Introducing ... 
Your New Review of Chemistry at Indiana University: 
News about the Department, the Faculty, Staff, and Students, and the Alumni 

STARTING OUR SECOND 50 YEARS
Note from the editors

In its 50 years of existence, the AIUC Newsletter has appeared in various styles and formats. In this issue, we are going over to an annual version in a magazine format that allows us to have a color cover and to make other improvements. We hope to use e-mail and the departmental Web site to help make up for the less frequent occurrence of the newsletter.

Check our Web site at http://www.chem.indiana.edu/ for the latest information about departmental activities. Please let us know about your latest activities, and we will put it in the “Alumni News” page on the Web or in the “Alumni News” section of this publication. Send snail mail to Harry Day (or to one of us), or e-mail shiner@indiana.edu or chemalum@indiana.edu. Also let us have your comments on the new format of IU Chemistry. With experience, and help from you, we hope to keep improving it!

— E. Campagne, Max Marsh, Jack Shiner

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Cover photos include Professor Shuming Nie and graduate student Steven Emory, McCormick Science Grant winner; Marty Pagel, director of the NMR and Molecular Vision Facilities, examining the structure of a molecule in the CAVE (Chemistry Automatic Virtual Environment); NMR Laboratory; Harry G. Day Chemistry Lecture Hall; Professor John Richardson and graduate students Brandt Burgess and David Godfrey; John Huffman, director of the Molecular Structure Center, adjusting a crystal on the diffractometer.
Models of Molecules: Past, Present, & Future

The Past...

Models of molecules have always been crucial to the study of chemistry. However, as most chemistry students and chemistry alumni can testify, creating these molecular models has often required much time and effort.

For example, Distinguished Professor Emeritus of Biochemistry E.R. Gurd assembled an enormous model of the myoglobin protein within the Chemistry Building in 1971. This model was constructed of precisely bent wire segments representing the amino acids, each fragment fastened to its neighbors with screws. Wires were stretched throughout the structure to ensure that various parts were held in proper alignment. A smaller “space-filling” model was also constructed. Working with an associate, Gurd required three weeks and a 20x30-foot room to assemble these models.

In addition to the biochemists’ desire to construct models that could be examined in detail, crystallographers in the department were also deeply dependent on the examination of three-dimensional molecular models. In order to visualize trial structures, models were constructed by placing large “hat-pins” with lengths of up to 18 inches in a Styrofoam block. By plotting two of the coordinates on the base of the model and making the length of the wire correspond to the third coordinate, it was possible to create a crude, but usable, three-dimensional model of the complex being studied.

While models continued to be used for many years, improved graphical techniques were constantly being developed to make the process easier. In the early 1970s, it was necessary to either wait for several days for the output to be delivered from the plotters located in the basement of the IPER building, or to make special arrangements to use the system late at night. One of the first interactive links to allow remote computing was established between the central computer and the crystallography laboratory to allow a typewriter-like output device to crudely draw plots. While these plots were very primitive compared to today’s output, they could be obtained in a matter of hours, whenever they were needed. With the development of smaller, more powerful laboratory computers, it finally became possible to generate plots locally during the late 1970s.

The Present...

Since the 1970s, advances in computing and information technology have made tremendous improvements in chemical research. The Department of Chemistry has been particularly aggressive in applying state-of-the-art computing technology towards the modeling of molecules.

For example, the Molecular Structure Center (IUMSC) has developed a sophisticated World Wide Web server that allows the crystallographers and their collaborators immediate graphical access to the structural data for compounds studied in the IUMSC. With nearly 1,500 structures already on-line, students can interactively view and manipulate images from nearly any computer connected to the Internet, allowing access not only from the laboratory and office, but from home and across the country as well. Collaborators as far away as Taiwan have been able to view crystallographic results from the IUMSC within hours of the completion of the study.

The server, located at http://www.iumsc.indiana.edu/, is publicly available and receives nearly 3,000 hits per day.

The IUMSC has also initiated a collaboration, the Reciprocal Net, which will tie crystallography laboratories throughout the world together in a common format. Crystallography (continued on page 2)
Molecules
(continued from page 1)
laboratories from 14 universities and the Los Alamos National Laboratory are involved in the project.

As another example, the StereoView Room provides interactive stereoscopic visualization of molecular models. Audiences wearing specialized liquid crystal display glasses or 1950s-style 3D paper glasses can view computer-generated models of molecules, which appear to be truly three-dimensional. The StereoView Room is one of only three facilities at Indiana University that can generate virtual environments for research investigations, and this facility is the only virtual environment in the world that is dedicated to the study of chemistry. More information about the StereoView Room is available at http://molvis.chem.indiana.edu/tour/SVR.html.

The ability to interact with molecular models in a three-dimensional virtual environment provides the chemist with an outstanding tool for many chemical modeling investigations. Such investigations include the modeling of biomolecular associations, building and comparing complex enantiomeric model structures, and computer simulations of

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Marty Pagel
Two BA degrees (cum laude) in chemistry and in biology were awarded Marty by Washington University of St. Louis in 1988. He received the PhD degree from the University of California, Berkeley, in 1993. He is staff scientist and director of the NMR and Molecular Visualization Facility in the IU chemistry department. Marty also serves as associate director of technical services, focusing on the automation of administrative activities of technical services groups. His hobbies include running, bicycling, collecting antique clocks, and watching Green Bay Packers football games.

Meet the authors

John C. Huffman
John is a senior scientist in the department. He is the coordinator of research facilities and director of the Molecular Structure Center. An X-ray crystallographer by training, John completed both his undergraduate and graduate work at IU. He received a PhD degree in 1974. He has been a major force in the development of communication and information exchange among crystallographers around the world. References to his published research are among the "most quoted" in the chemical sciences. His outside interests include the Boy Scouts, canoeing, and the collection of early computational devices.
'Tis the season to be thankful

With this fall publication of the chemistry department news, we are changing to a new format. Instead of the semiannual newsletter, we will be publishing an annual magazine-type issue. We hope that you will find it interesting and the new format attractive. The coverage will be expanded, with emphasis on alumni and their activities, as well as more depth in reporting specific departmental projects.

Another change has been made in the editorial staff. Professor Emeritus Jack Shiner has replaced Professor Emeritus Ernest Campagne as co-editor. Ernest has been responsible for the development of the newsletter for the past 10 years; under his guidance it has grown and flourished. The mark of his inimitable style has contributed much to its success. He will continue to make valuable contributions to the publication in a reporting and consulting role.

It is my pleasure to publicly acknowledge the following gifts to the Department of Chemistry. All are endowed gifts that will exist in perpetuity, and will make a big difference as we face the future and a new century.

