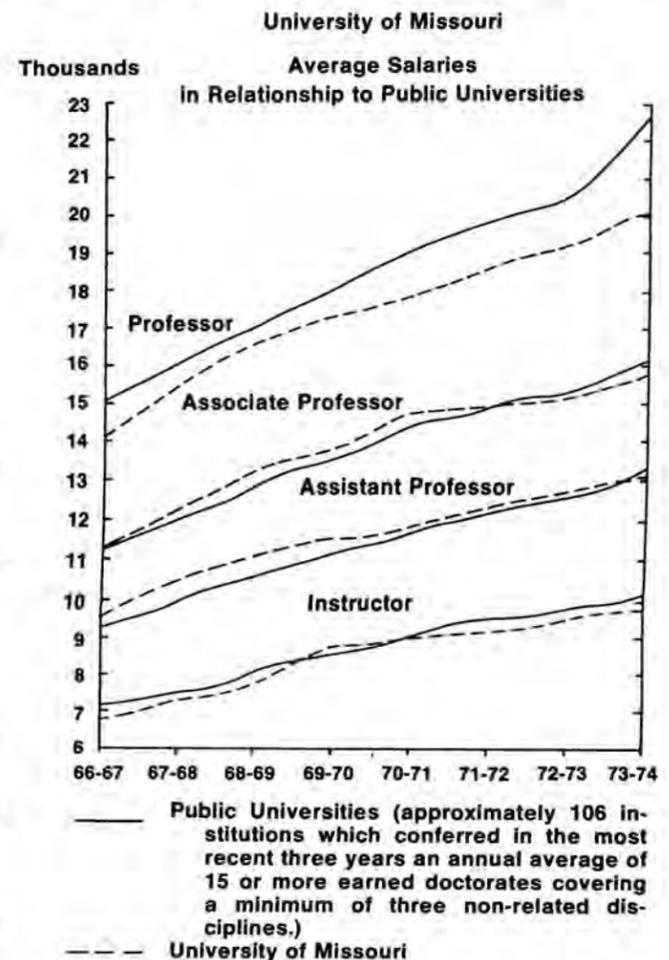
- Legislative Budget for Capital Items
- Legislative Budget for Current Operations
- Legislative Budget for Current Operations: Missouri Institute of Psychiatry, State Historical Society of Missouri, Missouri Regional Medical Program and Renal Disease
- University of Missouri Financial Report: 1973-74

there will be other mandatory costs such as higher utility prices.

The arithmetic of it is that \$11.1 million more would have to be added to the UM budget in order to cover an 8 per cent salary increase—\$9.8 million for direct salary and wage adjustment and \$1.3 million for the associated benefits.

The University also requested an 8 per cent increase in non-salary expense and equipment. That would take \$3.5 million. An 8 per cent increase is a conservative estimate of inflationary impact and does nothing to compensate for the current inflationary impact.

Inflation is the main culprit. The federal government's Consumer Price Index is running about 12 per cent ahead of a year ago. A more accurate measure of the purchases of the University is the federal government's Implicit Price Deflator, which shows price levels of state and local government purchases nearly



## Nitty gritty

As the old saying goes, it's the little things that count. Take toilet paper, for example, an essential but increasingly costly item on civilized man's shopping list. During a period roughly corresponding to the 1973-74 school year, the University saw the price increase by 60 per cent.

Other items purchased by the University, along with the percentage by which the price increased, in the same period:

- Paper towels 157%
- Xerox paper 39%
- Duplicator paper 32%
- Mimeo paper 32%
- Yellow tablets 44%

- Cotton mops 23%
- Paper bags 76%
- Twine-cotton 49%
- Black steel pipe 94%
- Envelopes 33%
- Metal desks 16%
- Wood desks 13%
- Wood chairs 10%
- File cabinets 17%
- Antifreeze 120%
- Gasoline 89%
- Computer cards 73%

- Roll bandages 20%
- Catheters 41%
- Canned fruit 49%
- Cold-drink cups 20%
- Carcass beef 24%

"If our fair share is in fact \$6.3 million, then every other state agency is in trouble, and someone needs to look at the level and quality of services that will result. . . ."

