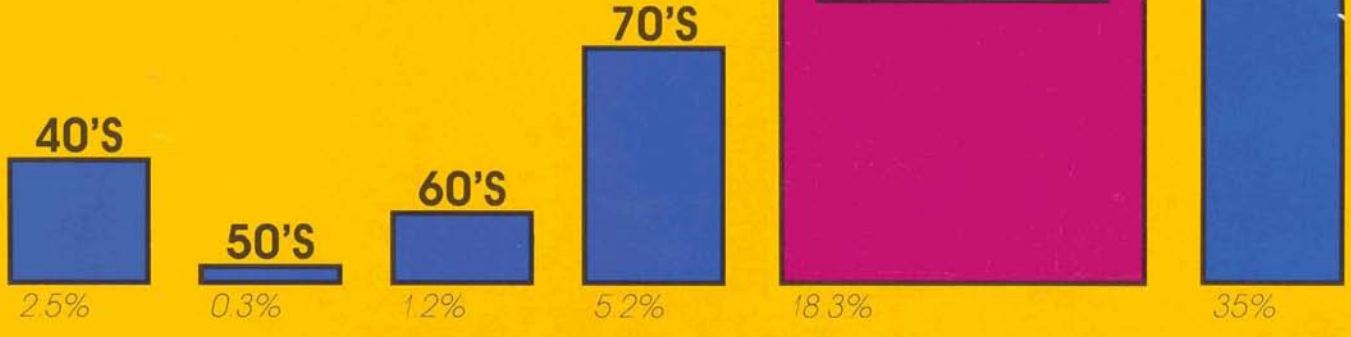
OKCHE

SCHOOL OF CHEMICAL ENGINEERING AND MATERIALS SCIENCE

The University of Oklahoma

WOMEN OF THE 80'S



OKCHE

Contents *Winter 1989-90*

OkChE Magazine

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NOTES FROM THE DIRECTOR

This issue of *OKChE* magazine focuses on our women graduates. Prior to 1970, relatively few women undertook engineering studies. In my undergraduate days at Case Tech between 1945 and 1950, I can recall there being only three women in the whole college. In chemical engineering here at OU we had several women in most classes through the 60's, but the significant numbers did not start until the 70's. By 1980, women accounted for between 20 and 25 percent of our undergraduates. This percentage has grown to 35 percent through the 80's. Chemical engineering has the highest percentage of women students in the College of Engineering.

A recent study by the National Science Foundation of future engineering needs and the available human resources concluded that women must play an increasing role in engineering to meet workforce needs early in the next century. Thus, it is with great pride that we feature some of our women graduates in this issue. We want to thank those of you that submitted information for inclusion in this feature. You serve as role models for what we hope will be increased numbers of women chemical engineering students in the 90's.

Establishment of endowed professorships and chairs is among the goals of the University's Centennial Campaign. This has been facilitated by the State's matching fund program that matches contributions up to $250,000 for a professorship and $500,000 for a chair. Our department has been singularly fortunate in obtaining matching commitments for two professorships and one chair.

As described elsewhere in this issue, we are receiving funding from the Asahi Glass Company of Japan for the establishment of an endowed chair in chemical engineering. This is the first such endowment that Asahi has awarded in the United States.

Two long time corporate friends of our program, Conoco and DuPont, now one company, are establishing an endowed professorship, the Conoco-DuPont Professorship in Chemical Engineering. The second professorship, for which fund raising is in progress, is the C. M. Sliepcevich Professorship, a Centennial project of your OKChE Board of Directors. A progress report on fund raising for this project is presented in this issue. We hope to complete the project by the end of 1990.

Raymond D. Daniels
Professor and Director

OKChE Contributions

Alumni Contributions	$ 5,768
President's Partners	2,400
Associates Program	5,217
Company Matching	26,519
	$ 39,904

OKChE Expenditures

Publications & Postage	$ 4,935
Scholarships & Awards	10,020
Student Activities	1,134
Academic Support	429
Secretarial Support	13,085
OKChE Meeting Expenses	408
	$ 30,011

OKChE Centennial Project
Sliepcevich Professorship

Goal: $250,000

Alumni & Friends	$ 87,671
Company Matching	88,368
Foundation Grants	10,100
Pledges Outstanding	2,700
	$188,839
Interest Earned	$ *6,480*

Regents Honor Sliepcevich with Appointment to Robert W. Hughes Centennial Professorship

C.M. "Cheddy" Sliepcevich, George Lynn Cross research professor of engineering, was given the additional title of Robert W. Hughes Centennial Professor of Engineering at the May meeting of the OU Board of Regents in Tulsa.

The professorship was endowed by Hughes, chairman and president of Prime Cable Corp. in Austin, Texas. Hughes was an undergraduate student in chemical engineering at OU in 1955, the year that Sliepcevich joined the OU faculty as professor and chair of the School of Chemical Engineering. A Ponca City native, Hughes received his bachelor's degree in chemical engineering in 1958 from OU and his master's degree in business administration from Harvard University. He is a member of the OU College of Engineering Board of Visitors.

"I wish to express my great appreciation to Mr. Hughes for providing the endowment for us to honor and recognize an outstanding faculty member who has given so much to this university and who is one of the most distinguished engineering professors in the United States," said OU engineering Dean Billy Crynes.

As a researcher, teacher, scholar and administrator, Sliepcevich has made significant contributions to engineering research during his 34-year tenure at OU.

Sliepcevich was the principal consultant and researcher in the design and development of process equipment for liquefying natural gas, and for design of ocean-going tankers for LNG transport. This work led to development of a multi-billion dollar international industry.

He has published more than 165 technical papers in energy scattering, high-pressure reaction kinetics, flame dynamics, natural gas technology, cryogenics, thermodynamics, heat and mass transfer, extractive metallurgy and desalination.

He was associate dean of the College of Engineering from 1956 to 1962, chairman of the School of General Engineering 1958 to 1963.

In 1963, he relinquished his administrative responsibilities to devote full time to research and teaching as a George Lynn Cross research professor of engineering—the youngest person to receive this honor from OU. He has developed the Process Control, Cryogenics, High Pressure, and Flame Dynamics laboratories.