Robert, BS’45, and Marjorie, BS’43, Mann established three Robert and Marjorie Mann Chairs in Chemistry! Each chair will provide salary or salary supplement, research funding, a graduate fellowship, and undergraduate scholarships. After graduating from IU in 1945, Bob completed his PhD in chemistry at the University of Minnesota in 1949. He joined Eli Lilly in biochemical research that same year and spent his career progressing through several executive management positions until his retirement in 1988. Marjorie worked at Eli Lilly as a research assistant until 1953, when their daughter was born.

Standiford H. Cox, BA’57, established the Standiford H. Cox Professorship in Chemistry. Professorships provide research funding for the named professor’s research and teaching.

Stan joined Eli Lilly in 57 as an associate organic chemist and later obtained an MS in organic chemistry from Butler University in 1960. His career at Lilly included a variety of scientific and nonscientific assignments. At retirement in 1989, Stan was director of the Production Control Laboratories.

William M., PhD’48, and Arlene LeSuer recently established the Ernest Campagne Award in Graduate Studies. Bill was senior vice president for research and development and member of the Board of Directors of the Lubrizol Corp. in Cleveland, Ohio. He retired after spending more than 35 years in the company’s research program. He holds more than 110 U.S. patents, five of which were based on his doctoral research at IU and were assigned to the IU Foundation.

During the summer, an anonymous donor, being most appreciative of Dr. John Billman’s teaching in organic chemistry, established the John H. Billman Scholarship. A grateful student indeed!

Earlier in the year John H., BA’32 and MA’34, and Dorothy McKenzie established the John H. and Dorothy McKenzie Scholarship/Fellowship in Chemistry. The award(s) may be given at either the graduate or undergraduate level, wherever exists the greatest need. John was vice president of research and manufacturing at the United Carbon Co. and later chair and CEO of Agritec Co., an agricultural manufacturing company he founded in 1972. In retirement, both John and Dorothy enjoy oil painting.

Thank you all for your kindness and generosity!

Many of our faculty have received major IU and national awards since our last newsletter. Martha Oakley received an NSF Faculty Early Career Development Award. These awards are given to support junior faculty who have begun their first or second full-time tenure-track appointment. The intent of the award is to provide stable support at a sufficient level and duration to enable awardees to achieve the education and research career development objectives of the program.

David Clemmer received a 1998 Alfred P. Sloan Research Fellowship. Selection procedures are designed to identify faculty members who, at an early stage in their research careers, show the most outstanding promise of making fundamental contributions to new knowledge. Sloan Fellowships are awarded for a two-year period, and the funds can be applied to a wide variety of research uses. In addition, Clemmer received a 1997-98 IU Outstanding Junior

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Chair’s letter
(continued from page 3)

Faculty Award. These annual awards are
given to recognize the achievements of
untenured faculty who show promise of
reaching distinction as scholars and
artists. The competition is highly
selective, and the faculty review panel
chose only those nominees whose
proposal and previous academic record
clearly promise a career of excellence and
significance.

Ernest Davidson received an honorary
doctor of engineering from Rose-
Hulman Institute of Technology in
1998. He was an invited speaker at a
symposium on “A Celebration of 20
Years of the Subdivision of Theoretical
Chemistry” at the fall 1998 ACS
National Meeting in Boston.

Odile Eisenstein, professor of chemistry
and director of France’s National
Laboratory of Theoretical Chemistry in
Montpellier, was awarded an IU hono-
rary doctor of science degree at the
1998 commencement ceremony in May.
Eisenstein was appointed last year as an
adjunct professor of chemistry in our
department and has returned regularly
since 1984 as a visiting scholar. She
works with four faculty research groups
here, has helped supervise 11 graduate
student theses, and has served twice as a
fellow of the IU Institute for Advanced
Studies. She is an exceptionally loyal
friend and participant in the life of our
department.

George Christou was named the
recipient of a Rudy Professorship, as of
July 1, 1998. Rudy Professorships are
awarded by Indiana University in
memory of James H. Rudy, who graduated
from IU in 1932 with a BA in
English. He died in 1956, leaving
farmland in Kentucky to his alma mater.
With this bequest, the IU Rudy Profes-
sorships were established in 1959 to
attract and retain outstanding faculty in
English and other fields.

Malcolm Chisholm has been selected by
the American Chemical Society to
receive the prestigious 1999 ACS Award
for Distinguished Service in the Ad-
vancement of Inorganic Chemistry,
sponsored by Mallinckrodt Baker Inc.
Activities recognized by the award may
include teaching, writing, research, and
administration. The award will be

presented at the 217th ACS meeting in
Anahiem, Calif., in March 1999.

Last spring semester, seven of our faculty
members — Jack Crandall, Romualdo
de Souza, Lawrence Montgomery,
James Reilly, Vic Viola, Rupert
Wentworth, and Jeff Zaleski —
received Teaching Excellence Recogni-
tion Awards, established last year by the
IU Board of Trustees. Each faculty
member was ranked numerically based
on teaching contributions. Courses
taught, course enrollments, and student
evaluations provided the principal
information.

Romualdo de Souza received an IU
Distinguished Teaching Award
(President's Award) at the Founders Day
ceremonies held on March 1. The
purpose of these awards is to call
attention to the importance of teaching,
as well as to recognize those who have
demonstrated excellence in it. The
Selection Committee chooses awardees
whose contributions to students, their
department, and the university indicate
exceptional abilities and efforts.

Congratulations to all!

— Gary Hietje

Molecules
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molecular motions. According to Marty
Pagel, director of the NMR and Mol-
ecular Visualization Facilities in the
Department of Chemistry, “using two-di-
ensional representations of molecular
models on standard computers is like
sculpting using only pencil and paper.
The StereoView Room revolutionizes
how the chemist can think and learn
about chemistry in a completely different
dimension.”

The Future...

To leverage future innovations in
computing and information technol-
gy, Indiana University has recently
formulated strategic plans to become a
leader in information technology in
absolute terms. The Department of
Chemistry will clearly be a major
participant in these plans.

For example, the IUMSC Data Server
was one of the first applications made
available using immersive techniques.

Working with the Virtual Reality/Virtual
Environment group at IU, software has
been developed that will allow users to
view and interact with the molecular
structures using hardware-assisted
stereographic systems (such as the Stereo
View Room), as well as truly immersive
systems such as the CAVE at IU.

Constructed in August 1997, the CAVE
projects three-dimensional images onto
two walls and a floor. The researcher
stands inside the CAVE room and feels
immersed in a three-dimensional
environment. Chemists can now use the
Reciprocal Net and the CAVE to “stand
inside” three-dimensional crystal lattices
of molecular models. The CAVE-
compatible Reciprocal Net was chosen as
IU’s showcase application during the
Alliance ‘98 meeting last April and has
been the topic of invited talks at the
recent American Crystallographic
Association and International Union of
Crystallography meetings. Further
development of the Reciprocal Net in
the CAVE continues to receive a high
priority among the VRVE development
staff.

