

# IMPACT

Kansas State University College of Engineering

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## Kansas "Engineer of the Year" Retires

William "Bill" Johnson, who retired September 4 from his post as director of the Engineering Experiment Station, is leaving K-State after a career filled with professional achievements and honors. His most recent recognition came from the Kansas Engineering Society who named him 1987 Engineer of the Year. The annual award was presented by the 1,000-member society to recognize Johnson's "substantial career contributions to the profession, to the community and to mankind." A KES member for 27 years, Johnson has held a variety of offices and served on many committees on both the state and local level. He was state resident in 1985-86.

Last year he was president of the American Society of Agricultural Engineers, an international society of 11,000 members. As president he emphasized that agricultural engineering must expand to include the processing and utilization of old or new products from agriculture. During his tenure as president new educational curriculums were developed.

Other accomplishments during his career include nearly 100 professional publications, a patent, several overseas assignments, consulting activities, and associated assignments in the area of institutional and public service. He is a recognized authority on soil-plant-machine dynamics and harvesting.

Johnson earned his bachelor's and master's degrees from Ohio State University and his Ph.D. at Michigan State University, all in agricultural engineering. He was associate chair of the agricultural engineering department at Ohio State and visiting scientist and lecturer at Texas A&M University before coming to KSU in 1970 to head the department of agricultural engineering. He became director of the Engineering Experiment Station in 1981. In that post he has been responsible for coordinating research activities of faculty in the College and for administering research funds from government and private sources. Until a new director is selected, Gale Simons, professor of nuclear engineering, will handle grant contracts and Dean Don Rathbone will take over other duties of the director.

## Construction Science Does It Again

Once again, the K-State student chapter of the Associated General Contractors of America has been voted tops among 108 student chapters in the country. This is the fifth time KSU's chapter has been named best in the nation. That record is more than any other chapter in the country. Selection is based on campus, community and chapter activities. Faculty advisor is Merrill Blackman. Members are students in the construction science curriculum.

The goal of the national organization is to promote a skill, responsibility, and integrity within the construction industry. Student chapters promote professionalism and student involvement through various activities. The K-State chapter had an average mem-

bership of 122 during the past academic year.

Major projects last year included work with University for Man on a home repair program to help homeowners who can't make repairs themselves; a clean-up project at Pillsbury Crossing; and Open House. Members also built a latrine at Tuttle Creek for the K-State rowing crew. Thirty-eight members contributed 57 hours to the campus blood drive. During 1986 the chapter members built a redwood ramp to make the Manhattan Emergency Shelter accessible to handicapped persons. In 1987 they re-stained it. They also participated in construction work for the new O.W. Kershaw Plaza by Durland Hall.

## New Department Heads Appointed

**Mechanical Engineering.** Allen C. Cogley is the new head of mechanical engineering. Cogley comes to K-State from the University of Alabama, Huntsville, where he was a professor of mechanical engineering. He earned a B.S. from Iowa State University, an M.S. from the University of Virginia and a Ph.D. from Stanford University, all in aeronautical engineering. His research interests are in radiation transfer, fluid mechanics and atmospheric sciences. In addition to his extensive teaching and research experience, he has been a department chair at Alabama and has worked as a research engineer at government laboratories. Paul Miller will return to teaching and research after 10 years as head of mechanical engineering.

**Industrial Engineering.** Doris Grosh, professor of industrial engineering, will be acting department head for a year while Frank Tillman is on leave in industry.

## Engineering Donors Number One in Dollars

A total of 4,500 engineering alumni contributed more than \$1 million to the college this year. "We're number one in dollars and I hope next year we also can be number one in the percentage of alumni who contribute," said Dean Donald E. Rathbone. Leading the percentage list of alumni donors were veterinary medicine alumni with 30.7 percent, followed by business administration with 27.3. Engineering was third with 27.1.

## Scholarship Awards at K-State

This is the final article in a series of three on establishing a scholarship at K-State.

