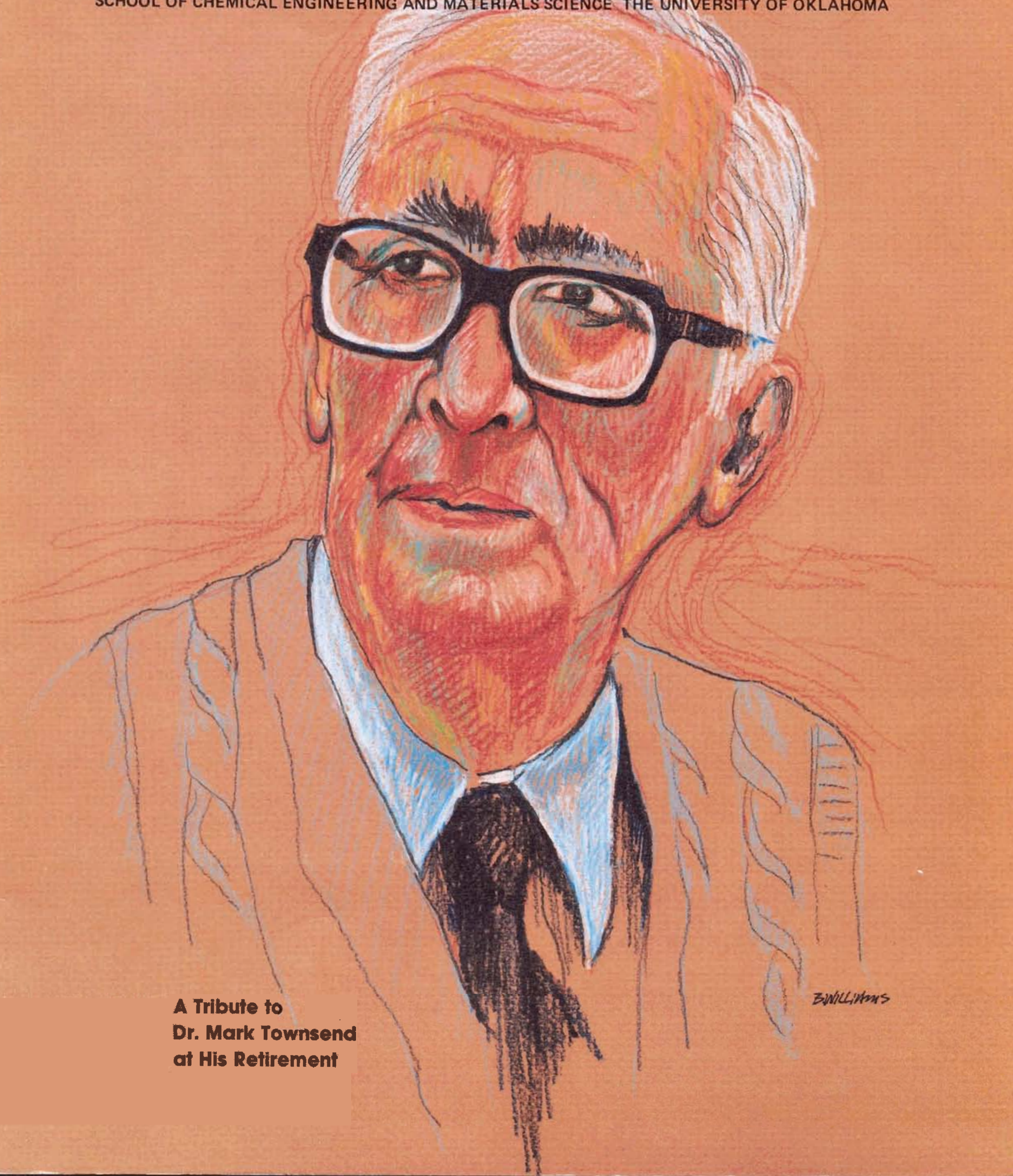
Spring 1983

OKCHE

SCHOOL OF CHEMICAL ENGINEERING AND MATERIALS SCIENCE THE UNIVERSITY OF OKLAHOMA



A Tribute to Dr. Mark Townsend at His Retirement

Contents

Spring, 1983

- Both master's and doctoral research dealt with the equilibria of the system triethylene glycol-water-natural gas. This work produced the fundamental data that established TEG as the most effective absorbent for dehydrating natural gas mixtures over a full range of field operating pressures. Today it is used to dehydrate the largest part of all natural gas going to market in the world.
- In 1952, Dr. Townsend discovered the sulfur-forming reaction between SO_2 and H_2S in an hygroscopic organic liquid medium of the glycol type in which a trace of water is the catalyst. The reaction has been developed into sour-gas treating processes. The generic form bears his name and is generally regarded as the "other" fundamental process with reference to the Claus process. To date, the Townsend process has been used to a limited degree (under license to IFP), but new technology promises extensive use soon, particularly in view of the increased value of natural gas and need for total sulfur recovery.
- He did a research project for the U. S. Air Force on contamination of JP-5 jet fuel in 1957–59. Dr. Townsend discovered the mechanism for detonating contaminated jet fuel-air mixtures in aircraft wing tanks by fuel-generated electrostatic discharges. This put an end to a rash of mid-air explosions of military aircraft flying in rough weather with JP-5 as fuel.
- His interest in gas dehydration turned to removal of water traces in organic liquids. A unique water exhaustion technique was developed that is now used in the petroleum industry to produce 100 percent glycols for super-dehydration of gas. Application of the principle to dewatering off-shore produced gas liquids prior to transport ashore is under consideration.
- Most recently, Dr. Townsend has been involved in developing technology for recovering and recycling methanol used to produce natural gas and hydrocarbon condensate by injecting it down-hole to decompose hydrates in reservoirs and in flow lines. This requires recovery from gas, hydrocarbon liquids, and produced brine—usually in a confined space on an off-shore platform located in very deep Arctic waters or in on-shore locations in very cold Arctic climates.

A younger Mark Townsend

These are only a few of his innovations and accomplishments. There are many more, for his is a truly curious, inventive mind. This may come as a surprise to many who know him well as a superb teacher and a tireless counselor. In addition, I can vouch for the fact that he is well known and highly respected in petroleum industry circles. A mutual friend once said to me. "Mark Townsend's greatest need is for a good press agent." But that item is last on his "want list."

Laurance S. Reid

From the Class of '59

One of the most vivid memories that I have of my engineering education is a story about Mark Townsend. Although the name and the number of the course in unit operations have long since slipped my mind, the lesson that Mark taught us all that day has stayed with me for 25 years.

The setting is an examination in unit operations on the second floor of the chemical engineering building which housed both the lecture facilities and a large portion of the unit operations laboratory. As always, Mark's rules allowed open notes, open books, and "smoke if you would like."

The problem this particular day was to evaluate the design of a distillation tower. Our task was to look at the feed streams and the design parameters as supplied by Dr. Townsend and to issue a judgment—would the tower, as designed, perform the separation as specified?

