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CHEMICAL Compositions

chemistry & biochemistry
departmental newsletter

Bard Wins Award from National Academy of Sciences

Allen Bard was recently honored by the NAS as one of twelve scientists from throughout the U.S. to receive awards for their research accomplishments. Al was recognized for his contributions to electrochemistry and to the development of scanning electrochemical microscopy. In a gesture that is so characteristic of Al, he will be donating some of his prize money back to the Academy to support its many projects.

This richly deserved and noteworthy honor prompted us to ask Al to summarize the current initiatives he and his research group are exploring. The following article is the result. After reading it, you will have a good sense of the breadth of his research interests and of the highly collaborative nature of many of his group's projects. Enjoy!

Prof. Allen Bard

In This Issue

Our research interests have been in the application of electrochemical methods to the study of chemical problems and include investigations in electro-organic chemistry, photoelectrochemistry, electrogenerated chemiluminescence, and electroanalytical chemistry.

We continue to investigate the application of scanning probe methods, where a small probe tip is moved near the surface under investigation to obtain information about the chemical and physical nature of the surface. For example, a member of my group has been using atomic force microscopy with a cantilever modified with a 15 µm diameter silica sphere to study the surface charge and potential of different types of surfaces, e.g., those modified with self-assembled monolayers and multilayers. We are continuing to use scanning electrochemical microscopy (SECM), developed at UT, for a number of problems. For example it is possible to use the SECM to examine electron transfer at the interface between two immiscible solutions (e.g., benzene/water) and the effect of a monolayer of phospholipid on this process. We are currently constructing a near-field scanning optical microscope and hoping to combine this technique—with its optical and spectroscopic possibilities—with SECM. Fu-Ren (Frank) Fan, one of the original inventors of the SECM, continues to push the limits of this instrument to measurements of single molecules—by trapping an electroactive molecule between the electrode tip and substrate—and single electron transfer processes—by using a "coulomb staircase" effect. We are also applying SECM to address problems brought to us by several industrial laboratories.

We continue our long-standing interest in electrogenerated chemiluminescence (ECL), where light is generated at an electrode. In fact, the new President of UT-Austin, Larry Faulkner, worked in this area when he was a graduate student here in the late 60s, so you know

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From the Chairman

Marvin Hackert

April '98 and we are nearing the end of another academic year. As I write this column we are having our last graduate student recruitment weekend. The weather is perfect and we are making good use of our courtyard area. I want to thank those companies and individuals who have contributed to our picnic table project to make the courtyard into an interactive area. The tables are well-used and enjoyed by our students, faculty and staff, and we could use many more!

Safety Enhancement Projects - pipe for the Welch Hall sprinkler system is cut and fitted on the south patio.

Many different activities have been occurring in the department during the past few months. We are well into the construction phase of Stage II of the Welch Safety Enhancements Project. The new alarm system and sprinkler pipe have been installed in many parts of the building. The elevator upgrades and remodeling of our research storeroom have also started. It helps us to cope with the disruption to realize that these upgrades are on schedule to be finished late this fall and will result in a safer building for all of us. The contract for the renovation of the Welch West Wing project has been awarded, with demolition scheduled to begin near the end of this semester. Construction of the new synthetic labs on the fourth and fifth floors of the Welch West Wing is projected to take about thirteen months, so we can look forward to end of construction and utilization of the improved space by the summer/fall of 1999.

In addition to the physical changes taking place in Welch Hall, we are actively recruiting faculty at the junior and senior levels. I am very pleased to announce that Professor Paul Barbara from the University of Minnesota will be joining our faculty later this year as the Richard J. V. Johnson Welch Regents Chair in Chemistry. Paul is an experimental physical chemist whose group is at the leading edge in using ultra-fast laser spectroscopic methods to study condensed states of matter. In addition, we welcome Dr. Larry Faulkner back to our "faculty" as the next President of UT-Austin (p.3). We are also recruiting junior faculty in the inorganic/materials and in the structural biochemistry areas. The University has recently established a Texas Materials Institute with Dr. Don Paul of Chemical Engineering as its Director, and our department and faculty are looking at ways that we can best support and participate in this initiative. Nearly one-third of our faculty have some active research programs related to materials, so I anticipate that the materials effort will impact the department in a manner similar to what has happened in the chemical biology initiative associated with the Institute of Cellular and Molecular Biology.

Heart painting by Jasmin Azanon - 1st grade - Zavala Elementary

One of the more pleasant things that happens in our department is to see the impact our faculty and staff have on improving the lives and education of our young people. There are several outreach programs sponsored through the department, and we had the pleasure of being blessed with a choir from Zavala Elementary that serenaded the department and brought us a valentine on February 14th. Our faculty continue to be recognized for their many fine accomplishments; most noteworthy is the 1998 National Academy of Sciences Award in Chemical Sciences to Al Bard (p. 1). I also want to announce two, recent major gifts to the department that will benefit the department for many years to come. The first is creation of the Fraser Professorship in Biochemistry (p.17), which will provide a means of recognizing an outstanding member of our biochemistry faculty. The second is the establishment of a charitable trust by Dorothy Burr Banks (BA Chemistry, 1923) to support scholarships/fellowships for chemistry and biochemistry students. Her generosity will assist us in attracting the best and brightest undergraduate and graduate students to the department.

On a sad note, we mourn the loss of Drs. Michael Dewar and Karl Folkers, both of whom died this past year (p. 15).

Finally, I want to congratulate all our graduating seniors and graduate students for a job well done and to wish them all success in the next step in their careers—keep in touch and let us know how we can better serve future generations of our students.

- Marv Hackert

Faulkner is new President of UT-Austin

Welcome back, Larry!

The Board of Regents recently named Larry Faulkner to succeed Bob Berdahl as President of UT-Austin. He previously was Provost and Vice Chancellor for Academic Affairs at the University of Illinois at Urbana-Champaign and assumed the presidency here in mid-April. Our department is particularly delighted with Larry's appointment because he is "one of our own," having earned his Ph.D. here in 1969 under the supervision of Al Bard.

Larry has spent the bulk of his academic career at Illinois, although we were able to lure him here for the academic year 1983-1984. He and Al are currently working on the second edition of a textbook on electrochemical methods that they originally co-wrote in 1980. Suffice it to say that Al, ever the "slave driver," is keeping the heat on to complete the revision before the duties of the presidency usurp all of Larry's time. In recognition of his outstanding research contributions in the area of electroanalytical chemistry, Larry recently received the Charles N. Reilley Award at the Pittcon meeting in New Orleans.

Larry R. Faulkner, President
Ph.D. (Bard) 1969

Bard wins award

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we've been working on this for a long time. This technique has been commercialized as a method of clinical analysis (immunoassay, DNA probes) and there is continued interest in new ECL active probes and possible new applications. For example, one member of the group has been investigating new compounds that show ECL in the near- infrared region. Another is involved in a project, in collaboration with Phil Magnus' group, to study new hydrocarbons that show interesting electrochemical and luminescent properties; some of these compounds also form interesting conducting polymers on electrode surfaces. We are also working on a joint project in which porphyrin monomers and polymers are being explored as ECL emitters and are continuing our studies of analytical methods based on ECL for detection and identification of small amounts of DNA.

Photoelectrochemistry, which involves studies of the effects of light on semiconductor electrodes, remains an area of active research, both for possible practical applications, e.g., solar energy conversion, and for fundamental understanding of the nature of the processes. In this context, our group is investigating new materials based on the Ga-In-N system in collaboration with researchers at the UT Microelectronics Research Center and have found interesting photocurrent and electroluminescent effects. We have recently shown that hot electrons can be generated in solution by using an electrode based on a thin layer of the wide band gap material Ta_2O_5 on a Ta electrode surface; these hot electrons can produce electroluminescence of solution species.

Our interest continues in the electrical and optoelectronic properties of thin films of organic single crystals, a field we have been studying for several years in collaboration with Marye Anne Fox's group. We have recently been obtaining encouraging results on materials with interesting properties that might find application to high density memories and other devices.

Overall, we remain excited about new possibilities in electrochemistry and believe it is still a rich and promising area of research. Our studies would not be possible without the financial support from a number of sources, including the National Science Foundation, the Robert A. Welch Foundation, the Texas Advanced Research Program, and several industrial firms.

The American Chemical Society - Student Affiliate: *A continuing success*

The American Chemical Society Student Affiliate (ACS-SA) Chapter at UT this year has continued to provide services and support for undergraduate chemistry and biochemistry majors. Due to student mobilization and interest and a very supportive faculty mentor (David Laude), the group has grown from 35 members in 1996 to the current total of 180 members! The ACS-SA gives useful information to members about their future careers and about opportunities at UT Austin. It is also a social organization where contacts are forged between students and between professional chemists and students.

ACS President Tara Spires and Public Relations officer Linda Cruz discover the perks of attending weekly ACS meetings – conversation with esteemed faculty, in this case Dr. Jim Boggs – and free pizza!

Fund Raiser: Both semesters started with our usual fund raiser involving sales of lab notebooks. Our profit of over $15,000 is being spent on activities and scholarships for undergraduate chemistry and biochemistry majors. The scholarships will be presented at a departmental ice cream social for which the ACS-SA provides refreshments.

Meetings: At our bimonthly meetings, we hosted a number of guest lecturers, who spoke on a wide range of chemistry-related topics. For example, Dr. Laude spoke about getting into graduate school, Dr. Young, MD/PhD, from Houston discussed his research, and an industry representative described his activities as a chemist in the business world. In addition Dr. Boggs spoke to the group about study-abroad opportunities, Dr. North from Texas A&M University outlined summer internships, and Dr. Iverson gave a research presentation.

Activities: We sent representatives to the national ACS meeting in Dallas in March. Several members presented posters, and all participants attended symposia on chemical education and brainstorming sessions on how to improve student affiliate chapters.

Members of ACS-SA continue to provide free tutoring for all lower division courses. In addition, our group provides information that is important to chemistry students but is not necessarily taught in classes. For example we held a seminar in February on getting started in undergraduate research.

The ACS-SA Journal club, a student seminar series, was started in the fall of 1997. Our members meet at a faculty member's home, and a student presents his or her undergraduate research project. The club provides a relaxed atmosphere for students to practice scientific presentations.

ACS members Linda Cruz and Jennifer Lara share a laugh with guest speaker Dr. Simon North from Texas A&M University.

Social events organized by the ACS-SA include broomball games against ΑΧΣ, the chemical engineering fraternity, in the ice skating rink of Northcross Mall. As treasurer Eric Gonzales calls it, broomball is the "thrill and the chill" of the semester.