By Donald E. Rathbone, Dean

The first two articles on the scholarship programs in engineering at Kansas State University discussed the kinds of scholarships we have and how one establishes a scholarship program. In this article, I would like to discuss the scholarship awards we typically make each year and why they are so important to the College.

Considering the last item first:

- The College of Engineering at K-State is competing for the top students in the state and the nation.
- Our average student is in the upper 10 percent of his/her high school class.
- More than half of the National Merit Scholars at KSU are in the College of Engineering. We are anticipating that 16 to 18 of

these top scholars will be in our freshman class this fall.

• The College also attracts top student leaders and the students who were "involved" in high school in many areas. In my opinion, our student body is second-to-none.

The question that obviously follows is, "Why are we so successful in attracting these outstanding students?" Part of the answer is "Scholarships!"

Scholarships are an absolute necessity if we are to attract an excellent student or a student leader. We are in a very competitive environment since engineering is attracting the top students who have almost unlimited choices of colleges.

Our College scholarship awards vary from \$250 to full tuition (fees) and books. Tuition and books total roughly \$1,650 per year. The estimated total annual cost for a student to attend K-State is now over \$5,000 (without a car and other extras). Thus, the tuition-and-

books scholarship pays for approximately 30 percent of a student's normal expenses. With the addition of loan programs, work-study, etc., we feel that this scholarship makes it possible for almost any student to attend the College of Engineering. It can, however, still be a big challenge for those who don't receive any appreciable support from home.

Finally, a word about you! The College has had great support from its alumni for our scholarship programs. Approximately 30 percent of our engineering alumni contribute to the University. This is one of the highest percentages among the public universities in the nation (first in the Big 8). Most of you designate the College of Engineering in your giving. This is *most* appreciated.

As I've said above, the College of Engineering is *the* College at the University that has the greatest challenge in attracting students since we are competing for the best scholars and leaders. To paraphrase the United Way slogan, "Thanks to you, we've been successful."

## Engineering Grads Win NSF Fellowships

Two Kansas State University engineering graduates are going back to school this fall with prestigious fellowships from the National Science Foundation which provide \$12,250 stipends plus full tuition at the graduate schools of their choice. An additional \$6,000 goes to their graduate schools to support their research. The winners are Vance Unruh and Michael Ekart.

Unruh, 22, a 1987 graduate in mechanical engineering from Kansas City, plans on using his NSF Fellowship to pursue a master's degree in mechanical engineering at K-State, and then plans to earn a doctorate at Purdue University. As a K-State undergraduate, he was elected to several honor societies including Phi Kappa Phi, Golden Key, and Pi Tau Sigma, mechanical engineering honorary.

A Putnam Scholar, he also received a KSU Foundation scholarship, and as a freshman, received a National Merit Scholarship. He was selected for the National Society of Professional Engineer's Outstanding Undergraduate Award. Unruh also was active in volleyball and basketball intramurals and was elected secretary of his residence hall, Marlatt Hall. A 1983 graduate of Turner High School, he is the son of Molly and Victor Unruh of Kansas City.

Ekart, 25, is a 1986 cum laude graduate of K-State's chemical engineering program. Currently a graduate student working on his master's degree at the University of Illinois, Urbana-Champaign, he plans to pursue his

chemical engineering studies to the doctorate level. While at K-State, Ekart was selected for Tau Beta Pi engineering honorary, was a National Merit Scholar, a Seaton Scholar, a state of Kansas scholar, and won an award for outstanding chemical engineering student. He is a 1980 graduate of Manhattan High School.

Only 500 of these NSF fellowships are given in the U.S. each year from a typical application pool of 4,000. One third of the fellowships go to applicants in the basic sciences, one third to those in applied sciences including engineering, and one third to those in social sciences and humanities. Besides the excellent financial support, the award carries a great deal of prestige. NSF fellows are generally eligible for continued support for their research in subsequent years of graduate work.

