Louisiana State University

CHEMICAL ENGINEERING

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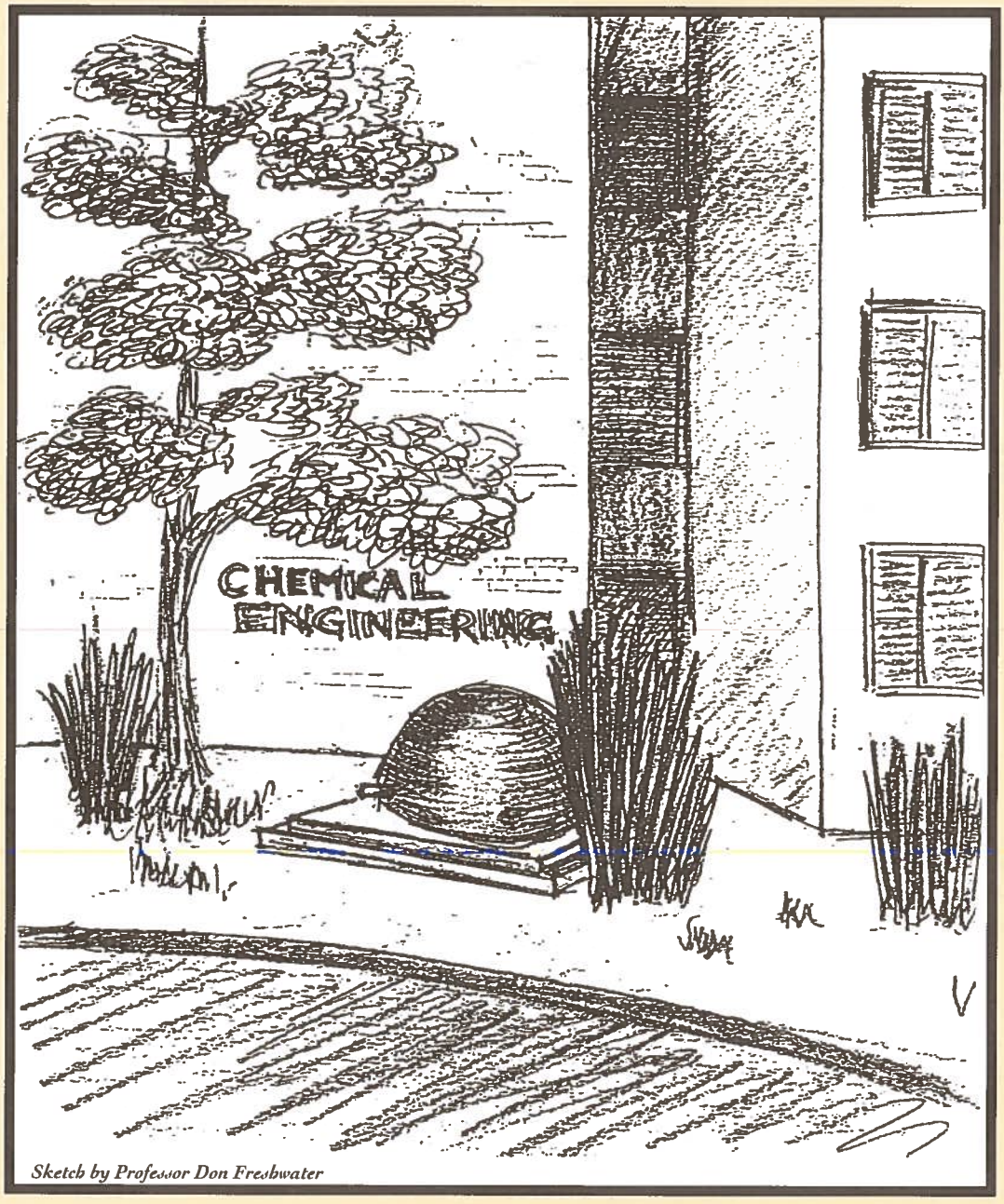

Sketch by Professor Don Freshwater

IN THIS ISSUE

A Letter from the Chairman

Dear Alumni and Friends:

I would like to begin by bringing everyone up to date on department news. After serving the department as chairman for the past three years, Professor Arthur Sterling has decided to return to full-time teaching and research. I would like to express to him the department's appreciation for his service.

On January 1, I became chairman. I am extremely pleased that the faculty and dean had the confidence to allow me to serve the department in this capacity.

There have been so many other changes in the department that it is difficult to know where to start. Five new faculty members have been hired recently. **Maciej (Mac) Radosz** has joined us as the M. F. Gautreaux/Ethyl Corporation Chair. He brings an international reputation in the study of polymer phase behavior, and he is currently serving as the editor of *Fluid Phase Equilibria* and a member of the editorial board of the *Journal of Chemical and Engineering Data*. Prior to joining LSU, Radosz spent 14 years with Exxon Research and Engineering Company in New Jersey. **K. T. Valsaraj** joined the department as an associate professor in 1995. He has expertise in environmental chemical engineering and received a Ph.D. from Vanderbilt University. **Mike Henson** joined us after completing his doctoral work at the University of California at Santa Barbara and a two-year post-doctoral position at Dupont. Henson's area of expertise is process control. He recently won the prestigious Career Development Award from the National Science Foundation, and his book with Dale Seborg, *Nonlinear Process Control*, was recently published. **Karsten Thompson** recently received his Ph.D. from the University of Michigan and he is currently establishing his research in flow and reaction in porous media. In early January 1998, **Elizabeth (Lisa) Podlaha** joined the faculty after several years as a scientific collaborator at the ETHL in Switzerland. She will be working with CAMD (Center for Advanced Microstructures and Devices) and establishing research in the electrochemical area.

Frank Groves retired, and then after a few hours, he decided he missed the department and students so much that he returned as a part-time faculty member. His part-time efforts are generally 8:30-5 daily, and I know all his students appreciate his advice and insight into chemical engineering.

A number of faculty members have written books and several more books are near completion. **Louis Thibodeaux** has completed the second edition of his book, *Chemodynamics*. **K. T. Valsaraj** has had his book, *Elements of Environmental Engineering — Thermodynamics and Kinetics*, published. **Danny Reible**, in addition to his duties as director of the EPA Hazardous Substances Research Center (South and Southwest), has just mailed the final version of his book, *Fundamentals of Environmental Engineering*, to the publishers. **Armando Corripio**, with Prof. Carlos Smith (University of South Florida), has completed the second edition of *Principles and Practice of Automatic Process Control*. **Ralph Pike** is actively working on the second edition of his book, *Optimization for Engineering Systems*. This is really an amazing amount of activity, considering each of these faculty members is teaching a full complement of classes and actively pursuing research.

Adam (Ted) Bourgoyne, dean of the College of Engineering, has agreed to help us update and refurbish the undergraduate lab. The College will provide a dollar-to-dollar match with the department for the modernization. The total investment is targeted at $200,000, and our contribution will come from past, and hopefully future, alumni donations to the department. **Kerry Dooley** is in charge of the project, and he is being assisted by **Daren Launey**, our computer systems manager, and **Bob Perkins**, our undergraduate lab manager. Dooley plans to add computer data acquisition and control to the lab experiments; it is crucial that our graduates are well-educated in these areas. If anyone is involved with this kind of work, I am sure Dooley would enjoy speaking with you. In addition to the planned modernization, our undergraduate lab also needs new experiments. We would really like to work with local companies to develop up-to-date experiments for our undergraduate lab. Many of you have fond memories of some of the vintage 70s experiments and classics such as the tank draining experiment. With industrial help and expertise, I believe we could bring four or five entirely new experiments to our undergraduate lab. These new experiments, plus the ongoing work by Dooley, could make our undergraduate lab really first-rate. If anyone can help us with this overhaul, please get in touch with me or Kerry Dooley. A more detailed write-up of the planned improvements can be found elsewhere in this newsletter.

The department successfully completed ABET accreditation, and we are in the initial stages of assembling our Industrial Advisory Committee. Al Lopez (Vice President, Exxon Research & Engineering Company) has agreed to chair the committee. An important goal this year is to renew our strong industrial ties.