For further information about the activities of the UT ACS-SA Chapter, please see the organization web site at http://www.utexas.edu/students/acs/.

- Tara Spires, 1997-98 ACS President

They're Baaack . . .

the recruiters, that is (with job offers)

The fall semester was marked by a flurry of company representatives seeking chemists and biochemists. Thirty-seven companies participated in interviews in the department, a marked increase over the past several years. Over one-third of those companies were major pharmaceutical companies seeking Ph.D. -level synthetic organic chemists.

With the increase in the number of positions available, the starting salaries that were offered also increased. The median annual salary reported to this office for bachelors'-level chemists and biochemists was $34,000. The median annual salary for Ph.D.s was $68,500.

The new location of the career services office, in the same suite as the chairman's office, provides excellent facilities for interviews. The reviews from those interviewers who used the facilities this past fall are uniformly favorable, so we must have done something right in designing the space.

Efforts to improve communication with all clients has led to the establishment of a career services web site (http://www.cm.utexas.edu/offices/career). Information available to employers includes departmental statistics, recruiting procedures, and links to maps of the UT campus and Austin hotels and restaurants. Students may view interviewing schedules, job postings and job fair dates. There are links to web sites of major companies and job banks and organizations hiring and offering help to chemists and biochemists. By visiting the web site, students and alums may learn how to subscribe to the Career Services e-mail list or printout registration forms.

- Joyce Thoresen

Graduate studies in Biochemistry

Program continues to flourish

I am pleased to report that our Graduate Studies in Biochemistry continue to flourish. At the present time we have a total of 36 graduate students in this program. Our present group of graduate students has a very broad national and international distribution, hailing from countries as far afield as Russia and China.

Students within the department who are interested in graduate studies in Biochemistry have the option of taking their degrees in two separate programs. Students with strong chemistry interests and backgrounds can pursue a Ph.D. in Chemistry (Biochemistry) while those oriented more toward molecular biology typically opt for the Ph.D. in Biochemistry. Core courses are similar in both programs, with the primary differences being the nature of the courses taken at the advanced graduate level. While many graduate programs within the life sciences are undergoing drastic revisions, as part of a general reorganization within the College of Natural Sciences, this will not affect either of the Biochemistry graduate programs.

Reflecting a broadened interest and expertise in biochemistry here, our Graduate Studies Committee in Biochemistry has been expanded over the past few years to include several members outside the department. These include Sean Kerwin, Creed Abell, Christian Whitman, all of whom are in the College of Pharmacy, and Austen Riggs (Zoology). The recent opening of the Institute of Cellular and Molecular Biology and the appointment of several faculty members in the chemical biology area further expand the list of mentors for graduate students in biochemistry.

Prof. G. Barrie Kitto
Biochemistry Graduate Advisor

A number of our Biochemistry graduates are now taking positions in industry, particularly in biotechnology, immediately after earning their Ph.D.s. However, the majority of our students go on to postdoctoral appointments prior to seeking more permanent professional positions.

AXΣ accomplishments

This has been quite a year for the Beta Theta Chapter of Alpha Chi Sigma! AXΣ is a national, co-ed fraternity for those involved with chemistry and the chemical sciences. AXΣ has as its objectives:

To bind its members with a tie of true and lasting friendship -

This year, our chapter has placed a focus on our history as a chapter and on continuing to create "new" history. The BΘ chapter of AXΣ was originally active from 1952-1985 and was reactivated in 1991 under the leadership of brother Carla Jo Harper. Between 1985 and 1991, much of the lore of the "old" chapter was lost. Last semester, our Historian and Alumni Secretary, Scott Bur, found a large box of "lost" photos. There were pictures of our former chapter house and ones of quite festive parties and dinners that took place in the late '50s and early '60s. Sadly, there were photos with no labels and labels with no photos. Albums were in pieces and out of order. Scott and our Fall Pledge Class set to work contacting alumni who might have information and rebuilding the photo albums. The most interesting bit of all came late in the semester. There were a series of pictures from a dinner dance, with one brother standing out. He was always facing away from the camera and shaking his rear end toward the lens. Nobody, including our alumni helpers, could remember who that crazy guy was. Long after we had given up hope of identifying the young man, Dr. John Gilbert stepped forward to reveal that it was he! Brothers Chris Jones and Jessica Robinson have been continually adding our historical record to the BΘ chapter website, www.cm.utexas.edu/groups/AXΣ/.

This semester, we have had a camping trip and plan to go rock climbing, play mini-golf, have dinner at the Salt Lick, and join in the semi-annual broomball battle with ACS-SA! We also plan to host a picnic for faculty and nearby alumni brothers in April.

To strive for the advancement of chemistry both as a science and as a profession -

The BΘ chapter is also committed to promoting chemistry, especially for young children. Last semester, we sponsored a departmental brunch during National Chemistry Week. At the brunch we collected and matched donations for WonderScience magazine subscriptions for elementary schools. Thanks to donors we were able to provide twenty-two elementary schools with an annual subscription! Our chapter also has participated in chemistry workshops, including two at Concordia University, where Girl Scouts were earning science badges, and one at Fern Bluff Elementary's Family Science Fun Night, where we performed a chemistry circus for 250 students and their families! We have plans to judge at least three science fairs this spring.

Christie Jester

In recognition of her contributions associated with this tenet of our fraternity, Carla Jo Harper was named the Alpha Chi Sigma Scholar Awardee for 1997 by the Scholarship Committee appointed by the Grand Master Alchemist.

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1997 - 1998 Graduate Awards and Fellowships

Camille and Henry Dreyfus Foundation Fellowship
Joel David Adcock
Todd Minehardt

Faraday Teaching Excellence Award
Kristen Smith
Stacy Sparks

H. R. Henze Teaching Excellence Award
Michael Elliott
John Lavigne
Christopher Simmons

Welch Teaching Excellence Award
Michelle Reyzer
Darrell Spells

Charles Morton Share Trust-Graduate Fellowship
Andrea Wells

Hoechst Celanese Academic Excellence Award
Hyeran Ihm
Michael Hillier

Joanne M. Ravel-Regents Endowed Fellowship
Anneke Metz

Robert E. Eakin Endowed Centennial Fellowship
John Pascal
Alexander Taylor

University Continuing Bruton Fellowship
Patanjali Kambhampati

University Continuing Fellowship
Brian Goolsby
Todd Minehardt
Cyndi Wells

University Continuing Tuition and Fees Fellowship
Maury Howard

Leon O. Morgan Fellowship
Jeffrey Pietryga

Royston M. Roberts-Regents Fellowship
Carilee Denison

Stanley H. and Kathleen F. Simonsen-Regents Fellowship
Eric Okerberg

Welch Fellowships
Jeffrey Pietryga
Debra Shuwarger
James Shriver
Christopher Simmons
Matthew Smith

Gilbert H. Ayres-Regents Fellowship
Thomasin Ruchti
Eric Okerberg

BASF Endowed Fellowship
Michael Best
Christopher Neipp

Chemistry Faculty-Regents Fellowship
Carilee Denison
David Kaelin
Christopher Neipp
Jennifer Kreisberg

Dow Chemical Company Foundation
Christopher Franklin
William Bryan Myers

Friends of Chemistry-Regents Fellowship
William Bryan Myers

H.L. Lochte Fellowship
Brenda Holtzman

Travel scholarships provided by:
John E. Mahler Endowment Fund

Clay B. Frederick-Rohm & Haas Endowment

1997 - 1998 Undergraduate Awards and Scholarships

Dow Chemical USA Centennial Endowed Presidential Scholarship
Tim Marquart

Dow Chemistry Alumni Centennial Endowed Scholarship
Hau Ho

Dow Chemical Company Foundation
Nitin Wadhwa

Norman Hackerman Endowed Presidential Scholarship
Brett Masterson

Burl Gordon Rogers Endowed Presidential Scholarship
Nathaniel Clark
John Volpi

Hoechst Celanese Scholarship
Jason Vogel
Abraham Thomas
Kwoon Wong
Tai-Shan Lin
Jennifer Schonitz
Siby Monnnumakal
Jessica Turner
Yubin Wu

Hoechst Celanese Academic Excellence Award
Kurt William Sattelmeyer

BASF Endowed Scholarship
Bena Ellickalputhenpura
Jacinthia Louis
Benjamin Hoster
Lisa Snyder
Massala Reffell
Linda Cruz
Owen Bishop

Louis Weisberg Memorial Chemistry Scholarship
Ryan Pate
Aashish Parikh
Tin-Sheng Chen

Marie Smith-Regents Endowed Scholarship in Chemistry
Toni Chu
Sharon Mauldin
Alice Johnston
Eurne Cho

Shell Oil Company Foundation
Courtney Sheinbein
Shreya Parikh
Aarti Mathur
Gunjan Parikh
Angela Nguyen
David Lola
Eric Gonzales
Sharon Mauldin

Friends of Chemistry-Regents Fellowship
Hansheng Liou
Trieu Ho

H.L. Lochte Scholarship
Joseph Wilwalico

Charles Morton Share Trust-Undergraduate Scholarship
Christopher Ackerson
Katherine Kershen

ACS Central Texas Award of Excellence
Katarzna J. Kedzierska
Nathaniel L. Clark

W. A. Felsing Memorial Award
Sujit Iyer

Pirrung Scholarship
Christopher Ackerson

New Faculty - Prof. Andrew Ellington, Biochemist

Editor's note: Andy joined our faculty and the Institute of Cellular and Molecular Biology in January. We lured him here from Indiana University as an Associate Professor and treated him to an Austin "winter." The following article allows you to get acquainted with Andy and his research interests.

Prof. Andrew Ellington

I have always been fascinated by the possibilities of molecular evolution. As a graduate student, I worked with Professor Steven Benner at Harvard University and the ETH-Zurich on the molecular evolution of dehydrogenase isozymes and began to speculate about the plausibility of the so-called RNA world. In particular, we postulated that modern metabolism was a "palimpsest" of an ancient RNA world, in which many biochemical reactions now catalyzed by protein enzymes were once catalyzed by ribozymes. As a postdoctoral fellow in Dr. Jack Szostak's lab at Massachusetts General Hospital, I developed experimental tests for these theories. These included a method for the *in vitro* selection of nucleic acid binding species, also known as "aptamers" (from the Latin word *aptus*, to fit). Large populations of nucleic acid sequences can fold into large populations of nucleic acid shapes. Those shapes that are chemically complementary to a target molecule can be sieved from the population by techniques such as affinity chromatography. The selected shapes can then be preferentially amplified by conventional molecular biology techniques such as reverse transcription, PCR amplification, and *in vitro* transcription. After multiple cycles of selection and amplification, large populations of nucleic acids can be winnowed to those few species that have high affinities and specificities for a target. Using this method, aptamer "hosts" that bind small molecular "guests" have been selected, as have aptamer "guests" that fit into the grasp of larger molecular "hosts."