After two hours of contemplation, head scratching, plate-to-plate calculations by the graph method (this was long before the day of the computer), and probably an occasional glance to see what all of our neighbors were doing, the quiz came to an end. As was Mark's habit, he held discussion of the test immediately after he collected the papers.

It quickly became obvious that the class was divided down the middle—half felt that the tower would perform as designed, half were just as convinced that the tower would not meet the requirements called for in the design. After we had all been allowed our say, Dr. Townsend took the floor and taught a lesson that I have carried through life, and while I can't quote him word for word, it went something like this.

You have all just learned an interesting lesson, not only in engineering but in life as well. There aren't many things in this world that are black and white, that *obviously* work or don't work. Most of the problems that you will face as engineers and as managers and most of the decisions you will be required to make will not be supported by evidence that clearly tells you what to do. Life just doesn't work that way. But what life does require, just as does an engineering problem, is that you examine as carefully as you can the data that you've got at hand before you make your decision.

While the lesson Mark taught all of us that day really had very little to do with engineering specifically, it did have a great deal to do with engineering generally, and more important, a great deal to do with life in general.

When I left Norman with what I thought was a fairly solid grounding in engineering, I also came away with something much more valuable—a realization that, while engineering was the vehicle he used, Mark was really teaching a much broader lesson about the problems which we would all face in the coming years, not only in engineering and business but in our personal lives as well.

Robert Schwartz

Dr. Townsend is this year's recipient of the Brandon H. Griffith Award, which annually recognizes an engineering professor for contributions to student activities and welfare.

Dr. Townsend and his wife, Naomi, enjoy a lighter moment with faculty and students.

From the Class of '81

There is a plaque in the Carson Engineering Center with a picture of Dr. Mark Townsend on it and room for the names of many future students. These students will be the recipients of the F. M. Townsend Scholarship created by the senior class of 1981 to honor Dr. Townsend for his contribution to the education of so many chemical engineers.

The class chose to honor Dr. Townsend in this way because he exemplified the qualities of a superior instructor and was a personal favorite of many of the students. The senior class felt that Dr. Townsend had given them something special and wanted to let him know how much his efforts were appreciated. Because Dr. Townsend gave so much of himself to the students, it was only fitting that a scholarship fund to benefit future students be set up.

Dr. Townsend made an impression on the '81 seniors while teaching Chemical Engineering Design in the fall semester. He presented course material in a straightforward manner and always had the patience to go over the material as many times as was needed for the students to understand it. He was always available to give students personal help with problems. Dr. Townsend was never bogged down with homework deadlines but was more concerned that the material covered was understood fully by students. He had faith in the students' desire to learn, and he helped them all he could.