Also at the end of this newsletter there is an Alumni Information Form, which I encourage everyone to return. We will include updated information in our next newsletter. Please tell anyone interested that this issue of the newsletter can be found on the department's web page at http://www.che.lsu.edu

In closing, let me wish you the very best for 1998. When you visit Baton Rouge, please stop by the department. The faculty and I, as well as your fellow classmates, want to hear from you.

F. Carl Knopf
Acting Professor and Chairman

This newsletter can be found on the department's web page: http://www.che.lsu.edu

General Department News

Gifts to the Department

We greatly appreciate the generous gifts and contributions the following alumni and corporations have made to the department.

Alumni

Henry Abbott (B.S., '49)
Jeffrey W. Alfolter, Jr. (B.S., '71)
Edwin L. Anderson (M.S., '62)
Robert D. Anding (M.S., '48)
Robert J. Bujol (B.S., '43)
Joseph Butterworth, Jr. (B.S., '49)
Joseph P. Cagnolatti '56; M.S., '62)
Mr. & Mrs. John H. Cartwright
N. Y. Chen (M.S., '54)
M/M. Armando Corripio (Ph.D., '70)
Adrian D. Cox, Sr. (B.S., '40)
Paul J. D'Amico (B.S., '92)
Roy P. Daniels (B.S., '26)
Galen M. Dino (B.S., '74)
A. N. Duplantis (B.S., '69)
Robert W. Dupree, Jr. (B.S., '60)
Clarence M. Eidt, Jr. (B.S.
Rafael Feo (M.S., '73)
Richard E. Fuchs (Ph.D., '64)
Roy D. Gerard (M.S., '58)
Thomas Granberry (M.S., '54)
Thomas F. Guidry (B.S., '74)
Lynn F. Guidry (B.S., '71)
M/M. J. R. Hopper (Ph.D., '69)
Howard E. Huckins, Jr. (M.S., '48)
Robert & Sylvia Jeansonne (B.S., '48)
Eugene A. Luc (B.S., '76)
Scott A. Mattisondas (B.S., '75)
William A. McElhannon, Jr. (Ph.D., '78)
Edmund F. Metz (B.S., '49)
M/M Stephen Melsheimer (B.S., '65)
Mr. & Mrs. John M. Olive (B.S., '72)
Biraya B. Paul (Ph.D., '60)
Howell B. Payne, Jr. (B.S., '56)
William G. Reymond (B.S., '48)
Michael J. Richard (Ph.D., '89)
M/M Murray W. Rosenthal (B.S., '49)
David Smith (B.S., '75)
Richard J. Spies (B.S., '75)
R. Woodrow Wilson, Jr. (M.S., '60)

Corporations

Air Products
Albemarle (Ethyl)
Alcoa
Allied Chemical
Amoco
ARCO
BASF Wyandotte
Chevron USA
Copolymer
Dow
DuPont
Exxon
Freeport Chemical Co.
Marathon
Mobil
Paxon
Phillips
PPG
Shell
Texaco
Union Carbide
Vulcan

Faculty and Staff Awards

John Collier received the 1996 James M. Todd Technological Accomplishment Medal from the Louisiana Engineering Society.

Armando Corripio received the 1997 Faculty Professionalism Award from the Louisiana Engineering Foundation.

Don Freshwater received the 1996 Dow Award for Excellence in Teaching.

Douglas P. Harrison was named the Alexis and Marguerite Voorhies Professor of Chemical Engineering in 1996. He also received the 1995 Dow Chemical Excellence in Teaching Award.

Michael A. Henson received a National Science Foundation Career Development Award in 1995.

Martin Hjortsø received the 1995 Dean's Research Award.

Carl Knopf was named the Robert D. and Adele Anding Professor of Chemical Engineering in 1995.

Ralph Pike was named the Paul M. Horton Professor of Chemical Engineering in 1995.

Geoffrey L. Price and his wife, Judy, received the Volunteers in Public Schools Golden Apple Award, the Freeport/McMoRan-WAFB Giving Something Back community service award, and were honored as a Distinguished Partner in Education by the Louisiana Board of Elementary and Secondary Education.

Danny Reible was named the Shell Chair of Environmental Engineering at the University of Sydney, New South Wales, Australia, for the years 1993-95.

Paul Rodriguez received the Outstanding Staff Award from the LSU Staff Senate in 1997.

Arthur Sterling received the 1997 Faculty Appreciation Award from the Engineering Council of LSU.

Louis Thibodeaux received the LSU Distinguished Research Master Award in 1995.

Lecture Series

The *Twenty-Second Annual Bicentennial Commemoration Lectureship* in Chemical Engineering was delivered by **Lanny D. Schmidt**, professor of chemical engineering and materials science at the University of Minnesota. Schmidt received his Ph.D. degree in physical chemistry from the University of Chicago in 1964. His research focuses on various aspects of the chemistry and engineering of chemical reactions on solid surfaces. He has published more than 250 research papers and supervised nearly 50 Ph.D. dissertations and 14 M.S. theses. He is a member of the National Academy of Engineering.

Schmidt's seminar, titled "Catalytic Partial Oxidation of Alkanes at Millisecond Contact Times," was delivered on March 6, 1997. He described his recent research results on the oxidation of alkanes to produce oxygenates from higher alkanes, such as butane, using a single Pt gauze as the catalyst at contact times as short as 10^{-5} seconds.

SEMINARS

We had several outstanding speakers during the 1997-98 Departmental Seminar Series, including the following:

- Professor **Dennis Hess**, Georgia Institute of Technology, spoke on "Plasma-Enhanced Oxidation and Nitridation of Silicon for Microelectronic Device Fabrication."
- Professor **Sanat Kumar**, Pennsylvania State University, spoke on "Phase Transitions of Polymer Mixtures."
- Professor **Julie D'itri**, University of Pittsburgh, spoke on "Selective Hydrogenolysis Heterolytic Molecules: Carbon-Chlorine Bond Cleavage Catalyzed by Supported Platinum."
- Professor **Clarence A. Miller**, Rice University, spoke on "The Surfactant/Foam Process for Aquifer Remediation."
- Professor **Rayford G. Anthony**, Texas A&M University, spoke on "Ion Exchange of Several Radionuclides on the Hydrous Crystalline Silico Titatanate, UOP Ionsiv IE-911."
- Professor **Karen McDonald**, University of California, Davis, spoke on "Plant Defense Proteins: Potential Applications and Novel Production Methods."
- Professor **R. Russell Rhinehart**, Oklahoma State University, spoke on "A Goodness of Control Monitor."

CHEMICAL ENGINEERING LABORATORIES—PAST, PRESENT, AND FUTURE

SITUATION AS OF 1997

Working in groups of two, fourth-year chemical engineering students perform four experiments per semester. The experiments include the following:

- ❒ continuous packed tower distillation
- ❒ batch distillation
- ❒ liquid-liquid extraction
- ❒ packed tower stripping and/or absorption
- ❒ tray dryer
- ❒ evaporator (thermosiphon reboiler)
- ❒ dehumidification/refrigeration
- ❒ packed-bed reactor
- ❒ liquid level control
- ❒ single-screw extruder
- ❒ biological (batch) reactor

Of these, only two are partly computer-interfaced. Most of the instruments in the lab are analog or visual output and pneumatically or hand operated; even some of these are not operational at present. An important aspect of the Unit Operations Lab is experience in following safe practices in the laboratory, but experiments are by necessity pretty much "by the book," obviating more critical thinking about safety and operating procedures.

CURRENT UPGRADE WORK

The University, ABET, and the dean of the College of Engineering all recognize the need to upgrade our lab courses. The dean has agreed to provide up to $100 thousand in a dollar-to-dollar match with the department (for a maximum total of $200 thousand) for needed improvements. This $200 thousand is really just a start, as lab improvements have been neglected for at least 10 years. We have started to computer-interface each experiment. The data acquisition and control will now be PC-based, with one central server and a backup. A standard platform such as LABVIEW (National Instruments) will be used to handle analog and digital IO.