Aptamers as pharmaceuticals - While at Indiana University, I explored *in vitro* selection for developing pharmaceutical reagents. Aptamers that could bind tightly and specifically to the Rev protein of HIV-1 were selected from random sequence populations. The anti-Rev aptamers not only inhibited interactions between Rev and its cognate RNA, the Rev-binding element, *in vitro*, but also inhibited viral replication *in vivo*. The anti-Rev aptamers are currently being developed as potential gene therapy reagents for the treatment of AIDS. The structures of the anti-Rev aptamers were modeled in collaboration with Bob Cedergren at the University of Montreal and solved in collaboration with Dinshaw Patel at the Sloan-Kettering Institute. These structures are proving useful for designing more conventional anti-viral drugs.

My research groups is continuing to explore the anti-viral applications of aptamers, but is also branching out into several other research areas. For example, aptamers may have interesting diagnostic applications. Like antibodies, aptamers are molecular receptors that can be readily configured to different targets and engineered as biosensors. Our lab has recently developed "smart" aptamers that can directly signal interactions with ligands in solution, and aptamer "chips" that can simultaneously detect multiple analytes. In parallel with this effort, we are attempting to understand the informational and structural basis for molecular recognition of analytes by aptamers. Selection experiments have previously revealed that aptamers that bind related analytes tend to have related sequences, raising the real possibility that there may be informational and structural "codes" for molecular recognition. By cracking these codes, it may be possible to design molecular receptors for new or even previously unknown ligands. Diagnostics based on codes for molecular recognition could potentially detect and distinguish between numerous related analytes via pattern recognition.

Origin of life - My fascination with molecular evolution remains, however, and I hope to address fundamental questions in how life originated. While organic chemists have convincingly demonstrated that nucleosides and short oligonucleotides may have originated prebiotically, it is less clear how these compounds assembled into larger nucleic acids and became organismal genomes. To this end, our group has recently provided an experimental demonstration of the likely first step in biogenesis, the faithful copying of oligonucleotide strings by random sequence substrates. The next step will be to encourage the emergence of self-replicating biopolymers from random sequence populations. Such self-replicating, information-bearing polymers could legitimately be called the simplest form of life, and their further functional augmentation and evolution should provide clues as to how the earliest organisms may have arisen. Nonetheless, it is clear from a variety of biochemical data that self-replicating oligonucleotides eventually diversified to become the RNA world. To better understand the capabilities of ribozymes in the RNA world, we are evolving novel ribozymes that contain modified nucleosides in place of the natural complement of bases. These experiments are equivalent to asking what would the capabilities of protein enzymes be if we could change the genetic code. In order to examine this question as well, my group is evolving novel bacteria with altered genetic codes in which unnatural amino acids replace their natural counterparts. Such "Un Coli" may eventually be of use in the selection and design of proteins that have capabilities far different than those currently seen in nature.

Bundle of joy - My wife, Heather, and I used to have a personal life and hobbies, which included hiking and playing video games, but have long since given up both to care for our fantastic son, Caleb, who was born on November 26, 1997. We also have two small dogs, Hiawatha and Pocahantas, a beagle and a border collie, respectively, who were once the focus of our lives but are now just rugs that we step around and don't feed nearly enough treats. Caleb weighed 16 lb 2 oz as of this morning (mid-February), and is just about the most wonderful little guy on the planet. He concurs from afar with an "Aooooooo!," his general word of approval.

Reminiscences

A. Furman Isbell recalls his experiences as a graduate student in the late 1930s

A. Furman Isbell
BA, Chemistry, Baylor University
MA, 1941, Ph.D. (Henze), 1943

Dr. Isbell spent 11 years as an industrial research chemist, after earning his Ph.D. In 1953, he joined the faculty at Texas A&M, rose through the academic ranks, and took early retirement as a Full Professor in 1977 because of physical problems. Despite being told by doctors to retire early because they did not expect him to live much longer, some 20 years later he continues to do scientific research in his garage. A measure of his success at "garage chemistry" is his having received two U.S. Patents in the past two years. (Note: bracketed comments are those of the editor)

This is largely a personal story of my four years as a chemistry graduate student, not because I think my situation at that time was unique in any way but because times were very different then when compared to now and because I really believe that I was a very typical student. Although the times were very tough, causing all of us to have to make some difficult decisions, looking back on those four years, I realize I also had many enjoyable times and formed many close friendships.

Having graduated from Baylor University in the spring of 1937 with a B.A. in chemistry, I considered myself an educated man fully prepared to make my mark in the world as a chemist. However, this was one of the worst years of the depression, so, much to my dismay, I found myself jobless for the next four months. I survived on a total of $25 during that period [no mean trick, even given the value of a dollar back then]. I finally found work as an analytical chemist for the First Texas Chemical Manufacturing Co., a pharmaceutical firm in Dallas, where my assignment was mainly to analyze all their products that contained narcotics. My salary was $100/month, and I received the magnificent increase of $25/month the second year [not bad, a 25% raise!]. Although I was earning a living wage, the job had no future, so about the beginning of the second year I took a Civil Service Examination. I received a report that I had done well on it but heard nothing more [still a typical response from the Government unless you owe some taxes].

Onward to Graduate School

A friend began encouraging me to go to graduate school and invited me to visit with him and his parents in Austin over the Thanksgiving holidays in 1938. While there I described to Dr. Henze, the department chairman, how badly I wanted to work on master and doctoral degrees but there was a problem—I had no money. My father had died in 1928 and my mother and two younger sisters were having a difficult time financially. Henze said the only way the university had to support graduate students was to hire them as teaching assistants in the freshman laboratories. However, he said all such positions had been filled for the school year starting in September 1939. Seeing the disappointment in my face, he finally said, "If you really want to come here, I will make you a deal. Come here on your own in June and take the two required courses for all students who want admission to our graduate work. The first course is Organic Qualitative Analysis and the second is Organic Quantitative Analysis. If you make A's in both courses and an extra teaching assistant is needed in September, you will get the job." I arrived on June 1 with $25 in my pocket to last me the entire summer, having arranged for a job to cover my meals and my room.

Testing my mettle

The two courses involved laboratory techniques, including a brief course in blowing soft glass. For anyone who could cope successfully with this type of glass, working with Pyrex, which became available about a year later, was duck soup. The department had no glassblower, but Bill Shive, the lab assistant in these courses, taught us well. My schedule every weekday of that summer was to work for my room and board from 6:00-11:00 AM, attend an hour lecture from Dr. Lochte and work in the laboratory from 1:00 PM until whenever! My first major shock at UT came with Lochte's first lecture. He had an incredibly thick German accent, and it took me the first two weeks just to learn to decipher his words. In fact, I was told that when Lochte first arrived at UT from Fredericksberg [still a Texas stronghold for the German culture] as a freshman student, he could not

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speak English at all [nowadays he would presumably have benefited from bilingual instruction!].

I encountered a second problem almost simultaneously with learning to translate "Lochtish," and this one had to do with my academic background. Baylor had a reasonably good pre-med program in those days, but I was the only chemistry major at Baylor and my chemistry training was deplorable. Often when Lochte would mention an organic topic, I would turn to a classmate and ask, "Do you know what he is talking about?" Usually the answer was, "Sure, I had that as an undergraduate." Consequently, I ran into the chemistry library at the end of almost every class and read about the subject until I understood it.

We were given 10–12 unknowns in each of the courses I took and were required to do certain analyses on them. Since I did not dare turn in any report that might be incorrect, I typically worked until midnight and even until 2:00 a.m. to get things right [were today's students only to have such dedication!].

A nearly disastrous accident happened one afternoon in the laboratory during the latter part of that summer. In the course of running quantitative analyses, a technique for analyzing for halogens and sulfur by combustion in a Parr bomb, Dr. Lochte had instructed us to weigh 200-250 mg of the organic compound into the bomb, followed by a "scoop" of sodium peroxide and 1.0 g of potassium chlorate. The bomb was then sealed with a metal cap, shaken thoroughly to mix its contents, and heated to effect oxidation of the sample. In this particular instance, a student, who shall remain anonymous, started heating the sample, with me standing immediately to his left and with Bill Shive to my own left. Suddenly there was violent and deafening explosion, after which one of the large light fixtures that hung from the ceiling by a heavy metal chain crashed to the floor. The explosion had blown part of the bomb through the window facing the library wing; the part then passed over the library wing and possibly went into orbit. The heavy steel screw cap of the bomb was propelled in the opposite direction, hitting the bench top about six inches in front of my head, ricocheting over Bill's head, bouncing off the fume hood, next taking a chunk of plaster out of the ceiling and, on its way down, cutting the chain of the light fixture, causing the fixture to crash on the floor. One tiny piece of the bomb drilled a hole through a 1-L beaker of solution one of the students was holding in front of his face. The student holding the ignition burner had some minor flash burns on one hand, but this was the only injury to the dozen individuals who were in the room at the time. Clearly, that was not our time to go!

At the time of the explosion, Dr. Lochte was about a block away, on his way home. Less than five minutes after the explosion, he burst into the laboratory as white as a sheet, saying that he'd heard the explosion and knew exactly what it was. I have never seen a more relieved human being once we assured him that we were just a bit late with our Fourth of July pyrotechnics. As to the cause of the explosion, the student finally admitted that he had had some difficulty getting the cap to fit on the bottom because the bomb was completely full of solid. A subsequent check of his lecture notes showed that he had written 10.0 g potassium chlorate rather than 1.0 g. This did make a difference!

In mid-summer, because of my score on the Civil Service Exam I was offered a position at $2,400/year with the Southern Regional Research Laboratory. I did not know that anyone made such a magnificent salary. Nonetheless, after 24 sleepless hours I declined the offer because I knew if I left Austin that summer I would never again return to graduate school. This momentous decision was made six weeks before I learned that I had made A's in each of the two courses. Soon, Henze called me to his office and awarded me a teaching assistantship for the fall semester. It paid only $650 for the academic year and carried no guarantee for the summer, but who was I to complain [for comparison, the current stipend for a first-year graduate student is $15,500 for twelve months]? To this day I feel sure that these two tough German profs said, "We have this crazy kid here who is trying in every way possible to get into graduate school. Let's create an additional assistantship so that he can." Years later I separately accused them of having done this, but neither would ever admit to it. This was not the only time that these two tough old Germans went to bat for a student [they may have seemed "old", but both would have been in their early 40s at the time].