15 per cent ahead of the previous year.

Higher utility costs cannot be covered by an 8 per cent increase in non-salary funds. The price of coal delivered to UMC on July 1, 1975, for instance, is expected to be more than \$30 a ton, compared with about \$25 a ton last October. In 1969-70, coal averaged \$6.32 a ton. "Supra-normal" price changes for fuel and utilities caused the University to ask for an additional \$528,600.

Add increases of 8 per cent for salary and wage adjustment and for non-salary purchases, plus the extra amount for fuel/utilities, and more than \$15 million of the \$20 million increase in operating appropriation has been accounted for.

An increase in medical benefits costs, funds to maintain the actuarial soundness of the UM retirement system, an expected increase in the cost of Workmen's Compensation and a cost-of-living adjustment for retired staff would add another \$1.8 million.

An expected enrollment increase would take \$1.5 million. Compliance with various federal and state laws would cost about \$1.3 million.

The total is nearly \$20 million, or the total amount of the request for increase in state appropriation for operations.

**What about program improvements?** A severely trimmed set of program improvements would cost about \$1.7 million in new revenue, along with some internal reallocations of existing budget.

With \$20 million more in appropriations and an expected \$1.4-million increase in non-state revenue, it could be done.

But an added \$20 million—an appropriation of \$133.2 million for 1975-76, compared with \$113.2 million for the current year—seems unlikely.

What to do? Major surgery, or further general malnutrition?

Answers depend in part on what comes

out of the House and Senate appropriations committee this spring.

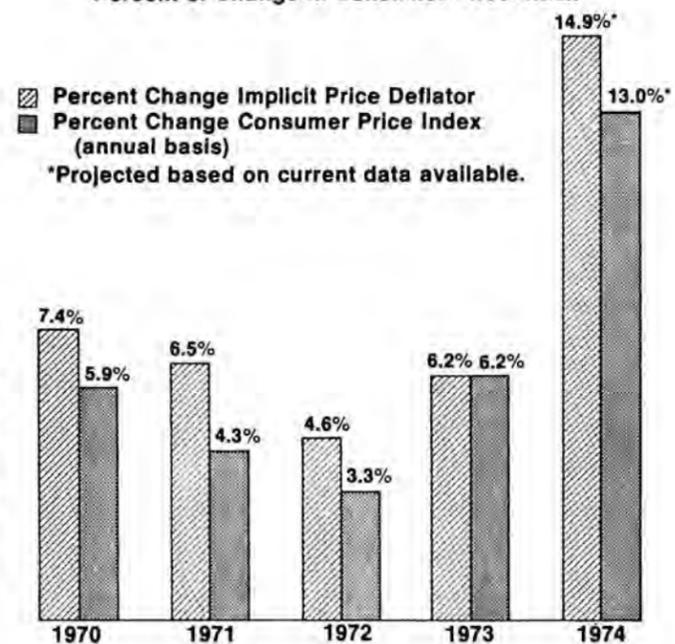
Complicating the situation is a legislative directive of last spring. The General Assembly appropriated \$50,000 to the University "for the planning phase of opening a school of optometry" at the University of Missouri-St. Louis. University-developed planning information has been sent to the coordinating board, the governor and the General Assembly.

**In putting** the planning information before the UM Board of Curators last month, President Ratchford said, "The University did not initiate this assignment. It is not in our list of academic priorities. We have nothing in our appropriations requests, either capital or operating, for a school of optometry. If it is decided that the University should proceed further with this assignment, new money will have to be made available now and in the future."

Standing unchallenged is a court decision of 1916 which said that while the legislature may not take away a part of the University, the legislature does have the power to add to the University. The interpretation of the language of the General Assembly's appropriation of last spring is that a decision already has been made that there will be a school of optometry. The question now is whether the legislature wants to invest up to \$11 million in such an enterprise.