The impetus for 100 percent computer control and data acquisition is not modernization per se; the chief pedagogical problem with the current lab is that with so much manual control, and so little opportunity for "what if" experimentation, students are given a limited view of the potential of each system. It will eventually be possible for the instructors to construct dynamic models of each system, based on past operation, existing within LABVIEW. These models can be used to rapidly test how the students propose to start up and shut down the experiment. Also, the entire process flowsheet will appear before the students in a P&ID format. Students should be able to spot potential operating errors more rapidly and will be less intimidated by the real systems. A new control/acquisition system will also allow those in charge of the lab to better alarm and interlock the systems, preventing serious mishaps and allowing the students to spot errors more quickly. Finally, the new system will encourage more assignments focused on the dynamic aspects of the systems and eventually assignments on better control strategies, hazop, etc.

THE FUTURE

Because the senior lab experiments are still for the most part in better shape than some of the junior lab experiments for third-year students, the goal is to move the more basic ones to junior lab, replacing some of the oldest experiments. We will also continue work to create new experiments on mass transfer for the junior lab; these are sorely lacking at present. We want each group in junior lab, as a minimum, to do one fluid flow, one heat transfer, one mass transfer, and one "other" (VLE, control, or simple measurement system) experiment. With the LABVIEW system in use in both labs, students will be introduced to simple control concepts earlier in the curriculum.

In turn we want to add three or four new experiments to senior lab. Possibilities include a polymerization reaction, membrane separation, and silicon oxidation experiments, but we are open to new ideas and, most important, assistance from industrial partners. If anyone can help us with these needed lab improvements, please get in touch with Dr. Kerry Dooley at 504/388-3063 or by e-mail at dooley@che.lsu.edu

OTHER ITEMS

—**Edward McLaughlin** retired as dean of the College of Engineering in 1996 after nine and one-half years of service in that capacity. Originally from Northern Ireland, McLaughlin received his doctorate from Imperial College at the University of London. He began his academic career at the University of London in the Department of Chemical Engineering Chemical Technology in 1956. In 1967, he ventured to LSU as an NSF foreign scientist fellow. Three years later, he returned to LSU as a professor. In 1979, he became the department chairman and remained in that position until 1987. His term as the dean of the College of Engineering was marked by a high level of productivity in scholarships, excellent standards in teaching and research, and a significant start in generating an independent source of income from endowments.

—The Chemical Engineering Building was renamed the Jesse Coates Hall by the LSU Board of Supervisors in honor of **Alumni Professor Emeritus Jesse Coates**. Coates, who passed away in 1994, served as the department chairman from 1955-67 and 1969-70.

—**Professor Emeritus James P. Cordiner** passed away January 22, 1992.

—A session to honor the many contributions of **Professor Emeritus Frank Groves** to chemical engineering education was conducted at the 1995 AIChE Annual Meeting in Houston. Papers were presented by **John Beard** (Clemson), **Larry Focht** (University of Akron), **Charlie Moore** (University of Tennessee) and **Jack Hopper** (Lamar University).

—In 1986, upon his retirement from Loughborough University, **Professor Don Freshwater**, one of Great Britain's most distinguished chemical engineering educators, came to LSU as a visiting professor. After ten years at LSU, perhaps a record for a visiting professor, his second retirement came in December 1995. Freshwater was the founder of the Department of Chemical Engineering at Loughborough and served as the department head for 29 years. At LSU, he taught process safety and risk analysis, but most ex-students will remember him from the unit operations laboratory. Freshwater and his wife, Eleanor, returned to England in 1996 and are now living in the "wilds of Leicestershire." Student welfare was always his first concern at LSU, and he would be happy to hear how all of you are doing. He can be reached by e-mail at D.C.Freshwater@lboro.ac.uk

—With funds from the LEQSF and a generous industrial contributor, **Professor Arthur Sterling** has established a Pilot-Scale Rotary Kiln Facility across Burbank Drive from the LSU experimental dairy facility. The facility began operating in 1995.

Faculty News

Grants and Contracts

John Collier received grants from LEQSF, American Sugar Cane League, ARPA, USDA, LTRC, NIST ATP, and private industry, including Buckeye Technology, Rheometric Scientific, Cinclare Sugar Mill, Cameco Industries, Georgia Gulf, and F. C. Schaffer and Associates.

Michael A. Henson received grants from NSF and LEQSF.

Kerry Dooley received a grant from MGK Corporation. Dooley and **Carl Knopf** received grants from the U.S. EPA and the Gulf Coast HSRC.

Gregory Griffin received three grants from NSF.

Douglas Harrison received two grants from the Department of Energy.

Martin Hjortsø received a grant from NSF.

Carl Knopf received grants from Exxon, DNR-PVE, and NASA/EPSCoR.

Ralph Pike received grants from NASA, GCHSRC, U.S. EPA, and Louisiana DNR.

Geoff Price and **Kerry Dooley** received grants from MGK Co., Ferro Corporation, and Handlers International, as well as an Exxon Foundation grant.

Mac Radosz received a grant from the U.S. Department of Energy.

Danny Reible received grants from the U.S. EPA, the U.S. Army Corps of Engineers, and the U.S. Department of Interior.

Arthur Sterling received a grant from LEQSF.

Louis Thibodeaux received grants from the U.S. EPA and Alcoa.

Karsten Thompson received grants from LEQSF and the Louisiana Energy Enhancement Program.

Kalliat Valsaraj received grants from the U. S. Army Corps of Engineers, the U.S. Department of Interior, the U.S. EPA through the LSU HSRC, the U.S. Federal District Court, and AIChE/CWRT.

Profiles of New Faculty

Michael A. Henson joined the department as assistant professor in 1994. He received his B.S. degree in chemical engineering from the University of Colorado, his M.S. from the University of Texas, and his Ph.D. from the University of California, Santa Barbara. From 1992 through 1993, he was a visiting research scientist with the Dupont Process Modelling and Advanced Control Group. His research interests are nonlinear process control, adaptive control, and bioreactor modeling and control. In 1995, he received a National Science Foundation Career Development Award.

With his NSF grant, coupled with yearly matching awards from such companies as Dupont, Exxon, Praxair, and Aigis Systems, Henson has been pursuing research in process control. He has developed new techniques for designing and analyzing control systems for nonlinear processes (e.g., distillation columns, pH neutralization reactors, and certain bioreactors). He has done computer modeling of the functioning of several such systems and is presently working with Exxon on plans to implement the models on a test basis at the company's Baton Rouge plant.

Elizabeth (Lisa) Podlaha joined the department as assistant professor in 1998. She received her B.S. and M.A. degrees in chemical engineering from the University of Connecticut, Storrs, and the Ph.D. degree in chemical engineering from Columbia University. During 1991-92, she was the recipient of an IBM manufacturing graduate fellowship. In 1991, she received the student research award of the battery division of the Electrochemical Society. From 1993 through 1997, she did postdoctoral work and teaching in the Materials Science Department of the Ecole Polytechnique Fédérale de Lausanne in Switzerland. Her research interests lie mainly in electrochemical characterization and the development of new materials and applications.

Her current research is directed toward electrodeposition of alloys and composites for micro-scale manufactured materials.

Maciej (Mac) Radosz, came to the department in 1995 as professor and the M. F. Gautreaux/Ethyl Corporation Chair in the Department of Chemical Engineering. He received his M.S. and Ph.D. degrees from Krakow Polytechnic University, Poland. Prior to joining the department he was a principal investigator at Exxon's Corporate Research Science Laboratories in Annandale, New Jersey. His research interests are in the areas of the phase behavior of polymer solutions and blends, macromolecular separations, and supercritical fluids. Radosz is the author of 70 journal articles, the inventor of a polymer fractionation process, coinventor of a low-emission lube oil, the editor of a book on supercritical fluid technology, the editor of the international journal *Fluid Phase Equilibria*, and a member of the editorial board of the *Journal of Chemical and Engineering Data*.

Karsten E. Thompson joined the department as assistant professor in 1996. He received his undergraduate education from the University of Colorado, Boulder. His M.S. and Ph.D. degrees in chemical engineering are from the University of Michigan.