Dr. Townsend has always been interested in his students as people as well as "young engineers." One never passed Dr. Townsend in the hall without hearing a friendly hello. In conversations, he was concerned about a student's personal life and remembered each student's interests. Dr. Townsend was always willing to listen to his students' problems and to share in their triumphs and to offer a few words of encouragement, comfort, or wisdom.

Though Dr. Townsend can never be repaid for the contribution he made to his many students over the years, the F. M. Townsend Scholarship is an attempt to provide future chemical engineers with a little of the generosity displayed by Dr. Townsend.

T. K. Boguski

From the Class of '83

"Are you in love?" Dr. Townsend asked, smiling. I had just finished describing my problems of lack of concentration, blanking out on tests, and having bouts of depression.

A sophomore in my fall semester, I feared losing my scholarship and came to him in tears to find out if anything could be done. Through his tutoring and counseling, I was able to get through that semester, and five more.

Dr. Townsend, through his Christian understanding, taught me how to have faith in myself. In all my college classes, that was the greatest lesson. I hope to show my gratitude to him by helping others when they falter as he helped me.

Sharon Potter

OKChE Board Meeting, 1982

We had a very significant OKChE board meeting on November 12, 1982. We found that several members have now retired from their industrial positions and have resigned from the OKChE board of directors. Therefore, we discussed changing the membership of the OKChE board to 15 for the present time.

It was decided that we should try to include some of the younger as well as female members of OU alumni as board members. A nominating committee made up of Dick Askew, Sam Sofer, Charles Perry, and Carl Locke was formed, and several names were suggested for this group to contact.

Charles Perry offered to draft a new set of bylaws for the OKChE board encompassing a restructure of board membership to include having a three-year option on membership. At the end of three years, a member would have an opportunity to discontinue or to stay at least one more term on the board.

In addition, we had some discussion of the metallurgical program in light of the accreditation report which indicated we have insufficient numbers of faculty in that program. We discussed the demand for metallurgical engineers and concluded that materials engineers were needed and that "metallurgical engineers" might be too specific a term.

A review of the status of the Energy Center included an examination of our area to be occupied in the building, approximately 25,000 square feet.

We discussed the possibility of having a building on South Campus to house gas processing research and other research including high-pressure experiments that would be difficult to conduct in the Carson Engineering Center. An additional building may well develop into a feasible project for the department.

The OKChE contributions for this past year had dropped from the

President William S. Banowsky (left) was on hand to greet faculty member Jay Radovich (right) and OkChE member Ed Lindenberg.

previous years; we have some concern about how to continue to encourage the donations. We discussed the OKChE magazine and continued publication of it twice a year. We felt that it was important for the magazine to continue to be published regularly in order to maintain contact with the alumni and develop contributions.

Expenditures for October 1981–October 1982 are shown in Table I. Donations for the year are shown in Table II.

We also decided to have a meeting in the spring to review the bylaws and organize ourselves in order to continue as an effective support group for the school.

The meeting included also, as usual, a reception involving scholarship students, at which time Lowry Blakeburn was presented the F. Mark Townsend Scholarship.

TABLE I
OKChE Expenditures
Oct. '81–Oct. '82

Scholarships	$10,350
OKChE Magazine	6,229
Meeting Expenses	1,522
Computer Terminals	1,700
Student Related Expenses (trips, meeting)	2,022
Miscellaneous	204
TOTAL	*$22,027

* The expenditures and contributions certainly do not balance, as these data indicate. We have been able to continue our scholarship support only because of the residual funds from previous years' donations. However, we cannot continue in this mode for very long. Unless donations increase, we will have to cut back on our expenditures.

TABLE II
OKChE Contribution Summary
1981–82

First Quarter	
Contributions	$ 4,615
Company Matching	2,360
First Quarter Total (25 contributors)	$ 6,975
Second Quarter	
Contributions	$ 60
Company Matching	
Second Quarter Total (2 contributors)	$ 60
Third Quarter	
Contributions	150
Company Matching	50
Third Quarter Total (3 contributors)	$ 200
Fourth Quarter	
Contributions	3,215
Company Matching	3,000
Fourth Quarter Total (15 contributors)	$ 6,215
TOTAL	$13,450

The OkChE board had a number of important matters to discuss at its November meeting.

Professors Enc[redacted]a[redacted]e Undergraduates in Research

Dr. Ed O'Rear: Flow Properties of Red Blood Cells

A red blood cell is often described as a bioconcave disc which is typically eight microns in diameter and two microns thick. In their normal role, red blood cells—or erythrocytes—are responsible for transporting oxygen from the lungs to the various tissues of the body. As the erythrocyte flows through vessels and organs of the body, it must be able to change its shape in order to traverse successfully the three-micron passages of the capillaries or the spleen.

