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SCHOOL OF CHEMICAL ENGINEERING AND MATERIALS SCIENCE THE UNIVERSITY OF OKLAHOMA

CEMS Alumni Create a Winning Tradition for Their University

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Contents

CEMS Alumni Create a Winning Tradition for Their University

Tradition is key to the perennial powerhouses in football, basketball and other sports. CEMS, too, has a winning tradition, a tradition that would not be possible without the support and successes of its graduates.

This issue of *OkChE* is dedicated to CEMS alumni. Several of our graduates have been asked to describe their career, family and college years at OU.

Deciding which alumni to feature created a number of very difficult decisions, but space limitations precluded presenting biographies of all we would like to have included. Given our format restrictions, we chose to emphasize the diversity of our graduates, knowing that in some sense each of these alumni has shared similar experiences and in so doing will represent all of our alumni.

Ex-CEMS students have gone on to establish corporate careers, to start their own companies, to teach at universities (including a dental school!), or even to enter medical, business or law schools. Many have worked at home while others have gone abroad. Represented are recent graduates and those well established. We are proud of all of our alumni, and we salute you with this issue of *OkChE!*

DOUGLAS J. BOURNE

"I'm not an average OU ex-chemical engineering major but more of an extractive metallurgist," Douglas J. Bourne (BSChE '44) explained. "The translation of a mineral discovery into an operating mine—I found that whole process extremely rewarding, from the exploration and discovery through the development of a resource into products for people," he said.

As a working engineer, Doug patented unit process steps, reagents and apparatus involved in mining. His expertise in mining has led him over the 40 years of his career to his current position as chairman of the board of directors and chief executive officer of Battle Mountain Gold Company, a precious metals exploration and mining company that emerged from the Duval-Pennzoil group and operates the largest domestic gold mine in the mountains of Nevada.

"I came to OU in 1940, and World War II started very shortly after," the Tulsa native said. "Life became chaotic at best." Doug compressed the typically four-year chemical engineering curriculum into three years, taking more than 20 hours per semester while participating in a naval pre-entrance program and involving himself in the larger community through the Greek system. "I thoroughly enjoyed my experience at OU," he said.

After completing his degree, Doug went on to midshipman's school as an apprentice seaman and served as a naval officer at sea. Doug returned to civilian life with the idea of continuing onto graduate school, but the semester had already started so the newly married chemical engineer took a job at Duval Corporation's sulphur property in Orchard, Texas. The stimulus of a working career led him into a 40-year career rise through the Duval corporate ranks to its highest executive offices and to those of its parent corporation, Pennzoil.

Transferring from Texas to Carlsbad, New Mexico, Doug developed further expertise in mining through several assignments, becoming a process engineer in 1951. His versatility emerged as he served as chief metallurgist, refinery superintendent and director of research before promotion to Duval's vice president of research and planning in 1964. Doug became president of Duval Sales Corporation in 1968, executive vice president of Duval Sales Corporation in

Douglas J. Bourne

1968, executive vice president of Duval Corporation in 1972 and president in 1977.

In 1983, Doug was named chairman and chief executive officer, in addition to serving Pennzoil, Duval's parent corporation, as group vice president of mining and as a member of Pennzoil's board of directors and executive committee before assuming his current position. During his rise to the top, Doug found time to complete the Advanced Management Program at Harvard Business School.

Doug has served the profession as director and past chairman of the Sulphur Institute, as a director and past chairman of the Potash and Phosphate Institute and as director of the American Mining Congress.

Doug and his wife, Hilda Hess Bourne (OU class of '44), live in Houston and have two daughters, Laurie (an OU alumna) and Janalee, and have four granddaughters. In his spare time, Doug enjoys playing golf.

CARL CROWNOVER

"The basics that I learned at OU formed the basis for just about everything I've done since," said Carl Crownover, president and owner/manager of Jordan Laboratories, Inc. "It may come as a surprise, but what you learn in school is precisely what you use on the job. The biggest challenge after school is learning how to work with people," observed Carl (BSChE '61).

Besides his studies, Carl believes the most valuable and lasting influence of his stay at OU was the opportunity to associate and become friends with Cheddy Sliepcevich, Jack Powers, Mark Townsend and others."The excitement from working for a guy like that (Sliepcevich) is probably responsible for two factors that have influenced my career," he said. "The first is that I think I performed far above what I perceived my abilities to be. The second, however, was that the jobs that were to follow were sometimes disappointing in comparison. That most likely created the impetus that resulted in where I am today."

Carl spent the first six years of his career at Conoco in the production, handling and storage of LNG. After several years at Coastal States Refinery as a project engineer and then as operations supervisor, Carl assumed his present position at Jordan Laboratories, Inc. Under his leadership, the lab has grown tenfold to become one of the more versatile, privately owned laboratory operations in the Southwest. The lab services the oil, gas, chemical, refining and uranium-producing industries.

Carl's first and most memorable assignment in the profession was on a research project at Lake Charles, La. The pilot-scale LNG process for removing carbon dioxide bv the "freeze-out" process never worked very well, Carl said. An allied project that did work was a 1,000-barrel, frozen in-ground storage tank for LNG. This all took place on a mosquito-ridden island in the Calcasieu River southwest of Lake Charles. Cheddy Sliepcevich was research director for the project, and Carl was his field liaison reporting directly to him.

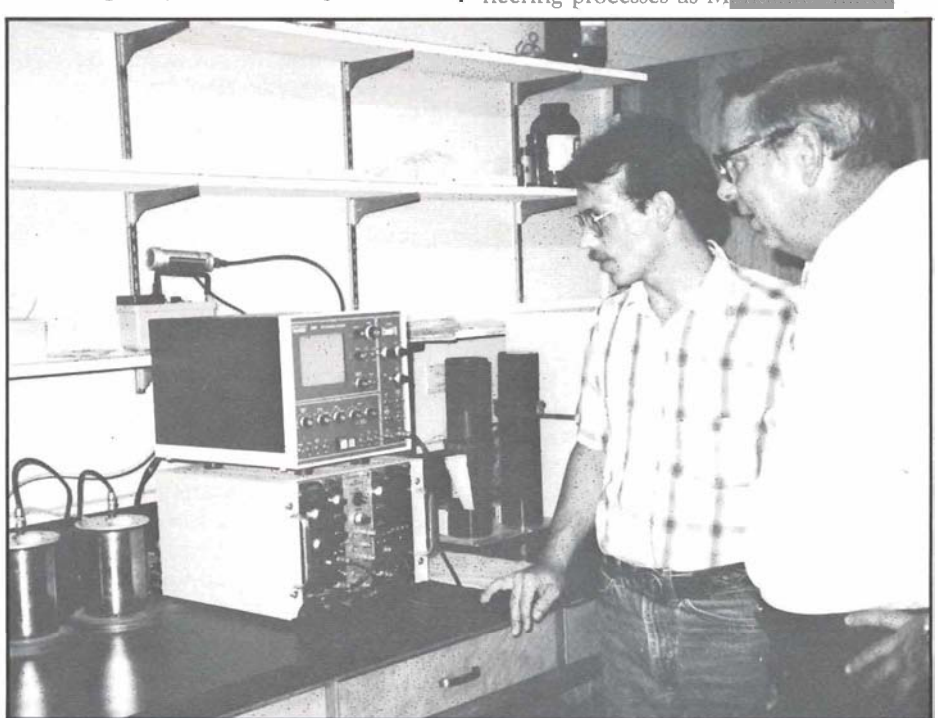
Recalling that project, Carl told the following story, remembering what it was like to be a farm boy from Oklahoma with the ink barely dry on his Ch.E. diploma.

Not many weeks into the job in Lake Charles, Cheddy called from a pay phone somewhere in Montana. His instructions were nothing more than: "Go to New York City and call me when you get there." There was to be an important meeting among American Gas Association members and industry representatives. Cheddy had car trouble and was stranded out west and needed Carl to substitute for him at the meeting.