Thompson's research interests are in the area of modeling flow in porous materials. His current research projects address both fundamental and applied problems. These include research in the area of petroleum production, studying how viscous fingering can be used to improve polymer injection during enhanced oil recovery processes, and in the area of groundwater contamination, studying how natural heterogeneity affects long-term transport and remediation efforts. Thompson is also performing fundamental research on how computational fluid mechanics can aid in modeling pore-scale flow in porous materials. This research has led to spin-off projects, including current collaborations with Kimberly-Clark Corporation.

Kalliat T. Valsaraj became associate professor in 1995. Prior to that time, he was an associate professor (research)

in the department. He received his M.Sc. degree from the Indian Institute of Technology, Madras, and his Ph.D. degree from Vanderbilt University. His research interests lie in the fate and transport of chemicals in the environment and interfacial phenomena-based separation processes for waste treatment. He is also teaching courses for the newly accredited environmental engineering degree program that the Department of Civil & Environmental Engineering began to offer last year. His textbook, *Elements of Environmental Engineering—Thermodynamics and Kinetics*, was published by CRC Press in 1995.

One area of his current research is focused on the development of mathematical models for the air emission of contaminants from dredged materials. Another focus area is the use of predispersed solvent extraction, solvent sublation, and surfactant-based mineral oxides for treating industrial dilute wastewater. His research is funded by the U.S. EPA, U.S. Army Corps of Engineers, and U.S. Department of Interior.

INDIVIDUAL FACULTY PROFILES

Professor **John R. Collier** continues to serve as president of the Faculty Senate, and is active in the areas of polymer and textiles processing, fluid flow, and conversion of agricultural and other wastes to value-added products. He and his wife, Dr. Billie J. Collier, director of the LSU School of Human Ecology, have developed a process (a patent is pending) for conversion of agricultural wastes into useful products. LEQSF (Louisiana Education Quality Support Fund), the American Sugar Cane League, the U.S. Department of Agriculture, and the Louisiana Transportation Research Center have been supporting this research. In addition, the Colliers are now using lyocell solvents to develop a new class of manufactured cellulosic fibers from bagasse. Collier recently received one patent on conversion of agricultural residues to value-added products and filed two patent applications; one on elongational rheology for both materials characterization and on-line control sensing, and a second on cellulosic microfibers.

The second edition of the text on automatic process control written by Professor **Armando Corripio** and Dr. Carlos Smith was published by John Wiley & Sons in early 1997. This textbook, *Principles and Practice of Automatic Process Control*, is widely used in the U.S. and abroad. Corripio also recently completed an Independent Learning Module, *Design and Application of Process Control Systems*, for ISA (the International Society for Measurement and Control). This is Corripio's second book in the ILM series, which is intended for practicing engineers and was originally created and edited by Dr. Paul Murrill, LSU chancellor emeritus and former head of the Department of Chemical Engineering. Corripio will reach another milestone this year—30 years of teaching in the department!

Professor **Kerry Dooley** is continuing his work in metal oxide catalysis and supercritical extraction. In 1996, he and Professor **Geoffrey Price** edited a special issue of *Catalysis Today* titled "Gallium-Loaded Zeolites and Related Systems." **Dooley** and **Price** have also been awarded grants from MGK Co, Ferro Corporation, and Handlers International Co. to pursue their work on catalyst/adsorbent development. Facilities available for this work include several low- and high-pressure reactor systems, an X-ray diffractometer, a thermogravimetric analyzer, a Fourier transform infrared spectrometer, a differential scanning calorimeter, temperature-programmed reduction apparatus, and adsorption and surface area apparatus.

Professor **Gregory L. Griffin**'s research focuses on the processing of advanced materials used in microelectronics and high technology ceramics. He is currently directing an NSF-sponsored project to study the reaction kinetics of the chemical vapor deposition of copper, a process that is under intense investigation in academic and commercial laboratories around the world as a replacement metallization technology for future generations of deep sub-micron integrated circuits.

Professor **Douglas P. Harrison** continues his research in the application of noncatalytic gas-solid reactions to the treatment of coal-derived gas and the removal of semivolatile environmental contaminants from water. In his work with coal gas, he has focused on high-temperature removal of H_2S from coal gas. He is looking into the feasibility of the direct production of elemental sulfur during this process. In the summer of 1996, he brought his expertise in this field to Turkey, where he helped to conduct a NATO-sponsored course titled "Desulfurization of Hot Coal Gas with Regenerable Metal Oxide Sorbants: New Developments." Since 1994, he has been working on a grant from the U.S. Department of Energy titled "Advanced Sulfur Control Concepts for Hot Gas Desulfurization," and in 1997 he received an additional grant from the same source for a project titled, "Combining Steam-Methane Reforming, Water-Gas Shift, and CO_2 Removal in a Single-Step Process for H_2 Production." He has served as a peer review panelist for the Energy Department's University Coal Research Program since 1994. In the area of environmental remediation, Harrison is carrying out research on the removal of contaminants from aqueous solution using a novel cascade crossflow air stripping approach. In 1997, Harrison became a peer review panelist for the Environmental Engineering Program of the U.S. Environmental Protection Agency.

Professor **Martin A. Hjortsø** continues his work in the areas of bioreactor engineering and modelling. Part of his research is directed toward discovering new biologically active compounds in local plant species. The primary objective of his current work is to develop a technology for producing plant metabolites from large-scale root cultures. A new project on investigation of growth kinetics of baker's yeast recently started with funding from NSF. The focus of these studies is on the oscillations in various state variables, such as pH and metabolite concentrations, that can be

observed in continuous cultures of baker's yeast. There is no agreement yet in the scientific community on what causes these unusual growth dynamics. We have built a facility for studying these oscillations and are doing experiments to try and discriminate between different models and explanations that have been proposed in the past. We are also carrying out our own mathematical modelling effort to try and explain the oscillations and to eventually be able to exploit them as a tool for dynamic optimization of bioreactors and as a probe for understanding cell growth kinetics.

Professor **F. Carl Knopf** took over as department chairman in 1998. He continues his research in the areas of novel separation and reaction systems. Ongoing research in the area of supercritical fluid extraction has evolved into specific fruitful applications including supercritical carbon dioxide reaction with cements to produce novel pH neutral materials. Knopf is also interested in transient pump-probe and Raman spectroscopy. These techniques are now being applied to the study of solvent effects on condensed-phase chemical reactions and nonlinear optics. Experiments are performed in real time with femtosecond resolution.

Professor **Ralph Pike** has been awarded several research grants including a 1995 award from NASA for a project titled, "Propulsion Chemistry for CFD Applications" and 1996 grants from the EPA for projects titled, "Development of an Engineering Tool for Source Reduction by On-Line Optimization," and "Advanced Process Analysis for Pollution Prevention." In 1996-97, his group presented papers on on-line optimization for waste reduction at symposiums sponsored by the AIChE and American Chemical Society. In 1995, 1996, and 1997, Pike chaired the sessions on experimental developments in kinetics, catalysis, and reaction engineering held at the annual meetings of the AIChE. In 1997, Pike was appointed co-editor-in-chief of the international journal *Waste Management*, which focuses on methods of control and disposal of hazardous industrial and radioactive waste.

Professor **Geoffrey L. Price** continues his interest in catalysis and, particularly, zeolitic catalysis. Price and his co-workers were the first to identify and describe an important solid-state ion-exchange process that takes place between gallium and zeolitic protons in gallium zeolites. In addition to probing the crystalline mysteries of zeolites, Price teaches the department's undergraduate thermodynamics, junior lab, and kinetics and reactor design courses, and graduate and undergraduate classes on catalysis.

Professor **Danny Reible** is presently serving as director of the U.S. EPA South/Southwest Hazardous Substances Research Center, a university consortium composed of LSU, Rice University, and Georgia Tech. The Hazardous Substances Research Center is concerned primarily with coastal pollution, and Reible's own environmental research shares that focus. He is currently working in two areas—transport phenomena in contaminated sediments and dredged materials, and the influence of the land-sea breeze cycle on airborne contaminants released from sediments and elsewhere along coastlines. He is presently chairman of a national working group on bioavailability for the American Academy of Environmental Engineering (AAEE) and the Strategic Environmental Research and Development Program (SERDP), and he serves as a member of the advisory committee for the Department of Defense Advanced Applied Technology Demonstration Facility (AATDF). In May of 1998, he will chair a session on technology for a symposium on contaminated sediments sponsored by the National Research Council.