While appearing normal under the microscope, pathologic cells may have significantly abnormal flow properties. The consequence of a decrease in deformability is a greater likelihood that the red cells will be trapped by the spleen and removed from the circulation. This increased blood loss can be a major factor in hemolytic anemias.

Looking at altered red-blood-cell flow properties for conditions of diabetes and conditions associated with chronic renal failure and heart valve replacement are six undergraduates in Professor Ed O'Rear's laboratory. This group and others around the world have investigated the biochemical changes that are concomitant with these abnormal physical properties of the cell.

As an example, increased intracellular calcium and decreased deformability have been found for red blood cells exposed to nonphysiologic fluid forces. Mechanical trauma or stress exposure due to these forces may be found in prosthetic heart valves, hemodialysis units, and other currently used medical devices.

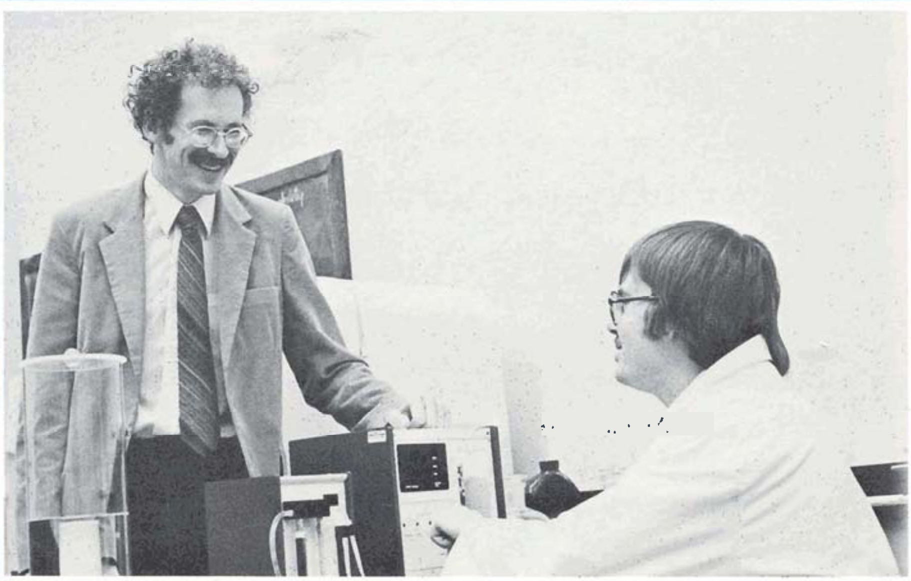
In the laboratory, this subhemolytic damage can be mimicked with the aid of a viscometer. As a result, therapeutic agents can be evaluated without taking blood from patients who cannot afford to give it.

Much of the present work at OU concentrates on the rational selection and *in vitro* testing of potential therapeutic drugs. One such compound, a Ca^{++}-antagonist, has already shown promising preliminary results.

Undergraduate research such as flow characteristics of red blood cells affords the student a unique educational experience beyond that of the classroom or lab. All of O'Rear's students must learn efficient use of the library, proper experimental techniques under the supervision of a graduate student, and effective means of presenting hard-earned results.

For the undergraduate, however, the greatest benefit of all is the opportunity to sample an important aspect of a graduate education before making a career decision.

Students Ali Arshad, Khoi Hoang, and Becky Savell prepare a laboratory viscometer for the exposure of a blood sample to nonphysiologic shear stresses.



Dr. Ed O'Rear (left) oversees a cell count by Ralph Markland.

Dr. John Scamehorn: Enhanced Oil Recovery

Primary production of oil (just pumping it out of the ground) only results in recovery of 35 percent of the oil in place. Secondary production by waterflooding results in another 10 percent recovery. This leaves over half of the oil in the ground. Enhanced oil recovery techniques are aimed at tapping this enormous target of unrecovered oil.

Professor John Scamehorn is supervising research in enhanced oil recovery by surfactant flooding in CEMS at OU. In this technique, a surfactant or detergent solution is pumped into the reservoir through an injection well and washes trapped oil out of pores in the rock as it flows toward the production well.

It is estimated that surfactant flooding can recover eight billion additional barrels of oil in the United States alone. However, 75 percent of this oil cannot be recovered by existing technology, mainly because of reservoir salinities and temperatures.

The focus of Scamehorn's project is to develop surfactant systems which will work under a wider range of conditions and will be less expensive than current systems. The goal is to use mixtures of ionic and nonionic surfactants instead of just one surfactant type. These surfactant mixtures exhibit large thermodynamic nonidealities of mixing which can be synergistic in enhanced oil recovery if one knows how to take advantage of the behavior.