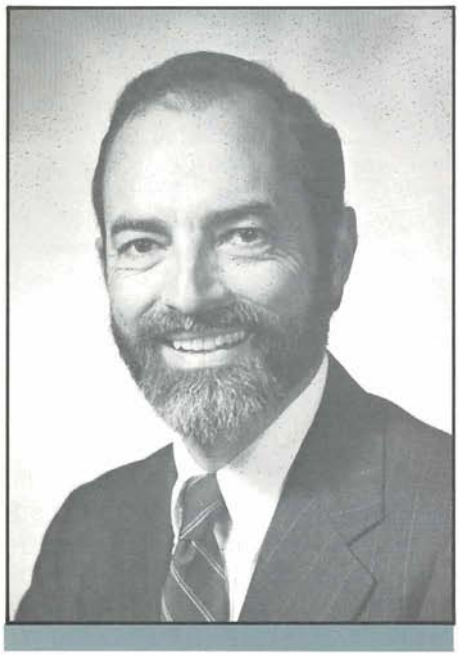
Today, as the president and owner of a successful company, Carl enjoys computers, flying and genealogy. His family consists of his wife, Rita, his daughter, Carla, and the staff of 14 at Jordan Laboratories.

JIM FULTON

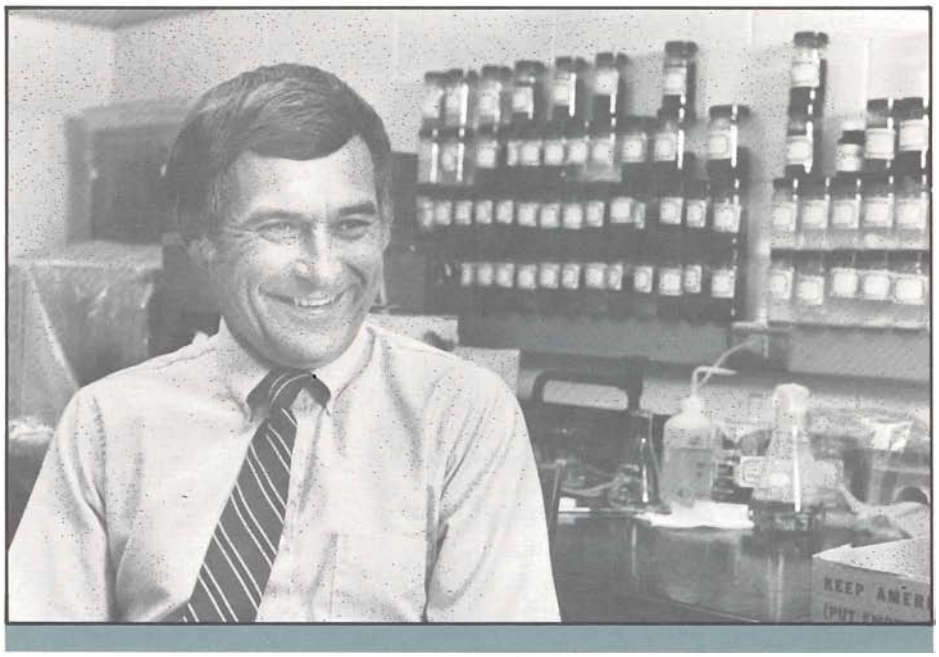
Twenty years on the job as a chemical engineer at Monsanto, Jim Fulton (MSChE '60, Ph.D. '64) has participated over the last four years in the integration of biochemical engineering into more traditional chemical engineering processes as Monsanto shifted



Carl Crownover (right) examines alpha energy spectrum with technician David Strauss.



Jim Fulton



Don Green

from petrochemicals to biochemicals. "The lesson I have learned," Jim said, "is that chemical engineers must be broad-based and willing to change."

After completing undergraduate work in biochemistry and earning his M.S. and Ph.D. in chemical engineering at OU, Jim moved up the road to Stillwater to accept an appointment on the faculty of Oklahoma State University. Three years later, Jim began his long association with Monsanto, first working in plant troubleshooting, expansion and process design at its Texas City facility. Today, 20 years later, he is working on biotechnology at Monsanto's St. Louis headquarters.

The two key studies benefitting his professional career the most, Jim said, are mathematical modeling and thermodynamics. These foundation subjects are applicable to all science and engineering in that they quantify what is happening, Jim explained.

Of those years at OU learning the basics to build that adaptable foundation, Jim particularly remembered one of his professors, John E. (Jack) Powers. "Powers was irrepressible, as one incident will illustrate," Jim said. "One afternoon Jack's back was in pain, but rather than lie in bed he strapped a heating pad to his back and plugged it into about 150 feet of extension cord. As he charged around the unit operations lab, laying down electric line in the aisles and around the equipment, he seemed like some wild computer/robot out of control. At the time, the scene was humorous, but it gave me insight into an indomitable spirit."

Jim has been recognized as an Engineering Fellow at Monsanto. He is a member of AIChE and a Registered Professional Engineer (Texas).

Jim, his wife, son and daughter were all born in Oklahoma. Jim grew up in Pawhuska, which he describes as "a short town in the tall grass of Osage County." In his spare time, the CEMS alumnus enjoys orienteering, a combination of cross-country running and navigation with a map and compass.

DON GREEN

"We continue to have bright people enter our profession, although enrollments are down in recent years," noted Don Green (Ph.D. '63) as an educator optimistic about the future of his profession. "There is some concern about the tendency of industry to move production facilities overseas, and I'm not sure of the long-range consequences of this action," he said. "One of our challenges as educators is to provide the right mix of teaching the fundamentals and the use of pre-packaged computer routines," he observed, commenting upon the increased use of computers in education and industry.

Don completed his work at CEMS in 1963 and, after working for Conoco as a research engineer, joined the faculty of the University of Kansas. He rose rapidly through the academic ranks to become full professor in 1971 and Conger-Gabel Distinguished Professor of Chemical and Petroleum Engineering in 1982. Don is well known for his research in enhanced oil recovery and as co-director of the KU Tertiary Oil Recovery Project.

Don remembered an incident from his OU days that demonstrates the resourcefulness of students. "One of my fellow doctoral students was Ken Bishop (MSChE '66), now a colleague at the University of Kansas," he said. "As a graduate student, Ken had a laboratory at the North Base. The area had been troubled by vandalism, so Ken wired up an alarm system for his building. When a person entered the building after hours, it was necessary to proceed immediately to a switchboard and turn off the alarm. Otherwise, after a few minutes, a loud siren on top of the building would go off," he explained.

"Bob Perry was acting chairman at the time, and he had not been made aware of the alarm system," Don said. "One evening he visited the lab, and sure enough, the system worked and the siren sounded. The police arrived and

apprehended Bob, much to his dismay. He tried to tell them who he was, but that wasn't good enough. They told him that they would have to call *Dr.* Bishop and verify Bob's identity with him before Bob could be released. Bob had a temper, and let me leave the story by simply stating that he was not exactly happy about the whole affair," Green related.

Some years later, after Bob Perry's death, Don was asked to assume the editorship for the Sixth Edition of Perry's *Chemical Engineer's Handbook.*

In 1983, Don received the Society of Petroleum Engineers Distinguished Achievement Award for Petroleum Faculty and this year was recognized as a fellow of AIChE. His accolades include KU's Gould Award for excellence in teaching, of which he is a three-time recipient. He admits that, as faculty representative to KU's athletic board, he does root for Kansas over OU.

In his spare time, Don likes to hike and play handball, and he enjoys baseball as a spectator. Don is Married to Patricia L. Green, and they have three sons, Guy, 22; Michael, 20; and Patrick, 19.

OMER PIPKIN

"Chemical engineering as a profession has the same appeal to me as it did almost 40 years ago," said Omer Pipkin, CEMS alumnus (BSChE '50). "Although there have been inevitable changes in emphasis over the years, it is a fine profession, full of 'meat' and fundamentals that are broadly useful."

Omer has used those fundamentals to build a successful career far from his birthplace in Blanco, Oklahoma. Son of a county school teacher, he had a home county rather than a hometown. He lived all over Pittsburg County in such places as Blanco, Tannehill, Blocker, Shady Valley, New State, Haileyville and Hartshorne.