He received the Curtis McGraw Research Award in 1958 from the American Society for Engineering Educacation. In 1959, he received the International Ipatieff Research Prize for his contributions to high pressure and catalytic chemistry. For contributions to the teaching of engineering students, he received the George Westinghouse Award in 1964 from the American Society for Engineering Education.

Other honors include the Engineer of the Year Award from the National Society of Professional Engineers, the William H. Walker Award from the American Institute of Chemical Engineers, Sigma XI Lecturer, Peter C. Reilly Lecture at Notre Dame University, Donald L. Katz Lecturer at the University of Michigan, the Oklahoma Academy of Sciences Award of Merit, and the University of Michigan's Sesquicentennial Award for Distinguished Alumni. He was elected to the National Academy of Engineering in 1972.

Sliepcevich was inducted into the Oklahoma Hall of Fame in 1974, and in 1975 received the Distinguished Service Citation—the highest honor OU can bestow.

He is a member of the American Chemical Society, American Institute of Chemical Engineers, American Society for Engineering Education and the American Association for the Advancement of Sciences.

Sliepcevich earned his bachelor's, master's and doctoral degrees in chemical engineering from the University of Michigan and taught there until he joined the OU faculty. □

Natural Gas Research Center Planned at OU

Plans to create a Center for Natural Gas Research at OU, were announced at the November meeting of the OU Board of Regents.

The Center, a consortium involving OU, OSU and the University of Tulsa, will be housed in the OU Energy Center in Norman. The new center will focus on technology, policy and legal and business issues in the use of natural gas. The center will concentrate on increased production of energy resources, value-added processes for natural gas, and development of related high-tech industry. □

Endowment Pledged for Asahi Glass Chair In Chemical Engineering

The Asahi Glass Co. Ltd., an international corporation with interests in chemicals, electronics and health and medical products, has contributed $250,000 of a $500,000 pledge to the University of Oklahoma to establish an endowed chair in the School of Chemical Engineering and Materials Science. The chair is the first that Asahi has established in the U.S.

The gift is a part of OU's Centennial Campaign and OU will request that it be matched by the State of Oklahoma Endowed Positions Program to establish a $1 million endowment for the Asahi Glass Chair in Chemical Engineering. Asahi will contribute the remaining $250,000 by June 30, 1990.

"An endowed faculty position is the most effective way to bring increased quality to the educational process," said OU president Richard Van Horn. "This very generous gift will allow us to enhance further the growing national recognition of our chemical engineering program," he said.

The position is to be filled in August 1990. CEMS has placed position announcements in Chemical & Engineering News and Chemical Engineering Progress.

Asahi executive vice president Hiromichi Seya noted that CEMS' applied surfactant research and ion-exchange membrane technologies are closely related to Asahi's chemical business. Asahi plans to further support these studies through cooperative research with CEMS by sending Asahi researchers to OU and by employing graduate students from OU.

Asahi Glass and its subsidiary ISE Chemical Industry Ltd. have been involved in Oklahoma since 1984 in the management of the Woodward Iodine Corp.

Asahi Glass was founded in 1907 by Toshiya Iwasaki to meet Japan's demand for the industrial production of sheet glass. The company produced its first pane of sheet glass in 1909 and opened the way for development of the industry in Japan.

In 1917, Asahi pioneered Japanese production of soda ash, one of the raw materials in sheet glass production. By 1937, the company had begun fabricated glass production and laid the foundations for its future—glass, chemistry and ceramics.

The great demand for automobiles following World War II and the arrival of domestic television broadcasting in 1953, led to rapid growth in Asahi's fabricated glass production.

Today the company makes glass and construction materials, components for electronics and software, commodity and fine chemicals, engineering ceramics, fine glass products, opthalmic and optical products and health and medical products.

The Asahi Glass Foundation for Industrial Technology promotes financial support for research in industrial technologies in private and public universities in the countries in which it operates and for their cooperative laboratories in Japan. Since its establishment in 1933, the foundation has donated $20 million to 3500 projects. The foundation is contributing to fund the Asahi Glass Chair in Chemical Engineering in cooperation with the Asahi Glass Co. □

Conoco DuPont Establishes Endowed Professorship in CEMS

Continuing its longtime support of the University of Oklahoma projects, Conoco/DuPont has committed $250,000 to fund OU's first endowed professorship in chemical engineering.

Making the formal announcement of the establishment of the Conoco/DuPont Professorship in Chemical Engineering was Archie Dunham, group vice president for chemicals and pigments of the E.I. DuPont de Nemours & Company, Wilmington, Delaware.

Dunham, a member of the OU Centennial Commission, presented a $50,000 check, the first installment of the gift, to OU Interim President David Swank during a spring meeting of the Centennial Commission on the OU Norman Campus.

The gift is expected to be matched by the Oklahoma Legislature and the Oklahoma Regents for Higher Education.

"This endowment means we can recruit an outstanding professional who will bring excellence in the classroom and the research labs of an already outstanding chemical engineering program," said Billy Crynes, Dean of the OU College of Engineering.

"The gift provides recognition of the quality of the program and the excellent work that is being done by the department," CEMS Director Raymond Daniels said, commenting that the professorship will "boost the morale of the chemical engineering faculty and will enhance external recognition for the program. We are very appreciative of Conoco/Du Pont's gift," he said, noting that many OU graduates have been recruited to work for Conoco and DuPont. □

Richard Van Horn Named OU President

Richard Van Horn assumed the presidency of the University of Oklahoma on July 15, 1989. His appointment by the OU Board of Regents in a special meeting on May 2 makes him the 12th OU president.

Van Horn has been noted for the outstanding leadership abilities and management skills he displayed during the previous six years as president of the University of Houston. During his tenure there, external research support more than tripled while private contributions increased 70 percent. Enrollment of National Merit Scholars rose during his presidency from six to more than 50 and the number of honor students increased significantly.

Prior to joining UH, Van Horn served 16 years at Carnegie-Mellon University, first as a faculty member and later as associate dean of the Graduate School of Industrial Administration, before filling executive positions as vice president for business affairs, vice president for managment, and provost. While there he played a leading role in building their exemplary computer-intensive enviroment.

During a two-year leave of absence from Carnegie-Mellon, he was director and professor of management systems at the European Institute for Advanced Studies in Management in Brussels, Belgium.

Van Horn's teaching and research areas include management strategy and policy, information systems, computers, simulation, and educational management.