Ratchford said, "To the extent that any allocation of general revenue funds is made for any public service, agency or institution, the total available revenue is diminished and is not available for other purposes. This is particularly true, of course, in relation to any new program expenditure. In a sense, all public programs are in competition with one another for support. But it is the responsibility of state government to raise funds and wisely allocate available revenue among the public agencies, institutions and programs."

Comparison of Percent Change in Implicit Price Deflator for Gross National Product Government Purchases of Goods and Services, State and Local Government to Percent of Change in Consumer Price Index



SOURCES: Survey of Current Business, U.S. Department of Commerce Monthly Labor Review, U. S. Department of Labor

### Capital request list

#### Physical Plant Improvements (\$2,500,000)

Includes major repairs and improvements to buildings to insure continued usefulness. Of the total, \$1.5 million would go to UMC, \$350,000 to UMKC, \$450,000 to UMR and \$200,000 to UMSL.

**Hazardous Chemical Storage Buildings (\$575,000).** To comply with federal Occupational Safety and Health Act. New facilities planned in Columbia (\$345,000) and Rolla (\$230,000).

**Microwave System (\$3,200,000).** Would enable campuses to employ modern communications with audio, video and data transmission.

**Additions, Renovations and Rehabilitations on Existing Structures.** University Hospital, Columbia (\$1,200,000); addition to Journalism building, Columbia (\$650,000); Harris Hall, Rolla (\$560,000); Civil Engineering, Rolla (\$360,000); chilled-water distribution system, Rolla (\$500,000); air-conditioned multipurpose building, St. Louis (\$650,000); Agriculture Experiment Station, Columbia, (\$200,000).

**Nurses Training Facility Planning Funds, UMC (\$200,000).** Proposed \$4-million facility would allow much-needed expansion of nursing program.

**Environmental Trace Substances Planning Funds, U-Wide (\$125,000).** Proposed \$2.5-million facility would provide critical laboratory space.

**Science Building Planning Funds, UMSL (\$300,000).** Physics and Chemistry would occupy proposed \$6-million building.

**Heating Plant Improvements, UMR (\$3,315,000).** New boiler needed to meet state clean-air standards and to provide adequate steam pressure for the campus.