Omer considered himself well prepared for the job market with his B.S.Ch.E. when he began his career with Cities Service Oil Company upon graduation in 1950. He held various engineering and operating positions at Cities Service, but said, "As time went on, perhaps because of the Sputnik era,

Omer Pipkin

I felt a need to renew and expand my technical skills." So Omer furthered his education, earning his Ph.D. in 1965.

With his doctorate in hand, Omer joined PASA Petroquimica in Argentina as technical director. PASA was "a chemical engineer's dream," he said. It produced styrene-butadiene rubber (SBR) starting with the basic raw materials of LPG and naphtha, with all of the intermediate processes located at the same site. He served as vice president and manager of operations of PASA for over three years prior to returning to Cities Service in New York as manager of technology in 1971. In 1976, Omer went to Brazil as vice president of marketing and finance for Copebras S/A and has served as president of Copebras since 1978. Copebras, which is celebrating its 30th anniversary this year, is Brazil's largest producer of carbon black and sodium tripolyphosphate.

Of the professors whose courses helped him make the long move from Blanco to Brazil, Omer remembered Dr. Frank Fowler, a professor who taught many courses. At the time, Professor Fowler was building a house, and Omer found it amusing to see him come to lecture covered with paint and sawdust, though the extracurricular activity took nothing away from his dedication to the classroom, Omer observed.

Tom Sciance

Omer's hobbies include golf, tennis and hunting. His wife, Marjorie, and he have about equal games in both golf and tennis and enjoy playing together. They have two sons, Allen and Tom, and four grandsons ranging in age from four to 10 years. "I will be recommending the profession to my grandchildren," Omer said. Their grandfather's climb to success should be a persuasive example.

TOM SCIANCE

"We must evolve away from some of the traditional technologies used in the oil and heavy chemical industries and toward those useful in smaller volume, specialty processes using flexible manufacturing, computer technology and specialized areas of knowledge such as bioengineering, advanced materials or membrane applications," said Carroll Thomas Sciance (BSChE '60) about the future of the chemical engineering profession. Chemical engineers are valued, he said, because of their training in the use of fundamentals and the use of a systems approach to solve complex real-world problems.

Tom attended OU during the turbulent 1960s. He recalls demonstrations against the two years of ROTC that

were compulsory at the time. "The funny part of that," he said, "was that most of the demonstrators were foreign students, who didn't have to take ROTC anyway, and the rest were FBI agents writing down each other's names." After receiving his B.S.Ch.E in 1960, Artillery Lieutenant Sciance spent two years serving his country at Fort Sill. Afterwards, Tom returned to OU to obtain his master's and doctoral degrees while working under Cheddy Sliepcevich on "Boiling Heat Transfer to Liquefied Hydrocarbon Gases."

Immediately after graduate school, Tom joined the manufacturing division of the plastics department of E. I. duPont deNemours & Co., Inc., at Wilmington, Del. There he became involved in the production of adiponitrile, an intermediate chemical for nylon, using a radically new catalyst system. He was later assigned to a liaison group with the engineering department to design a plant incorporating the new process, with responsibility for facilities to manufacture and recover catalyst.

In 1970, Tom moved to Orange, Texas, as assistant superintendent of the technical division. His next major assignment involved a move to France in 1975, as project manager of Butachimie, a joint venture between duPont and Rhone-Poulenc Industries to produce adiponitrile by the duPont process. Tom returned to Wilmington as planning manager, nylon intermediates division, of the petrochemicals department and was promoted to technical manager of the division. He attained his present position as director of engineering research in the engineering department in 1983.

Tom has been very active in engineering education as a member of the OkChE Board and chairman of the academic committee, and in similar capacities for the Center for Catalysis Science and Technology at the University of Delaware, the College of Engineering Board of Visitors for Rice and Duke universities, and as an advisory board member for the Graduate School of Chemical Engineering at Texas A&M. Tom also contributed to the highly regarded University of Texas report, "Chemical Engineering Education for the Future." Next year, he is scheduled to give the tutorial lecture for the chemical engineering division at the annual meeting of the American Society for Engineering Education.

Tom thinks university chemical engineering curricula must be extensively revised, just as was done in the late 1950s, to accommodate changes in complex world needs and to adapt manufacturing to increase flexibility to meet those needs. Tom suggests that materials science may be the field of the next decade to lead in the development of high-tech ceramics, composites and plastics.

Reflecting on his OU experience, Tom said he values most the faculty expectation of students to do a lot of hard work. Faculty standards both for quantity and quality were high. As an undergraduate, Tom won second in the national AIChE Student Problem Competition, and in graduate school he received the best paper award at a National Cryogenics Conference in Boulder.

The college fad in Tom's day at OU, he recalls, was panty raids. The administration took it all very seriously, taking photographs of the participants and expelling them. Engineering students would have liked to participate, Tom surmises, but didn't have time, what with fulfilling all those high faculty standards; hence, their reputation for being nerds.

"Academics aside, by far the best thing I got from OU was my wife," Tom said. Anita was either the first or second woman to receive a degree in chemical engineering from OU (BSChE '60). Tom and Anita celebrated their 25th anniversary this year. They have four children: Steve, 24; Frederick, 22; Thomas, 21; Erica, 20; and Fang, the family dog, who is 6. In his spare time, Tom likes music and bridge and is also an avid philatelist.

Sheila Stuckey

SHEILA STUCKEY

Though one of our more recent graduates, Sheila Stuckey (BSChE '78), has had several major assignments since joining Procter & Gamble in 1980. Sheila began as manager in a packaging section requiring "little engineering but a lot of managing." Later as a hydrolyzer project manager, she took a unit from conception through construction and startup.

In 1983, Sheila moved from Dallas to Augusta, Ga., for the construction and startup of another new plant and was promoted to department manager. This year she switched from manufacturing to the engineering division of P & G in Cincinnati.

Of her OU education, Sheila recalled the emphasis on problem solving, both technical and people oriented. "Dr. Block taught me to look at things with a lot of common sense," she said. "Sometimes the answer can be very simple."

Sheila remembers Dr. Block and Dr. Townsend as outstanding CEMS faculty involved in her education. While she was an undergraduate, she recalled, the students presented Dr. Locke with a copy of the fundamentals textbook at the faculty roast. The particular book was enclosed in plastic. Dr. Locke's rejoinder was that this copy could be opened as much as most of his students had opened theirs!

Of her college days, Sheila remembered when Coach Barry Switzer was new to the job and Billy Sims and Joe Washington were outstanding OU players and when fans threw beachballs in the stands. Sheila still makes it to a lot of games and never missed one while working in Dallas.

The Pauls Valley native is not married, but said, "I think there is hope in the near future." Her pastimes include working on her house and playing tennis and golf as well as playing softball on the Oxydol team. Sheila also serves as a prompter in community theater at a Cincinnati playhouse.

BERNARD VAN WIE

"I would not be in a position to say that I have a heart to do quality research and teaching and to help others achieve their potential had it not been for the heart and commitment of people at OU," said Bernie VanWie (BSChE '77, MSChE '79, PhD '82). "This desire extends to helping students catch the vision of how their lives might also encourage others," the Washington State University assistant professor added.

"I realized that many individuals had spent countless hours devoted to my personal development," Bernie reflected. "In chemical engineering circles, Dr. Sam Sofer was the most notable. It was Sam who took me aside one day after an intro Ch.E. class and asked me to join his research team. From that day forward, my life was to take on new direction, for it was largely due to Sam's excitement and encouragement that I continued on at OU all the way through my Ph.D."