Professor **Arthur Sterling** stepped down as department chairman in 1997. He continues his research into combustion phenomena at the new Pilot-Scale Rotary Kiln Facility and on nearby full-scale industrial incinerators. He is seeking to develop computer models of the incineration process that can help industries improve their incineration systems and associated air pollution equipment to operate more efficiently and economically. He is also collaborating with Carbomedics, Inc., in Austin, Texas, on an experimental program to better understand the coating of heart valves by pyrolytic carbon in a spouted bed reactor.

In 1996, Professor **Louis Thibodeaux** completed the second edition of his widely acclaimed textbook, *Environmental Chemodynamics—Movement of Chemicals in Air, Water, and Soil*, published by John Wiley & Sons. He also traveled to Indonesia as a visiting scholar to the Department of Chemical Engineering, Gadjah Mada University, to assist with research on an ongoing project titled "Analysis of the Fate of Organophosphor Pesticides in Rice Field Soil," and to help update students on recent developments in chemodynamics research. In 1995, he stepped down as director of the U.S. EPA South and Southwest Hazardous Substance Research Center. His current research focuses on replicating the behavior of contaminated bed sediments and developing possible new methods of remediation of difficult-to-access contamination. He is also serving on the editorial boards of the following journals: *Journal of Hazardous Materials, Environmental Science and Engineering, Remediation*, and *American Environmental Laboratory*.

Associate Professor **David M. Wetzel**, Henry J. Kaiser/Kaiser Aluminum Professor, continues to do research on the modeling and application of crossflow air stripping of low volatility organic compounds from wastewaters. He is also working with faculty and students in the LSU School of Forestry, Wildlife, & Fisheries on the modelling of wood drying processes.

VISITING RESEARCHERS

The department had a number of visiting scholars from 1995 through 1997, as follows:

❖ **Antonio Araujo**, University Federal Do Rio Grande Do Norte, Brazil.

❖ **Gulnur Birol**, Bogazici University, Turkey, who is

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Student News

Undergraduate Students

The undergraduate student chapter of the AIChE has been active during the past three years. The 1997-98 officers are **Molly Soulier**, president; **Melissa McCutcheon**, secretary; **Melissa Robert**, treasurer; **Susie McMullan** and **Jane Byerly**, Engineering Council representatives.

A student chapter of **Omega Chi Epsilon** has been established. The 1997-98 officers are **Allain White**, president; **Molly Soulier**, vice president; **Rob Wegener**, secretary; **Rachel Vicknair**, treasurer; and **Luke Hart**, Engineering Council representative.

In 1995, a **Texaco Help Study Center** was established on the second floor of the Chemical Engineering building, thanks to a $10,000 grant from Texaco, Inc. The study center, staffed by volunteers from the AIChE and ΩXE student chapters, is equipped with two computers with MatLab software and copies of all textbooks used in the undergraduate curriculum.

In 1997, the **Society of Professional Hispanic Engineers** selected two LSU chemical engineering students, **Monique Delafosse** and **Oscar Rene Flores**, to receive scholarships.

A chemical engineering sophomore, **Erica Madeira**, presented a research project at the National Technical and Career Conference of the Society of Hispanic Professional Engineers in Orlando, Florida, on February 5, 1998.

Undergraduate Student Award Winners

High GPA Senior • Brad Moncla, 1995; Adrian Mitchell, 1996; Li-Bong Wei, 1997.

High GPA Junior • Adrian Mitchell, 1995; Christopher Agostinelli, 1996; Jess Frey, Melissa McCutcheon, and Allain White, 1997.

High GPA Sophomore • Allain White and Savita Iyer, 1995; Melissa McCutcheon, Katherine Toney, and Jess Frey, 1996; Ali Abidi, Benjamin Boussert, David Farritor, Lisa Lambert, and Chad Thomas, 1997.

McLaughlin Award • Christopher Agostinelli. This award was first presented at the December 1997 Commencement to the graduating senior in the College of Engineering with the highest GPA.

Coates Award • Kenneth Aldrige, 1995; Adrian Sherrill, 1996; Donna Howard, 1997.

Dow Outstanding Junior Award • Adrian Mitchell, 1995; Jonathan Picard, 1996; Katherine Toney, 1997.

American Institute of Chemists Award • Jeffrey Skinner, 1995; Yvette Morgan, 1996; Adrian Mitchell, 1997.

Outstanding University Students • Adrian Mitchell was the sophomore, 1995; junior, 1996; and senior, 1997 nominee from the College of Engineering. He also became the College of Engineering recipient and was named the University's outstanding student in each of the three years.

Senior Award for Finishing in Four Years with No Drops • Joseph Delhoussaye, Carolee Laffoon, Brad Moncala, and Scott Simmons, 1995; Chad Bourgeois, Kevin Burkes, Mridul Desai, Mrinal Desai, John Golda, Tina Scully, Adrian Sherrill, Jason Smith, and Ka Chan, 1996; Ellen Chagnard, William Koonce, Adam Lambert, Todd Schneider, Brian Watts, Li-Bong Wei, and Thomas Williamson, 1997.

Senior Design Award Sponsored by BASF • Teresa Atkins and Luyen Vo, First Place, 1997; Tracy Allen, Oscar Pedescleaux, and Tod Viso, Second Place, 1997.

Bachelor's Degrees Awarded

Spring 1997
Clyde D. Alcon, Jr.
Monica P. Astete
Teresa C. Atkins
Melissa A. Bacci
Brandon W. Bello
Joseph A. Benson
Anthony G. Boone
Jason P. Bourg
Ellen R. Chagnard
Michael J. Clemmons
Erick J. Comeaux
Michael G. Corripio
Brant R. DeLaune
Jefferi T. Dickens
Nicole E. Dowling
Angela M. Furnish
Laurel A. George
Jennifer A. Gibbs
Joseph M. Hanna, Jr.
Jill A. Hogan
George F. Holder, II
Sarita S. Iyer
William A. Koonce
Brian A. Lambert
Sandra K. Langston
Mary C. Lanier
Jada D. Lewis
Brandon B. Light
Holly S. Logan
Janel M. McDonald
Patricia A. McKneely
John L. Naquin
Michael P. Normand
Leah C. Oubre
Gustavo E. Paredes
Eric N. Parvin
Gaurang J. Patel
Beth M. Pederson
Oscar J. Pedescleaux, Jr.
James P. Roach
Todd A. Schneider
Rakshay R. Shah
Raymon O. Slaughter
Toriano A. Taylor
Scott E. Thomas
Terry W. Thomas
Tod M. Viso
Luyen Thi Vo
Brian W. Watts
Li-Bong Wei
Thomas P. Williamson
Anthony R. Zareck

Summer 1997
Hugh B. Brian
Ryan J. Clausen
John A. Durnin, III
Christopher D. Martin
Christopher E. Rowzee

Fall 1997
Christopher M. Agostinelli
John R. Aiton
Tracy K. Allen
Michael L. Betbeze
Steven M. Gardner
William C. Guidry
Tracy D. Hess
Benjamin C. Hill
Trisha M. Legaux
Todd P. Peltier
Connie E. Perrin
John C. Picard
Jeffrey A. Price
Fabian M. Rizo
Michael G. Shelby
Denise V. Spiers
Corey E. Sullivan
Dung A. Tran
Cheryl A. Tucker
Stacy Weidner
Todd G. Winterton

Graduate Students

• In 1995 and 1996, **James Becnel** (M.S., '97) presented two papers on work done with Dr. Kerry Dooley. He presented a paper titled "Comparison of Extraction Methods for Removal of Aromatic and Chlorinated Hydrocarbon Mixtures from High Organic-Content Soils" at the 1995 annual meeting of the AIChE. At a meeting on *Emerging Technologies in Waste Management* held in 1996, he presented a paper titled "Supercritical Fluid Extraction of Aromatic and Chlorinated Hydrocarbon Mixtures from Heavily Contaminated Soils."

• **Michelle Bryant** presented a paper at the 1996 AIChE regional student convention on her work with Dr. Kerry Dooley titled "Alkane Dehydrogenation Catalysis of Post-Transition Metal-Loaded Zeolites."