Sleepless in Austin

Because I usually had a freshman laboratory or a quiz section to run at 8:00 a.m. each school day and rarely got away from my research laboratory before midnight, I was interested in finding a way to squeeze in a few more minutes of sleep. One night I noted that there was a comfortable sofa in the third-floor ladies room. Knowing that a night watchman consistently checked the building at 7:00 a.m., I asked that he be sure to visit that room and awaken me if he found me there; the nights I opted to sleep there yielded about 30 valuable minutes of additional sleep. I did this only occasionally, but it worked well for months until one morning when I was awakened by a female voice saying that I was in forbidden territory. Quickly regaining consciousness, I agreed with her, opened the door a wee bit and glanced down the long hall both ways. Finding the hall empty, I rapidly exited, with no one but the woman who woke me the wiser. I never knew what happened to my friendly night watchman, but decided the strategy for gaining extra sack time was not as good as I had first thought.

The 8:00 a.m. freshman laboratories were the source of yet another incident, which involved the fearsome Dr. Watt. This occurred because when I returned to my rooming house after a late session in the research laboratory, I had no difficulty going to sleep but did have a problem waking. The problem was compounded by my ability to turn off the alarm clock without gaining full consciousness. After my executing this tactic one morning, the telephone rang and none other than Dr. Watt was on the other end. He simply said, "Do you know you are already ten minutes late to your freshman laboratory?", to which my response was, "I will be there in minutes." My room was near the old Tri-Delt house, 6–8 blocks from the chemistry building, but I almost certainly set a world record for the 800-meter dash because I was in the laboratory

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by 8:20 [that certainly could not have allowed for a shower].

'Tweren't All Work and No Play

Some of us greatly enjoyed dancing with the many attractive female students. The great jazz bands of the time found it financially attractive to play for Saturday night dancing in Gregory Gym before 5,000 happy students. Such an all-university dance was held about once a month. Band directors I enjoyed dancing to were Benny Goodman, Tommy and Jimmy Dorsey, "Satchmo" Armstrong, Paul Whiteman, Sammy Kaye, Jan Garber and others [my, what a listing of the "big bands'" of yesteryear]. A male could go "stag" for $.50 [what was the cost for a "doe"?] and for $1.10, he and his date could dance and enjoy a coke.

Charlie Holder, a close friend and co-worker of mine, and I often attended dances as "stags" because the price was right and we were able to dance with virtually all the good-looking females. On Saturday night, December 7, 1940, Charlie and I went to a dance in the student center. Shortly after we arrived, Charlie said to me, "You must dance with that cute young lady because you will never find a better dancer anywhere." He was right. That excellent dancer's name was Edith Roberts, she was a graduate student in microbiology and her date that night was her fiancee. Between Charlie, me and some other "stags," the fiancee did not get to dance much with his date. A year later Edith had become a research technician with Dr. Williams' group, and I had become better acquainted with her. On the Saturday night of December 6, 1941, there was a similar dance, attended by Charlie, me, Edith Roberts and her fiancee from Dallas [this was a long engagement!]. Again, Charlie and I dominated Edith's dance time. On the historic following night at 8:00 p.m., Edith dropped by my laboratory to tell me that she was accepting my marriage proposal [wondrous things occur in chemistry labs]. We have been married for more than 55 years, and she can still dance!

Faculty and Students

The Chemistry Department at UT was initially developed to a high level by four Germans—Henze, Lochte, Schoch and Felsing. About my time, these four brought in Watt, Williams, Matsen, Anderson and Hatch and one or more others (my memory has slipped a bit in the past 55 years). I owe much to those I have named because they contributed to my education and they all became some of my closest friends. I do not know as well some of the faculty who have been added more recently but what the old Germans started seems to be continuing.

In my days as a graduate student working with Dr. Henze, the Department of Chemistry did not emphasize theory (organic chemical theory was just starting to develop at such schools as Illinois, Michigan, Minnesota, Indiana, Harvard, Berkeley, etc.), but I believe UT was unexcelled at teaching synthetic techniques and the practical solution of chemical problems—just what industry wanted [and what one would have expected from a Germanic tradition]. Consequently, throughout my career I worked with a number of chemists who were much better theoretical chemists than I, but I quickly learned that my skills as a synthetic experimentalist were equal or superior to any of my co-workers, regardless of the reputations of the schools from which they had received their degrees. If that sounds like bragging, it really is but, as "Dizzy" Dean used to say, "It ain't braggin' if you can do it."

"In addition, I owe the UT Chemistry Department more than I can repay because it gave me the training to be the kind of scientist I had always wanted to be."

The Henze Group

I worked in the same laboratory with Cecil Gayler, Chessie Rehberg, Leslie Schenck, David Humphreys, "Snuffy" Smith, Tommy Thompson, Burl Rogers, Loren Long, Aubrey Nease, Leslie Nunn, Bob Speer, Woodrow Wyatt and one or two others. Although any of these would be worth at least one good story about their laboratory activities, I'll limit myself to one. In the Henze group, we all became Grignard reaction experts—especially Chessie Rehberg. One afternoon I knew he was working on the formation of a Grignard reagent because I heard him mumbling for at least two hours trying to get the reaction initiated. Around 6:00 p.m. he left for supper, came to me, saying that he had added all the organic halide [that's a sophomore-level mistake!] and was sure that the reaction had taken place, even though he had not observed the usual exothermicity.

Chessie had been gone for less than 30 minutes when I heard what sounded like the eruption of Old Faithful geyser. Indeed, what I saw on his desk was a geyser [nowadays, such phenomena would occur in a hood], with liquid blowing out the top of the Liebig condenser. As the ethereal solvent evaporated, a white solid fell like snow throughout the laboratory. I raced around the laboratory looking for any flames, fully expecting an imminent and violent explosion that would relocate the entire laboratory on the ground, three floors down. Fortunately, nothing else happened, but I wrote a note which I attached to Chessie's empty reaction flask and left to eat some supper. The note said, "Chessie, you have still not run a heatless Grignard reaction!!!" In those days chemistry graduate students surely had a special angel watching over them.

In spite of the fact that Henze's office was the most cluttered I believe I have ever seen, otherwise he was order personified, and he demanded such order from his graduate students. In the four years I worked with him, I had a conference every Saturday morning at 8:00 a.m. [today's graduate students certainly are not around at that hour on weekends]. We discussed my research of the previous seven days and planned what I would do

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the next week. I quickly learned not to go into a conference unprepared. To achieve this, I routinely worked all night on Fridays, checking physical constants of newly prepared compounds, doing analyses, occasionally running an additional synthesis, etc. If I told him that I had run a certain experiment, he often asked, "Why did you do that." I always wanted to have good answers. This taught me to do research in an efficient and orderly way. In a subtle way, Henze taught his students to develop innovative and ingenious techniques and routes that provided better solutions to our problems. It was not all work and no play in the Henze group, by the way. Occasionally the "Boss" himself would accompany his students to a bar for a few beers on a Saturday night and Schultz's Garden was a favorite spot on a hot summer afternoon for the graduate students to gather in order to solve weighty chemical problems.

Work hard, play hard

Of the roughly 60 chemistry graduate students at UT at the time, virtually all were very hard workers, about 30% knew how to play equally well and some were real clowns. Bill Eakin [later to become a faculty member here] always had a twinkle in his eye and usually was looking for some kind of mischief. The handsome and suave Atlantan, Cecil Gayler, was always unpredictable. For example, about midnight one night I encountered him riding atop a streetsweeper on Guadelupe Street. He was giving the driver a hard time because Cecil said that he had been refused a transfer to "the Peach Tree streetsweeper." To the great relief of the driver, I talked Cecil into going with me to his boarding house. One never knew whether Cecil just had had an extra drink or two or whether he was simply pulling your leg.

During my last two years Herschel Mitchell, Vernon Cheldelin, Esmond Snell [another graduate student who was later to become a member of our faculty] and I played a doubles handball match about twice a week. Occasionally the foursome could not get together and I would go over to Gregory Gym looking for an opponent. A number of times the opponent I found was Dr. Schoch, who must have been around age 70 at the time. Yes, I was younger and faster than he and could beat him if I continually hit the ball away from him. But, we had most enjoyable games when I gave him a reasonable chance to hit the ball. Under those circumstances, he could destroy me. Moreover, Dr. Schoch disdained the regular shorts that everyone else wore. His attire was winter longjohns [appropriate wear for someone who would be a founder of chemical engineering here].

Success stories

I am not up-to-date on many of my fellow students at UT. I believe that Herschel Cudd later became President of Standard Oil of Indiana, Cecil Gayler became Vice-President of the Celanese Corporation, and Loren Long became Director of Research at Parke-Davis Pharmaceuticals. Aubrey Nease's short fuse while a graduate student and his reputation of being a menace in the laboratory might have suggested a less than rosy chemical future for him. In fact, after working two years at General Aniline, he and a co-worker started a specialty chemical production company. When I last saw Aubrey about 25 years ago, he not only had taken early retirement, but he was a multimillion-aire. Not bad for an Okie! Many others had very distinguished careers by staying in their laboratories and doing the quality research that is so satisfying to all scientists. Even though in those days Texas did not have the reputation of producing outstanding teachers of chemistry, Ben Dailey did well at Columbia University, two of my group, whose names escape me, were at Yale around 1965, another was a professor at Berkeley, and Bob McKee was successful at the University of North Carolina. This is a very impressive list, and I certainly have over-looked some other academicians. I apologize for any such omissions.

I really can't think of any bad things that happened in my days as a graduate student [time heals all wounds]. In addition, I owe the UT Chemistry Department more than I can repay because it gave me the training to be the kind of scientist I had always wanted to be. Having been closely associated with Baylor, Texas and Texas A&M, I could be accused of having split loyalties but looking back at all the good things that happened to me at Texas, I am proud to be called a "tea sip."

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ALUM RETORTS

1943

Donald M. Ross, B.S. Chemistry, MPH (1953) and Sc.D. (1956) University of Pittsburgh ~ was honored with the first Department of Energy Industrial Hygiene Award in recognition of his outstanding service to the department and the profession of industrial hygiene. He retired from DOE in 1996, and is an Occupational Health & Safety Management Consultant in Bethesda, Maryland.