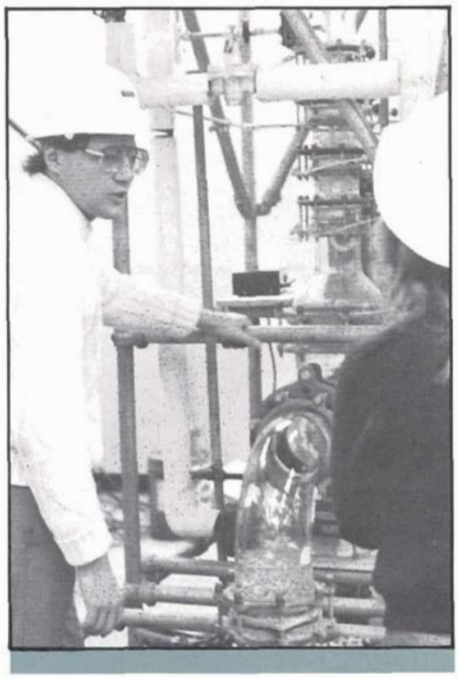
Another professor Bernie credits is Dr. Ken Starling. "His emphasis on quality effort on every aspect of a research project has been incorporated into my style of overseeing graduate student projects at Washington State University," he said.

"Our department is research active," Bernie continued, "yet the quality of our undergraduate teaching program has not been sacrificed. We can do quality research and maintain good teaching standards due in part to the fact that graduate courses are taught jointly with the University of Idaho (eight miles away)." The shared responsibility, he said, "reduces total numbers of courses taught by both departments but also increases the variety of course work we are able to offer.

"My research has focused on biomedical and biochemical applications of chemical engineering. Washington has established a Technology Center to provide funding to stimulate the development of critically emerging technologies of which biotechnology is a major emphasis," he said.

"I have also tried to provide an opportunity for undergraduates to begin testing their research skills," Bernie said about his current work. "This has proven to be an effective means of interesting students in pursuing graduate studies."

Bernie recalled one such opportunity he had as a student at OU, a biogasification project. "The work involved anaerobic digestion to produce methane gas from cow manure. During its infant stage the project was housed in the Unit Ops Lab. Needless to say the odors coming out of the lab and permeating all the way up to the dean's office were quite objectionable. To demonstrate the utility of the project we invited the professors and CEMS staff to a coffee break at which we used the biogas as our heating fuel. However, in spite of all our efforts and assurances we could not convince all of our guests that the odor of the gas in no way influenced the flavor of the coffee.



Bernard VanWie

"Probably the most difficult task was the collection of enough manure to fill a 1,520-gallon high-density crosslinked polyurethane bioreactor [our graduate student supervisor, Mike Brule (BSChE '75), always insisted we refer to the bioreactor by its formal name because it sounded more impressive]. To do this, we would load up 20-gallon carboys on a university flat-bed truck and travel to the various farms surrounding Norman (one farm by itself could by no means supply all of our manure needs). On one occasion, he said, "we spun the truck and spilled manure all over the highway. To our embarrassment a juvenile police officer was right at the scene, and we thought, boy, now we're in for it. Luckily he was pretty understanding."

Dedication to his job is evident in Bernie's involvement as faculty advisor for the WSU student chapter of AIChE, as associate editor for the AIChE Student Annual 1985 and editor for the 1986 edition, and as advisor for Tau Beta Pi engineering honorary society student chapter. He serves on several committees governing the direction and development of WSU's general, engineering and bioprocessing curricula.

Bernie was listed in Outstanding Young Men of America 1982 and since has received funding for several research projects. He is a member of American Society for Apheresis, AIChE and Tau Beta Pi.

Bernie, his wife, Paige, and their son, Joshua, aged one and one-half, enjoy Pullman, a small community of about 9,000 that triples in size with the influx of students in the fall.

ARTHUR VEIS

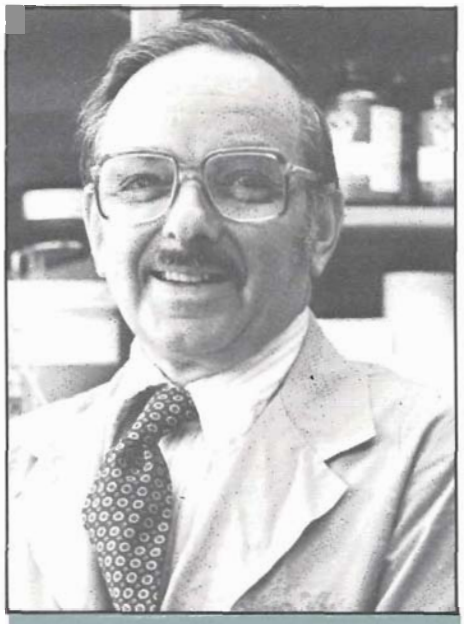
"In my day at OU, as a member of the NROTC in 1943–1945, there wasn't too much amusing," said CEMS alumnus Arthur Veis (BSChE '47). There was, however, in those years of World War, plenty of serious work in the demanding chemical engineering curriculum.

Art prepared himself further for his career, completing graduate school in physical chemistry in 1950 and working as a postdoctoral student with Lloyd Swearingen on theoretical problems in thermodynamics and kinetics.

Art taught for a year in the chemistry department at OU before entering industry at the central research department of Armour and Co. in Chicago, where he was promoted to head of the physical chemistry department. Art reentered the academic sphere as associate professor of biochemistry at Northwestern University Medical School and was promoted to full professor in 1965. He served as assistant, and then associate dean, in the graduate and medical schools but chose after a sabbatical to return to teaching and research in 1977.

Veis has been honored with international recognition at Stanford University as a Guggenheim Fellow and visiting professor in 1967–68; he also worked with Paul Flory at the European Molecular Biology Laboratory at Grenoble, France, and at the Weizmann Institute of Science at Rehovot, Israel, as a Fogarty Senior International Scholar in 1977–78. Art was named a Case Centennial Scholar in 1980. He serves on the editorial boards of *Calcified Tissue Research, Biopolymers* and other scholarly journals as well as being editor-in-chief of *Connective Tissue Research* and chairing two of the prestigious Gordon Conferences.

Art and his wife live in Skokie, Ill., "a suburb of Chicago, with lots of character," he said. They have three daughters: Judith, who is currently chief resident of internal medicine at Columbus Hospital; Sharon, who has earned her M.S. in speech pathology; and Deborah, who is studying molecular biology at Princeton.



Arthur Vies

SAM A. WILSON

"We had the fundamentals pounded into us—and industry recognized that—and none of us had problems except to decide which job we wanted," said Norman native Sam A. Wilson (BSChE '53). Sam came to CEMS from Norman High School, where he graduated with honors while lettering in football, basketball, baseball and golf. As a Sooner, the young dynamo served as president of the Engineers Club and LKOT 314; was named Outstanding Engineering Student; and was honored inductee of Tau Beta Pi, Sigma Tau and Alpha Chi Sigma.

Sam values the opportunities at CEMS to work with Professors Huntington, Reid, Campbell and Fowler, as well as to work and become friends with his fellow students. His most memorable project, Sam said, was Doc Huntington's heat transfer experiment using a watermelon, which sounds like an experiment that merits further study.

Graduating in 1953 with honors, Sam went into the military and, as a naval officer in the South Pacific, participated in the first hydrogen bomb explosion. After his tour of duty, he earned his M.B.A. in 1957 at Harvard Graduate School of Business Administration.

Sam A. Wilson

A technical background has served Sam well in his management positions since. He is now president of Wilson Oxygen and Supply Company, which he founded in 1963 with only two employees. Today the firm has 60 employees at five locations serving all of central Texas. He says his old K & E slide rule still sits on his desk and is used more than any fancy calculator.

As a big game hunter who has traveled to all the western states, Mexico, three provinces of Canada, Alaska and Mongolia, Sam has collected most of the game animals on the North American continent. The outdoorsman also enjoys collecting bronzes of western, Indian and wildlife themes.

Sam is active in several Austin civic organizations and maintains ties with universities through advisory boards of the OU College of Engineering, the Harvard Business School and the School of Industrial Distribution at Texas A&M. Sam and his wife, Sonia, have three children, Steven, Sterling and Sharon. Sonia spends much of her time working on behalf of the Austin Symphony Orchestra.