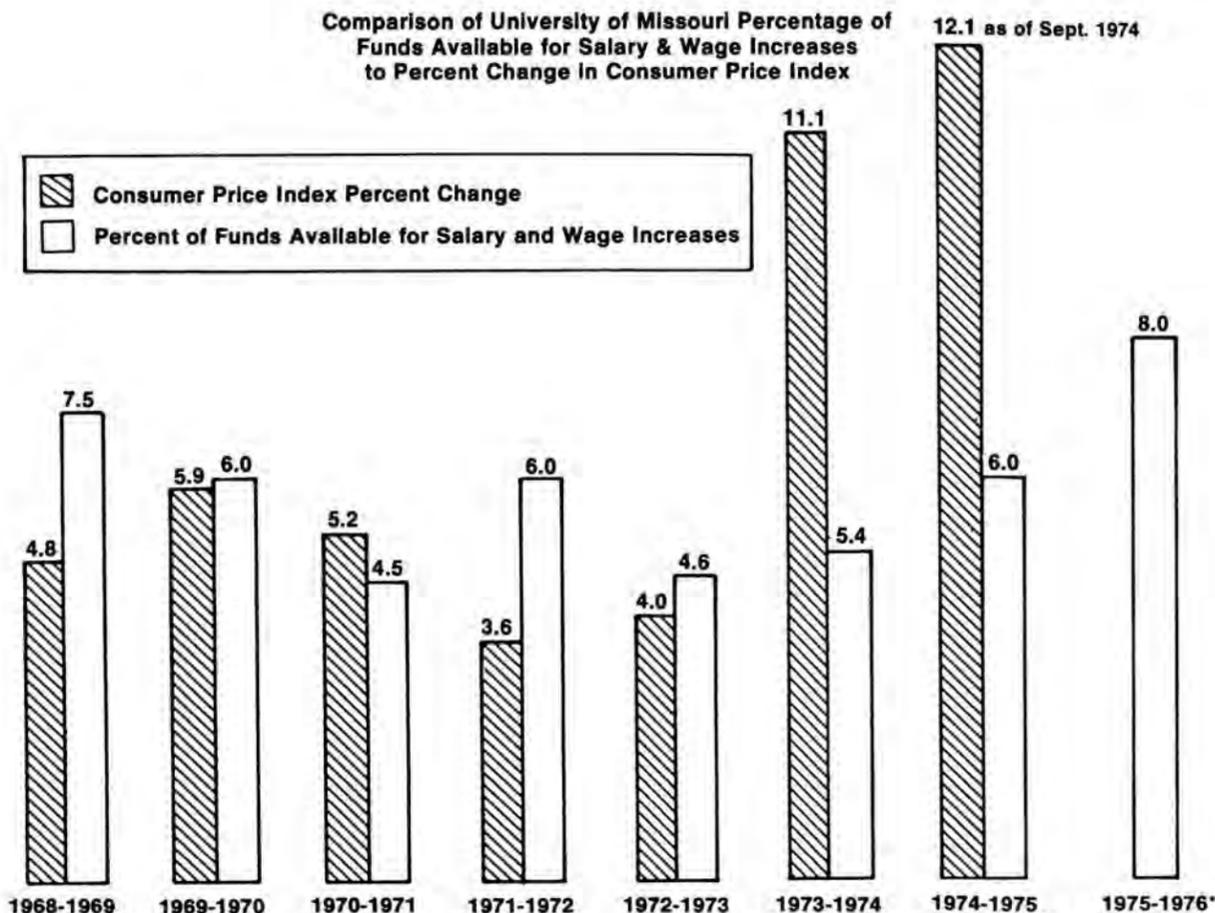
**Law School Planning and Site, UMKC (\$837,500).** A non-University evaluation team called the law building "woefully inadequate" and the library "deplorable."

**Sites for Campus Development (\$500,000).** For purchase of sites adjacent to campuses as they become available.

**Garage Facility, UMKC (\$345,000).** For servicing University vehicles.

Comparison of University of Missouri Percentage of Funds Available for Salary & Wage Increases to Percent Change in Consumer Price Index

Consumer Price Index Percent Change  
Percent of Funds Available for Salary and Wage Increases



Note: Data is on fiscal year basis of July 1 through June 30.

\*University of Missouri Request

### Vital role

More than 10,000 men and women are awarded degrees every year on the various campuses of the University.

UM is responsible for advanced professional training in law, dentistry, pharmacy, medicine, nursing and veterinary medicine. Among the 10,618 graduates in 1974

were 99 physicians, 142 dentists, 359 lawyers, 1,362 engineers, 84 pharmacists and 94 nurses.

Also, UM is the only public institution in the state offering doctoral programs.

## Student body ages

The student population of the nation's colleges and universities is getting older, according to a report from the U.S. Bureau of the Census.

In 1947, the report states, students 25 to 34 years old constituted about 18 per cent of the total enrollment of 2.3 million. By

the fall of 1973, the percentage of students in this age group had increased to 22 per cent of a total enrollment of 8.1 million.

## Jefferson Award

A U-wide committee has been formed to determine the recipient of the 1975 Thomas Jefferson Award.

The award, which was made possible by a gift from the Earl McConnell Foundation, is presented annually to a member of the University community who "through personal influence and performance of duty in teaching, writing and scholarship, character and influence, devotion and loyalty to the University best exemplifies the principles and ideals of Thomas Jefferson."

Nominations should be sent to Prof. Edwin Westermann, history, UMKC; Prof. Loren Reid, speech/drama, UMC; Prof. Larry Christensen, history, UMR; or Prof. Arthur Shaffer, history, UMSL.