He has authored numerous articles and papers and co-authored three books: *Automatic Data-Processing Systems, Business Data Processing and Programming* and *Management Information Systems: Progress and Perspectives.*

The new president has significant industrial experience a well, having worked ten years in the Rand Corporation, where he worked on the application of computers to management.

Van Horn was born in Chicago and raised in Fort Wayne, Indiana. He completed a bachelor of science degree in industrial administration with highest honors from Yale University, a master of science degree in industrial management from the Massachusetts Institute of Technology and a doctoral degree in system sciences from Carnegie-Mellon.

Van Horn's professional activities include service as a national council member of the Institute of Management Sciences and as department editor

of *Management Sciences*. He is a national lecturer for the Association of Computing Machinery and director and chairman of the audit committee of Glosser Brothers Inc., a Midwestern retail company that operates department stores and food markets. He has also served as chairman of the visiting committee for Information Technology at Harvard University, chairman of the board fo the National Center for Higher Education Management Systems, vice chairman of the board of EDUCOM and chairman of the Education and Technology Committee of the National Association of State Universities and Land-Grant Colleges. □

IASR Project Ranked 1st in OCAST Competition

The Oklahoma Center for the Advancement of Science and Technology (OCAST) has funded the scale-up from bench-scale to pilot plant operation of a waste water treatment process developed by faculty of the Institute for Applied Surfactant Research (IASR). The project was ranked first in potential for economic development among 23 approved by OCAST in its first applied research program competition.

IASR's new process of colloid-enhanced ultrafiltration for water purification offers great promise as a method to help clean our present environment, and to prevent further pollution by helping industrial companies meet government environmental standards.

The process involves injection of a stream of liquid industrial waste into the plant which then passes through a complex series of ultrafiltration systems combined with a series of chemical reactions of surfactants and micelles for removal of tiny solid particles from the liquid. What remains is a series of compartments with reuseable pure water and reclaimed material, and a compacted mass of solid waste for disposal.

IASR teams are exploring solid waste mass reduction processes and clean disposal methods, including conversion of waste to something usable.

Though the process has not yet been tested in a pilot-scale plant, it has operated with great efficiency at bench scale. If scaled up successfully, it could provide the basis for new industrial activity in environmental cleanup and waste disposal.

In-state and out-of-state companies and the U.S. Navy have expressed interest in the pro-

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cess. The process could lead to development of manufacturing of water softener and purification units for homes and industries, pollution-control devices for industry and government, and shipboard water purification devices for shipping use.

IASR's next major step toward commercialization of the process is to find companies in various industries which will accommodate operation of a pilot plant on their property.

The pilot plant would be about the size of a normal 8 by 12 foot room and contain a series of tanks, piping and a combination of hollow tube-type and tightly wound, rolled membranous filtration devices. The number of filters used would correlate with the planned capacity of the plant. Filtration would be combined with settling tanks for precipitation of large solids. Waste would be removed from the filtration stream by injection of surfactants chosen for tendencies to attract or repel tiny particles.

Valuable metals and other solids caught up in the industrial waste stream, could be reclaimed by surfactants selected to repel them into different streams or containers. This reclamation, could then be used to defray some of the cost of operation.

IASR was organized in 1987 by faculty of CEMS and the OU Department of Chemistry and Biochemistry to develop surfactant technologies to solve important industrial problems in separations, detergency, enhanced oil recovery, corrosion inhibition, blood substitutes, biotechnology and other areas.

CEMS members of IASR are Jeff Harwell, Ed O'Rear, and John Scamehorn, IASR associate director. Chemistry faculty of IASR are Sherril Christian, director, and B.M. Fung.

The institute is sponsored by a consortium of corporations in the surfactant field, including Aquaion, Du Pont, Kerr McGee, Sandoz and Unilever. □

Alumnus William Talley Chairing OCAST

CEMS alumnus Dr. William W. Talley II was unanimously elected as the new chairman of the Oklahoma Center for Advancement of Science and Technology (OCAST) during the entity's November meeting. The OCAST term will last one year. Talley is chairman of the board and chief executive officer of The RAM Group Ltd. and RAM Asset Management Co. of Oklahoma City. He also is chairman of RAMCO Oil & Gas Inc. of Tulsa.

OCAST has launched initiatives fostering more than $55 million in science and technology research and development in the state since it was created two years ago.

Talley received the baccalaureate degree in chemical engineering at OU in 1964. He then obtained dual masters degrees at OU in both chemical engineering and nuclear engineering in 1971, and went on to receive the doctoral degree in chemical engineering in 1973.

MIT's James Wei Presents 15th Harry G. Fair Lecture

James Wei, department head and Warren K. Lewis professor of chemical engineering at MIT, presented the 15th annual Harry G. Fair Memorial Lecture in Chemical Engineering in March 1989.

Wei discussed "Reaction and Diffusion in Zeolites", which are regular crystals of silica and alumina possessing sets of porous channels that act as molecular sieves, he said, by giving strong preference of passage to specific molecules enabling selectivities which can enrich thermodynamic equilibrium values from 25% to as high as 99%. He said many paradoxical configurational diffusional properties await explanation and exploitation.

Named one of 30 "eminent chemical engineers" by AIChE in 1983, Wei has been honored with the Institute's Warren K. Lewis, William H. Walker, and Professional Progress awards.

The Harry G. Fair Memorial Lecture is made possible by a fund contributed by his widow, Jane Swift Fair.

Fair received his B.S.Ch.E. at OU in 1939 and joined Phillips Petroleum Company. He worked his way up to vice president for supply and transportation. He joined the M.W. Kellogg Company in 1966 as executive vice president in charge of all engineering activities. Fair was executive vice president of Coastal States Gas Corp. from 1971 until his death in 1974. □

Alumni Robert Purgason and Sam Wilson Honored by Regents for Service to OU

Bob Purgason

Robert S. Purgason (BSChE '78) and Sam A. Wilson (BSChE '53) were among ten individuals presented OU Regents Alumni Awards on October 7. The awards are presented annually by the OU Alumni Association to alumni and friends of the University who have given generously of their time and services to OU.

Wilson and Purgason received their awards at a presentation luncheon prior to the OU *vs.* OSU football game. Each received a plaque and their names will be engraved on a plaque located in Oklahoma Memorial Union.