Dr. John Scamehorn (foreground) has had little difficulty getting students (left to right) Obaidul Haque, Jim Rathman, Odie Yoesting, Mike Thompson, Cuong Nguyen, Bob Dunn, and Bruce Roberts to work on his research projects, shown here with the high-performance liquid chromatograph.

For example, Scamehorn has ongoing studies in the minimization of surfactant adsorption on minerals and surfactant precipitation, two mechanisms by which surfactant is lost or wasted. These processes can "make or break" a flooding operation.

Others also think that Scamehorn's ideas have real potential since he has received grants for research from the National Science Foundation, the American Chemical Society, the OU Energy Resources Center, and the Oklahoma Mining and Mineral Resources Research Institute.

This research may appear more like petroleum engineering than chemical engineering, but because of the chemistry involved, chemical engineers have a background which uniquely qualifies them to study this technology. Most of the people studying surfactant flooding in industry and academia are chemical engineers.

"Perhaps it is because they recognize the value of training in this area in the job market, but I have had no trouble recruiting students on the project," says Scamehorn, who has had seven graduate students and 10 undergraduates involved on the project during the past two years.

1983 Senior Design Projects

Once again this year the Advanced Process Design students have developed projects of which our department is justifiably proud. We would like to share with you the topics that have interested these students.

Anaerobicise

Mark Boren, Martin Herlacher, Kyle Pearson, Steve Rickey

Our group will produce methane gas by processing municipal sewage using anaerobic bacterial digestion. We will utilize solar energy as our primary heating source, and the product gases will be processed to recover methane that can be marketed or used as a back-up energy source.

Cepar

Mohamed Al-Kaakaty, Kamal Chebli, Hussein Elhage, Maria Palacios, Steve Roark

Cepar will design and evaluate a 100 ton-per-day methanol plant using cow manure as biogas feedstock in the Hereford-Demit area of the Texas Panhandle. The design includes optimization of critical parameters to maximize feedstock conversion and minimize operating costs and total capital investment.

Design Specialists Incorporated

Geoff Chappell, Arlen Honts, Mike Parker, Ward Zerger

The purpose of the DSI project is to produce 99.95 percent pure ethylene from a natural gas feedstock. The process will include, but not be limited to, cryogenic separation, catalytic cracking, and possibly selective adsorbance.

Oilco

Ali Arshad, Brad Eckhardt, Mike Jones, Eddie Snow

Oilco plans to recover carbon dioxide from a natural gas sweetening plant using the physical solvent Selexol. The carbon dioxide will then be transmitted by pipeline for injection into existing oil wells for tertiary oil recovery.

Pep

Rowena Buck, Susan Dockery, Cuong Nguyen, Kelly Skaggs

Pep is designing a plant to produce linear low-density polyethylene from ethane. The ethane will be thermally cracked to form ethylene and then will be converted to polyethylene using the Unipol catalyst.

Techniques

Suzan Cox, Dean Loftin, Tom Long, Tom Perry

The intent of Techniques is to design a coal gasification facility, focusing on the gasification, gas sweetening, and sulfur recovery steps. Several methods for each step will be examined and recommendations will be made on economic, productive, and environmental efficiencies.

Developers of Unique Designs

Don Armijo, Jack Lane, Craig Narum, Jim Rathman

DUD will design a natural gas sweetening process using current membrane technology. Our plant will produce a salable natural gas stream, a carbon dioxide enriched gas stream for reinjection in an EOR project, and elemental sulfur from sour-gas feeds varying from 50 to 150 MMSCFD.

Just Design Students

Dale Christian, Paula Root, Chiu Kwan So, Byron Yee

JDS is designing a process to produce soybean oil and high-protein meal from soybeans. In our process, supercritical carbon dioxide is used in the extraction instead of hexane. Supercritical carbon dioxide gives comparable oil yield as hexane, is less hazardous, and eliminates the process of organic-solvent removal.

MINR

Man-Kwan Chien, Richard Davis, Ibrahim Jaber, Marla Noak

MINR will design a process for the production of 1000 gal. per hour of ethyl alcohol from grain using immobilized yeast. Carbon dioxide and 700 lb. per hour of high-protein distillers dried grain will also be produced. We will examine markets for this foodstuff and methods for preserving it.

Let's Race

Joyce Callen, Bernard Haley, Donna Graham, Sharon Potter

The purpose of our project is to produce 5 million lb. per year of dimethylsulfoxide from the black liquor of a pulp plant. Market outlook, economical feasibility, and local and global optimization will be considered.

LNG

Bruce Barton, Abeer Choudhury, Jamal Saleh, Khaled Shana'a

Liquefied natural gas serves as an alternative to pipeline gas transmission under conditions in which such a mode of transportation is not feasible. LNG will design an expander cycle base-load natural gas liquefaction plant capable of processing 700 MMSCFD of natural gas. LNG will consider process optimization and plant economics in the final design.