## Bigger minority

A total of 2,895 minority students were enrolled on UM's four campuses for the 1974 fall semester, according to the University's Office of Institutional Research.

This represents a gain of 351 minority students over the 2,544 reported for the 1972 fall semester, the last time such data was gathered. Minority students are defined by HEW as American Indians, blacks, Asian Americans and Spanish Americans who are U.S. citizens.

A breakdown shows the University last fall enrolled 139 American Indians, 2,367 blacks, 179 Asian Americans and 210 Spanish Americans. In 1972 the totals were 131 American Indians, 2,013 blacks, 128 Asian Americans and 272 Spanish Americans.

The University had a 1974 fall enrollment of 49,789 on the four campuses, including students at the St. Louis Graduate Engineering Center operated by the Rolla campus.

By campus, the following totals of minority students were reported, with the comparative 1972 fall totals in parenthesis:

**Columbia:** American Indians, 46 (49); blacks, 567 (522);

Asian Americans, 59 (52); Spanish Americans, 48 (86).

**Kansas City:** American Indians, 58 (29); blacks, 702 (636); Asian Americans, 64 (28); Spanish Americans, 110 (111).

**Rolla:** American Indians, 5 (8); blacks, 112 (82); Asian Americans, 23 (25); Spanish Americans, 17 (20).

**St. Louis:** American Indians, 30 (45); blacks, 986 (777); Asian Americans, 33 (23); Spanish Americans, 35 (56).

Data on minority students was gathered and compiled by campus admissions offices from cards filled in voluntarily by students at registration. The resulting reports were submitted to HEW in Washington and the Coordinating Board for Higher Education in Jefferson City. The University is required to submit data on minority student enrollment to HEW every two years.

## Early degrees

Twelve students at UMKC's School of Dentistry were graduated last month, six months ahead of schedule, under the school's accelerated dental-education program.

Their graduation brings to 99 the number of students who have successfully completed the special program.

In January 1971 UMKC's dental school became the first in the country to depart from the traditional four-year course of study. Since then numerous other schools have followed its example.

## UMA finds a home

The University of Mid-America eventually will be headquartered at Beatrice, Neb., at the former Pershing College.

After Pershing closed as a result of financial problems, the campus was taken over by the University of Nebraska, one of the five universities constituting UMA.

come *The Bible* (98), Homer's *Iliad* (96), Dickens's *David Copperfield* (95), Bulfinch's *Mythology* (93), Swift's *Gulliver's Travels* (90), Homer's *Odyssey* (88), Twain's *Tom Sawyer* (88), Defoe's *Robinson Crusoe* (86), Carroll's *Alice in Wonderland* (81), Stevenson's *Treasure*

# When weather forbids

A memo from President Ratchford outlining the University's policy regarding closings forced by severe weather has been sent to business and personnel offices on all campuses.

According to the memo, closings are to be considered under only "the most severe weather conditions." The decision to close a campus is to be made by the chancellor, following consultation with the president. Announcement of a closing should be made by the chancellor or by the OPI.

Employees providing essential services, the memo says, should be informed of the importance of reporting to work whenever possible.

The memo continues:

"When closing becomes necessary... employees normally scheduled to work will be compensated as if they had worked. Employees on University leave, including vacation and sick leave, or a regularly scheduled day off, will not be compensated additionally for an inclement-weather day. Employees required to work to maintain essential or specified service will be granted compensatory time off at a mutually convenient time. Such compensatory time should be used within the fiscal year in which it occurred. In the event that severe weather conditions develop or threaten during a normal work day, the chancellor may announce an immediate or phased closing of the campus."

# Library group to be set up

An All-University Committee on Library Resources will be named soon to examine information and reports which the University's library directors have been gathering during the past several months.

A representative of each campus faculty senate, the chairman of each campus library committee and the provost or dean of faculties from each campus will join the library directors to "become directly involved in the study and the decision-making process," according to Ardath Emmons, vice-president for research.