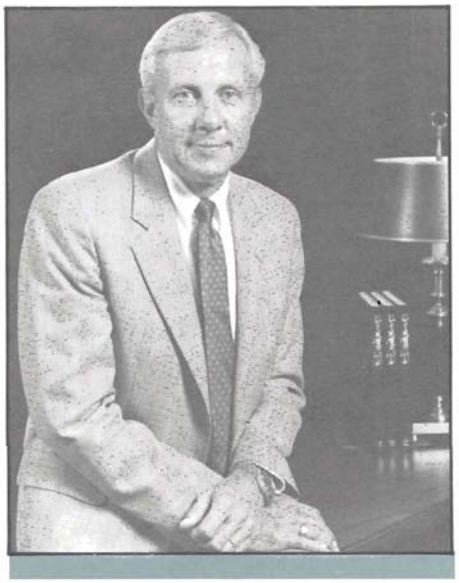
Frank E. Horton Serves as 11th OU President

Dr. Frank E. Horton, a veteran university administrator cited for his strong academic and leadership credentials, assumed the OU presidency on Sept. 11, 1985.

As chancellor of the University of Wisconsin at Milwaukee for the past five years, Horton led the second largest campus of the University of Wisconsin System through a period of physical and academic growth.

Also during his tenure at Wisconsin, Horton worked in partnership with the state to enhance its economic development efforts and improve its academic opportunities.

He established the Office of International Programs and spearheaded a dramatic increase in the development of formal relationships with universities in Europe, the Pacific rim and China. One result of these expanded international efforts was a provision in the 1985–86 Wisconsin budget that funded a new Center for International Business at UWM.



Frank E. Horton

A university administrator since 1968, Horton is nationally known for serving in leadership positions for the National Association of State Universities and Land Grant Colleges and the American Council on Education. Previously, he was on the faculty at Lake Forest (Ill.) College, the University of Iowa and Southern Illinois University at Carbondale.

A native of Chicago, Horton earned a Bachelor of Science degree in business administration from Western Illinois University and Master of Science and doctoral degrees in geography from Northwestern University.

As an urban geographer, he has studied urban growth and development, urban transportation and urban policy issues. He is the author of numerous books and articles focusing on urban, economic and transportation issues, and he was named a fellow of the Urban Land Institute in 1982.

Horton was born Aug. 19, 1939, in Chicago. He and his wife, Nancy, enjoy a number of outdoor activities, including skiing, hiking and playing golf. They have four daughters, Kim, 23; Pam, 22; Amy, 18; and Kelly, 16.

Faculty Update

Professor Jeff Harwell's first M.S. student finished in the spring 1985 and will be continuing on for his Ph.D. in enhanced oil recovery research. A paper based on this work, which was a preliminary investigation of a new enhanced oil recovery process invented with Professor John Scamehorn, was well received at the recent national meeting of the Society of Petroleum Engineers. As a direct result, Harwell has entertained a petroleum engineer from France and been invited to present his research to Mobil Research in Dallas. The same process was also selected as one of 10 enhanced oil recovery projects to be funded by DOE nationwide. The award for the first year, received jointly with Scamehorn, was for $150,000.

Professor John Scamehorn chaired a symposium on "Phenomena in Mixed Surfactant Systems" at the 59th annual Colloid and Surface Science Meeting at Potsdam, N.Y., last June, with 34 papers presented. He is currently editing a book based on the symposium. Scamehorn and Harwell have just completed an invited chapter entitled "Surfactant-Based Treatment of Aqueous Process Streams" for *Surfactants in Chemical Engineering*, to be published this spring. Scamehorn has given papers recently at the annual meetings of the American Oil Chemists' Society (Philadelphia), Colloid and Surface Science Division (Potsdam), American Chemical Society (Chicago) as well as at a DOE symposium on Low-Energy Separation (Knoxville).

Professor Lloyd Lee was recognized as an Engineering Excellence Lecturer for his outstanding contributions in research. Newlywed Lee will have help spending the cash award that accompanies the honor with his charming new wife, Chi Ming. Lee's primary interest has been in the derivation of thermodynamic properties from statistical mechanics models. He has published numerous papers and continues to work on his book, a treatise on statistical mechanics. Over the summer, he studied supercritical extraction technology and mixture behavior for solid-fluid systems at Oak Ridge National Laboratory.

Professoor Ray Daniels' failure-analysis project for the Air Force (the "Tinker Project") has been funded for the seventh consecutive year under his direction. One study of the project, stress-corrosion cracking of high-strength steel in an environment of the residues produced in aircraft ignition starters, resulted in a paper that won honorable mention in a student paper contest at the 1985 annual meeting of the National Association of Corrosion Engineers. Two other papers based on Tinker project work will be presented at the International Conference on Fatigue, Corrosion, Cracking and Failure Analysis to be held in Salt Lake City in December 1985.

Professor Ken Starling is on sabbatical during the fall semester and is spending his time concentrating on personal research. He recently returned from a trip to Paris where he delivered a paper entitled "Development and Evaluation of a Data Base for Highly Accurate Correlation of Pure Component and Binary Mixture Data for Prediction of Natural Gas Thermodynamic Properties" to the CODATA meeting. Recent research grants include the DOE award and an award from the National Bureau of Standards for "Development of a Critical Compilation of Binary VLE Data for Light Hydrocarbons with Methane." This latter project was funded for one year at $49,923.

Professors Rick Mallinson and Starling have joined forces on a project sponsored by DOE involving examination of the chemical structure of coal liquids by a number of analytical techniques and correlation of the calorimetric properties of the fluids with the quantities of the chemical structures present. The natural synergism for this work in CEMS at OU results from the combination of Mallinson's background built upon doctoral work on the kinetics of coal liquefaction, which involved experimental characterization of coal liquefaction products as well as modelling, and from Starling's distinguished background in thermodynamic correlation work, including work on coal fluid properties. These two backgrounds combine well to provide the ability to determine the needed characterization data and then obtain them. This will allow for constructing of an optimal correlation as well as finding the critical variables needed for such correlations. Between his yachting activities, Mallinson has made remarkable progress in equipping his laboratory. These efforts paid off with the receipt of his first research grant. Mallinson will continue as advisor to the student chapter of AIChE.

Professor Bob Block will co-chair a session on failure analysis at the ASM technical division conferences this fall. Two papers with summer Ph.D. graduate Joe King will be presented at the meeting. Block continues to be recognized as an effective instructor in the classroom. He also has received a small contract from Tinker AFB for research on aspects of failure analysis of aircraft engine and accessory components.

Professor Sam Sofer, with his graduate student Carl Camp, presented a paper on "Microsomal Enzyme Systems in a Robotically Controlled Extracorporeal Shunt" at the New Aspects in Extracorporeal Detoxification Symposium at Tutzing, West Germany. Sofer also co-chaired a New Enzyme and Membrane Reactor session at the meeting. With bioprocessing scientists from industry, universities and government, Sofer was invited to attend a space bioreactor workshop at the Johnson Manned Spacecraft Center in Houston. Discussions centered around the space bioreactor that is scheduled for launch in the spring 1987.

Professor Rex Ellington led the GRI compressibility factor data acquisition project to completion of an active summer program with about a thousand new, high-quality data obtained on mixtures. Second virial coefficients and interaction coefficients were also derived. Two master's theses and a journal article were submitted. The Energy Systems Project has concentrated on systems that might have commercial potential in the state of Oklahoma. For example, CO_2 recovery from a combined-cycle gas turbine has been examined for use in enhanced oil recovery. In another project, work is under way on the characteristics of solvents above their critical points. A master's thesis that presented a new way of correlating solubility data for supercritical systems was completed. This work is expanding into the removal of organics from rock matrices such as oil shales.

Professor Edgar O'Rear has five undergraduate students working alongside graduate students in his laboratories. O'Rear has three papers that will be published soon and another four papers under review. Topics of these articles range from two-dimensional solvents to the role of platelets and fibrinogen in thrombotic events. O'Rear had a recent visit from a representative of the domestic branch of Hoechst-Roussel Pharmaceuticals, a French-German consortium, to discuss some future research.