## Avery Wins Steel Ring Scholarship

Robert Avery, senior in electrical engineering from Manhattan, was the 1987 recipient of the Steel Ring leadership scholarship. The \$1,000 scholarship is awarded to students exhibiting leadership qualities in academic and extra-curricular activities within the College of Engineering and the university. He also is the recipient of a \$1,000 M.A. Durland scholarship.

## Jarrett Wins Fulbright Scholarship

Gregory J. Jarrett has been awarded a Fulbright Scholarship for a year of study in Germany. Jarrett is the 14th K-Stater in the past dozen years to win a Fulbright award. He will study in Germany under the Fulbright program this year.

A K-State graduate with a B.S. in electrical engineering, Jarrett has taken graduate classes in electrical engineering. He is a 1978 graduate of Labette County High School, Altamont. A 1984-85 recipient of the Giessen-K-State Exchange Scholarship, he spent a year studying in Giessen, West Germany. At KSU he has been active in German Club, Students in Solidarity with Central America, and the Manhattan Alliance for Central America.

The Fulbright provides round-trip transportation, tuition, and a monthly stipend for one academic year in one of 55 countries.

## Distinguished Service Awards Presented

Distinguished Service Awards were presented to three engineering grads at undergraduate commencement ceremonies May 16. Receiving DSAs were Don E. Curtright, Leawood, chairman of the board, chief executive officer and treasurer of Greb X-Ray Co.; A.R. (Jack) Way, president of Concrete Industries Inc., Lincoln, Neb.; and Ernest O. Nelson, Mission Woods, former senior vice president for operations, Panhandle Eastern Pipe Line Co. and Trunkline Gas Co.

Curtright, a native of Lyons, earned a bachelor of science in electrical engineering from KSU in 1950. He joined Greb X-Ray as a sales engineer and branch manager in Wichita upon graduation and later transfer-

red to the home office in Kansas City as general manager over a four-state region. Curtright served 30 years on many development and engineering committees for Picker X-Ray Corp., one of the largest manufacturers of diagnostic X-ray apparatus in the world. He became Greb president and CEO in 1978 and chairman this year.

Way was born in South Dakota and moved with his family to Wichita in 1942. He earned a K-State bachelor of science degree in architectural engineering in 1954. Upon graduation Way worked as a structural design engineer for an architectural firm in Lincoln, Neb. This was followed by various manage-

ment positions with concrete companies. He became president of Concrete Industries Inc., a subsidiary of NEBCO Inc., in 1973. The company produces, sells and delivers construction products relating to concrete.

A native of Scandia, Nelson graduated from KSU in 1947 with a bachelor of science in civil engineering. He joined the Panhandle Eastern engineering department and advanced within the organization to vice president in 1968 and senior vice president in 1982. He retired in 1985. Nelson has been an officer in many industry associations and is a recipient of the American Gas Association Distinguished Service Award.



Curtright



Way



Nelson

## Engineering Advisory Council Adds Three

Three engineering professionals have joined the KSU College of Engineering Advisory Council. David C. Ayers, president, Quintron Corporation, Quincy, Ill., Gary Edwards, vice president, refining, marketing and transportation, North America, Conoco, Inc., Houston, and Robert G. Tointon, president, Phelps, Inc., Greeley, Colo., are the newest members of the 20-member council, which meets several times each year.

## Donnert Completes ANS Presidency

Herman Donnert, professor of nuclear engineering, has just completed a two-year term as president of Alpha Nu Sigma, national honor society for nuclear engineering. During his tenure the group completed a major revision of the constitution, added four new chapters to the national organization, and passed on honorary memberships for nationally- and internationally-known professionals in the field.

KSU established the founding chapter in 1978. When the group went national in 1979 Donnert was a member of the committee which established a national membership. There are now about 1,100 members in 25 chapters nationwide.