As another example, a collaboration
between academic partners and private
corporations has been created to develop
real-time interactive environments for
molecular modeling in the StereoView
Room and with a proposed Interactive
Workbench. One main focus of these
developments will be the replacement of
the standard computer keyboard and
mouse with computer input devices
designed for three-dimensional envi-
ronments. Pagel explains that “modeling
molecules with computers provides
tremendous advantages, but the chemist
has literally lost touch with the virtual
molecular model. These new interactive
molecular modeling environments will
remove the distraction of cumbersome
computer technology, allowing the
chemist to focus on the chemistry.”

The Reciprocal Net was made possible
through sponsorship by the Office of the
Vice President for Information Technol-
y. The StereoView Room is made
possible through joint sponsorship by
the Research and University Graduate
School and from funding through the
New Computing Initiatives Program
provided by the Office of the Vice
President for Information Technology.

— Marty Pagel and John Huffman
The Chemistry Department special lecture series began last spring on Feb. 25 as **John W. Moore** presented the Briscoe Distinguished Lecture in Chemical Education. Moore taught at IU from 1965 to 1971. He is currently professor of chemistry at the University of Wisconsin, Madison, where he is also director of the Institute for Chemical Education. In addition, Moore is the editor of the *Journal of Chemical Education*. His lecture topic was “Can Virtual Reality Have Real Virtue? Using Electronic Media Effectively.”

On March 3, a Shell Distinguished Lecture was given by Professor **Karl Wieghardt**, director of the Max-Planck Institute at Mülheim, Germany. One of the world’s leading inorganic chemists, he spoke on “Phenoxyl Radical Complexes: Models for Metalloprotein Cofactors.”

This year’s Frank T. Gucker Lecturer was **Paul C. Lauterbur** of the University of Illinois at Urbana-Champaign. On March 11, he discussed “The World As an Environment for Nuclear Magnets.” Known worldwide for proposing and developing NMR imaging techniques, Lauterbur holds several appointments at Illinois, including service as head of the Department of Medical Information in the College of Medicine. He is a member of the National Academy of Sciences.

A special Lecture on Industrial Chemistry was presented by **William F. Carroll Jr.** on March 25. Carroll received his PhD from IU in 1978 and has recently been appointed an adjunct industrial professor in this department. He is currently a vice president of Occidental Chemical Corp., Dallas, Texas. His lecture concerned “Vinyl Chloride and Cancer: How Disaster Helped Grow a 15 Billion Pound per Year Industry.”

On April 8, an Eli Lilly Distinguished Lecture was given by Professor **Alan G. Marshall** on the topic “Fourier Transform Ion Cyclotron Resonance Mass Spectrometry: State of the Art.” He holds several appointments at Florida State University — among them, director of the Ion Cyclotron Resonance Program, National High Magnetic Field Laboratory.

Professor **Ignacio Tinoco Jr.** presented a Pharmacia-Upjohn Lecture on April 22. He has been the Miller Research Professor of Chemistry at the University of California, Berkeley, and is a member of the National Academy of Sciences. “RNA Structural Motifs” was the topic of his lecture.

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A new assistant professor in the department is Donald H. Burke, who completed his undergraduate studies at the University of Kansas and received the PhD degree from the University of California, Berkeley, in 1992. Following NSF and NIH postdoctoral support, he has come to IU this year. His research interests include the study of RNA enzymes (riboxymes) and the mechanism by which RNAs and proteins recognize and interact with small molecules.

Ken Cautlon was voted chair-elect of the ACS Division of Inorganic Chemistry. He lectured at a meeting in Russia to honor the career of Mark Vol’pin, as well as at the International Conference on Coordination Chemistry in Florence Italy. One recent research accomplishment of his group is the catalyzed isomerization of vinyl ethers into carbene ligands of relevance to olefin metathesis catalysts. In addition, a combination of experimental and quantum chemical studies (the latter with the groups of Ernest Davidson and of Odile Eisenstein) has shed some surprising light on reactions that cleave the very strong C-F bond.

During the last 12 months, George Christou has been an invited speaker at several universities in the U.S. and Europe. In November 1997, he was the recipient of the 1997 Akron Section Award of the American Chemical Society, which also involved visits to the B.F. Goodrich Co. and the University of Akron for the presentation of the award and his associated research lecture. In September, he was an invited speaker at the International Conference on Coordination Chemistry in Florence, Italy, and will be an invited speaker at the European Science Foundation meeting on “Magnetic Clusters” in December. In January, he took over as executive editor for the Americas of the journal Polyhedron. Effective July 1, he became Rudy Professor of Chemistry.

Malcolm Chisholm presented some 20 lectures during 1998 including the George Watt Centennial Lecture at the University of Texas at Austin and the Lee Lecture at the University of Chicago. He continues his work as associate editor for the Americas for Chemical Communication and Dalton Transactions and is organizing a symposium “Inorganic Chemistry at the Turn of the Millennium,” which is jointly sponsored by the Royal Society of Chemistry (U.K.) and the American Chemical Society. This will be held in London at Imperial College in January 2000. It was announced at the fall ACS meeting in Boston that he has been selected as the recipient of the 1999 American Chemical Society Award for Distinguished Service to Inorganic Chemistry.

Chisholm, colleagues Ken Cautlon and Dave Baxter in physics, and co-workers Shio- Huey Chuang and Coey Minn reported a new low-temperature route for the chemical vapor deposition of tungsten metal films (Chem. Comm. 1998, 1447). The procedure involves the use of an organometallic compound that forms a thin film of tungsten.
carbide at 360°C. This film is then post treated with H₂ to give tungsten metal. Tungsten metal thin films find wide-ranging applications as inert coatings and as metallic contacts in microelectronics. The present two-step procedure avoids the use of noxious chemicals such as WF₆, SiH₄, and HF.

George Ewing was honored in Bloomington on May 15-16 on the occasion of his 65th birthday and his having been named Chancellors' Professor of Chemistry. David Chandler, PhD'80, and Deon Anex, PhD'87, organized the fete, which began Friday afternoon. After some introductory remarks by Gary Hieftje and Charles Parmenter, George's former graduate students and postdoctoral associates recalled events during their Bloomington years and after leaving. Besides David and Deon, those present were De T. Sheng, PhD'71, Charles Long, PhD'71, Giles Henderson, PhD'73, Charles Bibart, PhD'73, Wallis Calaway, PhD'75, Carlos Manzanares, PhD'77, Richard Kopec, PhD'81, Rex Pendley, PhD'81, Chris Baumann, postdoc'87, Don Lupo, PhD'84, Bill Schinzer, PhD'85, Hugh Richardson, postdoc'87, Constantine Douketis, PhD'89, Rob Disselkamp, PhD'90, Otto Berg, PhD'92, David Dai, PhD'94, Kent Davis, PhD'98, and David Weis, PhD'98. Many guests brought their families. A dinner for the visitors at Le Petit Cafe also included George's family and several of the chemistry department faculty. On Saturday, the group gathered for a luncheon picnic at a local park.