Professor Carl Locke and graduate student Kevin Kennelley went to Venezuela to discuss research concerning the corrosion of steel in concrete being conducted at the University of Zulia and the University of Oklahoma. Locke is also collaborating with investigators at the University of Manchester Institute of Science and Technology (UMITT) to develop monitoring methods to determine corrosion of pre-stressing strands in pre-stressed concrete.

Professor Robert L. Shambaugh completed his work on the NASA spacesuit glove project. Drs. Shambaugh, Brian Peacock of industrial engineering, Jerry Hordinsky of the Health Sciences Center and a team of 15 students traveled to Washington, D.C., in early June to present their results to NASA staff members. As a reward for their efforts, the entire group has been invited for a VIP tour of Kennedy Space Center and a view of an actual shuttle launch.

Radovich Leaves OU

During the summer, Jay Radovich resigned his appointment as associate professor of chemical engineering in order to head a membrane research group at Bend Research Institute in Bend, Oregon. Radovich (without a "t" as he often quips) had joined the faculty of CEMS after receiving his doctorate from Washington University (St. Louis) in 1976. His B.S. degree was from Notre Dame, and his M.S. was from Stanford University.

Among many innovations, the annual faculty roast by the AIChE student chapter was begun by Dr. Radovich. Long known as an effective and popular instructor, Radovich had recently received research awards from the Whittaker Foundation, DOD and Air Products. In 1982, he received the DELOS Award from ASEE in recognition of his contributions to undergraduate laboratory instruction.

The CEMS faculty look forward to continued professional collaboration through mutual research interests and wish him the best of luck in Oregon.

Student Scholarship and Award Winners

Forty University of Oklahoma students in the School of Chemical Engineering and Materials Science recently were recognized for their scholarship:

OKChE Scholarships
Johannes Bailey
Grady Bergen
Susan Burnett
Kris Christain
Russ Council
Robin Ewing
Stephen Heimbach
Jone Higdon
Brian Huff
Scott Jardine
Yen Khuong
Kenneth King
Eric Kozlowski
Joseph Li
Ngoc-Chau Thi Thai

Phillips Petroleum Co. Scholarships
Lori Walker Brant
Richard Krenek
Katherine Washer

Proctor & Gamble Scholarships
John Barton
Sharon Patterson
Barry Penney

Atlantic Richfield Scholarship
Timothy Melton

Celanese Chemical Company Scholarships
Nic Cordum
Bradley Harris

Cities Service Company Scholarships
Erik Anderson
Lisa Curtis

Continental Oil Company Scholarship
Jeff Finch

Dow Chemcial Company Scholarships
Marilyn Grass
Steven Shimoda

Gulf Oil Company Scholarship
Billie Kae Winter

Mobil Oil Fund Scholarships
Michael Fox
Murray Hamilton
Kent Narup..
Steven Statham

Undergraduate Research Scholarships—Fall '85
John Barton
Lori Walker Brant
Bradley Harris
Billie Kae Winter

R. Boyd Gunning Scholarships
Robin Ewing
Marilyn Grass

F. Mark Townsend Scholarship
Nancy Gullickson

Alumni Scholarships
Lori Walker Brant
Murray Hamilton
Daniel McCurley
Timothy Melton
Barry Penney
Steven Shimoda
Katherine Washer

University Scholarships
Johannes Bailey
Kris Christain
Russ Council
Jone Higdon
Brian Huff
Joseph Li

College of Engineering Scholarships
Susan Burnett
Yen Khuong
Eric Kozlowski

CEMS Outstanding Sophomore Award '84–85
Barry Penny

Dow Outstanding Junior Award '84–85
Richard Krenek

American Institute of Chemical Engineers '84–85
Kenneth King

continued →

Pictured left to right are Richard Krenek, recipient of the Dow Chemical Co. Outstanding Junior Award; Barry Penney, recipient of the CEMS Outstanding Sophomore Award; Lori Walker Brant, recipient of the Robert Vaughan Award for excellence in undergraduate research; Kevin Clary, recipient of the American Institute of Chemical Engineers Award; and Brad Gollhardt, recipient of the Phillips Petroleum Co. Award for Outstanding Senior. The awards were presented in conjunction with the 11th Annual Harry G. Fair Memorial Lecture held April 19, 1985.

CEMS Student Named Outstanding Scholar

For her grades and participation in activities and organizations, Marilyn Kay Grass was honored as one of the two most outstanding members of last year's class of University Scholars.

Grass, an R. Boyd Gunning Scholar at OU, is a member of the executive council of the Scholars Program, the President's Leadership Class, the Chemical Engineering Advisory Board, the Academic Program Council and the American Indian Science and Engineering Society.

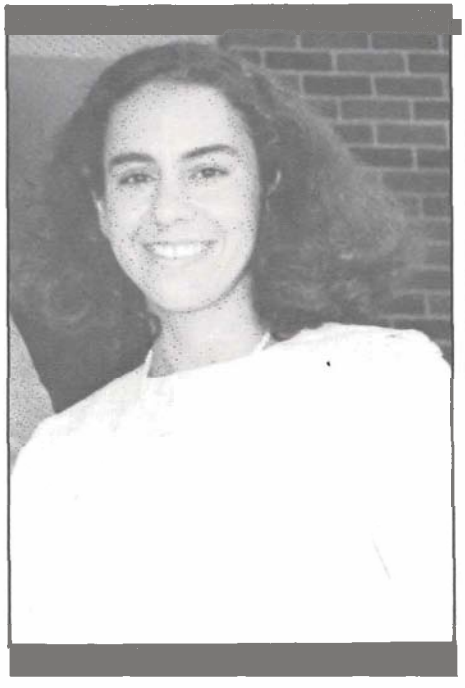
A chemical engineering student with a pre-medicine option, Grass is listed on the President's Honor Roll and has been nominated to the International Directory of Distinguished Leadership and the Directory of Young Leaders. She also was selected to represent OU in Los Angeles at a national engineering convention and to tour the Lawrence Livermore Labs near San Francisco.

Currently, she is collaborating with Dr. Robert Floyd of the Oklahoma Medical Research Foundation on a paper dealing with a project she completed as a Fleming Scholar.

Grass, who has a perfect 4.0 grade point average, has taken honors courses at OU and earned 21 hours of advanced standing.

A graduate of Putnam City West High School, she is a chemistry tutor for the Minority Engineering Program at OU and teaches baton twirling classes for children.

In addition to receiving a plaque and a $50 check, she will have her name inscribed on a plaque in the office of Stephen M. Sutherland, assistant dean of University College and director of the University Scholars program.



Marilyn Grass

Student Scholarship and Award Winners *continued*

Phillips Award for Outstanding Senior '84–85
Bradley Gollhardt

American Institute of Chemists Award '84–85
Stig Peiterson

Robert Vaughan Award for Excellence in Chemical Engineering '84–85
Lori Walker Brant

Pamela Pesek Johnson Award '84–85
Kevin Clary

Distinguished alumnus Dr. John M. Campbell (Ph.D. '51) provided expert insight into the "Management of Technology: A Critical Challenge," when he addressed CEMS students, alumni and OKChE board members at the 11th annual Harry G. Fair Memorial Lecture given April 19, 1985.