## Student Magazine Wins Three Awards

The *Kansas State Engineer* student magazine won three awards in recent national competition of the Engineering College Magazines Associated at its annual meeting at the University of Minnesota, Minneapolis. K-Staters won merit awards in three categories: best editorial, all issues; best non-technical article; and most entertaining feature.

Judging period covered the calendar year 1986. Athena Wong, Manhattan, was editor during the spring semester. Fall semester editor was Dennis Shields, Lindsborg.

# Major Donors Aid College

A memorial to the late O. W. (Willard) Kershaw, founder of Kershaw Ready-Mix Concrete and Sand Co. in Manhattan, was dedicated May 15. The College of Engineering honored Kershaw with dedication of a plaza at the southeast corner of Durland Hall. Kershaw was a graduate of Kansas State University.

The plaza is the new resting place of the Sigma Tau pyramid. One of the university's early landmarks, the pyramid was moved last summer to Durland Hall from near Seaton Hall. The Kershaw company assisted financially in improving the area now occupied by the pyramid. Seating has been installed and a sidewalk and lighting added to the current stairway area across from Ahearn Fieldhouse.

The KSU student chapter of the National Society of Architectural Engineers was responsible for the general design of the plaza area. Construction science students, members of Associated General Contractors of America, designed a base for the pyramid and did the construction work on the project.



Dean Rathbone displays a plaque in Kershaw's honor which has been placed in the plaza.

## Outstanding Teaching Award to Johnson

Gary L. Johnson received the Hollis Teaching Award at commencement ceremonies this spring. A member of the faculty of the Department of Electrical and Computer Engineering since 1966, Johnson primarily teaches undergraduate courses in energy conversion, electromagnetic theory and electronics. His research area is wind power and he regularly teaches a popular course on this subject.

He received both his B.S. and M.S. degrees in electrical engineering from KSU in 1961

and 1963, and earned a Ph.D. from Oklahoma State University in 1966. As a licensed professional engineer he has served as a consultant on electric power problems. He received the Eta Kappa Nu Distinguished Faculty Award in 1984, the Halliburton Faculty Development Award in 1984 and 1985 and the Electric Power Professor Chair, sponsored by the Kansas Electric Utilities Research Program, in 1986. His textbook, *Wind Energy Systems*, was published by Prentice-Hall in 1985.

## Rathbone To Chair Engineering Society

Dean Donald E. Rathbone was elected July 14 chair-elect and chair of sustaining programs for Professional Engineers in Education, a practice division of the National Association of Professional Engineers. As chair-elect, Rathbone will serve on the group's board of governors and its executive board. Before taking office next year he will prepare comprehensive plans and goals for activities, committees and projects to be undertaken during his term as chair.

Professional Engineers in Education tracks state-level legislative initiatives on behalf of engineering education; provides guidance to individual states on ways to organize their own initiatives on behalf of engineering education; conducts statewide studies; develops workshops to explore areas of concern among engineering educators; prepares publications to address problems in engineering education; and supports programs of benefit to the entire engineering education community.

## Hoppe Named Outstanding Advisor

Frederick J. Hoppe, an associate professor of engineering technology, was named outstanding advisor in the college. A KSU faculty member since 1984, Hoppe teaches machine design and a mechanical design lab. He received a bachelor's degree from the Washington and a master's from the University of Missouri. From 1950 to 1964 he worked with the Military Tracklaying Vehicles Defense Systems Division of Paccar in Renton, Wash. He was named director of engineering for Off-Hiway Mining Vehicles, Dart Truck Co., division of Paccar, in Kansas City, Mo., in 1964, a position he held until joining KSU 20 years later.

# Scenes from Open House



Dessert anyone? It was all in the spirit of Open House fun as Ray Hightower, assistant to the dean, takes a pie on the chin.



Rebecca Bromish presided as master of ceremonies for the Engineering Open House parade.



An Open House guest watches his entry in the mousetrap launcher competition.



Two generations of Open House royalty met at Open House when the 1933 St. Pat and St. Patricia, Kenneth U. Benjamin (EE '33) and his wife, the former Ethel B. Fairbanks, met 1987's royalty, Martha "Marty" Smith (ME '87) and Dennis Shields (AgE '87).