The fete was so overwhelming for George that he flew to England the following day to join three friends for a week of walking (pub hopping) in Yorkshire. George will be on sabbatical during spring 1999. He will be dividing his time between home and Fairbanks, Alaska, where he will hold a Chapman Fellowship at the Geophysical Institute from mid-January through mid-March. For the spring months, he will be in England, where he will be a Quatercentenary Visiting Fellow at Emmanuel College of Cambridge University. The focus of his research will be the chemical and physical properties of thin films of ice and water.

Professor Lawrence Montgomery was an invited lecturer at an international conference on "ID Metals and ID Magnets," held in Los Angeles recently. The meeting preceded the 1998 Meeting of the American Physical Society, where there were several presentations based on his research. Montgomery and his doctoral student, Kyle Starkey, also participated in the International Conference on Synthetic Metals 1998, held in Montpellier, France, in July.

At the 193rd meeting of the Electrochemical Society held in San Diego, Calif., in May 1998, Dennis Peters presented a paper ("Catalytic Reduction of 2-Bromo- and 2-Iodoethanol by Electrogenerated Cobalt(I) and Nickel(I) Cyclam") co-authored with Michael A. Semones, a graduate student. In addition, Michael J. Samide, another graduate student, gave a paper ("Cobalt(I) Salen-Catalyzed Electrochemical Reduction of Diphenyl Disulfide at Carbon Cathodes"), co-authored by Peters.

At the 216th meeting of the American Chemical Society in Boston, Peters presented a paper ("Catalytic Reduction of Halogenated Organic Compounds by Electrogenerated Transition-Metal Complexes") at the award symposium honoring Gary Hieftje. In addition, Peters introduced Hieftje, the 1998 recipient of the American Chemical Society Analytical Chemistry Division Award for Excellence in Teaching. IU has the first chemistry department to have two winners of this award — Peters in 1990 and Hieftje in 1998.

In mid-October, Peters spent approximately two weeks in France, where he presented an invited talk at an international symposium, Molecular Electrochemistry 98, at Le Tronchet; served as a member of a doctoral dissertation examination at the University of Paris 13; and attended the International Conference on (continued on page 8)
Lecture news

(continued from page 7)

Rennes; and gave an invited research lecture at the University of Paris 7.

Gary Wiggins received the 1998 Herman Skolnik Award of the ACS Division of Chemical Information at the fall ACS meeting. The Skolnik Symposium on Electronic Publishing was well attended, as was the reception that evening. The events were sponsored by Elsevier Science, John Wiley and Sons, Springer-Verlag, and WCB/McGraw-Hill.

The Indiana Silicon Sphere group (Viola/Kwiatkowski) spent the summer at Brookhaven National Laboratory in New York measuring nuclear reactions between 8 GeV antiprotons and gold nuclei. The experiment, which lasted throughout the months of June and July, demonstrated distinct differences between antiprotons and normal protons in their ability to heat nuclei.

Results from the ISIS program were presented at several meetings during the past year. Vic Viola spoke at the INRDA workshop on Nuclear Reactions in Caen, France, and also presented three invited symposium talks at the Dallas and Boston ACS meetings. Kris Kwiatkowski spoke at the 14th Winter Workshop in Snowbird, Utah, and the International Nuclear Physics Conference in Paris, and presented several seminars at Texas A&M University and Los Alamos National Laboratory. One of the former undergraduates in the group, David Ginger, BS'97, was awarded the ACS Charles Coryell Award ($500) for research in nuclear chemistry. He was also one of the five finalists for the American Physical Society Aker Award for Undergraduate Research. David is presently pursuing graduate studies at Cambridge University as a Marshall Scholar.

Several personnel changes have occurred in the group during the past year. Kris Kwiatkowski, who has been a driving force in the group for years, has accepted a position at Los Alamos National Laboratory, which began this fall. Gang Wang has accepted a position at HK Systems in Milwaukee, Wis., and Wen-Chien Hsi is now doing postdoctoral work in accelerator physics at IU. New additions include Thomas Lefort, postdoctoral research associate, who received his PhD at the University of Caen, and Luc Beauleau, who begins as an assistant scientist after a postdoctoral stint at Lawrence Berkeley Laboratory. Luc received his PhD from the Université de Laval.

— E. Campagne

Retiring Rupert Wentworth honored with reception, inorganic mini-symposium

One June 25, the chemistry department hosted a retirement party at the Woodburn House for Rupert A. D. Wentworth, who is retiring from active teaching and research after 33 years at Indiana University. A large number of faculty, staff, friends, and former students, as well as his daughter, Amy, attended the party.

A program, with Gary Hieftje as master of ceremonies, featured speakers Charlie Parmenter, Ken Caulton, Lee Todd, and Ray Childers, PhD'72, a former student of Wentworth's. Kenneth E Miller, PhD'78, also a former Wentworth student, was also in attendance.

Rupert, who has always taught that chemists make good cooks, received gifts to support his hobby — a pasta maker, a pasta recipe book, and a Calphalon Wok stir-fry skillet and spatula.

At his retirement reception, Rupert Wentworth, left, listens as his former student Kenneth Miller, right, regales attendees with stories about his mentor.

On Sept. 25, the ninth annual Inorganic Alumni Mini-Symposium was held in the Harry Day Lecture Hall. This year, the returning speakers were all former doctoral student of Professor R.A.D. Wentworth. For two hours, the audience was treated to some great insights into the “Hidden Value of an Inorganic PhD” by Ken Miller, director for Lexan Technologies at GE; “Imido Molybdenum(V) Chemistry and Other Assorted Subjects” by Professor Mark Noble, of the University of Louisville; and “R.A.D. Wentworth - S.O.B.: An Anthology” by Professor Eric Maatta, of Kansas State University.

Through this remarkable series of tales from the past, which literally brought the house down at times, came a common theme: Success after IU comes from having gained good work habits, a healthy respect for a rigorous and demanding program, and the development of good communication and interpersonal skills.

Following the symposium, there was a dinner in honor of Wentworth at Le Petit Café. Many of his former students who were unable to attend sent messages, and the event was clearly a fitting tribute by the inorganic group to the revered professor’s 33 years of research, teaching, and service at IU.

After the dinner, Rupert and his wife, Ann, left to ready themselves for four weeks of vacation on Cape Cod. The “inorganic residues” retired to the Irish Lion, but were out in force at Hardin Ridge for the picnic on the following day. With temperatures of 90°F and blue skies, the crowd of 60-80 people, which included alumni from as far away as New Zealand and such guests as Professor Gottfried Huttner from Heidelberg, Germany, enjoyed good food, beer, and relaxation, as well as swimming, volleyball, and cricket. The sun set across Lake Monroe at 6:32 p.m. precisely.