"The excellent work of the library directors should be recognized," Emmons said. "Their work, with staff support, on University library needs has progressed to a point where other representatives of campus administration and faculty should become involved."

Emmons will continue to meet with faculty groups on the campuses to review findings and various proposals on library needs. A meeting was held Dec. 4 at UMC. Others are planned for UMSL on Feb. 7, UMR on Feb. 11 and UMKC. The last is not yet scheduled.

# Staff workshop

Members of personnel staffs from all campuses recently attended a UMKC workshop intended to prepare each campus for compliance with Equal Employment Opportunity legislation and to develop a model for interviewing that would be consistent with affirmative-action plans.

Participants in the first session of the two-day workshop explored counter-productive attitudes and beliefs as they relate to the employment process. The activity was based on a role-processing technique

**Participants at UMKC's personnel workshop wasted no time between sessions.**



*Island* (79), Steinbeck's *Grapes of Wrath* (77) and Thoreau's *Walden* (76).

## Twain tops reading list

The Wisconsin Council of Teachers of English has published a report based on a survey in which English professors were asked what books they would like their students to have read before coming to college. Topping the list, with 109 votes, is Twain's *Huckleberry Finn*. Then

# Spectrum

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UNIVERSITY OF MISSOURI

# Personnel study

A study of administrative/professional positions throughout the University is under way, according to William D. Poore, director of personnel services.

Poore said the study is aimed toward the development of a compensation program for such positions. It will also be of assistance, he said, in establishing internal equity for different types of work, identifying career ladders and re-evaluating employment standards. Perhaps most important, Poore said, is the contribution the study is expected to make toward attainment of the goal of equal pay for equal work.

"Among the primary reasons for engaging in a study of this type at this time," Poore said, "is our continuing effort to comply with the equal-pay provisions of the Fair Labor Standards Act and our commitment to affirmative action. In a large system like the University of Missouri, with great numbers of position titles, the task of insuring system-wide equity becomes increasingly complex. Even titles such as director, coordinator and manager entail wide ranges of duties and responsibilities."

President Ratchford has appointed 11 persons to serve on an Advisory Committee to provide guidance and direction to the study. They are:

Columbia: Barbara L. McDonald, senior administrative assistant, sociology/rural sociology; James R. Oglesby, coordinator, space and facilities; Jack Horn, associate director, hospital.

Kansas City: Linda H. Talbott, manager, Alumni and Developmental Publications; Richard E. Hoover, associate dean of students.

Rolla: Arthur S. Burton, director, student personnel; John F. Dietzman, assistant purchasing agent.

St. Louis: Edwin F. Bailey, Jr., assistant director, Student Financial Aid; John P. Perry, business officer.

U-wide: Robert H. McFarland, acting vice-president for academic affairs; James H. Ollar, director, fiscal affairs, Cooperative Extension Service.

Poore said eight to 10 other committees would be set up to deal with specific areas designated for study and evaluation, such as student services, computer services and fiscal operations.

Plans call for open meetings on each campus. Schedules will be announced presently.

developed by Dr. William Jessee, UMKC School of Education.

The second and third sessions were devoted to discussion and interpretation of EEO legislation and its application to the University's employment procedures, while the final session dealt specifically with the University employment process and procedures for developing and implementing affirmative-action plans.

The workshop was part of a U-wide program to assist personnel staff members in implementing the University's Affirmative Action Plan. Information may be obtained from campus personnel offices.

## UMC Equine Center grows in prestige and top-notch facilities

Missouri is experiencing a population explosion—in horses. At last count, Missourians owned over 250,000 horses, and one predictor says that number may nearly double by 1980.

The rise in popularity of the pleasure horse has created an increasing need for specialized equine medical care such as that now being provided by UMC's Equine Center at the Middlebush Farm south of Columbia.

On the sprawling 288-acre farm—once the home of University president Frederick A. Middlebush—the Equine Center is growing in prestige and in physical facilities.