Purgason is vice president and general manager of Williams Power Company of Tulsa.

He has been a member of OKChE's Board of Directors since 1983, serving as chairman from 1987 to 1989. As chairman, he initiated the OKChE Centennial fund raising drive to establish the endowed Sliepcevich professorship. He was a founding member and first president of the Northeastern Oklahoma Engineering Alumni Chapter. He is a member of the OU Centennial Commission, chairman of the Student Affairs Centennial Committee. Under his direction, the committee has fostered four decade alumni reunion weekends and established the Crimson Club, and promoted expansion of the Huston Huffman Fitness Center and development of a university child care facility. He is a member of A.I.Ch.E. and a registered professional engineer in the state of Texas.

Wilson is president of Wilson Oxygen & Supply Company of Austin, Texas. He has been a member of the College of Engineering Board of Visitors since 1984 serving as its chairman in 1987-88. He has been a member of the Century Club, OU Stratton D. Brooks Council, William Bennett Bizzell Council, and George L. Cross Century Council. He has promoted organization and fundraising by Austin area engineering alumni.

He is past director of Austin National Bank, and Interfirst and

Sam Wilson

First Republic Banks of Austin. He is director of the Austin Chamber of Commerce and a member of Rotary Club, Junior Achievement and Crime Stoppers. He is Chancellor of Knights of the Symphony and past president of the National Welding Supply Association. He is a member of the advisory councils of Harvard Business School, of which he is a graduate, and Union Carbide.

Wilson was helpful in encouraging Mr. Robert Hughes to become active in the College of Engineering support group and in his subsequent endowment of the chair in the the college which CEMS professor C.M. Sliepcevich now holds.

Sam Wilson Endows College Scholarship

CEMS alumnus Sam A. Wilson has established a $100,000 endowed scholarship in the College of Engineering as a memorial to his father who was employed by the OU Physical Plant from 1932 until his death in 1956.

The Sam A. Wilson Memorial Scholarship Fund administered by the OU Foundation will grow each year to provide increasing financial support for scholarships. Twenty-five percent of the annual earnings generated by the initial principal sum of will revert permanently to the endowment to protect the fund from inflation.

While the scholarship may be awarded to any qualified full time U.S. undergraduate or graduate student in the College of Engineering, preference will be given to chemical engineering majors and graduates of Oklahoma high schools.

Recipients will be selected by a committee in the College of Engineering to include the college dean and the CEMS director. The first recipient will be selected in 1990-91.

OKChE Women

Although the number of women graduated by the School of Chemical Engineering and Materials Science has historically been few, the trend of the last decade, here as elsewhere in higher education in all fields of engineering, has been changing. Of our 122 female alumni, over 80% graduated during the last ten years. While women account for only about 8% of our total alumni, women now comprise approximately 32% of CEMS' current undergraduate enrollment and 38% of the Program of Excellence Scholarship class. We salute a representative group of CEMS' trendsetting women of the '80's.

Tracy L. Snider, *BSChE '78, MSChE '80*

Although Tracy Snider has not chosen to pursue a traditional career path as a trained chemical engineer, her contributions in software engineering for research instrumentation may help many who do chemical engineering research.

Her employer, General Electric, is a world leader in sales of magnetic resonance imaging systems used by chemists for analysis and structure determination of various compounds, from hydrocarbons to pharmaceutical drugs to proteins.

As a senior software engineer for G.E.'s Medical Systems Division in Fremont, California, just outside the San Francisco Bay area, Tracy has enjoyed the challenge of designing and programming the graphical user interface for G.E.'s Sun Computer-based Omega Nuclear Magnetic Resonance systems introduced two years ago.

"When our NMR systems were converted to the Sun computer, all of the software had to be completely rewritten," she said, "both to operate the instrument and to display and analyze the data. Obviously this was a very large engineering effort," she said of the four-year project.

Tracy received a G.E. Manager's Award for a menu-driven user interface that she developed for their earlier Nicolet-based systems.

"I got into software engineering as a career during the early 80's when there was not a lot of demand for chemical engineers," she said. "I began taking computer classes at the University of Wisconsin in Madison, 'just for fun'. I was hired by Nicolet Instruments soon after, hence my knowledge of Nicolet computers, which was useful experience for getting my current job here at G.E."

At a huge trade show sponsored by the ACS in Pittsburgh in 1989, Tracy provided the engineering expertise for G.E. imaging system setup, maintenance and customer demonstration.

"Though I'm not directly applying my chemical engineering courses *per se*, from them I gained a solid approach to problem-solving," Tracy said. "Courses I took in mathematics, chemistry and computer programming during my years at OU provided a good background for the work I am now doing," she explained.

"I have continued to take various computer courses through the U.C. Berkeley Extension utilizing the G.E. Employee Educational Assistance Program," she said. She plans to eventually complete an M.S. in Computer Science.

In her free time, Tracy enjoys cross-country and downhill skiing, photography, sewing, reading and visiting art museums, and collecting Southwest art for her home in Pleasanton. She likes to travel and has been to Europe three times during the last four years, visiting Italy two years ago, and Greece and Turkey last May.

of the 80's

Nancy J. Farrell, *BSChE '81*

"Experience tells me that in many companies, the Chem. E. degree opens doors and is looked upon as the most desirable undergraduate program from which to pull future well-rounded management professionals," says Nancy J. Farrell (formerly Cox), senior correlation analyst in Phillips 66 Company's Planning and Budgeting Department.

Though she doesn't use much of her technical chemical engineering background direct-ly in her current position, Nancy has been able to apply the mind-set of engineering analysis to business situations. Her success in technical positions earned for her opportunities in the business side of Phillips.

"Many of the problems in business, as well as engineering, occur where things fall through the cracks' between departments, companies, operating units, or pieces of process equipment," she said. "That is where you look for opportunities to improve things."

As one of a team of four analysts and planners with rotating responsibilities, Nancy translates operating forecasts from the Refining, Marketing, NGL and Transportation Divisions into an overall plan and monitors performance against that plan.

Special projects are a major part of her job, involving a wide range of areas such as refining utility costs, product inventory management, energy futures trading and gasoline blending, with special emphasis from the business and economics viewpoint.