MASH

Carl Camp, James Canavan, Daria Di Scipio, Michael Patry, Jeff Pursley

MASH will design a mobile blood detoxification unit using immobilized enzymes in a fluidized bed reactor. This device is to be used as an assist during the treatment of liver disorders caused by hepatic enzyme damage or deficiencies. Our critical design parameters are considered from the viewpoint of clinical application, process control, biocompatibility, scale-down, and the economics of mass production.

Aggressive Engineering

Phil Applegate, Daryl Bitting, Russ Davidson, Hamid Farzammehr

Our group is working with the process which produces insulin manufactured from *E. coli*. It has been genetically engineered to produce two chains of peptides that can be combined into biosynthetic human insulin. This technology might someday solve the projected insulin shortage and give diabetics an alternative to animal insulins currently being used.

Cryo Gyro

Lowry Blakeburn, Johnny Jordan, Bill Swain, Pam Tucker

Our group will design air separation plants to produce nitrogen as the major product. We will consider several process configurations along with economic evaluations and the process variables used in sizing and optimizing the plant designs.

Plasmatics

Charlie Ahn, Mike Bresson, Mai Nguyen, Stephen Orr

Our project is concerned with converting atactic polypropylene and other industrial waste plastics into usable fuel oils. The product of the pyrolysis will then be flash-distilled and condensed into two usable hydrocarbon fractions, the low-boiling fraction consisting of 76 percent alkenes and 23 percent alkanes, and the high-boiling fraction consisting of 92 percent alkenes and 6 percent alkanes.

The Bean Machine

Mark Langenberg, Tom Langland, Sumner Tison, Thai Tran

Soya lecithin, a natural emulsifier and dispersant, has many diverse uses in the food and chemical industries. Our group will design a plant to process 2,000 short tons of soybeans per day, producing soybean meal, semi-refined oil, and bulk and modified lecithins.

FSI

Larry Erickson, Chris Grout, Doug Nath, Tom Stone

FSI will design an alternative primary process for synthesizing butadiene from butene for the further production of synthetic rubber. It is our intention to produce 600 million pounds per year of a 99.5 percent pure product from 1.6 billion pounds per year of feedstock with a net profit of $5 million per year assuming a rate of return of 15 percent.

Oklahoma Research and Engineering

Mark Kennelley, Virginia Luster, Michelle Simmons, Carol St. John

ORE will design a chlorination process to produce titanium dioxide pigment from ilmenite ore. This process will be compared to current technology which uses rutile, an ore consisting largely of titanium dioxide, which is less abundant and more costly than ilmenite.

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Pride and Engineering Go Together

Musical engineers may not be the norm, but for years now, talented OU engineering students have been taking a few hours out of their studies each week to participate in OU's marching band.

Each fall, just before classes begin, 400 students audition for the Pride of Oklahoma marching band. Of these, 208 plus 15 alternates are selected, and in any given year, several band members will be chemical engineering students.

CEMS director, Carl Locke, says about these marching engineers: "In our department there is a long tradition of having chemical engineering students who play in the marching band. We are proud of them because so many are outstanding students in chemical engineering, and they show their versatility by playing in the band as well."

This past year, 10 CEMS majors were among the select group.

Carol St. John, Norman senior, has played with the Pride for four years. She emphasizes that playing in the band has meant "an awful lot" to her.

"Occasionally, I had to miss plant trips because of Friday practices and that was disappointing," Carol says, "but if I had to do it all over again, I'd certainly choose to play in the band. The friends I've made and the opportunity to meet people with different majors have made it all worthwhile."

Gene Thrailkill, director of the Pride, singles out Carol in particular for the loyalty she has shown to the band during these last four years. And he generalizes about the loyalty of many engineering students who stay with the band because "they want to be involved, not because it is required," as is the case with music majors.

Despite loyalty and despite their skill as musicians, which he also commends, CEMS majors are very rarely the recipients of band scholarships, which usually go to music majors.

"Many engineering students are excellent musicians and could qualify for a band scholarship, if we just had more funds available," the band director says.

Thrailkill would like to see the establishment of several joint band-engineering scholarships that would be open to outstanding engineering students who also play in the band.