Started in the fall of 1973, the Center is designed to serve four basic functions—treatment of disease, specialized training for students, research involving equine ailments, and continuing education for practicing veterinarians.

The Center began with just two buildings including a farm home which was remodelled to serve as an office and laboratory. The other original building contains a surgical area, stalls and a conference room.

Recent additions are a blacksmith shop, a 10-stall barn to house clinic cases, and a research building which contains a surgery/recovery area and equipment to monitor heart-lung functions of equine research subjects.

Equipment in the latter building will soon include radio-activated monitors which will record the vital signs of horses while they roam the fields of Middlebush Farm.

Costs of buildings and equipment are being met by contributions of individuals, foundations and associations.

Research is focused on unlocking the mysteries of laminitis, an insidiouscrippler of horses. Investigators at the Center have found that hypertension (high blood pressure) is a characteristic of laminitis. They are now attempting to determine what part hypertension plays in laminitis. They are also hoping to characterize the disease from a comparative medicine standpoint as a model for further study of human hypertension.

The laminitis research is being funded by grants from the American Quarterhorse Association, the Morris Animal Foundation and Hoescht Inc., a pharmaceutical firm.



Staff members and students work together in preparing a mare for surgery to remove a tumor near the eye. Lower left picture shows shaving of the eye area prior to removal of the growth.

### Middlebush's wish—"to further academic excellence"—becomes reality

Principal investigator is Dr. Harold Garner, a Ph.D. graduate of Baylor College of Medicine where he worked with the circulatory assist research team under heart surgeon Michael DeBakey.

A related research effort is involved in studying epistaxis (nosebleed)—particularly in race horses. This work is funded by the Grayson Foundation.

Principal investigator Dr. Jerry Johnson has found that the incidence of hypertension is higher than average among the "bleeders" he is examining.

Director of the Equine Center is Dr. James Coffman, a widely published authority in equine medicine and charter diplomate of the American College of Veterinary Internists.

After a year's experience as head of the Center, Coffman can see "considerable benefit" from the effort to interrelate the clinical operation with the teaching and research effort. As an example, Coffman cites "the marked increase in the survival rate of small bowel surgery patients at the Center."

The teaching program under Dr. Louis Tritschler continually benefits from a wide-ranging clinical operation, according to Coffman. Some 1,700 horses were treated at the Center's clinic last year.

When Dr. Middlebush gave his farm to the University in 1964, he stated a wish that it be used "to further academic excellence." That wish has come true at a facility which may well become the finest Center of its kind in the Midwest.



# School of education advances new concepts in urban education

# Kansas City

"We feel it is necessary to prepare our students to teach in rural, suburban, urban and inner-city settings," said Dr. J. Joseph Doerr, Dean of Education. "Thus our students are exposed to value systems other than their own so as to enhance their capability of teaching well in any cultural setting."

The school's undergraduate pre service teacher preparation program has, therefore, become more clinical through the past decade. The program, includes a junior seminar field oriented experience in addition to the traditional student teaching experience. The course has been designed not only to enable the student to learn and apply teaching concepts by serving as a tutor to area pupils, but also enables the UMKC student to gain exposure to pupils of various ethnic and socio-economic backgrounds.

Both aspiring teachers and present education professionals in the area can take advantage of special service programs, including a master's degree in counseling and guidance, reading education, elementary and secondary teaching, school administration and education research. In addition doctoral programs are offered in school administration, higher education administration, guidance and counseling, curriculum supervision, and reading education.

In response to a growing national trend to provide special education services for exceptional children, the School is expanding its curriculum to educate teachers to meet these needs.

"We are in the process of developing a master's program for teachers of the learning disabled or emotionally disturbed youth," Dean Doerr said. "We anticipate awarding our first degrees in special education at commencement this May under special degree granting authority attached to the Truman Campus. By that time, also, we anticipate a full range of special education courses and degree programs operational under Volker Campus auspices.