• At the 1996 AIChE annual meeting in Chicago, doctoral candidate **Wu-Ning Huang** (Ph.D., '97), and graduate students **Alejandro Lopez-Ortiz** (M.S., '96), and **Julie White** appeared with Professors Frank Groves and Douglas Harrison to present their paper titled "An Innovative Approach to the Regeneration of High-Temperature Desulfurization Sorbents."

• In November 1997, **Vaughan Hart** presented a paper titled "Pt/Post-Transition Metal/Zeolite Dehydrogenation Catalysts Prepared by Solid-State Techniques" at the annual AIChE meeting in Los Angeles.

• **Guilhem de Seze** and **R. Ravikrishna**, Ph.D. candidates in the department working with Dr. Valsaraj, presented papers on their work on contaminanted sediments at the 1997 HSRC/WERC annual meeting in Albuquerque, New Mexico.

• **Xuang Chen**, a Ph.D. candidate, presented papers on her research on on-line optimization at the AIChE annual meetings in Chicago in 1996 and in Los Angeles in 1997.

• Working with Dr. Valsaraj, **Chunlong Zhang** (Ph.D., Civil & Environmental Engineering, '97), a student from the People's Republic of China, won Honorable Mention as *Outstanding Water Resources Dissertation in the Field of Engineering and Physical Sciences*, an award given annually by the Universities Council on Water Resources.

Master's Degrees Awarded

Spring 1997
James M. Becnel
Fei Deng
Wendy S. Harris
Wu-ning Huang
Peter M. Kim
Jiaqiang Luo
Sanat Mohanty
Derek H. Rester
Tiyun Xu

Summer 1997
Indu Muthukrishnan
Valery Temyanko
Antwane L. Shephard
Yiding Zeng
Sen Zhang

Fall 1997
Gang Guo
Christopher L. Porter

Doctoral Degrees Awarded

Spring 1997
Minqui Lu
(Adviser: Professor John Collier)

Summer 1997
Santosh G. Bhagwath
(Adviser, Professor Martin Hjortsø)
Mohammed Fahrurrozi
(Adviser, Professor John Collier)

Fall 1997
Narendra S. Borgharkar (Adviser, Professor Gregory Griffin)
Michael J. Kurtz (Adviser, Assistant Professor Michael Henson)

Visiting Researchers—

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presently doing her postdoctoral work with Dr. Hjortsø.

❖ **Girish Chandra**, Dow Corning Corporation, Midland, Michigan.

❖ **Richard C. Farmer**, SECA Inc., Huntsville, Alabama.

❖ **Alexander Kochetkov**, Institute of Experimental Meteorology, Obninsk, Russia, who spent one full year as a visiting researcher in the environmental group with Drs. Reible, Valsaraj, and Thibodeaux.

❖ **Fresia Orellana**, University of Concepcion, Chile.

❖ **Michael Palermo**, U.S. Army Corps of Engineers, Vicksburg, Mississippi.

❖ **Simioan S. Petrovan**, Technical University "Gh. Asachi" Iasi, Romania. He is presently visiting research associate professor in the department and is collaborating with Professor John Collier on elongational rheology of polymers and industrial products from sugar cane and kenaf fibers.

News of Alumni & Friends

1940s

Howard E. Huckins, Jr. (B.S., '44; M.S., '48) is presently a staff consultant for the AIChE/CCPS. He retired from DuPont R & D in 1985.

E. Edward Littlefield (B.S., '47) passed away on August 2, 1992.

Fred G. Thatcher (B.S., '42) is retired and living in New Lenox, Illinois.

1950s

Alvin B. Couvillon, Jr. (B.S., '52) passed away on July 31, 1993.

Biraja B. Paul (M.S., '58; Ph.D., '60) is the managing director of a chemical company in Bombay, India. He is an adviser to IFC (World Bank) and ADB (Manila).

Donald A. Winkler (B.S., '57; M.S.'58; Ph.D., '61; M.D. '68) practices ophthalmology in St. Augustine, Florida.

1960s

Jorge M. Ferrer (B.S., '67) is an environmental engineer with the East Baton Rouge Parish and a member of the Louisiana State Board of Registration for Professional Engineers and Land Surveyors.

John V. Landry (B.S., '60) is president of Landry and Associates in West Columbia, Texas.

John L. Medina (B.S., '66) is presently the executive director and member of the board of Degussa Corporation. He is also an executive contact for CMA Responsible Care and a member of the CMA Executive Leadership Group.

Jaime Porres (B.S., '66) is the president of Azucarera San Sebastian y Santa Clara, S.A. de C.V. and Grupo Azucarero Asociado, S.A. de C.V. in Cordoba, Mexico.

Roy E. Sanders (B.S., '65) is a superintendent of loss prevention for PPG Industries in Lake Charles, Louisiana. He is also a Fellow of AIChE.

1970s

Carlos M. Acevedo (B.S., '75) is president of Unique Chemical Technologies, Inc., in San Juan, Puerto Rico. In 1993, he was nominated to *Who's Who in Puerto Rico*. In 1994, he was mentioned as the preferred supplier by the Upjohn Manufacturing Company, Puerto Rico. He is also the president of the Puerto Rico chapter of the LSU Alumni Association.

Patrick E. Byrd (B.S., '77) works as a corrosion engineer for the Strategic Petroleum Researve with Dyn McDermott.

Galen M. Dino (B.S., '72) works for Fluor Daniel, Inc., in Sugarland, Texas.

Wilson T. Gautreaux, Jr. (B.S., '73, M.S., '79, Ph.D., '81) has been employed by Westvaco Corporation, a pulp and paper, packaging, and chemical manufacturer, since graduation in 1981. He worked at the Charleston Research Center for 10 years as a research chemical engineer. Currently, he is the environmental manager for the Kraft Division, which includes lumber mills and a pulp and paper mill in North Charleston, South Carolina. He enjoys the technical challenges in the environmental field. He manages a team of chemical engineers and technicians and the mill wastewater treatment plant department. His daughter, Alison, is a freshman and Alumni scholar at LSU, studying pre-med.

Michael W. Leger (B.S., '71) is a senior vice president with Turner, Mason and Company Consulting Engineers. He was named to *Who's Who in Engineering* in 1994.

James R. Madden (B.S., '72; M.S.'74) is an R & D specialist with Albemarle Corporation. His recent assignments include quality, safety, process safety, regulatory compliance, responsible care, ISO internal auditing, and implementation of SAP software-Plant Maintenance Module. He is an active volunteer leader with Club Scouts and Boy Scouts at pack, district, and council levels. He is also a volunteer with the American Red Cross and a Certified First Responder in Louisiana.

Nhuan (John) P. Nghiem (M.S.' 79; Ph.D., '82) is currently a research staff member in the Bioprocessing Research and Development Cluster of the Chemical Technology Division at the Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Lloyd S. Shehorn (B.S., '77) is an oil spill preparedness/response specialist with the Shell Western Exploration and Production, Inc., California Division.

Louis J. Snyder, Jr. (B.S., '71) is with Armtex, Inc., as a development and product manager.

1980s

Russell A. Babin (B.S., '80) has been with Exxon Baton Rouge Refinery since graduation. He is currently in the process control area on a two-year loan assignment to Exxon's Benicia California Refinery.

Wayne B. Bolden (Ph.D., '86) is a manufacturing area superintendent, Quality Control/Finishing, with the DuPont Polyester Film Manufacturing Site, Florence, South Carolina.

Gregory G. Comeaux (B.S., '83) is with the Dow Chemical Company, Midland, Michigan.

Travis R. Dickinson (B.S., '85) is an associate product manager, Weed Control Business Unit, Ciba Crop Protection, Ciba-Geigy Corporation in Greendboro, North Carolina.

Neal A. Grob (B.S., '86) has been a process development Engineer at Rubicon, Inc., Geismar, Louisiana, since March 1992. He was issued a patent (#5,266,530) for work as senior research engineer at Dow Chemicals in Plaquemine, Louisiana titled "Process and Materials for Treatment and Repair of Electrolytic Cell Separators."