— E.C.
Profile:
New Faculty
Romualdo de Souza

Romualdo de Souza came to IU Bloomington in 1991 following a postdoctoral appointment at Michigan State University. He received his BA in chemistry from Washington University, St. Louis, in 1983, where he graduated without honors but making sure, as he put it, “to try a lot of fun things as an undergraduate.” It was during his graduate work at the University of Rochester that he began to distinguish himself. He was appointed Sherman Clarke Fellow, Hooker Fellow, and finally Arnold Weissberger Fellow based on his academic record. Under the tutelage of his thesis advisor, J.R. Huizenga, Tracy Harris Professor of Chemistry and Physics, Romualdo earned a degree in nuclear chemistry in 1988. Upon coming to Indiana, he was a recipient of an A.P. Sloan Fellowship. Shortly after receiving tenure in 1997, he was named a Gill Fellow. His work in teaching has recently been recognized with a Teaching Excellence Research Award (1997-98) and a President’s Award (1998).

Romualdo, an avid competitive runner in his collegiate days, is looking forward to the day when he can challenge any of his students to a five-mile race around campus.

Malcolm Chisholm interviews Romualdo de Souza on teaching

Q: To be recognized so early in your career as an exceptionally gifted and effective teacher is rare, especially at the freshmen chemistry level. You are certainly to be congratulated on this and on your university teaching award. To what do you attribute your success?

A: Well, oddly enough, it was my experience in the large freshmen general chemistry course (C106) that taught me how to teach the graduate class (C501). What made a tremendous difference in learning how to teach C106 was being mentored by Rupert Wentworth.

We were paired up to co-teach C106 the first time I taught the class. At a very basic level he taught me how different students come to the course with different expectations — not just different abilities. Somehow to be successful, one has to be conscious of that fact. Otherwise, you simply can’t connect with the students and without connecting, you can’t reach them effectively. Good teaching isn’t a one-way dialogue!

Q: What advice can you offer those who are about to start teaching in our general chemistry program?

A: Our general chemistry is so important to our educational mission as a department that we absolutely must have our best teachers involved! Moreover, we simply have to make sure that the young faculty in the department develop into excellent teachers. It is always dangerous to draw conclusions from a limited number of trials, but I think that pairing up a newcomer to the general chemistry program — particularly young faculty — with someone who has been successful at the freshmen level is a big help. Thanks Rupert!

Q: The core of general chemistry is much as it was 20 or 30 years ago, yet the books we use as freshmen texts are very different. How do you think the new texts change the way chemistry is taught and learned?

A: Perhaps it’s a sign of which side of the fence I am on, but I really prefer the old textbooks to the new textbooks. The text I learned general chemistry from contained 700 pages and was printed in black and white. The shocking thing one immediately notices about the new textbooks is the amount of color they contain and the amount of information they contain — most are over 1,000 pages. In fact, I think both of these “advances” are distracting and detrimental to the student learning the essence of the subject matter. Somehow one needs to start with a solid foundation. The texts are so replete with information — little, or not so little, sidebars on applications, history, whatever — that they have sort of defined my lectures. I go into the lecture believing that I have to provide this concise, clear picture of what would otherwise be a hopeless barrage of information to the students.

Q: Within the last decade computers have really become an integral part of instruction. Over the past few years you have developed some innovative uses for computers in the general chemistry sequence. Can you describe for us how the system works and how the students work with it?

A: Gladly. Actually, since my early education was in India and the Middle East — based on the English educational system — I am keenly

(continued on page 10)
aware of how drill and practice is used heavily at an early stage of education outside the U.S. If you think about computers in general terms and I use them heavily in my research, they do three things exceptionally well: They do calculations, they store information, and they automate tasks that are beyond the limits of human patience. These characteristics make them ideal as a tool for drill and practice.

So, what I developed was a Web-based program that allows students in the general chemistry sequence to do their homework electronically. What makes this program particularly special is that the structure of the program is based on a PhD qualifying exam and that the questions are generated algorithmically. I mean that the program provides a student — each student — with an individualized question on a particular topic. Then, when the student answers the question he or she is immediately provided feedback about the correctness of the answer. What a concept — immediate feedback! Moreover, if students are incorrect, they are presented with a leading question. If they answer the leading question incorrectly then they are re-presented with the original question — with the hope that now the question has “clicked” with them. Otherwise they may be presented with another leading question. What is also special about the program is that since each student gets an individualized question, if they work together they have to communicate symbolically not just copy answers!

As to how the students work with it — they log in from their dorms as well as from the chemistry building or sites all over campus. Since it is Web-based they can access it from anywhere in the world. In fact some of our commuting students do access it from Indianapolis and beyond. The beautiful thing about this approach is that since the information is delivered from a centralized location, the central computer also keeps track of all the interaction of all the students with the program. The instructor can then use this on a daily basis, if desired, to determine comprehension of a particular topic. This semester we have about 1,500 students in four courses using the program. Perhaps some of our alumni would like to log in? The address is http://www.indiana.edu/~chemcalcm/CALM.html. If you use the username guest and the password 1112233333, you can have full access to the program.

Q: How effective is this system? Is your evidence just anecdotal or do you have empirical evidence?
A: When we started with this about two years ago, the first semester the feedback we got from students was mostly anecdotal. They loved the system for precisely the reason I designed it! With all grading automatic, I assigned mandatory homework as part of their grade. As such, it kept the students on track — no more putting off doing homework problems until right before the exam. The students loved the immediate feedback and they loved the fact that it forced them to keep up with the course. The next semester, with the help of Bob Althauer over in sociology, we conducted a “proper” study. The results show fairly conclusively that even correcting for prior knowledge and ability, participation in CALM makes up to a letter grade difference in students’ performance on exams. It is really a little funny if you think about it — here we are proving that doing your homework helps.

Q: What impact has all this had on student-teacher interaction? Does it diminish the role of the teacher?
A: In fact, the only initial concern I had — that it would lessen student-teacher interaction turned out to be false. Student-teacher interaction increased. In contrast to previous years, the students now come into my office with specific questions.

Q: Do you feel that this system is adaptable to other courses?
A: Absolutely! Right now we have material for all of general chemistry (C105/C106) and are developing material for the liberal arts course C101. One could use it for higher level courses, but in fact I think that the real benefit of a program like this is in the large lecture classes. The program could quite easily be expanded to all fields of math and science. It will take a few years to assess the true long-term impact of a program like this, but I’m a firm believer that high expectations lead to high performance.

Q: Do you think that eventually this will become a broadly accepted part of the curriculum across the country?
A: I think so. The future is always hard to read, but the potential is clearly there. When you think how long we need to expose students to math and science in elementary and high school in order to convey the basic concepts, the usefulness of the program at the pre-university level is striking.