Nancy joined Phillips after graduation in 1981 at their Borger, Texas, Refining Division. She was assigned to Process Engineering during her first four years where she learned the business of fuel and chemical production. As she rotated through the refinery units, she monitored operations, diagnosed and solved operating problems, recommended and ordered catalysts and coordinated small engineering projects.

In April, 1985, she was given the opportunity to join the Economics Group at the refinery as the Economic Operations Planning Engineer. For the next three years, she was the production planner, using linear programming models to optimize operations and forecast planning production. She also coordinated communications inside and outside the company, managed intermediate feedstock inventory and worked to answer many economic questions. The position gave her significant responsibility and enabled her to work more closely with management than most employes of her level. The job set her career in motion, steering her away from the technical toward the business side of the company.

Shortly after graduation, Nancy married Norman Farrell, another CEMS graduate of '81. He also works for Phillips, in the Research and Development area. He does a variety of things, such as computer process control of a hazardous waste incinerator, engineering project work, and PC support and networking.

Nancy enjoys living in Bartlesville again, where she grew up, and being close to both her own and Norman's families. Nancy is active in the Toastmasters International speaking organization and her hobbies range from golf and drawing, to identifying wildflowers. She is currently planning a second vacation to England and Scotland.

Mary S. Anderson, *BSChE '82*

"There have been many instances when my knowledge of chemistry, kinetics, fluid mechanics and thermodynamics enable me to solve problems that a chemist, petroleum engineer or geologist would not be prepared for," said Mary S. Anderson (formerly Justice).

"I am able to communicate with chemists as well as with a wide variety of engineering disciplines," she said, attributing her expertise to the scope of a chemical engineering education.

Mary is a Development Engineer in the Formation Evaluation Group of the Stimulation Engineering and Design Section of Halliburton Services in their Research Center in Duncan, Oklahoma, where she went to work immediately after graduation in May, 1982.

Her group provides a technical link (in the area of oil and gas well stimulation) between Halliburton Research and Halliburton Services field personnel throughout the world, and when necessary, directly with Halliburton customers.

Mary has seven years experience in specialty testing of formation core samples for the primary purpose of providing stimulation recommendations. She has been responsible for the design of stimulation treatments ranging in cost from $5,000 to $1.5 million.

Her responsibilities include coordination of laboratory tests, maintenance of laboratory, evaluation of test results and preparation of recommendations for stimulation treatment. In some cases, stimulation recommendations are made based upon evaluation of previous treatment and well response data, rather than upon the results of laboratory testing. Mary is often required to travel to locations to assist in the treatments she has designed.

In addition to her tecnical expertise, good written and verbal communications skills are essential when she is called upon to instruct classes at Halliburton in Duncan and at customer schools located throughout the world.

Most of her travel is in the continental U.S., but she has been to Europe and Scandanavia on numerous occasions. Her current work is split roughly in half between domestic and international projects. Most of her international work involves North Sea and Middle East projects.

Pamela S. Tucker, *BSChE '83*

"The most unusual thing 3M has to offer," Pam said, "is the freedom to work on the project I want to pursue, and to approach it as I choose. I am not sure this much freedom exists in other, similar companies."

Since beginning her career at 3M nearly two years ago, Pam Tucker has worked in three different divisions, though always in the same area, electronic shielding materials, a new area for 3M. She is currently assigned to the Electrical Specialties Division at Austin, Texas.

Pam has worked on layered composite materials for injection molding of such things as computer, telephone, calculator and electronic housings. More recently, she has been investigating the electrical properties of ionomeric polymers.

While 3M has no electronic shielding products on the market right now, Pam predicts the company, if successful in this research, could have several within the next few years. Expected customers would be molders for computer and telephone companies, and automobile manufacturers.

"Most of my work is very individualized", she said, "rather than team oriented. I have worked with one other person on a couple of projects, but most of the time I am the only researcher on a particular pro-

ject. This has both advantages and disadvantages as one might presume," she said.

"I work in the Materials R & D group within my division. This group is comprised of others with a similar background," she said. "There are five women in my group now out of about 22 or 23 total. My experience is that being a woman is neither an advantage nor a disadvantage in this field, but the quality of the work produced and the rapport of the individual with others are very important," she observed. "At higher levels, gender may be a factor, but one of the six divisional technical directors here in Austin is a woman."

After completing her undergraduate degree in chemical engineering at OU, Pam finished graduate studies at the University of Texas, obtaining her master's degree in chemical engineering in 1986, and her Ph.D. in 1988.

"Just prior to finishing my degree at UT, I was selected to serve on the Younger Chemists Committee of the American Chemical Society. I now chair this committee and am learning a great deal about one of our premier professional societies. Our committee tries to address the needs of the chemical professional in transition, i.e., between school and an established career. We produce a newsletter biannually which is mailed to about 40,000 'younger chemists', conduct two symposia at each national ACS meeting, present about six Roadshows each year on career issues at campuses across the country, and we are in the process of completing a high quality slide-tape production containing seven modules on specific careers in chemistry for distribution at cost to colleges, universities, libraries and individuals."

Exercise and sports are a big part of Pam's life outside work. She and others from 3M run nearly every day during lunch-break to stay in shape. She also plays soccer and basketball and has participated in bike races, running races and triathlons since moving to Austin.

Pam and a friend bought a house on 1.5 acres in early 1988 and have remodelled extensively. They personally painted inside and out, wallpapered three rooms, laid ceramic tile in the bathrooms, kitchen and laundry rooms, doubled insulation in the attic, made and installed sunscreens over the west windows and installed ceiling fans. They contracted out carpet and rain gutter installation. They are now working on bringing order to the mostly wild yard by planting trees, bushes and cultivating flower beds.

Laurinda R. Crow, *BSChE '85*

Laurinda Crow was recruited away from Frito Lay by Mobil Chemical into a Management Trainee Program designed to provide a fast-paced, two-year, training environment. She is slated for promotion to a department manager position a mere five years since her graduation.

The Jacksonville, Illinois, facility where she has worked since August 1988 employs about 1600 people with both the Packaging and Consumer divisions represented. Both facilities extrude and convert various polyethylene products.