## St. Pat & St. Patricia Rule Over Open House

Martha D. Smith, a mechanical engineering major from Overland Park, was named St. Patricia and Dennis A. Shields, an agricultural engineering major from Lindsborg, was named St. Pat at KSU Open House festivities in March. Later in the year, both were among 48 engineering students designated as "knights" of St. Patrick for their academic excellence, leadership skills, and participation in professional societies and other engineering and campus organizations. Students were nominated by department heads and faculty advisors.

Others nominated as Open House royalty were Bruce Letellier, nuclear engineering major from Junction City; Danny Odle, chemical engineering major from Prairie View; Darcie Bailey, chemical engineering major from Neosho Rapids; and Stephanie Berland, architectural engineering major from Manhattan.

### Open House awards:

- Yellow Brick—Construction Science
- Best Department—Architectural Engineering
- Best Open Class Display—Architectural Engineering
- Best Limited Class Display—Engineering Technology

## News from Engineering Alumni

**R. L. Chandler (CE '49)**, Overland Park, retired in January from Water District No. 1 of Johnson County after 32 years with the utility, 28 as general manager. He's now operating Chandler Consulting Services.

**Don Chesnut (EE '50)**, is the new president and chief executive officer of Boeing-Vertol Company, Philadelphia. He was promoted from executive vice-president. Chesnut also is a member of the College's Engineering Advisory Council.

**Gary Edwards (CE '63)**, is chairman of Conoco Ltd. in England. He was reassigned to London in late August. Edwards also is a member of the College's Engineering Advisory Council.

**Jerry Wilbeck (EE '66)**, is program manager, Tactical Systems, for the Greenville division of E-Systems, Inc. He's also a member of the College's Engineering Advisory Council.

**Todd Vest (ME '84)**, Troy, N.Y., has completed his master's degree in mechanical engineering and now is in the doctorate program at Rensselaer Polytechnic Institute. He says graduate school was recommended to him by one of his K-State professors and has turned out to be a great experience.

### Deaths

**Jesse D. Garinger (ME '40)**, Garden Grove, Calif., died April 3. Before his retirement in 1977 he had been a quality control engineer.

**Floyd L. Tempero (CE '43)**, Ardmore, Okla., died June 18. He had worked as a civil engineer and production foreman for Shell Oil Co. for 43 years. At K-State he was a member of Acacia Fraternity and K-Club.

**Irwin A. Benjamin (CE '49)**, Rockville, Md., died March 2.

### Alumni Fellow

**Donald G. Prigmore (CE '55)** has been named an alumni fellow of the college. Prigmore is a management consultant in the San Francisco bay area specializing in corporate strategy, marketing and organization development. His background includes nearly 30 years of experience with various GTE Corp. subsidiaries, culminating as president of GTE Sprint, a billion dollar long-distance communications company.

Prior to his two-year tenure at Sprint (1984-1986), Prigmore was president of Consolidated General Telephone Companies of the southeast United States and in Kentucky for three years, and president of General Telephone Company of Michigan for two years.

During his career Prigmore has been active in civic, philanthropic, business, and professional organizations. He has served on the boards of several banks in Michigan and North Carolina, and has been a member of state and local chamber of commerce boards, public and private school boards, and the boards of a variety of charitable organizations and foundations.

In addition to his B.S. from KSU, Prigmore holds a master's degree in business administration from the University of Michigan.



Prigmore

"Don Prigmore has had a very distinguished career as an engineer and as an administrator," said Dean Donald E. Rathbone. "He was very involved in student activities at K-State and has continued to be involved in civic and professional affairs throughout his adult life. Don represents the true professional, a leader in his field and an active participant in his community. The College is very proud to have Don as its 1987 Alumni Fellow."