1945

Nell Mondy, M.A. (Snell and Williams), Ph.D. Biochemistry 1953 (Cornell University) ~ received the first Elizabeth Fleming Stier Award, presented by the Institute of Food and Technologists, honoring a member for the pursuit of humanitarian ideals and unselfish dedication resulting in significant contributions to the well-being of the food industry, academia, students, or the general public. Mondy's research on potatoes and her solutions to Third Word malnutrition problems are her most notable contributions.

1950

J. Virgil Waggoner, M.A. (Bailey) and M. June Waggoner have recently committed $5,000,000 to the College of Natural Sciences to establish a program focused on research into the molecular basis of alcoholism. The M. June and J. Virgil Waggoner Chair in Molecular Biology for Studies Related to Alcohol Dependency will be funded with $2,000,000 of the gift. Previously, the Waggoners established a chair in our department which currently is held by Marye Anne Fox. Virgil retired as President of Sterling Chemical Company in 1996.

1968

Dan K. Seilheimer, B.S. Chemistry, M.D. Baylor College of Medicine ~ is in his 14th year as Head of Pediatric Pulmonology at Baylor College of Medicine and Chief of the Pulmonary Medicine Service at Texas Children's Hospital in Houston.
Mary Newman White, Ph.D. (Shive) ~ is supervisor of the ASTM lab in Dow Chemical's Polyurethanes Department. (See Dexter White, 1969, and Sarah White, 1993.)

1969

(Warren) Dexter White, Ph.D. (Cowley) ~ was recently promoted to head of Dow's Materials Research and Development Lab in Texas. He sends news on other family members (see Mary White, 1968; Sarah White, 1993), including daughter Kahtleen (Katie) White (BS, Education, 1996) who is entering graduate school at North Texas to pursue a masters degree in education.

1971

Denis Emil Miller, B.S. Chemistry; Ph.D., University of North Texas ~ has developed chemical fossil technology for oil exploration at Phillips Petroleum and Exxon, has worked computer materials science, and currently does geochemical databases.

1973

(David) Wayne Goodman, Ph.D. (Dewar) ~ recently named to a Welch Chair at Texas A & M University, Department of Chemistry.

1974

Anselm (Andy) Griffin, Ph.D. (Dewar) ~ is Dean of the Graduate School at the University of Southern Mississippi.

1978

John Calhoon, M.D., Biochemistry ~ was named an Outstanding Young Texas Ex for 1997 by the UT Ex-Students' Association. As a professor and head of cardiothoracic surgery at the University of Texas Health Science Center in San Antonio, Dr. Calhoon has become a nationally recognized leader in organ transplantation. In 1991, he led the surgical team that successfully performed a heart transplant operation on an 18-day-old baby girl, the youngest patient in Texas to have undergone this procedure. In 1992, Dr. Calhoon was the first surgeon in the world to perform the Ross procedure, a sophisticated heart-valve operation.

1983

John A. Colapret, M.A. 1979, Ph.D. (Martin) ~ left academics to manage the newly formed Quality Assurance Department of MEMC, an electronics supplier, in Pasadena, Texas.

1984

Mark Edward Baze, B.S. Chemistry ~ reports he is working at the Clorox Company in Oakland, California, combining his chemistry education with patent law, enjoying the job very much, and bemoaning the high cost of living in San Francisco, where he has an apartment.
Dustin K. James, Ph.D. (Whitesell) ~ is Technology Exploitation Manager for Koch Specialty Chemicals Company in Sugar Land, Texas.
Thomas C. (Tom) Wright, B.S. Chemistry (1981); Ph.D. (Jones) ~ reports he and his wife moved back to Austin in 1997 and are both attending law school.

1985

Richard Todd Dean, B.S. Chemistry ~ is a Database Administrator for Johnson Controls, Inc. in Wisconsin.
Daniel F. Persico, Ph.D. (Lagow) ~ recently moved to South Carolina and accepted a job as Director of Technology for Kemet Electronics Corporation.

ALUM RETORTS

1986

Denise Guinn, Ph.D.(Martin) ~ was granted tenure with the promotion to associate professor at Regis College. She also became chair of the department.

1988

Wei Li, Ph.D. (Martin) ~ moved from Novartis to Pharmacopeia, where he is now a senior scientist.

1989

Edwin Garcia, M.A. 1985, Ph.D. (Bard) ~ is the Director, Diversity Initiatives for Eastman Kodak Company, Rochester, New York.
Luis Felipe Rodriguez, M.A. 1988, Ph.D. (Holcombe) ~ recently moved to the suburbs of San Juan, PR, and is employed by Lilly del Caribe, Inc.

1990

Jeffrey Dean Hugdahl, Ph.D. (Sessler) ~ has been hired as an assistant professor at Mercer University, Macon, Georgia. He will be responsible for helping develop a biochemistry program at Mercer. He and his wife, Carol Bokros, have two young children. Carol (Ph.D., Biology, 1994, UT-Austin) is starting her own business called "Explorations" to teach science to preschool and elementary school-aged children.
Cory Momany, Ph.D. (Hackert) ~ will join the University of Georgia faculty as an assistant professor in the Department of Pharmaceutical and Biomedical Sciences and Center for Drug Discovery in the School of Pharmacy.

1991

Richard Austin, Ph.D. (Martin) ~ moved from his position at Glaxo Wellcome to a position at Selectide in Tucson, Arizona. Selectide is a wholly owned subsidiary of Hoechst Marion Roussel and is primarily a site for generation of potential drug leads.

1992

Jeffrey Byers, Ph.D. (Webber) ~ works at Sematech.
Shara Godiwalla, B.A. Biochemistry ~ reports that after graduation from UT, she worked with the Peace Corps in the Fiji Islands as a health education trainer. She is completing a master's degree in public health at Johns Hopkins University, focusing on epidemiologic methods of evaluation.

1993

Rodney D. Schluter, Ph. D. (Cowley) ~ is an Assistant Professor at College of Charleston in South Carolina.
Sarah White, B.S. Chemistry ~ will graduate next year from Cal Tech with a Ph.D. in chemistry.

1994

Minmin Tian, Ph.D. (Munk) ~ is working in Japan for Procter & Gamble Far East Center.

1995

Bruce Anderson, M.A. (Martin) ~ moved from his position at Pfizer to ILEX Oncology in San Antonio, Texas, where he is a Process Specialist.
Vanessa Flores, B.S. Chemistry ~ is employed by Samsung Austin Semiconductor.
Andrew Scheie, Ph.D. (Holcombe) ~ works for ARCO Chemical Company in Pasadena, Texas.
Kevin Shreder, Ph.D. (Iverson) ~ is a Senior Research Scientist for the Abbott Diagnostics Division, Abbott Laboratories, Abbott Park, IL.

1996

Ye Maggie Ruan, M.A. (Holcombe), M.S. Civil Engineering 1997 ~ recently moved to Redlands, California. She works at the Environmental System Research Institute, where her current task is developing instructional internet courses.
Adam R. Urbach, B.S Chemistry, M.S. Chemistry 1998 (California Institute of Technology) ~ is employed by Clinical Micro Sensors, Pasadena, CA, as a Research Associate.

1997

Jungseok Hahn, M.A. (Webber) ~ is in the Korean Army.
Ted K. Joe, B.S. Chemistry ~ reports he is freezing in Connecticut, but enjoying his work at Bayer Pharmaceuticals.
Weijin Li, Ph.D. (Fox) ~ is a Postdoctoral Research Associate at Northwestern University.
Denise Marie Perreault, Ph.D. (Anslyn) ~ is an NIH Postdoctoral Fellow at the University of Wisconsin - Madison, Department of Chemistry.

ALUM RETORTS

Former Postdoctoral Fellows

Kevin Krosley (Fox) ~ has been promoted to Vice President for Research and Development for Research Biochemicals International.
Matthew Marx (Martin) ~ has taken a position with Pfizer Central Research Division in Groton, CT.

Former Faculty

Patrick LeGrand Parker, Professor Emeritus, was honored with the 1996 Alfred E. Treibs Award in Geochemistry. He began his extensive study of stable isotope-organic geochemistry at UT-Austin, Marine Science Institute in 1963. His research led to 90 papers and reports and produced 18 Ph.D. and 11 Masters degrees. Dr. Parker retired in 1994 and now lives in Arkansas.

Austin Symposium on Molecular Structure March 2–4, 1998

Every two years since 1966, scientists from throughout the world have gathered in Austin to share their research results in areas of chemistry and physics dealing with the structures of molecules and the chemical consequences of those structures. As many of you know, these meetings have all been organized by Jim Boggs and bring significant international recognition to our Department and the University.


Prof. Jim Boggs

The Seventeenth Austin Symposium was held here in early March. This year's meeting featured 39 oral and 68 poster presentations by scientists from 17 different countries. Among the papers was one by our own John Stanton.

Some 120 individuals were registered for the symposium, including two Nobel Laureates. One of them, Sir Harold Kroto of the University of Sussex, also gave a special presentation on buckyballs to an elementary school group at Zavala School. It was for the discovery of buckyballs that he, Bob Curl, and Richard Smalley shared the Nobel Prize in 1996. Coincidentally, these three scientists were originally brought together when Kroto was in Austin to attend a Molecular Structure Symposium, during which Curl invited him to stop in at Rice on his way home. While there, Bob introduced him to Smalley, and the story of buckyballs began. Yet another of the participants in the Symposium, Prof. Kozo Kuchitsu from Japan, remained in Austin to give this year's W. A. Noyes Distinguished Lecture, entitled "Dynamics of Atomic and Molecular Clusters in the Gas Phase."

A reflection of the reputation of this meeting in the scientific community is the fact that most of the participants fund their own travel expenses. However, some financial support for foreign scientists is made available from the College of Natural Sciences and from the Department of Chemistry and Biochemistry. In both cases, the monies are derived from development funds provided by industry and alumni. Although Jim is "retiring" at the end of this academic year, he intends to continue his program of theoretical research. Moreover, he is already laying plans for the eighteenth edition of the symposium, which will be held in March, 2000. A great way to end the 20th century!

Major Chemistry Conference Comes to Austin

The 1998 Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) meeting will be held October 11-16, 1998 at the Convention Center in Austin, Texas. The sole purpose of FACSS is to organize an outstanding scientific meeting in all areas of analytical chemistry and spectroscopy. FACSS is one of the leading analytical chemistry conferences in the world, with over 1,500 participants and 800 presentations. Two-thirds of the presentations are by invited or solicited authors. As a result, FACSS is an ideal meeting to learn about the latest developments from the world's leading scientists, not only in particular topical areas but throughout analytical chemistry and spectroscopy. Specific topics for this year's symposium include: Atomic Spectroscopy, Electronic Spectroscopy, Biotechnology/Bioanalysis, Environmental Chemistry, Chemical Sensing, Industrial Chemistry, Computational Methods, IR Spectroscopy, Electrochemistry, Raman Spectroscopy, Separations, Mass Spectrometry, NMR and Surface Phenomena and Characterization. Workshops held during the conference will also provide continuing education. Other activities include an exhibition of state-of-the-art chemical instrumentation and an employment bureau.