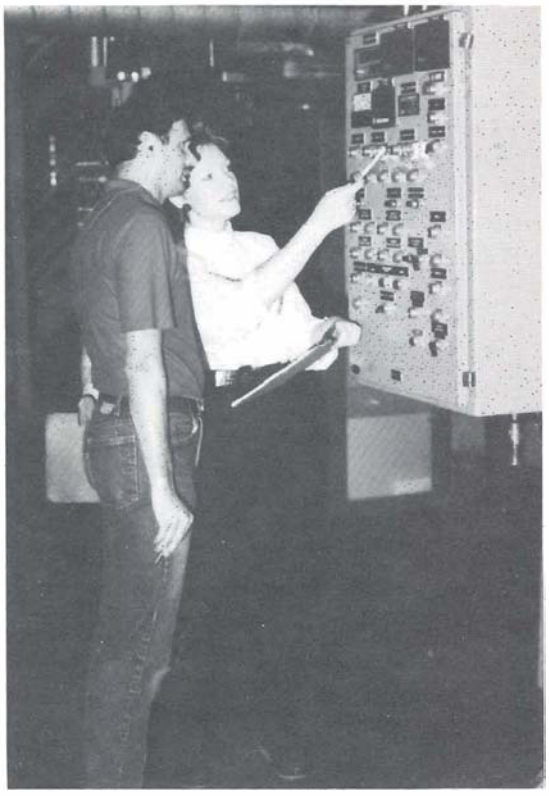
As the Cinch Sak Juran Quality Improvement Coordinator, Laurinda is responsible for 16 employes including two section leaders in Mobil's Cinch Sak Consumer Division. She teaches a company seminar in quality improvement and, this year, revised the Cinch Sak Job Safety Analysis Manual and wrote a Standard Operating Procedures Manual. She is currently developing the 1990 operating standards and overhead budget for the Cinch Sak department.

"The University of Oklahoma gave me the foundation and self confidence necessary to compete in the fast paced, manufacturing environment," she said. "The longer I am in industry, the more I realize how relevant the Chemical Engineering experience was to my personal development. Engineering develops a problem-solving ability and rationale that other disciplines do not offer."

"Industry, specifically manufacturing, is changing rapidly," she observed. "Process control is being implemented so quickly to adjust to the competitive market that trained individuals are in high demand. The current trend is to hire engineers into management development programs so they can manage these systems efficiently."

"I would encourage all undergraduates, specifically women, to not give up or become discouraged with the engineering program," she said.

"Even though I am not employed as an engineer, I would not have been hired into this position without my degree. I enjoy production because I always want to be in the middle



of 'the action'. It is challenging beyond words."

After graduation, Laurinda was employed by Baxter Healthcare (formerly Baxter-Travenol) in Mountain Home, Arkansas from January 1986 to November 1987, where she was involved in the manufacture of a frozen drug bag. As a production supervisor, she was responsible for 56 employes, including two group leaders, at the 1600-employe plant. Later, as a quality engineer, she was responsible for the three-shift drug bag operation at the facility, performing various process capability studies and validating all new machinery installed in the area. Her more personalized projects included writing and production of a 30 minute video of the frozen drug operation and instructing a communications seminar for all group leaders and maintenance employes.

In November 1987, Laurinda joined Frito Lay's Jackson, Mississippi plant where about 1000 employes make all potato chip and corn related snack items. As Potato Chip Packaging Manager, she implemented a scrap weighing system at Frito to track individual performance of her 25 employes in the high speed, SPC-controlled packaging environment. The system reduced scrap production by 50%.

Laurinda is currently single. She spends a good deal of private time in aerobics class or in free weight lifting. She attends personal development seminars and listens to taped seminars as well. Her latest passion is Indian beadwork, specifically earrings. She enjoys the small-town, very "mid-west" environment of Jacksonville and weekend get-togethers with friends for cookouts.

Michelle Magner, *BSChE '83, MSMetE '85*

Michelle Simmons Magner is employed as a metallurgical engineer for Hercules Aerospace at Magna, Utah, a division manufacturing rocket motors for both the space and defense industries, as well as solid propellant to fuel the motors. The division also manufactures graphite fibers and composite materials for the aerospace industry and for industrial, automotive and recreational markets.

Michelle's responsibilities include metallurgical support of government and private contracts for rocket motor manufacture. Her primary job functions involve material selection, failure analysis and corrosion prevention of tooling and facilities.

Michelle was metallurgical task team leader in the failure investigation of the propellant mixer fire of March 1989. The fire cost nearly $20 million in destroyed tooling and equipment, and in down town.

Michelle developed a repair process for the Trident II winding mandrels used in rocket motor case manufacture which prevented scrapping the tooling. This enabled a significant cost savings to the company.

"Coursework at OU proved extremely beneficial," Michelle said. "I use nearly every aspect of metallurgical training I learned at OU, along with much of the coursework taken in chemical engineering. In fact, I'm considering a leave of absence to return to OU to complete my Ph.D.," she said.

Outside her busy career, Michelle enjoys live theater, hiking and "most avidly—skiing. Utah definitely has THE greatest snow on Earth!" she said.

Susan Millsap, *BSChE '86*

"Combining marriage, a part-time job, and a two-hour daily commute with an average load of 18 credit hours was no easy task," said Susan Beth Millsap (formerly Lack) about her senior year at OU. "The experience taught me the value of commitment, wise time management, and good old-fashioned hard work," she said. "These are some of the very qualities sought by employers that have helped me successfully become a competent young engineer."

After graduation from OU, she was hired as an engineer by Energy Analysts, Inc., of Norman, a safety consulting engineering firm to the petrochemical industry. Her primary job activities involve comprehensive facility risk assessments including identification of potential hazards, hazard zone evaluation, and quantification of potential risk to off-site populations associated with each hazard.

As test director for a recent project involving small-scale atmospheric releases of monomethylamine and ethylene oxide, Susan was responsible for test design and coordination and data collection and analysis. She presented her findings at the First International Conference on Loss Containment in September 1989.

Susan maintains the Energy Analysts' Hazards Analysis Package (EAHAP) material data base and related instruction manuals and is involved in verification of the programs in EAHAP.

She also performs siting and feasibility studies for LNG facilities, including identification of possible storage tank/impoundment system designs to meet both capacity and code requirements. These studies involve hazard zone calculations, design optimization, and site layout recommendations.

She has co-authored four papers pertaining to aerosol releases, vapor cloud description, and storage tank siting.

Susan married Mark Millsap, M.D., an ophthalmologist in residence, during her senior year at OU. They live in Oklahoma City, but will soon relocate to Temple, Texas, where Mark will continue his residency.