Sharon B. Hill (B.S., '86) is an environmental engineer with ERM-Southeast, Charlotte, North Carolina.

Nels C. Kjeldsen (B.S., '86) is a process engineer with Uniroyal Chemical, Geismar, Louisiana.

Philip LeBlanc (B.S., '84) is a production engineer with Ciba-Geigy Corp. in St. Gabriel, Louisiana.

Helen LeBlanc (Causey) (B.S., '76) works at Dow Chemical in Plaquemine, Louisiana.

Lawrence P. Louque (B.S., '82) works as a production superintendant with IMC-Agrico in Uncle Sam, Louisiana.

Mark Malhiet (B.S., '86) is currently assistant plant manager, butanediol plant, BASF, Germany.

Aroon Mital (B.S., ChE '82; B.S., CSC '85) is an information services staff analyst with Tenneco Gas in Houston, Texas. He has assisted in on-campus recruiting at LSU for computer science and QBA students for permanent and intern employment in information services at Tenneco Gas.

Kenneth Pate (B.S., '80) is a physician specializing in infectious diseases in Pensacola, Florida.

Laurence R. Poché (B.S., '81) has been employed at the Alliance Refinery, Belle Chasse, Louisiana, since graduation in 1986. His current position is environmental specialist. He is married to Janet Reynolds and has three children —Jeff, 7 years; Claire, 5 years; and Matt, 3 years.

Julie Nierman Ricardi (B.S., '83) is a quality assurance director for PACE, Inc., New England-Maine Laboratory, an environmental analytical laboratory.

Majd El-Zoobi (M.S., '89) is a senior production engineer, Toluene Diisocyanate Plant with Olin Chemicals in Lake Charles, Louisiana.

1990s

Scott Gendron (B.S., '93) is a production engineer with Rhone-Poulene Basic Chemicals in Baton Rouge, Louisiana.

Y. S. Koo (Ph.D., '93) is a faculty member in the Department of Chemical Engineering at Anyang University, South Korea.

Sanat Mohanty (M.S., '97) is presently a Ph.D. candidate in chemical engineering at the University of Minnesota.

Beth Pederson (B.S., '97) is presently working on her master's degree in chemical engineering at LSU.

Greg Thoma (Ph.D., '91) is presently an assistant professor of chemical engineering at the University of Arkansas, Fayetteville.

S. W. Rhee (Ph.D., '91) is presently a faculty member in the Department of Environmental Engineering at Kyonsii University, South Korea.

Matt Schumacher (B.S., '93) is a process engineer with Formosa Plastics, Inc., in Baton Rouge, Louisiana.

Adrian Sherrill (B.S., '96) is a Ph.D. candidate at the University of Delaware. He is the recipient of an NSF Fellowship.

Jose Tabora (B.S., '92) received his Ph.D. from the University of Virginia. He is presently employed with Merck Laboratories, New Jersey.

Li-Bong Wei (B.S., '97) is a Ph.D. candidate at Princeton University.

A SPECIAL THANKS

Erick Comeaux (B.S., ChE, 1997), an R & D engineer at Georgia Gulf's PVC Technical Center in Plaquemine, Louisiana, has been instrumental in having laboratory and pilot-scale equipment donated to the University. Most recently he arranged the donation of a pilot-scale twin-screw extruder and accessories. Erick is also involved with Dr. Collier on student projects and frequently visits the department.

LOST ALUMNI

1914

Henry M. Giordani

1915

Y. Ryan Emilio
Cyrus T. Hel
Glynn H. Ledbetter
John R. Mays

1922

Leonard M. Levy
Ramchandra G. Padhye
Norman G. Platts

1924

Ernest E. McCollough

1926

Clement A. Barrere

1927

Rudolph F. Duelfer

1931

Robert E. Schexnailder

1933

Russell N. Lay
Lawrence O. Lord

1934

Phillip J. Bertin
Reginald N. Blaize

Samuel R. Fitzgerald
James E. Lindsay
Ellsworth N. Smith

1935

Henry P. Broussard
Mary L. Digirolamo
Charles E. Gill
Hamilton M. Johnson
Richard A. Pratt
M.R. S. Rao
Frank W. Valls
Guy G. Vanderpool

1936

Lealand A. Enberg
Louise T. Kennedy
James Hardie McGee
Francisco Pepito Pilapil
Alvin D. Rolufs

1937

John Lucious Burt
Delma McCabe Cointment
Angel Alberto Colon
Eugene E. Ellis
Richard L. Hodges
Edwin Liebert
Morris Leonard Perlman
William Everitt Rowbotham
Junius Eugene Sapp
Robert Boyd Stewart
M. R. Subra
William Owen Switzer

1938

James Camille Aucoin
Charles Edwin Going
Walter Hudson Johnson
Gangadhar Dinker Kane
Otis Bernard Rowland
Herman Siegel

1939

George Timothy Mercier
Sidney Schulder
David Connell Walsh

1940

Henry Blanchet
James Wilson Bridges
Edward Stirling Johnson
Y. Ebra Jose
James V. Senese

1941

Harry Clair Cole
Charles Arthur Overstreet
Willis Wilcox Williams

1942

William Fowler Daniels
Gilbert Fletcher Moore
James Stanton Patterson
James David Wall

1943

Ora C. Day
Robert Emmett O'Connor
George Albert Speir

1944

Manuel Mestre
Jack William Racine

1945

Armando Alonso
Juan Castresana
Karl Albert Muller
Charles Bernard Richard

1947

George Charles Conrad
Thomas Harper Goodgame

1948

William B. Chanceler
Guillermo A. Dominguez
William Alfred Dominguez
Harold L. Keaton
Edward O'Donnell
Charles Joseph Perilloux
Dwaraknath Reddy
Jeptha Vanday
Richard Weldon Waldsmith
Stephen A. Winborn

1949

Maurice Gordon Baxter
Richard Cameron Berry
Thomas Fulton Burke
Edmund Pettus Davis
Billy Joe Grady
Thomas Moody Logan
John Rurick Major
Pablo Navarrete Vaillant
Bruce Eugene White
Ben Allen Willard

1950

Harish Chandra Anand
Earl Paul Babin
Raul Victor Capote
Vincente Carreto de la Mora
Albert Lacy Fourmy
Gene Armond Freiss
Juan Ignacio Gabilondo
Prasanna C. Goswami
Boyce Nunnally
Clarence Earl Phillips
Robert Denton Platt
Wilson Clyde Pullig
Theodore Russell Ray
Osvaldo R. Rodriguez
Jose Sales
Claude Joe Stiles
Manuel Fausto Villapol

1951

Basil Wayne Andrews
Martinez Ricardo Felix
Ruble Landis Huff
Lonnie Zach Mallory
Jimmy Edgar Middleton
Pramod Lal Sarma
Arthur Wellington Sellers
Elvin Andrew Stafford

1952

Omar Arape
Fernando Hoyos Bergonzoli
Frank B. Clary
Raymond Raffray
Andre Edward Rouillard
John Dempsey Stokes

1953

Mansour Ghadar
Riyad Abdallah Khalaf

1954

Philip Earl Brubaker
Robert W. Duhl
John B. Fontenot
Kenneth Odell Halbrook
Gene Addison Johnson
Humberto Pinheiro Machado
Jose Antonio Moncada
Mario Posada
Kenneth L. White

1955

Zevada M. Avalos
Albert Kennedy DeFrance
Wiley B. Fisackerly
George Mathieu Guidroz
Stanley Dison Hanesworth
Raymond Calvin Hatfield
Guy Clifton McCombs
Wilhelmus Melis
Patrick Gerald Simms
Ezra Jasper Westbrook
George W. Wright

1956

Whitney Paul Breaux
Thomas W. Howard
Kenneth Hoy
Robert Pole

1957

Yeganeh A. Amir
Jose A. Chapman
Rafael Jorge Garcia
Norwood William Matherne
John William Maurin
Felix Fortune Planche
Walter James Porter
Silva Joaquin Sanchez
Regulo Atilio Sardi
Harold Alfred Simms
James Joseph Swearingen
Luis Alberto Wallis
Ignacio Warner