Prof. David Laude

The conference provides a great opportunity to get back to Austin to relive what made your time here so wonderful. The conference will promote the unique wonder that is Austin, with its combination of gracious Texas hospitality, live music and cultural venues. All of these will be an integral part of the conference social festivities.

The Department of Chemistry and Biochemistry and the College of Natural Sciences are actively involved in organizing and promoting the conference. Dave Laude will serve as General Chair and Jim Holcombe, Jenny Brodbelt and Jason Shear are organizing symposia. In addition, Joyce Thoresen in the Placement Office will support the employment bureau, and Nobel Laureate Steve Weinberg will also deliver a plenary lecture.

You are invited to consider making an oral or poster presentation in one of the topical areas listed above. To learn more about the conference or to register for it, check out the Website at http://facss.org/info.html or contact Dave Laude at dalaude@mail.utexas.edu.

Karl Folkers - Medicinal chemist extraordinaire


Dr. Karl Folkers

Karl Folkers (born September 1, 1906, died December 9, 1997) left a legacy of over 66 years of outstanding research in organic and biological chemistry, particularly related to biomedical research. He was active in research until his death, serving as Director of the Institute for Biochemical Research and Ashbel Smith Professor in the Department of Chemistry and Biochemistry and College of Pharmacy.

Dr. Folkers (B.S., University of Illinois 1928, Ph.D., University of Wisconsin 1931, Postdoctoral Fellow, Yale University 1931-34) was associated with Merck and Co., Inc. from 1934 to 1962, where he held various positions, ultimately becoming Vice-President for Exploratory Research. He then served as President of the Stanford Research Institute from 1963 to 1968, after which he joined UT-Austin as Professor in the Department of Chemistry and Biochemistry and College of Pharmacy. Karl was also the founding Director of the Institute of Biomedical Research here, which had joint activities with many other laboratories, particularly in Sweden, Japan, Germany and Italy. He received Honorary Doctor of Science degrees from the Philadelphia College of Pharmacy and Science (1962), and the universities of Uppsala and Wisconsin (1969), Illinois (1973), and Bologna (1989).

Karl received numerous awards and citations for his discoveries and leadership in combining basic chemical research and clinical medicine to achieve new treatments of disease, Among these were the Presidential Certificate of Merit (1948) and the Presidential National Medal of Science (1990). He also earned numerous awards from scientific organizations, and these included co-recipient of the Mead Johnson & Company Award for vitamin B_6 work (1940), and for vitamin B_{12} work (1949), Scientific Award from Merck and Co. (1951), American Chemical Society Award in Pure Chemistry (1941), Spencer Award (1959), Perkin Medal (1960), Nichols Medal (1967), American Thyroid Association Van Meter Prize (co-recipient 1969), for structure and synthesis of the first hypothalamus releasing hormone, Robert A. Welch International Award (1972), Academy of Pharmaceutical Science Research Achievement Award (1974); Priestley Medal of the American Chemical Society (1986), and Infinity Award American Academy of Anti-Aging Medicine (1996). He served as President of the American Chemical Society in 1962.

Dr. Folkers is noted particularly for research on the early development of antibiotics, the isolation and synthesis of B vitamins, the isolation and characterization of crystalline vitamin B_{12} , the structure and synthesis of coenzyme Q_{10}, the structure and synthesis of the first hypothalamic hormone (thyrotropin), and on the use of vitamin and related substances in the treatment of diseases, particularly vitamin B_6 and coenzyme Q. Karl and his research group at UT-Austin developed an enzymatic assay for measuring vitamin B_6 status in blood. At the same time, they identified the structure of and synthesized thyrotropin-releasing hormone from samples provided by collaborators at Tulane University. This collaboration expanded to other peptidic hormones and ultimately resulted in development of a number of inhibitors to luteinizing-releasing hormone (LHRH). Folkers and his group continued work on coenzyme Q, including the development of an improved laboratory assay for its measurement in blood and tissue and the study of its clinical uses.


Prof. William Shive

In 1990, Dr. Folkers founded the Karl Folkers Foundation for Biomedical and Clinical Research. The Foundation supports research throughout the world, including that of the Institute for Biomedical Research at UT-Austin.

- Bill Shive

Michael J. S. Dewar - A brilliant semi-empirical life


Dr. Michael J. S. Dewar

With characteristic insight and humor, Michael Dewar summarized his career in the succinct title of his autobiography, "A Semi-Empirical Life." It remains for those of us who have seen the bright light of his intellect and creativity to add the word "brilliant," and we do so without reservation!

Born in Ahmednagar, India in 1918, where his father was a civil servant for the Crown, Michael was sent to England at the age of 8 to obtain his formal education. After matriculating at Winchester, where one of his "fondest" memories was the cold showers he took each morning, Michael received his BA, MA, and D.Phil from Oxford University (Balliol College), the last in 1942. Considering his excellence in all academic subjects, it is a somewhat amazing and very happy circumstance that he chose organic chemistry for his career. As a young chemist in chemical industry, Michael's genius was so overwhelmingly evident that he was appointed directly to the Chair in Chemistry at Queen Mary College of the University of London (1951), bypassing all of the customary junior positions. Some of us who knew him later still have difficulty envisioning this intense, highly creative, and research-oriented genius in the demanding administrative role of Chairman, but he was indeed highly successful even in this unlikely role.

Michael then shocked the world's chemical establishment, especially that in Great Britain, by accepting the Kharasch Chair at the University of Chicago in 1959. He never concealed his amusement at having contributed so greatly to the "brain drain" across the Atlantic. Then in 1963, Michael moved to the University of Texas at Austin to accept the very first Robert A. Welch research chair and to exploit the new and "powerful" computer (less powerful than most current personal computers) at our university. What Michael and his research group did with this computer in developing his semi-empirical molecular orbital methods is nothing short of astounding. Michael was to spend the most productive and probably the happiest years of his career here at the University of Texas. His final move, to the University of Florida, came in 1989. He retired in 1994 as Professor Emeritus at Florida.

Michael's research career spanned a truly astonishing six decades. He authored six books and about 600 research papers, while training

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Michael J. S. Dewar - A brilliant semi-empirical life

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more than 180 collaborators. He broke onto the international research scene in 1943 with a paper that is still talked about with near-reverence. In that paper he not only elucidated the structure of a natural product (stipitatic acid) that had confounded the natural products experts, but he conceived of an entirely new aromatic system (tropolone), that would help found the new research area of non-benzenoid aromaticity. It was in the decade of the 1950's that Michael published his classic, long series of nearly impenetrable but tremendously important theoretical papers on perturbation molecular orbital (PMO) theory—back to back in the *Journal of the American Chemical Society*. The staid old *Journal* was by no means enamored of theoretical chemistry and even less inclined to publish a long series of papers. However, Michael was not accustomed to even *hearing*, much less *taking*, "no" for an answer, and he ultimately and probably predictably prevailed in this issue. Then, shortly after coming to Austin, Michael began to bring his dream of carrying out chemistry on the computer to fruition with his now famous semi-empirical programs MINDO, MNDO, and AM1. Michael was especially proud of the fact that, although chemists at that time could not detect transition states, these crucial states represented no major problem for his theoretical methods.

The honors accorded to Michael in his long and distinguished career are far too numerous to mention here, but it is especially noteworthy that he was a member of *both* the National Academy of Sciences and the Royal Society of Chemistry (London), an honor accorded to extremely few scientists. In view of the significance of his contributions to chemistry, it is regrettable that the Nobel Prize was not to be among Michael's many honors.

Michael will remembered by many for his heroic vision of chemistry, his sparkling intellect, and his good humor. He will also be recalled as a scientist frequently involved in controversy and as one who sometimes treated his adversaries in what might kindly be described as a prickly manner—this writer was himself occasionally a target of Michael's aggressive criticism. One vignette that perfectly captures this side of Michael was described by E. Thomas Strom, in the January, 1998, issue of the *Southwest Retort.* In 1970, Strom was in the audience for a talk by Dewar in which Michael asserted that the Woodward-Hoffmann Rules were obviously foreshadowed by work reported by M. G. Evans in the 1930s and thus were basically derivative rather than innovative in nature; this remark caught the attention of Roald Hoffmann, who was a prominent occupant of a front-row seat for the talk. His was the first hand to shoot up after the presentation, and he asked if the Rules were all that obvious, why didn't Dewar himself devise them. Michael's acerbic and succinct response was, "I suppose I should have, really."

Prof. Nathan Bauld

The many graduate students, postdoctoral fellows, and visiting scholars who studied with Michael remember him in yet a different way. They knew him as a person of unlimited and uncontrollable energy, where this energy was provided by an inexhaustible passion for and fascination with research that encompassed an amazing variety of topics. Many of his coworkers were treated to the scene of seeing Michael fling himself back in his office chair and laughing as an interesting new result was presented to him. With respect to such occasions, it was well known among his colleagues that Michael never described research, whether his or that of others, as brilliant or important. Rather, the greatest compliment he would give to a piece of work was to describe it as "amusing," or in rare cases, "extremely amusing." All of his students learned to consider his use of such terms as the highest possible compliment and strove to merit this accolade. Clearly Michael saw research as

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When news of Michael J. S. Dewar's death reached the department, we immediately contacted Derek H. R. Barton, who won the Nobel Prize in Chemistry for his work in conformational analysis, to elicit his comments on Michael's scientific career. Barton was in South Africa at the time, and provided the following memorial "off the top of his head." Although what Sir Derek wrote duplicates some parts of the locally produced obituary, he brought a different perspective to summarizing Michael's status as a scientist, so we are publishing his article in toto.

On a sad note, Barton himself died suddenly of a heart attack on March 17th.

IN MEMORY OF MICHAEL DEWAR

In his generation, Professor M.J.S. Dewar was one of the world's greatest and most inspiring organic chemists. He was a boy genius who became an adult genius. He was excellent at any academic subject. Happily, he chose organic chemistry, in which he was mostly self-taught.

In his early twenties at Oxford, he wrote a theoretical paper on a natural product whose formulation had not hitherto been possible. Michael recognized a new type of aromatic system–examples of which he called tropolones. Rapidly this subject became a major branch of Organic Chemistry.