Women Engineers, a Statistical Profile

In 1989, a nation-wide survey of members of the Society of Women Engineers was conducted under direction of Dr. Eleanor Baum, Dean of the Albert Nerken School of Engineering at the Cooper Union for the Advancement of Science and Art in New York City.

The survey revealed interesting statistics regarding the demographics of the working woman engineer, her career profile and expectations and job satisfaction. Some of the findings included:

- More than two thirds are 35 or younger. 57% received their bachelor's degree in the past 10 years.
- Nearly one third have a graduate degree in addition to an undergraduate engineering degree, but only 5% hold a Ph.D.
- Nearly 75% are members of other technical societies (such as A.I.Ch.E.).
- 89% are employed full time, with 93% of those in an engineering related field. Of the 4% employed part-time, nearly two thirds do so to spend more time with their children. Only 2% said that they were unable to find suitable work.
- The most common areas of engineering specialization were: Mechanical (9%), Management or Business Administration (7%), Electrical/Electronics (9%), Computer Science (6%), Environmental/Sanitary (6%), Civil (5%), Aerospace (4%) and Chemical (4%).
- 53.5% are employed in private industry. 13.3% work for federal, state and local governments, and 6.8% work in academia. Utilities employ 7%. 11.3% are consultants. Only 2.1% are self-employed.
- Nearly two thirds of women engineers have been working for less than 10 years and only 6% have been employed for 20 years or more.
- 82% said their engineering career has met the financial expectations they initially had. 71% earn under $50,000. 19% earn between $50,000 and $70,000, and 5.3% earn over $70,000. 44% of women engineers 35 years old or younger earn under $40,000. 59% of those over 35 earn over $50,000 and 30% earn over $70,000. 61% said they earned salaries equal to or greater than their husband's salary.
- 18% of women engineers cite management as their principle job function; design, 16%; analysis, 14%; development, 13%; and teaching, 4%.
- 40% have some supervisory responsibilities——19.5% supervise a project or section, 12% supervise a team or a unit, and 8% manage a major department or division.
- Asked to list their top three reasons for choosing the engineering profession, 72% wanted to do interesting work; 70% liked the challenge of solving problems; 58% expected to earn a good salary; 19% wanted a profession that was transferable throughout the world; and 13% anticipate opportunities to solve societal problems.
- 89% felt their profession is respected. 87% said that their jobs were interesting. 85% felt they do important work.

Seema Vad, *BSChE '86, MSChE '88*

"Dow is the largest chemical company in the U.S. and being a chemical engineer and working for the largest chemical company is very, very satisfying", said Seema Vad. "Dow is the leader in many technology frontiers in the chemical industry and I am very proud to be part of such an organization."

Seema is part of the product research group in Dow's Polyethylene Research Department in Freeport, Texas. The department, composed of 130 personnel, is broken down into process, product and specialty product research groups. All three conduct research involving ultra-low density, low density, linear low density and high density polyethylenes, used in films, sheets, injection molding, blow molding, fibers and rotomolding.

Seema's area of specialty is in linear low density polyethylene films used in such products as trash bags, sandwich bags, grocery sacks, merchandise bags, food packaging, diaper liners, stretch wrapping for unitized packaging and numerous other products.

Seema's research in resin development generally involves modification of structures of existing polyethylene resins by process modification or by a change in resin chemistry, but brand new resins and fabrication processes to produce them are her area of expertise.

Seema is responsible for evaluation and film property comparisons of products of experimental resins made in Dow's pilot plant, and comparisons of Dow product to that of the competition through competitive performance analyses.

Through additional research efforts, Seema helps Dow continuously improve blown film fabrication technology to help Dow's customers produce premium quality films with Dow resins and to achieve optimum properties. Results of her evaluation of various methods are presented to new and potential customers.

Marilyn Grass Culp, *BSChE '89*

Marilyn Grass Culp completed CEMS' premedical curriculum in chemical engineering in May 1989, and has since started classes in the University of Texas Southwestern Medical School at Dallas where she will be working toward the Doctor of Medicine degree.

"I hope to specialize in either Pediatrics or Opthalmology," she said, "however, I'm going to wait until I've finished my third and fourth year clinical rotations before making a definite decision."

During the fall of 1988, Marilyn volunteered at Dallas' Parkland Memorial Hospital in the surgical intensive care unit, the leading trauma center in the Southwest, and worked with many accident victims and AIDS patients.

"I enjoyed my experience at Parkland because I was able to give something to the community," she said, "while gaining further insight into the challenges of modern medicine."

Marilyn explored other areas of opportunity for chemical engineers while at OU, working summers for Kerr-McGee, Du Pont, ARCO, Mobil and Oklahoma Medical Research Foundation.

While at Mobil from January through July 1989, as a student intern technician, she was assigned to the Enhanced Oil Recovery group on a project involving design and construction of an apparatus for the study of CO^2/Oil miscible multiple contact phase behavior.

She was responsible for calibration and pressure testing of the new device and worked with her supervisor to develop an equation of state to match literature saturation data for Amoco Synthetic Oil. The experiments they designed to test the accuracy of the apparatus were successful with results matching the literature values to within 0.15%.

Marilyn's husband Brian is a graduate of the University of Missouri at Rolla in mechanical engineering and an engineer with ARCO based in Dallas. They reside in Carrollton, a northern suburb of Dallas.

Senior Vanessa Ong First Black Woman In Navy Nuclear Power Program

CEMS senior Vanessa Ong was selected as the first black woman ever to participate in the U.S. Navy's nuclear power program, which can be worth more than $34,000 during during a student's final two years at OU.

"I'm very proud of being selected, but I'm surprised that I'm the first," Vanessa said.

After graduation from OU, Vanessa will enter Officer Candidate School. Afterwards she'll be commissioned as an ensign and teach for four years at the Naval Nuclear Power School in Orlando, Florida.

"I do get to tour the facilities before I decide if I want to go there," she said. "I don't think too many people would turn it down."

While in Florida, she will be admitted to the master's program at the University of Central Florida. "I didn't want to graduate and go straight to work," Vanessa said. "I think this will be the best avenue for me to take. I have so many options," she said. "I'm getting my master's in computer science. I can either stay in the Navy and cross-train, or I can get out after four years. The opportunities are only limited by myself."