Chisholm: Once again, Romualdo, let me congratulate you on your remarkable efforts and success in our freshman teaching program. The students obviously appreciate you and the department is very proud to have you with us both as a distinguished scientist and as an effective teacher.
Profile: New Industrial Professor William F. Carroll Jr.

Bill Carroll came to Indiana University with a BS degree in chemistry and physics from DePauw University, Greencastle, in 1973 and an MS degree from Tulane University, New Orleans, in 1975. Like most of his contemporaries, his first thought on leaving graduate school was to go into academics. With the scarcity of those jobs, however, the future lay in industry. He chose plastics, without once thinking of the movie "The Graduate."

Upon leaving IU in 1978 as a freshly-minted PhD, Bill went to Philadelphia to work with Rohm and Haas developing impact modifiers for poly(vinyl chloride), PVC, in the Bristol, Pa., plant. “The week I arrived, I thought I could knock a tough project out in a couple of weeks. I still have my first samples of material. They stunk.” After a year, he was recruited by Firestone Plastics Co. to be its manager of research for PVC resins. “This was the offer you couldn’t refuse: an opportunity to oversee a lab and 10 researchers. I still don’t know why they picked me, but it worked out well for me and the company as well.”

Firestone was acquired in December 1980 by Hooker Chemical Co., a division of Occidental Petroleum. Hooker later changed its name to Occidental Chemical Co. Between 1981 and 1983, Hooker had two research departments, which were later consolidated into one, with Bill as the manager. His responsibility was synthesis of resin products using a number of different technologies.

It was about this time that he started working as a company representative to the industry’s trade association, the Society of the Plastics Industry. One newly formed division of SPI, the Vinyl Institute, was particularly focused on issues related to PVC. At that time, the main issue for the plastics industry was fire and toxicity of combustion products, and Bill managed the VI’s research effort in that area.

In 1985, Bill was promoted to director, technology, with responsibility for research, pilot-scale development, customer technical service, and eventually licensing of PVC technology developed in his research labs. The first license was granted at Wuxi in the People’s Republic of China, and Bill led the plant startup team. “China’s chemical industry in those days seemed to be stuck in 1958, the year of the Great Leap Forward, when most of its plants were built. They were small, about the size of our pilot plants, and they manufactured all chemicals in the product chain, which were then used locally — China didn’t have the transportation infrastructure to support world-scale plants dedicated to single products.” OxyChem technology was one small part of the major change that China has seen in the past two decades.

By 1989, issues changed and Bill’s job changed as well. The issues evolved from fire to waste disposal. On behalf of the Vinyl Institute, he conducted research on incineration. For Occidental, as director, commercial development, he started a recycling business that retrieved PVC bottles from the consumer waste stream and turned them back into new bottles.

“Postconsumer recycling is the exact opposite of what the industry usually does. Usually, manufacturing occurs close to the source of raw material and the quality of that raw material is consistent. The biggest challenge in recycling is delivering virgin-quality product at a lower-than-virgin price and doing it from a dirty, widely dispersed raw material.”

After the product, EcoVinyl®, had been brought to market, the years of work with trade associations provided the background for another opportunity. In 1994, Bill was loaned to the Chlorine Chemistry Council, a business group within the Chemical Manufacturers Association in Washington, D.C. This time, the issues concerned OxyChem’s basic chemical product, chlorine, and issues of science and science policy. The stay in Washington gave Bill an opportunity to work with the Environmental Protection Agency and other parts of the executive and legislative branches, and to develop some experience with the political system.

At the completion of a two-year term in D.C., Bill returned to OxyChem as vice president of chlorovinyl issues. “My title reflects our investment in the chlorine production chain, which includes not just chlorine and caustic soda, but also the intermediates leading to production of PVC.” Regulatory, technical, and public affairs issues fall in his area.

“One afternoon I was giving a presentation on vinyl building products to a group at the headquarters of Habitat for Humanity, a well-known nonprofit group involved in building affordable housing. A new intern there — it was his first day — asked me after the presentation, ‘So, do you teach for a living?’ and my answer was, ‘Yes, I guess in a way I do.’” Bill also conducts in-house training for employees at all levels on the company’s products and processes, and challenges confronting the chemical industry.

“I discovered that what I did amounted to teaching, and I was reminded that was why I went to school in the first place. When Dennis Peters described the Industrial Professor Program, I jumped at the chance. Working in industry is fun. I’ve had the opportunity to see a lot of stuff in 20 years, and I hope my experience will be useful to students just starting out.”

Bill lives in Dallas with his wife, Mary, who has a BA and MPA from IU. They have three children: Allison, 16, Will, 12, and Quin, 3.

— Dennis Peters
Faculty Profile: Charles S. Parmenter

All About Charlie

Charles S. Parmenter. Do you know what the initial “S” stands for? I didn’t so I asked him. “S” stands for “super” he said. And so it does, for in every way Charlie is super and special.

Charles completed his BSc in chemistry at the University of Pennsylvania, and then after a year in the workforce at DuPont, he returned to university to do graduate studies at the University of Rochester with W.A. Noyes Jr. From there he moved to Harvard University for a postdoctoral fellowship with G.B. Kistiakowsky. Then in 196 the young Charlie moved to Indiana University Bloomington. This was a super move for IU and his “S” (special) qualities were soon recognized.

Indeed, after only four years he received his first university award: the Standard Oil of Indiana Distinguished Teaching Prize (1968). This was really an exceptional recognition for a young professor to receive since effective teaching is something that a professor normally “matures into” — rarely does one find excellence in teaching so early in a faculty member’s career. But then Charlie is really exceptional when it comes to teaching. He has an excellent manner for conveying even the most complex information in a seemingly effortless, relaxed fashion that is evident in all his scientific lectures.

The reward for good and effective teaching is more of it, and Charlie has certainly served the department and university well in this vein, both at the freshman and advanced levels. Teaching freshmen has its own set of challenges — large classes, sometimes audio-visual problems and, of course, a class that is generally only half-awake and half-wanting to take chemistry. However, Charlie has his own “S” way of keeping people awake during his lectures. He is always armed with a cartoon from such magazines as the New Yorker, and his dry humor just pops out unexpectedly.

In traveling this country, I am always meeting IU graduates and most of them have some chemistry stories to tell me. Numerous such persons I have met have fond memories of Charlie as their freshman chemistry professor, and all can recount a tale that reveals the “essence of Charlie.” One recounted to me how Charlie, in the old lecture theater had pulled down a clean blackboard on which to write only to discover that someone had boldly implanted on the otherwise clean board a well known and politically incorrect and most certainly impolite four-letter word beginning with F and ending with K. As the board came into view the lecture theater became silent. Charlie stared into the board, then slowly turned to face the class. Everyone was awake and at attention. Finally Charlie said, “So I see someone has learned a new word” — and then proceeded on to the chemistry.