CEMS Degrees Granted 1984-85

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

Ali Abdollahi
Basil Hussam Al-Dhahi
Warren Becraft
Samuel Bieligk
Steven Bond
Kent Bowden
Joyce Callen
William Camp
Charles Carr
Mike Chance
Abeer Choudhury
Kevin Clary
John Coffin
Stanley Cox
Karen Davidson
Anthony DeSouza-Lawrence, Jr.
Keith Earle
Melanie Givner
Bradley Gollhardt
Phillip Haddad
Clarice Hatch
Sabina Henry
Keith Kauffman
Douglas Kelly
Daniel Kim
Linden Kirlin
Robert Larkins
Mike Edward Lee
Lisa Tibbetts Lyhane
Patricia Lyle
Quang Xuan Mai
Darryl Mamrosh
Ralph Markland
Elven Mitchell
Hussin Mohd
Abdalla Mutawe
Benjamin Myers
Hoan Nguyen
Tuyetmai Nguyen
Michael North
Steve Outlaw
Christina Pattison
Stig Peitersen
Quang Pham
Mark Pilling
Scott Powers
Dru Ann Preston
Johnny Price, Jr.
David Quillin
Laura Rausch
Stephanie Reid
Philip Roberts
James Rogers
David Rucker
Clarence Smith III
Kevin Sneed
Janet Tateya
Hong-Manh Thi Thai
Kelly Trice
Kenneth Underwood, Jr.
Stan Vlasimsky
Steven Woods
Danell Wright

BACHELOR OF SCIENCE IN METALLURGICAL ENGINEERING

Abdullatif El-Yazgi
Ivette Perich Romero
Scot Roswurm

MASTER OF SCIENCE IN CHEMICAL ENGINEERING

Seyed Arshad
Dave Blakeburn II
Bradley Eckhardt
Hamid Farzammehr
Obaidul Haque
Merajul Hassanzia
Jennifer Howard
Fahim Khan
Muhammad Khan
Ema Ogoro
Odie Yoesting

MASTER OF SCIENCE IN METALLURGICAL ENGINEERING

Sumar Mukherjee

DOCTOR OF PHILOSOPHY (CHEMICAL ENGINEERING)

Joseph Alison King
Lester Landis
Jeffrey Lee Savidge

Alumni Notes

William A. Kennedy, Jr., (BSChE '66) was awarded the Outstanding Engineer in Management Award in Oklahoma by the Oklahoma Society of Professional Engineers. He is vice president and general manager of Corken International Corp of Oklahoma City.

Paul Mehta (MS MetE '76) writes that he has been transferred to Schenectady, N.Y., in order to introduce lasers into the manufacturing technology at the Gas Turbine Division of General Electric. He and his wife, Nina, have developed a special nylon string that expands and contracts with moisture content and can be used in a nonelectrical adaptive control water feeder for plants.

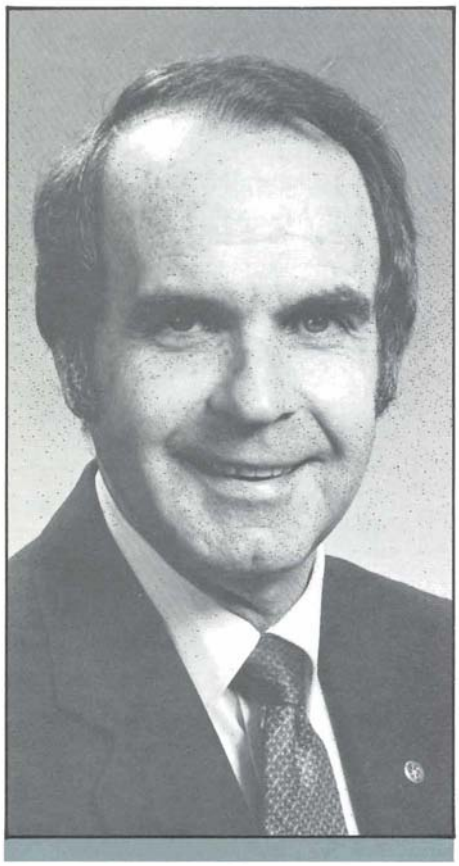
Ken Applegate (BSChE '79) and **Gene Cotten** (BSChE '84) were interviewing seniors for employment with American Petrofina recently in Norman. Ken is now a feedstocks trader for them in Dallas, and he is in crude oil sales. Gene is at their refinery in Port Arthur, Texas.

Jim Williams (BSChE '79) was a process engineer with Oklahoma Refining at Cyril. When this refinery was closed recently, Jim began working for Akzo Chemic America, which has Ketjen Catalysts. Jim is a senior technical services representative for Fluid Cracking Catalysts.

CEMS would like to thank the many alumni who offered early editions of *Perry's Handbook*, including:
C. M. Anderson (BSChE '47)
Leo L. Baker (BSChE '38)
Harold D. Hansen (BSChE '44)
Howard D. Hopps, Jr. (BSChE '45)
James Pipines (BSChE '39)
Glen Purcell (BSChE '29)
Robert Royer (BSChE '49)
Arlo Scoggin (BSChE '39)
George T. Snyder (BSChE '40)
Arthur Veis (BSChE '47)

We are hereby challenging each of our alumni to find another CEMS alum who does not receive *OkChE* magazine. Use the donation card to send us the name and address, and we will begin mailing *OkChE* to them. Please join our scavenger hunt!

Notes from the Director



Carl Locke

We have had some interesting developments on campus during the seven months since I wrote the last Notes from the Director. We have a new president, the enrollments continue to drop, the opportunities for employment are apparently increasing for BS graduates, and we have lost a valuable faculty member to industry.

There is an article in this issue introducing you to Frank Horton, our new president. He comes to us with an excellent academic background and is highly recommended by those who have worked with him at other academic institutions where he has served. We are very happy to have someone with so much experience in higher education as our new leader.

Dean Martin Jischke served the university well as the interim president, making a decided impact on the morale of the faculty and also making a very good impression on behalf of the university around the state. He has now come back to the College of Engineering as dean and is forging ahead with plans for the college in a very energetic manner. We are glad to have him back.

Enrollments in the undergraduate program are continuing to drop. The enrollment of undergraduates in chemical engineering is 163 this fall. Last fall the total number was 218. This drop is still probably due primarily to the decrease in job opportunities from two to three years ago. I attended a meeting of chemical engineering department heads from around the country recently and found we are right in step with most of them. We will graduate about 40 or so BS chemical engineers in May 1986 compared to 60 in 1985), and we probably will graduate only 20 to 25 in May 1987. We expect there will be a shortage of BS graduates around the country in 1987 because the total number of graduates will also be down dramatically.

The number of companies coming to interview BS graduates this fall and the coming spring is up significantly over the past two years. This reinforces my opinion that the need for chemical engineers may be increasing at a time when the number of graduates is decreasing. Now seems to be a good time for an incoming student to choose chemical engineering.

We were sorry to see Jay Radovich leave the university. However, the new job opportunity seems to be an excellent one for him, and we wish him well.

In summary, things are going well here in Norman. If you get a chance, come to visit us.

Carl E. Locke
Professor and Director

OkChE Board and Fund-Raising Summary

The OkChE board met October 19, 1985. The board membership is as follows:

Ed Lindenberg—Chairman
Robert Purgason—Vice-Chairman
Mary S. Justice—Secretary/Treasurer
Richard G. Askew
Don Green
Verne Griffith
James A. Kennelley
Garmon O. Kimmell
David P. Kurtz
Charles R. Perry
Laurance S. Reid
C. Thomas Sciance
F. Mark Townsend
M. F. Wirges
Frank Wolfe
Carl E. Locke (Ex-Officio)

You alumni have been very helpful to the School of Chemical Engineering and Materials Science through your contributions over the past 18 years. These monies have been used for scholarships, laboratory equipment, this magazine and other student-related activities. We think these funds have been one of the differences that has made CEMS among the best—if not *the* best—departments on campus.

This is a brief report of the history of your giving, expenditures this past year and our projected expenditures during the coming year. In addition, Bob Purgason, member of the OkChE Board, compiled a summary of the giving by all of you since 1978. The Perry matching fund was the $10,000 challenge given by Perry Gas Companies for several years. That elapsed after the 1980–1981 year, thus explaining the precipitous drop in giving.

Your response to our appeals has been very good, and many of you are using the company matching funds to excellent advantage. In addition, the uni-

versity has several giving programs that allow designation of your giving to CEMS. The President's Partners funds can be totally designated, and one-half of the Associates funds can be designated. We hope you will remember us if you decide to donate through those programs.