1958

Joseph M.P.H. Adam
Augustine Joseph Corona
Harry Alonzo Edwards
Robert L. Evans
Bernard J. Goussault
Paul Joseph Gravel
Franklin Murry Ingram
Mohan Singh Kothari
Ferdinand Louis Larue
Euclide Howard Leleux
Jean Pierre Mariani
William Claborn Meek
Bobby Morgan Miller
Maurice Khalil Nasser
Joseph Marie Pierre
Joseph T. Regard

1959

Charles Ellis Adams
James Kernon Crochet
Jai Narain Goel
Willard Milton Hanks
Thomas Charles James
Paul Richard James
Harold Douglas Jelks
Robert Harley Jines
Gerald W. Kattong
Habib Labbauv
Freddy W. Landae
John Morgan Webre

1960

Charles Edwin Beckler
Ronald G. Corley
Ronald Anthony DeJean
George Paul Distefano
Jose L. Fuertes
Sebert Albert Haynes
Charles Emory Knight
Robert W. Lacour
William Francis Lanigan
Michael Joseph Maurin
Jose Leandro Mendez
John L. Morrison
Biraja Bilash Paul
Larry Joseph Remont
Calvin Antoine Rousse
Cacques L. Saudy
Raphael Toufic Smayra
Shwen Ih Wang
John Wurster Wheeler
Hugh Glenn Wilson
Don Wesley Wolsefer

1961

Heraldo A. Agreda
Hector Joaquin Corella
Robert Allen Davis
Jimmy McMath Givens
Ernest Woodard Harrison
James Cleveland Holland
Manduley Enrique Insua
Y Pino Jorge
Boyd Young LeBlanc
Humberto E. Lopez
Sanchez Humberto Lopez
Jose G. Lopez-Barreda
Jorge A. Pino
Fernando Xavier W. Pires
Victor Plas
Emilio Rebull Rivera
Konchady Nagesh Shenoy
Agreda Heraldo Sifontes
William Dave Taylor
Vincent Stephen Verneuil
Glenn Lamar Wise
Gary H. Young

1962

Jeff W. Baird
Leonard M. Boudreaux
Fred Edward Causey
Edward Leroy Glass
Charles Reggie Guerin
Jack Welbur Harris
Clovis P. Legleu
Eugie A. Martin
Walter H. Plain
James M. Shipp
Carlos A. M. Troncoso
Henry M. Troth
James Vastine Valliant

1963

Jose Francisco Agreda
Maria Z. Aguilar
Gerald Eugene Butler
James Leston Case
Francisco C. Eala
Robert Guerra
Billy Wayne MaGee
Frank Nemours Newchurch
Jimmie Doyle Pottorff
Maria Aguilar Rodriguez
Leo Simon Sues

1964

Joseph Frank Accardo
David Gray Caddy
Ronald Calvin
Ivan E. Caro
Danilo P. Castillo
Omar J. Esmal
Herbert James Louque
James M. McCormick
Gary Martin Montgomery
Motiram Kisan Patil
Pietro K. Piralla
Denarakonda Hanumantha Rao
Juan Ramon Santa-Coloma
Robert Glenn Tripp
Jose Tito Villa

1965

Nolan Joseph Adams
James Henry Brooks
Malcolm Lafayette Dove
Mauricio A. Lopez
Madhigiri S. R. Ramesh
Richard C. Robinson
Nora Antonia Sanchez
Antonio Velidanes

1966

Gerardo Ten Brink
Richard Freeman Buckley
Orlando Felipe Cardoso
Harold Louis Hebert
James Edward Horn
David Wesley Miner
Pedro Joaquin Nogueira
Bueno Jaime Porres
Sims Louis Roy
Mario Moises Salinas
Richard Joseph St. Pierre

1967

Richard G. Beecher
Raul Cardenas
James H. Doub
Joseph Larry Edmonson
Gilbert Stevens Fox
Ronald E. Jones
Wilbert S. Mackay
Hooshang S. Moghani

1968

Arunendu Bhattacharya
Michael Taylor Edgerton
Ricardo J. Gomez
Guy J. Harel
Randall John Indovina
Ronnie D. Jackson
Clayton Phillips Kerr
Julio C. Padilla
Kenneth J. Parent
Robert D. Schultz

1969

Antonio D-Aurrecoh
Jose J. Aquirre
Yu-Chin Liu Chen
Alvin A. Fairburn
Louis A. Gonzalez
John Randolph Langley
Yu-Chin Liu
James Ray McClelland
Carlos Eduardo Moreno
Ivan A. Navarro
Juan C. Salazar

1970

Alvaro Campuzano

1971

Sain D. Anand
Michael John Atchetee
Jose F. Azouth
Leroy Joseph Cavaliere
Thomas Frederick Dominick
Richard Edwin Dorris
Carl David Engel
Segundo Fernandez
Charles Goodson Guffey
Mark Austin Jeffers
James Vincent Jurasinski
Ronald Dean Miles
Danny J. Perrer
Glen Dale Savoy
William Alden Settoon
Vinodchandra R. Shah
Marlin Rufus Vernon

1972

Juan F. Ardila
Robert John Camacho
Bernad C. Chan
Frank R. Cusimano
T. Augustin David
Michael Michaud
Jose Rafael Morao
Marshall Budd Nelson
Richard Wayne Nill
Sanford James Stinnett
Wing Yan Woo

1973

Denzel Allen Brown
Justin Dwight Edwards
Olivier Damianus Habibe
Hsiao-Nan Huang
Mohammad Reza Karbassian
Ronald Jules Manuel
Richard Lee McGlamery
Madhusudan Nathany
Mehmet Ozbay Ozelsel
Lokesh H. Parikh
Anan Siripong
Roger Earl Waguespack
Emilio Ramon Zarruk

1974

Jamal Al-Din Barzinji
Mohamad B. Behbehani
Galen M. Dino
Frank Darral Duringer
Aurelio B. Dutary
Hafez Hafezzadeh
Mostafa Mina
Lowery Wayne Paxton
Oscar Ivan Pinilla
Najmeh Sadighi-Nouri
Suresh Mansukhlal Vora

1975

Carlos Manuel Acevedo
Rabie Ahdoot
John Allen Alexander
Mohammad Ali Movahed
Ahmad Sharonizade
Paul Timothy Siegmund

1976

Stephen William Krajicek
Frederick Henry Pitts

1977

Patrick Joseph O'Neill
Owaraknath Reddy

1979

Manuel A. Arguello
Ender J. Ferrer
Le N. Hue
Jamaleddin Madjdpour
Carl E. Sladek
Tuan A. Tang
Beth Maria Troxler

1980

Mary E. Ahner
Villa D. Holland
Duc M. Pho
F. R. Roberts
Edward A. Thistlethwaite
Labrador Angela Vitelli
Martin K. Wiewiorowski

1981

Edgar Hernandez
Joel H. Keiffer
Patrick Craig Lejeune
Gwendelyen A. Mayeux
Andrew C. Mok

1982

Patrick B. Broderick
Jean E. Carvajal
Joseph Khalk Koro
Narinder B. Lakhani
Jaime A. Pineda
Thomas Anthony Stroud

1983

Daniel Mark Brignac
Lawrence T. Faucheux
Lily Gunawan
Randall D. Roddivek
Sharron R. Woodall

1984

Neftaly E. Rodriguez
Susan K. Snodgrass

1985

Mohamad Kheir S. Habbal
Corey A. Hay
Robert D. Moore
Lynne Carol Tutzauer

1986

Ann C. Dartez
Kigham Seropp Yeretzian

1988

David E. Cockrill

1989

Michael R. Landry
Jacob Thomas

WE WANT TO HEAR FROM YOU!

We would like to hear from you. Please print or type the information requested below and return to:

Dr. F. Carl Knopf
Chairman, Department of Chemical Engineering
Louisiana State University
Baton Rouge, Louisiana 70803
Fax—504/388-1476 • E-mail—jarr@che.lsu.edu

NAME _____

YEAR GRADUATED & DEGREE _____

ADDRESS _____

_____

CITY/STATE /ZIP _____

TELEPHONE (HOME) _____ (WORK) _____

CURRENT ACTIVITIES (EMPLOYER, POSITION, ETC.) _____

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Thank you for your cooperation!

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