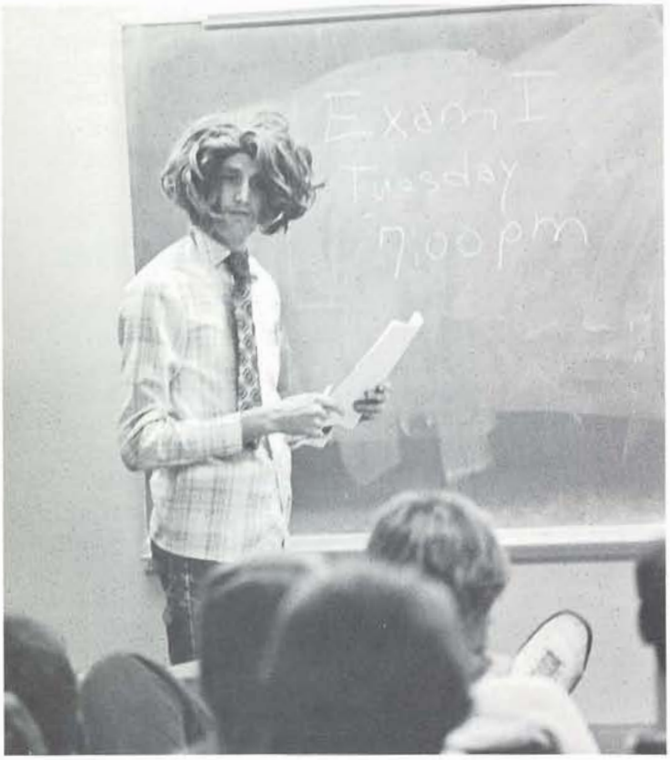
Gaining a spot in the Pride is no small achievement, but from Thrailkill's point of view, education has to come first. And a person's decision to attend OU has to be based on the quality of education available here—not on a guaranteed place in the marching band.

He says, "Every year some student will come to me and say, 'I'll come to OU if I can play in the band. If I can't, I may go somewhere else to study engineering.' My response even to an outstanding musician is, 'Go where you think you can get the best education.' By making my priorities clear, I know the students who play in the band are here because they believe OU is the best place to get their education."

The loyalty, the versatility, the challenge that go with being part of the outstanding Pride of Oklahoma organization characterize these engineering students. They have chosen to attend OU for the excellent education they can gain here, and they have chosen to spend many of their free hours marching with the Pride.

Marching chemical engineers: (front row from left) Gary Simons, Tulsa, trumpet; Tim Holt, Pryor, trumpet; Antoinette McDaniel, Spencer, clarinet; Paula Root, Norman, flute; Ann Poindexter, Tulsa, trumpet; (back row from left) Warren Becraft, Ponca City, French horn; Billie Winter, Bartlesville, clarinet; Sheri Breece, Richland, W.V., clarinet; Linda Kaiser, Enid, clarinet; Carol St. John, Norman, French horn. Gene Thrailkill, director of bands.

CEMS Student-Faculty Roast, 1983



The students proved they could give as well as take the roasting. Here Brad Lowery performs.

In CEMS the pizza-and-beer tradition is second only to senior awards and roasted faculty members, all of which continued this spring. There were some notable additions to this year's version of the student-faculty roast, however.

This was the first (and last) year that Dr. Townsend was roasted. He was still smiling when it was all over, so he must not have been burned too badly.

Also this year, the students chose to use the technology of videotape and slides for much of their presentation. Although hard to reproduce in magazine format, they were nevertheless effective in showing just exactly what goes on in CEMS—the true story!

Not to be outdone, the faculty gave a series of awards to outstanding seniors, including—to Sharon Potter—the Scarlet O'Hara Sound Alike Award, and to Will Kastens, the Honorary Senior Class Advisor Award because he has been a senior longer than anyone else.

Opening the evening, but closing this report, the roast featured a highly literary effort by Dr. Locke. Below you will find a slightly condensed version (the flavor and meter are definitely retained) of Dr. Locke's sendoff to the Class of '83.

Dr. Carl Locke announces the senior awards, meticulously selected and written on a paper napkin.

An Ode to the Class of '83

Well here we are at another Roast,
And about another class we'd like to boast.
I'm sure you will all agree
This is a vintage class—you of '83.

You students have had a lot of fun
In all your classes as you stay on the run.
It started in Fundamentals with good ole Dr. Bob,
His elegant elephant problems really made you sob.

And what a fine thing you were all found in—
Two courses back to back with Dr. Mark Townsend.
You were the last of a long line of grateful engineers;
This was his last semester of teaching after 30 years.

In kinetics I'm sure you did not sadden,
As through back mix and tubular reactors you were led by Mike Madden.
This semester, isn't it great you now find
How much fun it is to boogie with Dr. Sofer in Process Design?

Enough of all that about faculty and other trivia,
A tribute to you good students we really want to deliver.
At graduation, when in your cap and gown people see you sob,
Some may think it sadness, when really you're crying for a job!

Jobs are tight now for all with a B.S. in Ch E.
But this is a temporary thing, just you wait and see.
Times like this before have come and gone;
Work will come to you before very long.

We hope you look back at us with feelings so fine
Because at OU we've seen you really shine.
Good engineers we know you will be
The guys and gals — Class of 1983!