Table 1 is a listing of expenditures for 1984–1985. Table 2 is a listing of our planned expenditures for this academic year and includes a $20,000 item for the Unit Operations Lab at the time of the move to the Energy Center. We have built up a reserve fund from your earlier donations and will use that to fund this expenditure. We will have a reserve fund balance equal to one year's expenditures after this expenditure. We need an additional $34,000 this next year to fund all the programs we envision for the coming year. The graduate student expenditure is a first for the OkChE funds and was approved by the board last year.

We appreciate your help and hope you will be able to continue to support us through the coming years.

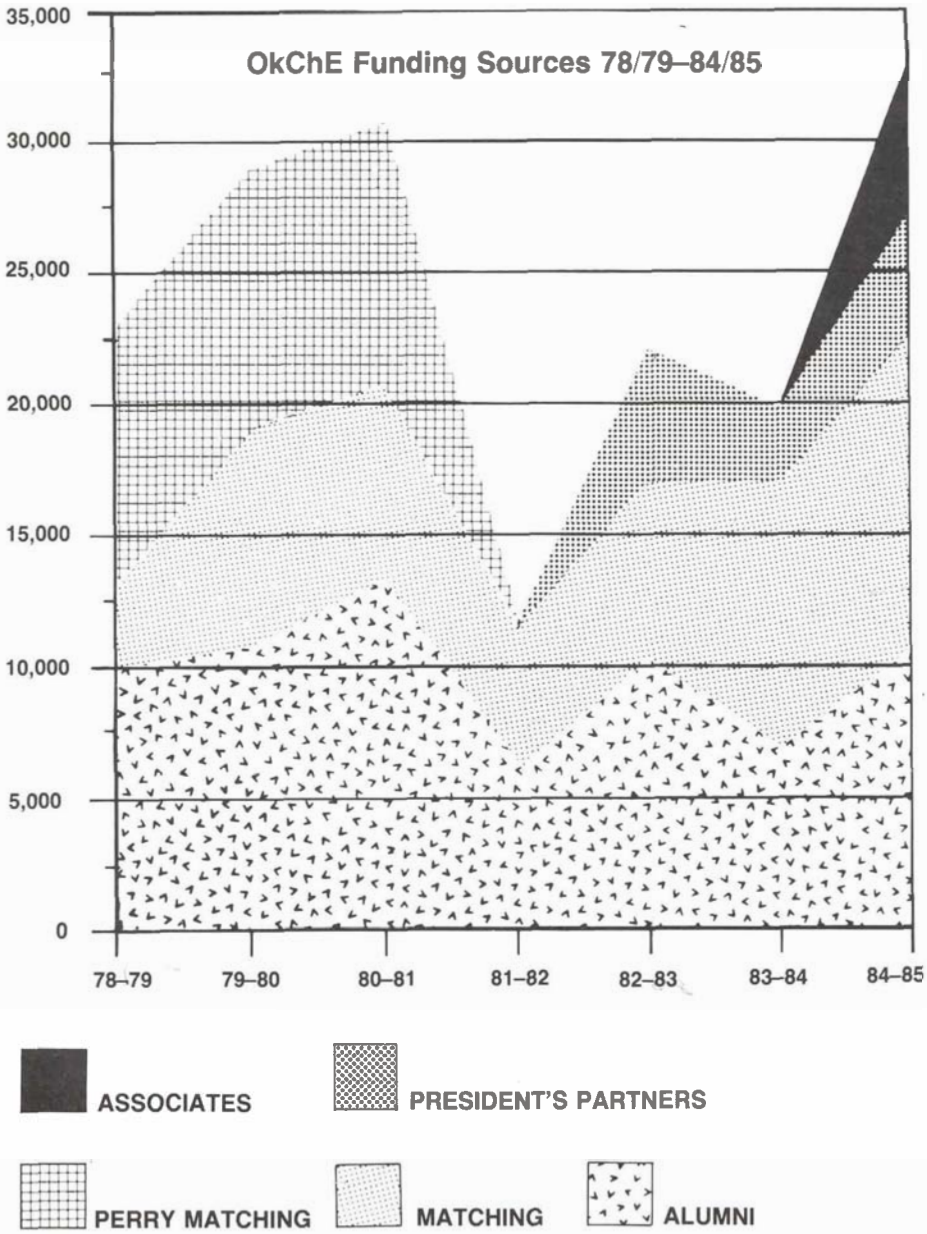


Table 1

Expenditures for 1984–85

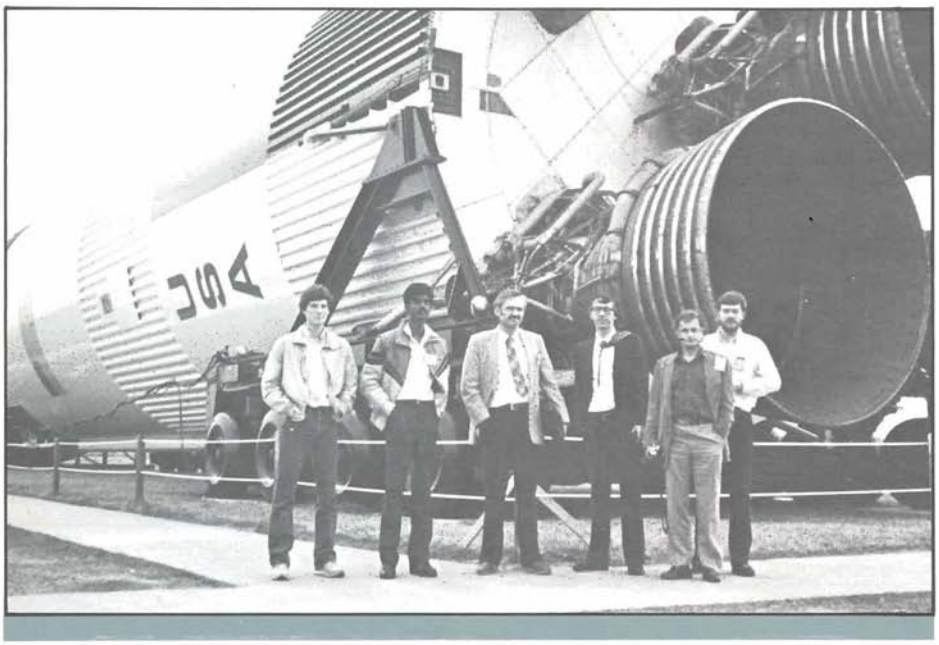
Magazines	$ 7,408.39
Scholarships	8,600.00
Laboratory Equipment	778.90
Perry Building—Fund Raising	863.44
Student Activities	1,330.24
Board Meeting Expenses	1,339.23
	$20,320.20

Table 2

Planned Expenditures for 1985–86

Unit Operations Laboratory Equipment (Matching Kerr Grant for $80,000)	$20,000
Undergraduate Scholarships	10,000
Graduate Student Support	10,000
Magazines	7,500
Secretarial Services to Improve OkChE Records	2,000
Student Activities	2,500
Perry Laboratory—Fund Raising	1,000
Board Meeting & Misc. Expenses	1,000
	54,000
From Reserve Funds	20,000
Minimum Needs from OkChE	$34,000

OU Team Designs Space Glove and Tours Space Centers



A team of OU students and faculty presented its design for a space suit glove at the Houston Space Center in May 1985. Members of the joint project of chemical engineering, industrial engineering and the OU Health Sciences Center are (from left) Mark Wenner, Ghandi Chinnadurai, Dr. Jerry Hordinsky, Dr. Brian Peacock, Dr. Robert Shambaugh and Allan MacArthur. The rocket behind them is a Saturn 5, the booster that carried the first men to the moon.

Space shuttle Challenger lifts off from Cape Canaveral in Florida in November 1985. The glove design team attended the launch at NASA's invitation in appreciation of their work on the project.

Dr. Peacock piloted a shuttle at a less well-known space center in front of a hamburger stand in Dallas on the way to the Houston Space Center. Dr. Shambaugh observed the risky venture with amusement.

Dr. Peacock demonstrates the OU gloves in a vacuum chamber in Houston. Checking results are Dr. Hordinsky (left) and students Mike Swatale and Shawn Smith. (photos courtesy of Robert Cote)