The highly intelligent, but impoverished, Michael then spent several years in an industrial polymer lab. In short order he made important contributions to polymer science.

Again his genius was recognized by his appointment to a Professorship at Queen Mary College in the University of London. He did not have to climb the academic ladder. This is perhaps the only case in V.I.C. Chemical History where such an appointment has been made.

After some years at Queen Mary College, whence came some impressive papers on the fundamental theory of chemistry, Michael surprised everyone again by changing his destiny: He accepted a Professorship at the prestigious University of Chicago. There his career continued with the same splendor as before. Yet again, after some years in Chicago, Michael surprised everybody by changing his destiny to a warmer, southern climate. He accepted a Welch Professorship at the University of Texas at Austin. The Welch Foundation exists to improve the state of excellence of chemistry in Texas. So the Foundation started by creating Welch chairs of chemistry which were exceptionally well-endowed with both money for the Professor and for his research. In Michael, they could not have chosen anyone more suited for this purpose. He immediately raised the University of Texas to universal fame in the specified subject of chemistry.

In Austin, his career continued with the same glory as before. Increasingly, he turned his attention to the application of the computer to semi-

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Wilson M. and Kathryn Fraser Professorship in Biochemistry

Wilson Morris Fraser, son of Loraine and Wilson P. Fraser, was born in Houston in 1926. Determining at the age of seven that medicine would be his life, he never changed that goal. He graduated from Kinkaid Preparatory School in Houston, where as quarterback he had led his team to an undefeated season in football, his lifetime favorite sport. World War II was at its height. After attending summer classes at the University of Texas, he joined the Army Air Corps at the age of eighteen. Assigned duty as a Medical Assistant on a tiny air base in the Aleutian Islands, he served there until the end of the war. Returning to his Pre-med studies at the University in 1947, he continued work on his double major, Zoology and Biochemistry.

Kathyrn and Wilson Fraser

Mary Kathryn Cawthon, a Plan II student under Dr. Harry Ransom, was also a native Houstonian. Like Wilson, she was deeply proud of her Texas roots, four of which extended back to the Republic of Texas. The only child of Lucile and Kollock H. Cawthon, she had graduated from Lamar High School in 1946, with honors in academics, art, music, and creative writing. The Plan II program, with its stimulating lectures, challenging studies, personal encouragement by the professors, and interaction with such bright classmates, was the most exciting experience she had ever enjoyed.

When Wilson and Kathy met in a small creative writing class in old B Hall in the fall of 1947, they began a life together that lasted fifty years. Although acceptance into medical schools was extremely competitive during this time when so many men were returning from the armed forces, Wilson and Kathy were determined that he would be one of those accepted. All else during those years became secondary to his grades. How great was their relief and pride when he was accepted to not one, but three top medical schools. They left Austin with memories of the happiest years of their lives and a lasting loyalty to their Alma Mater.

Wilson chose The University of Texas Medical Branch in Galveston. After four successful years there, he completed a rotating internship at Parkland Hospital in Dallas, then five years of residency at Baylor in Houston: two in Internal Medicine, followed by three in Dermatology. He soon passed his Boards in Dermatology and later in Dermatopathology.

All of Wilson's years of private medical practice took place in Houston. For most of those years he was a partner and frequent board member of the Kelsey Seybold Clinic, for whom he had created and headed the section of Dermatology. Throughout his practice he was an active staff member of both Methodist and St. Luke's Episcopal Hospitals in Houston as well as Clinical Assistant Professor at Baylor College of Medicine. He was an active member of the Houston Dermatology Society, a member of Harris County, Texas, and the American Medical Societies, and a Fellow of the American College of Physicians and of the American Academy of Dermatology.

Before entering clinical medicine, Wilson had actually considered an academic career of research in biochemistry for himself. He and Kathy shared an acute interest in the field, feeling that it was in this area the really important breakthroughs would take place in the future. However, other considerations intervened, causing him to enter clinical practice instead. Later in life, when the opportunity and the means presented themselves, they were only too happy and honored to help establish a professorship in the field that was so dear to their hearts.

The Frasers have two children, Patricia Fraser Reeder and Wilson Morris (Bill) Fraser, Jr. and six grandchildren. Patricia and Jeff Reeder (M.S.E., UT Austin, 1981) live with their children Sarah and David near Kansas City. Bill (M.S.E., UT Austin, 1981) and his wife Molly (B.B.A. UT Austin, 1981) and their children Paige, Ryan, Luke and newborn, Emily, reside in Wichita, KS.

Michael J. S. Dewar - A brilliant semi-empirical life

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an adventure to enjoy and not as a vehicle to be used to elevate his own status. His influence on the field of chemistry has been of major importance and his scientific legacy will continue for years to come.

We would be remiss if we failed to mention still another aspect of Michael's persona: The social events that he and Mary hosted and their unexcelled generosity to their guests. Their cocktail parties were without peer, and one cannot forget the sight of Michael cruising through their living room, a pitcher of Manhattans in one hand and a pitcher of martinis in the other; one's glass was never empty. Those guests who did not imbibe alcohol were not left to fend for themselves, because sparkling water and orange juice were always close at hand; they did, however, have to serve themselves! And their dinner parties were memorable for the quality of food and wine that was served to their fortunate guests. Many of their acquaintances do not know that Michael was a remarkably good chef, particularly when it came to Chinese and Indian cuisine; indeed Michael developed a sufficient number of customized recipes for Chinese dishes that a self-published cookbook resulted. His accomplishments in the kitchen are probably a reflection of his roots as an experimental organic chemist, despite the fact that he forswore the laboratory bench for the computer in the latter stages of his scientific career! As Michael was wont to say, "Organic chemistry is the best preparation for anything."

Michael J.S. Dewar died on Friday, October 10, 1997, in Gainesville, Florida, at the age of 79. His beloved wife of fifty years, Dr. Mary Williamson Dewar, had already preceded him in death in 1994. It has been suggested by their dear friend, Nobel Laureate Sir D.H.R. Barton, that the two are now "united in a never-ending discussion on the intellectual meaning of life." Michael and Mary are survived by their two sons, C.E. Steuart Dewar of Morganton, Georgia, and Dr. Robert B.K. Dewar of New York City.

- Nathan L. Bauld

1997-98 Seminars

Once again, our teaching and research program benefited from presentations by individuals whose research interests cover a broad spectrum. Although the list that follows categorizes the speakers on the basis of the traditional divisions within the department, a significant number of them discussed topics that bridge the usual divisional boundaries, a fact that reflects our continuing efforts to foster interdisciplinary interactions among our faculty, postdoctoral fellows, and students.

Analytical/Physical

Prof. Allen Bard, UT-Austin
Prof. Dusan Berek, Polymer Institute of the Slovak Academy of Sciences
Prof. Jennifer Brodbelt, UT-Austin
Prof. Carlos Cabrera, Univ. of Puerto Rico
Prof. Charles Campbell, Univ. of Washington
Dr. Bruce Chase, DuPont Central R&D
Prof. Luis Colon, SUNY-Buffalo
Dr. Larry Dubois, DARPA
Prof. Ellen R. Fisher, Colorado State Univ.
Prof. Robert Forester, Dublin City Univ.
Prof. John T. Fourkas, Boston College
Dr. Brian Gregg, National Renewable Energy Laboratory, Boulder
Dr. Adam Heller, UT-Austin
Prof. James Holcombe, UT-Austin
Prof. Paul L Houston, Cornell University
Prof. Jay S. Huebner, Univ. of North Florida
Dr. David Klein, Texas Parks & Wildlife
Prof. Paul Kohl, Georgia Tech
Prof. David Laude, UT-Austin
Prof. John McDevitt, UT-Austin
Dr. Mehdi Moini, UT-Austin
Prof. Marcel Nooijen, Princeton Univ.
Prof. Fred E. Regnier, Purdue Univ.
Prof. Jason Shear, UT-Austin
Prof. John Stanton, UT-Austin
Dr. Jay Trautman, Sarnoff Corporation
Prof. Roger Y. Tsien, UC-San Diego
Prof. Zdenek Tuzar, Inst. of Macromolecular Chemistry, Czech Republic
Dr. Shimon Weiss, Lawrence Berkeley Lab
Prof. Arun Yethiraj, UW-Madison

Biochemistry

Prof. C. David Allis, Univ. of Rochester
Prof. Bruce N. Ames, UC-Berkeley
Prof. Charles Barlow, Dartmouth College
Dr. John Erickson, NCI
Dr. D. Travis Gallagher, NIST, Univ. of Maryland Center for Advanced Research in Biotechnology
Dr. Lee Gehrke, Harvard Univ.
Dr. Barbara L. Golden, Univ. Colorado at Boulder
Prof. Robert A. Harris Indiana Univ.-Purdue Univ. at Indianapolis
Dr. Alan Hinnebusch, NIH
Prof. Kenneth A. Johnson, Penn. State Univ.
Prof. Caroline M. Kane**,** UC-Berkeley
Dr. Gene Lian, American Red Cross
Dr. David Matthews, Agouron Pharmaceuticals, Inc.
Dr. Andrew Mesecar, UC-Berkeley
Prof. Frank M. Raushel, TAMU
Dr. William E. Royer, Univ. Mass. Medical Center
Dr. A. Yousif Shamoo, Yale Univ.
Prof. Janet L. Smith, Purdue Univ.
Prof. Ming-Daw Tsai, Ohio State Univ.

Inorganic

Prof. David Atwood, North Dakota Univ.
Dr. Angela Belcher, UC-Santa Barbara
Prof. Thomas Bjornholm, Univ. of Copenhagen
Prof. Francois Gabbai, Technische University
Prof. Peter Comba, Univ. of Heidelberg
Prof. Larry Falvello, Univ. of Zaragoza
Prof. H. Patton Gillis, UCLA
Prof. Eugene Irene, UNC-Chapel Hill
Prof. Mercouri Kanatzidis, Michigan State Univ.
Prof. Ian Manners, Univ. of Toronto
Dr. Atul Parikh, Los Alamos National Lab.
Prof. Marc D. Porter, Iowa State Univ.
Prof. Philip P. Power, UC-Davis
Prof. Christopher A. Reed, USC
Prof. Daniel P. Stack, Stanford Univ.
Prof. Gordon Yee, Univ. Colorado at Boulder

Organic

Dr. David Coffen, ArQule, Inc.
Dr. Paul DaSilva-Jardine, Pfizer Research
Prof. David Dolphin, Univ. British Columbia
Prof. Gregory C. Fu, MIT
Dr. Craig Hawker, IBM Almaden Res. Ctr.
Prof. Thomas R. Hoye, Univ. of Minnesota, Twin Cities
Prof. Laura Kiessling, UW-Madison
Prof. Chaitan S. Khosla, Stanford Univ.
Prof. Bernard Kreutler, Univ. of Innsbruck
Prof. Lechoslaw Latos-Grasynski, Univ. of Wroclaw
Prof. James W. Leahy, UC-Berkeley
Prof. Prezemyslaw B. Maslak, Penn. St. Univ.
Prof. Daniel Romo, TAMU
Prof. Karen L. Wooley, Washington Univ.