Dean Doerr said that ever since the School of Education recently accepted responsibility of programming for continuing education for professional educators, both the number of courses, programs and enrollees have increased.

"The importance of continuing education is in allowing us to assist area education personnel by offering relevant courses and assistance on short notice," Dean Doerr said. "In this way we can present courses to health professionals, persons in business, industry and education and to any others who want to learn to teach better."

The Education Building itself, which was completed in 1971, provides several facilities which aid students in developing various teaching skills. There is a complete video tape communication system, which is used to instruct students by showing examples of a concept in action. It also enables instructors to develop broadcast quality tape to demonstrate new concepts. An observation classroom, which doubles as a television studio, allows UMKC students to observe a class and its teacher from an area school in an actual teaching situation.

Several classrooms are equipped with a student responder system which permits the professor to determine whether the class is comprehending the concepts under discussion. An instructional materials center contains a collection of materials which can be used by students or area educators to gain ideas on teaching grades K-12.

Recently, enrollment in the School has risen to 1,750 reflecting an increase of nearly 25 percent. Dean Doerr said the growth is indicative of the recent addition of programs on the H.S. Truman campus and growth in Volker campus graduate programs.

Dean Doerr said he feels that preparatory education for youngsters of the future will be better geared to their individual needs and abilities than in the past. Educators are recently focusing attention on the application of developments in educational technology teaching techniques and pedagogical knowledge which will bring changes in present day patterns of schooling.

Dean Doerr said the School of Education plans to continue to be a mini force in the preparation of professional educators as these changes take place.



**Dr. J. Joseph Doerr, dean of UMKC's School of Education, at work in his office in the four-year-old School of Education Building, home base for a variety of programs designed to prepare young people and professional educators to teach in rural, urban, suburban and inner-city settings.**

## Booster Club trip planned

Circle the evening of Feb. 11 on your calendar.

That's the day UMKC's Basketball Booster Club is sponsoring a bus trip to the away game between the Fighting Kangaroos and William Jewell College. The price—only \$3.50—includes the bus ride and the game ticket.

Watch The Reporter for details, or call Ext. 2713.

## Center hosts holiday dinner

Contrary to common belief, Friday the 13th can be a very lucky day. At least that was the case for the employees—full-time, part-time and student—of the University Center and Housing. On that day last month, they were the guests at a dinner in Pierson Hall which was planned, prepared and cooked by the management staff.

Barry Phillips, director of the Center and Housing, said it was the first time the event has been held, and he explained its purpose.

"The management staff wanted to find a way to show our gratitude to everyone for the extra efforts and sacrifices they make during the year," he said. "Too often these things are overlooked. We felt the holiday season would be an appropriate time, and decided to prepare a buffet meal, using some of our own recipes, and invite everyone—including the wives, husbands or dates."

The event was a success with more than 100 people attending. "I think everyone enjoyed it," Phillips said. "I know we all had a great time preparing and serving the meal. Some of us even got tips!"

The menu included shrimp au gratin, pepper steak, roast beef, turkey, chicken, several vegetables, cranberries, and apple crisp for dessert. The response was so enthusiastic, Phillips said he would like to see the dinner become an annual affair.

## Administration to hold forum

The School of Administration is sponsoring a Health Services Administration Research Forum Tuesday 3-5 p.m. in 11 Epworth House. The topic, "Quantitative Methods of Effective Hospital Management," will focus on military and industrial techniques applicable to effective employment of hospital resources. The January speaker will be Dr. Richard Newman, Administration production and operations research professor and a consultant to the U.S. Army Aviation Systems Command and U.S. Army Armaments Command. The forum is open to all those interested in research efforts being conducted in order to understand and improve the administration of health care delivery systems. For additional information, call John Baker, Administration assistant professor and Area Health Education Center coordinator, at Ext. 1512.



**Stan Dalen, assistant business officer, serves coffee to dinner guests during the Center's Holiday Buffet.**