Pondering on his 35 years at IU, I asked him “How many freshman students do you suppose you have taught over the years?” He replied, “Probably not very many — but I have come in contact with quite a few.”

Of course you do not get elected to the National Academy of Sciences for being a good teacher or having a dry sense of humor (although both probably help in more ways than one might initially think), and over the 35 years that Charlie has been at IU he has had a tremendous effect on physical chemistry. I asked Charlie to describe for us some of his research projects. How he got going — what did he do before there were lasers — what is new in energy transfer? Also I thought it only fair to Charlie to ask him about his teaching style — what does it really take to make a super professor. The following is Charlie’s response.

— Malcolm Chisholm

Teaching

As every professor knows, nothing so inspires successful teaching as good students. They are in abundant supply at IU. It is they who make teaching a joy.

I always understood that one of my teaching assets is being of only modest intelligence on a relative professorial scale. Thus I am forced to work out subjects in some detail for my own understanding as well as for lectures. As I learned even from my first solo effort (teaching a summer chem course at Harvard), students bond to this approach.

The most essential ingredient for successful classroom teaching is, of course, genes. To a large extent, clear explanations, interesting approaches, and an understanding of tough issues that require special emphasis are primarily intuitive. Students recognize our empathy for their learning challenges. To be sure, much is learned from the feedback of experience, but most of our apparatus is hardwired by the genes. We can’t take much personal credit.

I have always expended more time than I care to admit in preparation of lectures and problem sets, not to mention exams, the bane of students and professors alike. Hindsight long ago told me that I spent far too much

Charlie, circa 1965
time on these preparations. My publication rate suffered, particularly in my pretenure years, and I am lucky to have survived. Going into class unprepared or having a poorly organized course is, however, high on my list of things to avoid, well above broccoli and cauliflower. I am still driven into spending a lot of time on teaching preparation. Nonetheless, a disheveled lecture still occurs occasionally, and it is a wake-up call that I can’t ignore.

It is great to see renewed attention at IU to undergraduate teaching. One of the more formal manifestations of this emphasis turns out to be an administrative thirst for detailed course syllabi. We are now called to do this in chemistry. Examples of the more fully developed product include a day-by-day score card complete with the chapter and verse of our chemical bibles. Perhaps naïvely, such detail seems to me painfully excessive for a college course. Moreover, this detail is all set up before the semester begins, and it is beyond me how one can stick with such predictions. In fact, my most successful efforts in general chemistry were in my early days when published syllabi were foreign objects and subject emphasis waxed and waned according to needs of the class.

I have changed greatly since I began teaching. General Chemistry has undergone, however, perhaps even greater change. It is now far more encyclopedic, tending towards brief encounters with many subjects. I sympathize with students as they try to navigate through the sea of topics now facing them. Our three-kilo textbooks are brimming with full color on glossy paper, built-in margin notes, shaded text, bold text, italicized text, boxed text, colored text, and even some ordinary text. They are no longer really portable. I sense that students are substantially less successful in learning from these texts than the straightforward productions of not too long ago.

Lecture demonstrations in general chemistry are back again after years during which there were neither facilities nor help to present them. Now thanks to departmental support and some dedicated people, they are routine. As a comment on our sage words, the students often say that demos are by far the best part of the lecture.

Demos are frequently the center of black humor, particularly when they don’t work. My most spectacular failure occurred in a freshman honors course during my first years when demos were not part of the scene. The subject was thermo, and I took advantage of a snowstorm to introduce the only demo of the semester. I brought in a snowball to demonstrate an “adiabatic process.” In a high tension demo, we would all watch it melt during the lecture. Of course it sat there for 45 minutes without melting. In the midst of hundreds of lectures to thousands of students, more than a few smiles erupted at the unexpected. Sometimes, even deliberate jokes work, but don’t bank on it. One semester, for example, nearly 80 percent of the students in my graduate spectroscopy course were newly arrived from Asia. While they were great students, truly impressive, they didn’t understand the jokes. Even the great master, Ernest Campagne, couldn’t have gotten through. I’m afraid they had a long semester with this mysterious professor.

Research: getting started

My parents were both academics. My father was a zoologist at Penn and my mother was a physiologist at Women’s Medical College in Philadelphia. With long evenings and weekends at their desks, it seemed to me that they were working even harder than I was as an undergraduate chemistry major at Penn. With resolve not to be an academic, after graduation I joined duPont as a technical representative (read salesman) specializing in photographic products, particularly those for the lithographic industry in Philadelphia.

Despite my enjoyment of being in the world of industrial lithography and meeting the masters of the trade, pouding the streets of Philadelphia ultimately told me that maybe graduate school would lead to a better way of life. So after two years in the Air Force (the ROTC effect) and a year with duPont, I found myself as a graduate student at University of Rochester, in retrospect a perfect choice. Recognizing that I knew essentially nothing about chemical research, I solved my dilemma of how to choose a research group by deciding to work with whoever was most well known. That was W.A. Noyes Jr. He was a busy guy, being simultaneously editor of JACS and the Journal of Physical Chemistry, and he let his students work largely independently. With lots of help from wonderful students and postdocs in that group, his approach fit me, and I prospered.

My choice of WA. Noyes Jr. was easy, despite the presence of four National Academy of Sciences members among the 20 on the faculty. Three of the four were organic chemists and my undergraduate experience with that world was less than inspiring. My undergraduate research at Penn centered on organic synthesis. After labors far more tedious than suggested by the dots and arrows of syntheses on the lecture blackboard, I triumphantly delivered my great creation to the professor. Looking at this small vial of crystalline residue, he said “Hmmm,” and it disappeared into his desk drawer. End of story, no further comment. I now admire the remarkable virtuosity of synthetic chemists, but that appreciation only came later, especially when I was exposed to the magic blackboard lectures of Ernest Wenkert at IU.

I chose IU among several possibilities largely because of Walter Moore’s influence, never suspecting how lucky I would be to be in the midst of so much additional faculty talent. In particular, my physical chemistry colleagues Ed Bair, George Ewing, and more recently Ernest Davidson have had big influences on both my science and the enjoyment of my IU years. Professor Bair got me started by showing me how to build a microsecond flash discharge system for my first experiments. Even more important, in 1966 he built for me an f/10, 1.7 meter optical scanning spectrometer, which sustains our research to this day. It has become an internationally known instrument that is replicated on other continents. This spectrometer has been a key part of the instrumentation used by more than 30 graduate students or postdocs. Professor Ewing has been my “scientific advisor” for all my years at IU as well as my best friend. Collaborations with Professor Davidson, formal and otherwise, brought a new dimension to our work. His remarkable theoretical insights never cease to amaze me.