Centennial Visiting Lectureship in Chemistry
Prof. Mark Wightman, UNC-Chapel Hill

The Clayton Foundation Biochemical Institute Regents Lectureship
Prof. Ken A. Dill, UCSF

Organic Division Distinguished Alumni Lecture Series
Prof. David A. Shultz, NC State Univ.

John E. Mahler Memorial Lectureship
Prof. Bernd Giese, Univ. of Basel

The F. A. Matsen Endowed Regents Lectureship on the Theories of Matter
Prof. Marshall Fixman, Colorado St. Univ.

The W. Albert Noyes, Jr. Lectureship
Prof. Kozo Kuchito, Josai Univ.

Rowland Pettit Centennial Visiting Professorship
Dr. K. C. Nicolaou, Scripps Research Inst.

The George and Pauline Watt Centennial Lectureship
Prof. Malcolm H. Chisholm, Indiana Univ.

Michael Dewar

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empirical calculations of the properties of molecules. As the years passed, his methods became more and more precise and are nowadays of universal application.

The end of the story was not to be played out in Austin. Destiny again intervened. Michael became increasingly dissatisfied with the Presidential Administration of the University. Certain promises given to him by an earlier President were not, in his opinion, being kept. So he made a final move to Gainesville, where the University of Florida has its main campus. Some years later, Michael told me that he was finally retiring from Chemistry.

Fortunately, Chemistry was not the only love of his life. The other was Mary, his wife of over forty years and the mother of his two sons. Mary was about the only lady Michael would find in Oxford with an intellect worthy of his own. However, her research was much cheaper than his because she was a distinguished medieval historian. Her recent death from lung cancer was a great shock. He has joined her now and I am sure that they are united in a never-ending discussion on the intellectual meaning of life.

- Derek H.R. Barton

Don Niebauer retires

Don Niebauer retired in January 1998 after 19 years with the Department of Chemistry and Biochemistry. Don came to the department after a twenty-year career in the United States Air Force in the Avionics Communication-Navigation field.

Don worked in the Instrument Design and Repair shop where he repaired and maintained electronic test equipment, laboratory equipment, and computers. His expertise in the repair of Apple computers was recognized campus-wide and beyond. Don's competence and cooperative attitude along with his determination earned him a University of Texas President's Staff Excellence Award in 1989 and a College of Natural Sciences Staff Excellence Award in 1996.

His long-time hobbies are woodworking and model-building. Equipped with his new band and coping saws and the additional time afforded by retirement, he intends to complete his 1/50th-scale model of the 1812 French sailing ship, the *Astrolabe*. Also, he and his wife, Kay, plan to continue one of their favorite pastimes, visiting arts and crafts shows throughout central Texas.

- Joyce Thoresen

Don Niebauer

1997 - 1998 Chemistry and Biochemistry Degree Candidates

Summer 97 Degree Candidates

Bachelor of Arts in Chemistry

Stoney Brett Barton
Oneida Morales

Bachelor of Science in Chemistry

Heather Lorelei Harris

Bachelor of Science in Biochemistry

Chi Kin Chen
Robert Francis Fernandez
Clayton Scott Harper
Joseph Elroy Roth
Mona Ajitkumar Shroff
Ritu Walia Singh

Bachelor of Arts in Biochemistry

John Marshall Cuddeback
Peter Eugene Easterly
Rolonda Barbett Hills
Shirien Navai Oskouee
Versha Ramashankar Yadav

Fall 97 Degree Candidates

Bachelor of Science in Biochemistry

Gira Hasmukh Bhakta
Delbert Ray Brod
Vineet Choudhry
Yong Woon Lim
Linh Ngoc Ngo
Christopher Lee Piwonka
Celia Soledad Rodriguez
Darwin Rusli
Gregory Edward Wiggins

Bachelor of Science in Chemistry

John Michael Cayias
Eunme Cho
Teddy Kite Joe
Michael Nevin Miller
Shigemasa Ouchi
James Bradley Stewart
Bin Zhu

Bachelor of Arts in Biochemistry

Sonal S. Desai
Sayantan Ghose
Matthew Thomas Henehan
Elisabeth Cherice Moore
Shephali Kantilal Patel
Jennifer Delores Schmitz
Catherine Leigh Wells

Bachelor of Arts in Chemistry

Jacinthia Kate Louis
Eduardo Ramirez
Rachel Reena Roy

Spring 98 Degree Candidates

Bachelor of Arts in Chemistry

Faisal Ahmad
Steven Neil Delao
Ernest Harrison Faucher
Ernesto Garza
Rebecca Monsalvo Iappini
Taneel Mareth
Ina Pavlova
Brian Dwain Reed
Maria Ngoc My Trinh

Bachelor of Science in Biochemistry

Tasneem Fazal Ahmed
Tulin Ayvaz
Owen Alexander Bishop
John Matthew Brehm
Tin-Sheng Chen
Joshua Edward Deford
Joseph Faries Denniston
Denis Renee Deshazo
Sonia Radhika Garadi
Ramiro Garcia
Chance Eben Hardie
Andy Leston Hawthorne
Phena-Bophal Im
Obianuju Ngozi Inya-Agha
Yin-En Lee
Manas Mewar
Lael Chad Mitchell
Tuan H. Nguyen
Jaime Andres Ortiz
Ina Pavlova
Angela Phuog Phuc
Rueywen Pi
Hanyiah E. Safady
Son Minh Tran
Kwoon Yiu Wong
Sephora Yao

Bachelor of Arts in Biochemistry

Gregory John Atkinson
Christopher Marc Danney
Murtaza Taher Ghadiali
Mark Essi Harounzadeh
Trieu Quang Ho
Kevin Robert Hude
Razuiddin Syed Hussaini
Sujit Srinivasan Iyer
Medhavi Jogi
Katarzyna J. Kedzierska
James Arn Kwon
Andrew H. Martin
Caitlin Sara Mcaneny
Sanghamitra Rani Moulik
Nonyerem Nnenna Osuji
Chetan Bharat Patel
Jing Shen

Bachelor of Science in Chemistry

Anthony Manuel Avila
Nathaniel Lewis Clark
Anastacia D. Cuellar
Pedro Rogelio Escamilla
Kristina Yvonne Foley
David Matthew Henslee
Phena-Bophal Im
David James Lola
Sarah K. Mathews
John Austin O'Dwyer
Jessica Ann Turner

IN MEMORIAM

Thomas W. Agnew, Jr., D.D.S., B.A. Chemistry 1952, date of death unknown.
Alexander Stuart Babetch, B.A. Chemistry 1940, date of death unknown.
Julian Carroll (J.C.) Baskin ~ died April 18, 1998 at the age of 78, following a long battle with bone cancer. J.C. worked for over 20 years in the department. Following his retirement in 1983, he fulfilled his life-long dream of traveling to all the continents. He is survived by his twin sister, Clara Marie Baskin Edmonds, cousins, nieces, and a nephew.
Ana Maria Rosales Carnes, B.S Chemistry 1960, B.S. Pharmacy 1964, died March 5, 1998. She is survived by a daughter, Dr. Cynthia Carnes, of Columbus, OH, a son, Glenn Carnes of Austin, and a brother, Joaquin Rosales of El Paso.
Hennie Jeanne Levy Gelber, B.A. 1926, M.A. 1929 (Felsing), passed away July 24, 1997 in Bryan, TX at the age of 91. Following a masters in chemistry from the University of Houston and graduate work at UT-Austin and Texas A&M, she taught high school chemistry for many years. She retired in 1982 but served as a substitute teacher well into her 70's. She is survived by her nephew, Paul Levy.
Oscar Edward Hall, Jr., M.D., B.A. Chemistry 1947, date of death unknown.
Mary Carmen Estes Roach, B.A. Chemistry 1969, died January 1, 1998, according the the *San Antonio Express*. She is survived by her husband, Dr. David Roach, and her son, John David Roach. She worked for over 25 years at the UT Health Science Center in San Antonio, specializing in the biochemistry of cancer and the mechanism of action of anti-cancer drugs.
Peyton Clark Teague, Ph.D. 1942 (Williams), died February 8, 1998. He was Distinguished Professor Emeritus of the University of South Carolina, Department of Chemistry.
Kyle Ward, B.A. Chemistry 1923, B.S. Engineering 1923, M.S. (George Washington University), Ph.D. 1932 (Friedrich Wilhelms University, Berlin) died November 3, 1997, in Appleton, WI, at the age of 95 after a brief illness. He was professor emeritus at the Institute of Paper Chemistry of Lawrence University, Appleton.
Lawrence Karn Yourtree, Ph.D. 1948 (Henze) died recently. Details are unknown.
Bernhard G. Zimmerman, M.S. Engineering, Ph.D. 1937 (Lochte), died December 22, 1997 according to the *Shiner Gazette*. He was the retired president of Zimmerman Associates at Greensboro, NC and Shiner, TX. He is survived by his wife, Anna Mae Zimmerman, four daughters, two brothers, one sister, and two grandchildren.

AXΣ accomplishments

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To aid its members by every honorable means in the attainment of their ambitions as chemists throughout their lives -

Besides keeping the ties going strong with our alumni, we are helping our current students attain their ambitions as chemists. Last semester, we inducted four new brothers into our chapter, Mike Best, Shelrie Houlton, Cindy Ly, and Suzanne Tomlin. This semester, we have six pledges whom we will induct in April. They are Theo Curey, Bill Murray, Paul Rookard, Meansup Song and faculty members Jon Sessler and Grant Willson. This pledge class brings our total membership to forty-five collegiate and sixteen faculty brothers!

This year we will also congratulate many graduates and send them off into the "real world". These brothers, including new and soon-to-be Ph.D.'s Todd Aplin, Carla Harper, Tim Histen, and Eric Schmidt, will be greatly missed. We wish them good luck in their futures!

CHEMICAL *Compositions*
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The University of Texas at Austin
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