Past alumni fellows are: 1983—Gilbert E. Johnson '55, president, G. E. Johnson Construction Co., Colorado Springs, Colo.; 1984—Gordon D. Goering '45, senior vice president, petroleum products group, Phillips Petroleum Co., Bartlesville, Okla.; 1985—Kenneth R. Collins '54, president, Aerojet Strategic Propulsion Co., Sacramento, Calif.; 1986—Joseph L. Downey '50, vice president, Dow Chemical Co., and chief executive officer, Dow Consumer Products Inc., Midland, Mich.

### News items

Ag engineering students have again taken first place in national design competition for the "Smooth Sprayer," a suspension system designed to reduce boom "bounce" in a field sprayer. K-State has won seven first prizes in ten years of Deutz-Allis Corp. and American Society of Agricultural Engineers-sponsored contest. Designers of the Smooth Sprayer were Allan G. Burk, McDonald, Craig L. Good, Dennis, and Gary W. Sweany, La Harpe.

Paul Johnson, graduate student in mechanical engineering, has received the first Amoco Foundation Inc. award offered at K-State. He received \$7,000 in recognition of his work on transmissions, which is similar to research Amoco is conducting.

# Research News

## Proving Tractor Tire Performance

Stanley Clark, professor and head of agricultural engineering, is working with Goodyear Tire and Rubber Co. on a study of the effect of speed and surface roughness on tire performance of off-road vehicles. He hopes to determine the degree of traction loss and how it can be reduced. Tractors can run at relatively high speeds. But the combination of rough field conditions and speeds over five miles per hour often cause the tires to slip excessively. Clark's study will add new information on off-road tire performance at tractor speeds greater than five miles per hour. He will test three types of tires—bias-ply, radials, and terra-tire—on two different soil types, sandy and clay.

Goodyear has provided more than \$30,000 in research equipment for the study. The company donated a truck outfitted with a laboratory for evaluating data on performance of various kinds of tires under different loading and soil conditions. The truck has a load cell and special hitch on the front for measuring pull produced by a test tractor. A 160-horsepower test tractor will be instrumented so that the wheel loading, drive axle torque, tractor speed, and wheel rotary speed can be measured.

The Kansas Department of Economic Development is providing \$20,000 in matching funds as part of its program to support research that would benefit the state.

"We need to keep on top of what is going on in tire design, because we are facing a lot of foreign competition," Clark said. "Off-road tires are important to Kansas, as they are used on farm tractors, earthmoving, and other construction equipment. Goodyear Tire Company has an off-road tire production plant at Topeka, which is important to that city and to the state."

Improving the data for tire design under high-speed conditions should result in improved tire performance for the user and better information for tire designers, he said. It also would help boost economic development in the state.

Assisting with the study is Dale Heise, graduate student in agricultural engineering from Scranton, Kan.

## Improving Radiation Safety

K-State nuclear engineer Gale Simons and his former graduate student Timothy DeBey, who now works for Sandia National Labs, have received a patent for a device which could improve health monitoring of persons working in a radiation environment. The two designed a thermoluminescent dosimeter, a tiny white crystal small enough to be incorporated into an identification badge for use in hospitals, nuclear power plants, chemical companies, universities—anywhere people must use radioactive materials.

## Studying Army Energy Use

The U.S. Army Corps of Engineers is getting some help from K-State researchers to determine how effective Corps building practices are.

A major project is being conducted at nearby Ft. Riley to test buildings designed by the Army for energy efficiency by comparing the energy consumption and efficiency of two older structures with two newer ones.

The project is being funded by Construction Engineering Research Labs. To date, more than \$100,000 has gone into the building monitoring program, says Byron Jones, director of the College of Engineering's Institute for Environmental Research.

The Corps of Engineers is responsible for constructing all buildings at Army bases, Jones said. "This adds up to millions upon millions of dollars," he says. "Because the amount is so significant, building practices are updated periodically to make sure everything is being done efficiently."