Alumni Notes

Let us know where you are and what you are doing. Please fill out one of the enclosed information cards and send it to us. We will publish the information in our next issue of *OkChE*.

1940s

J. Barker Killgore, BS '40, 966 Monterrey Blvd., Baton Rouge, LA 70815, is retired.
William P. Orr, BS '40, 137 Canoe Brook Parkway, Summit, NJ 07901, retired in Sept. 1982. He was formerly chairman of Lummus Group Inc.
Lee C. Parker, BS '40, 2300 Wignall, Port Arthur, TX 77640, has retired from Texaco.
Gerald A. Conger, BS '44, 701 Wayland Drive, Arlington TX 76012, has moved his home and engineering consultant business to Texas.
Earl E. Patterson, BS '44, MS '47, 8318 Whitewood Road, Richmond, VA 23235, retired from Reynolds Metals, and with 19 other retirees has formed a consulting company called Experience Associates Inc.
Zane Q. Johnson, BS '47, 556 Squaw Run Road E., Pittsburgh, PA 15238, is retired.
Ed C. Lindenberg, BS '47, Box 1589, Tulsa, OK 74102, is the senior vice president of Warren Petroleum Co.
Gene K. Reinmuth, BS '49, MS '50, 507 Nautilus, Crosby, TX 77532, is the director of marketing research (plastics) with Phillips Chemical in Houston.

1950s

Ron G. Bruce, BS '58, MS '59, 2530 Parana, Houston, TX 77080, is assistant manager of refining operations planning for Conoco Inc.
Charles W. Sayles, BS '59, 6174 Dalecrest, Woodland Hills, CA 71367, recently joined the nuclear engineering staff of Southern California Edison after nearly 19 years with Rockwell International.

1960s

Burt Espy, BS '61, 20824 SW Teton, Tualatin, OR 97062, is self-employed at the Lake Grove Chiropractic Clinic.
John H. Waller, BS '61, 16100 Baywood, Granger, IN 46530, is vice president for sales and engineering with Speareflex.
James D. Butterworth, BS '62, 21305 Canyon View Dr., Saratoga, CA 95070, is vice president for marketing with Prentice Corp.
Richard A. Hall, BS '62, Box 35034, Dallas, TX 75235, works for Frito-Lay as Area IV vice president—manufacturing.
Harry W. West, PhD '68, 42 Bond Street, Brighton, England BN1—1 RD, is employed by the Engineering Design Group Inc.
Michael Kopplin, 11611 Sela Lane, Houston, TX 77072, works for the Randall Corp. as a process engineer.

1970s

Fred Hall, BS '71, 50 Metacomet Street, Wrentham, MA 02093, recently moved to Massachusetts after accepting a position with the Foxboro Co. in the energy and minerals industry division.
Hafez Hafezzadeh, MS '77, 3205 S. Roanoke, Springfield, MO 65807, works as a project engineer with Syntex Inc.
Charles Thomas, BS '77, 3410 Meadow Lane, Ponca City, OK 74601, is a senior process engineer with Conoco.
Bill Hinson, BS '78, 1006 Thomason, Huntsville, TX 77340, is the campus director of Campus Crusade for Christ at Sam Houston State University.

1980s

Terrie K. Boguski, BS '81, 812 Plantation, Angleton, TX 77515, is an associate engineer with Amoco Chemicals Corp. and the mother of a new daughter, Rebecca Lynne, born November 16, 1982.
Kaylan Mitra, MS '82, Box 4642, Downey, CA 90241, recently joined Teck Form Products in Anaheim, Calif., as materials engineer working on high-grade and microelectronics items specifically on caubarizing.

Faculty Update

R. D. Daniels presented a paper entitled "A Model for Radiation Blistering" at the Third International Conference on Hydrogen in Metals in Paris, June 6–10, 1982.
Rex T. Ellington was elected fellow in AIChE in December 1982. He was also notified by GRI of acceptance of a $247,000 proposal for compressibility factor data acquisition.
Ed. A. O'Rear was awarded a grant-in-aid from the American Heart Association to study the effects of Ca^{++}-antagonists on altered red cell deformability. This is a prestigious and highly competitive award. He also received an Outstanding Young Men of America, 1982, award.
J. M. Radovich was elected director of ASEE Delos Division. Last summer he presented a seminar on chemical engineering laboratory courses at ASEE summer school in Santa Barbara, Calif., and worked as a senior engineer at Warren Petroleum as part of an industry-university interaction program.
John F. Scamehorn published four articles in technical journals last year and chaired a technical session on adsorption at the National AIChE meeting in Houston. He received research grants from the National Science Foundation and the American Chemical Society. He also received an Outstanding Young Men of America, 1982, award.
Kenneth E. Starling was named to the editorial board of *AIChE Journal*.