After completing her tour with the Navy, she will be enlisted for four years in the Navy Reserve.

Vanessa also recently received the national Black Engineer of the Year award in the student leadership category. Her selection makes this the

third straight year an OU engineering student has won this award sponsored by the Council of Engineering Deans of Historically Black Colleges and the Mobil Corporation.

CEMS Student Awards 1988-89

Outstanding juniors and seniors in CEMS were recognized with awards sponsored by industry, foundations and by OkChE, at a reception held in March 1989, following the spring meeting of OKChE.

Kimberly Yates, an Oklahoma City junior, was recognized as an outstanding junior by three awards. Her superior academic performance earned her the $100 American Institute of Chemical Engineers Award, as well as a $1,000 award by the Dow Chemical Company. Additionally, she received a $1000 scholarship sponsored by members of Tau Beta Pi general engineering honor society at the Kerr-McGee Corporation.

The Texaco Award for an outstanding junior in chemical engineering went to Ponca City, Oklahoma junior Derek Gregory.

Seniors receiving awards were Kris Christain of Newalla, Oklahoma, who received the $100 American Institute of Chemists Award; Burt Lampl of Shawnee, Oklahoma, recipient of the $200 Phillips Petroleum Company Award to an Outstanding Senior; Steven Shimoda, of Ponca City, recipient of the $200 Pamela Pesek Johnson Award to an Oustanding Senior in Process Design; Joseph Klepak, of Norman, who was recognized with the $200 Robert Vaughan Award for Excellence in Undergraduate Research. Norman senior Theadore Cole received the $800 F. Mark Townsend Scholarship for 1988-89. Taylor Walraven was recognized as the first recipient of the $800 Laurance Reid Scholarship in Natural Gas Engineering.

CEMS award winners in 1989 (left to right) Hans Christain, Derek Gregory, Ty Walraven, Joe Klepac, Kimberly Yates, Steven Shimoda, Ted Cole and Burt Lampl

Alumni Updates

Jeffrey Arnoldi (BSChE '76) and his family have relocated to Anchorage, Alaska. Jeffrey is senior engineer at ARCO Alaska, Inc. in "the last frontier".

Verne E. Griffith, Jr. (BSChE '62) has been promoted to president of Koch Engineering Co., Inc. He and his wife Susan live in Wichita, Kansas.

Richard Krenek II (BSChE '86) is a reservoir engineer in Exxon's Central Production Division in Houston. His current assignment includes field surveillance and project work for several Houston area oil fields. He recently completed a $10 million oil field acquisition as a special project. Rick and his wife Susan (formerly Champlin, of Norman) recently bought a home in Kingwood, Texas.

Sam Little, a former chemical engineering major and University Scholar at OU, recently started his third year of a six-year residency in urology at the University of Indiana Medical Center in Indianapolis. Sam entered OU on the early entry program in 1979 and continued here until 1983 when he was accepted at Washington University School of Medicine in St. Louis prior to receiving a baccalaureate degree. While in medical school, Sam received academic achievement awards in pathology and histology and was selected for membership in Alpha Omega Alpha, an honorary professional fraternity. He graduated first in his class and received numerous senior awards including the Dr. Robert Carter Medical School Prize, Alpha Omega Alpha Book Prize, John E. Kirk Scholastic Award, and the Louis and Dorothy Kovitz Senior Award in Surgery. Sam and his wife Michelle (formerly Bernier) have a six-week-old daughter, Stephanie Michelle.

Jay K. Morris (BSChE '81, MSChE '82) and his wife Lynn report that they've enjoyed their first year living in Zaire. Jay is lead production facilities engineer for Zaire Gulf Oil Company (Chevron). Jay and Lynn had their first child, John William, in February.

Kevin L. Steiner (MSChE 81, PhD '86) has joined International Bio-Synthetics, Inc. as senior research associate for its as senior research associate for its applications laboratory in Charlotte, North Carolina. He will provide technical support for the company's U.S. and Canada sales and marketing of enzyme products for the detergent industry.

Sheila Stuckey Tidwell (BSChE '78) is a loyal Sooner to the nth degree. She recently married Russell M. Tidwell, plant manager of the Dallas Water Utilities Waste Water Treatment Plant. Following the wedding ceremony which included Pachebel, Bach, Telemann and other classical selections, the traditional wedding recessional was followed by "Boomer Sooner," the University of Oklahoma fight song! Sheila is employed as city safety manager, risk management, for the city of Dallas.

Bernie Van Wie (BSChE '77) says "God invented sensors when he gave us nerve cells, so I figured I didn't need to start from scratch to build a sensor for the laboratory." Van Wie and a team of researchers at Washington State University have incorporated snails' brain cells into the design of a "living microchip." The "biochip" as Van Wie has called it, will be able to detect or "sense" exposure to chemicals, such as pesticide residues in food, identify the chemical, and measure the quantity. Though the chip looks like the average silicon variety, it contains a tiny well just large enough to hold the neurons. It also holds a circuit capable of processing information gathered by the neurons and transmitting it to a computer. Because the neurons are extremely sensitive, the biochip is expected to be much more effective than conventional sensors used in biological research, manufacturing and medical diagnosis.

New Alumni 1989

BSChE
Bobbie Joe Balentine
Cynthia Corbett Clark
Virginia Ann Clark
Curtis Bruce Kelly
Meng Hua Kin
Maurice B. Lampl III
William Douglas McClure
Timothy Allen Melton
Laura Renee Onofrey
Steven George Shimoda
Bernadette Imglok Tan
Ali Reza Taremi
Taylor James Walraven

MSChE
Olakunle John Fagbemi
Krishnan Gangadhar
Nancy Denise Gullickson
Marc Alfons Uyttendaele
Chechian Ko
Jeffrey Lynn Marnix
Fernando Otero
Clara Stella Ortiz
Donald Boyd Peterson
David Lee Steinhoff
Ahmadali Tabatabai

PhD ChE
Kevin Leslie Gering
Nicholas Peter Hankins
John Charles Kayser
Muhammad Alauddin Khan
Chon Lin Lee
David Michael Pfund
Philip Duke Nguyen
David Arthur Rockstraw
Mohammad Tahiri
Vinod Vashdev Tuliani
Rong Song Wu

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