All information from the monitoring equipment is fed into a data logger which is linked to a computer by telephone. Data is recorded minute by minute, for accuracy, then averaged by hour and stored.

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## What's New With You?

We'd like to know -- and so would your former classmates. Please take a few minutes to jot down any job changes, professional or other activities, whether you've retired, or any reminiscences you'd like to share. Use the form below or write to: IMPACT Editor, College of Engineering, Durland Hall, Kansas State University, Manhattan, Ks. 66506.

Name \_\_\_\_\_

Class of \_\_\_\_\_

Major \_\_\_\_\_

Address \_\_\_\_\_

News for IMPACT \_\_\_\_\_

Return to: IMPACT Editor, College of Engineering, Durland Hall, Kansas State University, Manhattan, Ks. 66506.

# Major Donors Aid College

Following is a list of company givers to the College of Engineering during the 1986-87 fiscal year of amounts of more than \$1,000, including matching:

Aerojet Strategic Propulsion Company  
Alcoa Foundation  
Allied Chemical Foundation (Bendix)  
American Society of Civil Engineers  
American Telephone and Telegraph Company  
Amoco Foundation, Incorporated  
Anheuser-Busch, Incorporated  
Atlantic Richfield Foundation  
Black & Veatch Foundation  
Boeing Company  
Cargill, Incorporated  
Caterpillar Tractor Company  
Centel Corporation  
Conoco, Incorporated  
Council for Chemical Research, Incorporated  
Dow Chemical Company  
Dow Corning Company  
I.E. DuPont DeNemours and Company, Incorporated  
Engineers Foundation of Kansas  
Exxon Education Foundation  
FMC Foundation  
General Electric Foundation  
General Mills Foundation  
Goodyear Tire and Rubber Company  
GTE Corporation  
Halliburton Foundation, Incorporated  
Hewlett-Packard  
International Business Machines Corporation  
Jets, Incorporated

G.E. Johnson Construction Company  
Kansas City Power and Light Company  
Kansas Construction Education Foundation  
Kansas Electric Cooperatives, Incorporated  
Kansas Electric Utilities Research Program  
KPL Gas Service  
Martin Marietta Corporation  
Merrill Lynch and Company, Incorporated  
Mobay Chemical Corporation  
Mobil Foundation, Incorporated  
Motorola Foundation  
Motorola, Incorporated  
National Electrical Contractors Association, Incorporated  
National Action Council for Minorities in Engineering  
Natural Gas Pipeline Company of America  
Olin Corporation  
Panhandle Eastern Pipeline Company  
Phillips Petroleum Company  
Procter and Gamble Company  
Rockwell International Corp.  
Shell Companies Foundation, Incorporated  
Square D Foundation  
Terra Chemicals International, Incorporated  
Vinnel Foundation  
Vulcan Materials Company  
Westinghouse Educational Foundation  
Wilson and Company, Engineers and Architects

Following is a list of private foundation givers of more than \$1,000 to the College of Engineering for fiscal year 1986-87.

Estate of Trafford William Bigger  
Willard J. and Mary G. Breidenthal Foundation  
Henry L. Doherty Educational Foundation  
John W. Jenner Trust Number Two  
Herbert M. Low Trust  
Muchnic Foundation  
Friends of Guy M. Shelley, Jr., Memorial Scholarship

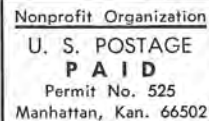
## Engineers Win National Contest

Three mechanical engineering students and their professor have won a \$1,000 prize in a nationwide engineering contest sponsored by a Memphis company. The winning students were Jeffery J. Ronning, Overland Park, Mark R. Corbin, Manhattan, and Brian Bramel, Niantic, Ill. Their sponsoring professor was Jon Held.

The team constructed a demonstration that showed "the superior lubricating qualities of Tri-Flow," a product of the company, Thompson and Formby, Inc. They also submitted a brief written explanation and a videotape.



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Acting Director, Engineering Experiment Station  
Dr. Gale Simons