My first IU experiment was aimed at solving a long-standing mystery. The
lifetime of triplet benzene is on the order of seconds in condensed phase. There were
reasons to suspect that it might be many orders of magnitude shorter in the isolated molecule.
Could that actually be the case? With Ed Bair’s flash system, I hoped to measure this gas phase
time by watching biacetyl light up when it is excited by collision with triplet benzene.
With my very first graduate student, the experiment was ready to go in late winter after
my fall 1964 arrival. I had worked out the shape of the signal we would see on the
oscilloscope, but of course chances were slim that scope settings would be correct on first
trials. But a miracle occurred. There it was: a beautiful trace of the rise and fall of emission
intensity in the microseconds after the flash, perfectly displayed. This rise and fall was far
more important than that of the Roman
Empire. Excitedly, I said to my student, “How
about that!” The reply was a sleepy “Hmmm.”
Deja vu. I sensed that I was in league with a
proto-organic chemist. Perhaps that happened
after the student transferred to another
university at the semester’s end. This benzene
experiment ultimately prospered because of the
capable hands of Merle Schuh. Fred Stein soon
applied it also to triplet naphthalene. Both
workers have had outstanding academic
careers, and Merle even introduced this
approach to undergraduate researchers at
Davidson.
My first research proposal was written as a
postdoc at Harvard in the spring before my fall
arrival at IU. Jack Shiner, then chair, wrote to
say it was a good proposal but not to be
discouraged if NSF doesn’t fund it. These are
tough times, it’s difficult to get first proposals
funded, etc., etc. (Now I hear that it is still
tough times, it’s difficult to get our last
proposals funded, etc., etc. Times are always
tough on the eternal quest for the Fountain of
Funding.) While Jack has wonderful talents
elsewhere, fortunately he was a lousy prophet.
The NSF funding arrived in November.
Part of the proposal focused on the profundi-
ties of triplet benzene. The rest concerned
exploration of dispersed fluorescence from
collision-free polyatomic molecules. Surprising
as it may seem now, this was totally virgin
territory in 1964 for molecules larger than
triatomic. Technology was the great barrier
even though Raman spectroscopists of the
time could have done it. With the 2537 Å line
(now at 253.7 nm) of an Hg discharge
obtained from a bank of fourteen 30-watt
germicidal lamps surrounding a half-meter-
long quartz cylindrical fluorescence cell,
beautiful UV fluorescence spectra from
benzene at pressures below 100 microtorr
emerged at 1 cm³ resolution. Anne Hosch
White, my first successful graduate student,
and I papered the hall with meters of collision-
free spectra from the strip chart recorder. In
the meantime, Helen Poland and later Larry
Anderson were busy with another apparatus
that isolated the 4358 Å Hg line from germi-
cidal lamps to study collision-free emission
from biacetyl and from glyoxal, a molecule still
much beloved in our
lab.
These first experiments
were a follow-up on my
postdoctoral research
that had revealed for
the first time that large
molecules (benzene)
could undergo transi-
tions between elec-
tronic states in the
absence of collisions.
The theory of these
nonradiative processes
was just emerging
during my first IU
years, and the whole
field became a hot
experimental and
theoretical area that
persisted for more than
20 years. What good
fortune to be in the
midst of it from the
beginning.
The 2537 Å benzene
spectra sparked a thirst
for generating a
collision-free spectrum
with a tunable light
source that could pump
excited state vibrational
levels selected by us
rather than by the caprice of atomic lines. This
was before lasers, and that was a glorious time
in the lab because the equipment always
worked. The trade-off was that a lot of
experiments couldn’t be done. In politically
correct parlance, one would say that we were
“photon-challenged.”

How could we get enough intensity with a
narrow wavelength spread that could be
imaged into a cell to generate detectable
dispersed fluorescence at the low pressures
needed to avoid gas collisions? The answer is
to have Mike Schuyler, a fearless experimental
guru, arrive in your lab. Mike coupled a 500
W Xe arc with a spectrometer to provide us
with microwatts of narrow band tuneable

Charlie at a Halloween Party
exciting light. (Incidentally, this terrible efficiency is about the same as that of an argon ion laser.) He used a mirror configuration adopted from high resolution spectrosopes to multipass the exciting light and another from Raman spectrosopes to image the resulting fluorescence into another scanning spectrometer. He built a single photon counting system to handle the dispersed fluorescence signal from a photomultiplier housed in his homemade liquid nitrogen cooler. After all was ready, there it was, a huge signal! Unfortunately, it was all scattered exciting light. At this point, some students would say to me, “Your experiment doesn’t work.” I’ve heard that more than once. Mike, on the other hand, persisted as every successful scientist must. With a drastically reconfigured mirror arrangement, a dispersed benzene fluorescence spectrum from a single vibronic level (SVL) finally emerged. It was a series of small hills on a long base line, but the spectroscopic signature of benzene was unmistakable.

This humble start opened major advances in spectroscopy, in photophysics, in photochemistry, and in collisional energy transfer. Prior to Mike’s SVL fluorescence approach, there was no secure way to assign vibrational bands in electronic absorption spectra. We had invented a tool that makes most assignments absolutely unambiguous. This SVL fluorescence technique long ago became a standard aspect of spectroscopy used worldwide, particularly with the arrival of lasers and cold supersonic expansions.

One of the early triumphs from our fifth-floor lab was a complete assignment of the vibrational structure of the famous $S_1 - S_0$ benzene absorption spectrum, described in George Atkinson’s now-classic three papers that extend over more than 75 pages in the Journal of Molecular Spectroscopy. I hope that George appreciates the stupendous intellectual achievement of his PhD research. The work was supported by a series of benzene SVL fluorescence papers that culminated in two 1975 JACS articles, put together with a big boost from the intellectual and lab expertise of an Aussie, Alan Knight, our first postdoc. (JACS, by the way, was already displaying its poor suitability for physical chemistry by printing our assigned spectra, the heart of our papers, so small that they could literally be covered with a postage stamp. I have since honored my resolve to never again publish in JACS.)

The ability to generate SVL fluorescence opened an area of photophysics that, in the long run, has been even more influential than assignment of absorption spectra. In effect, it brought photophysics into the modern area by enabling chemists to study collision-free photophysics and especially the dependence of electronic state decay processes on vibrational energy content. It quickly became a big industry.

Mike Schuyler’s first benzene experiments taught the world just how spectacular this dependence could be by observing the sudden cut-off of fluorescence as the excited state vibrational energy climbed above 2800 cm⁻¹. Some fast nonradiative process became suddenly dominant at these energies. Now known as “Channel Three,” that process has been the subject of more than 70 papers.

Our paper describing this novel photophysics as well as showing many of the first SVL fluorescence spectra is, in my heart, one of my two or three most significant papers. Sadly, it is almost secret stuff, being published in a French journal, Journal de Chimie Physique, and in a special meeting supplement at that. Total obscurity! In 1969, there were no mentors of young faculty and no annual faculty reviews. Had this help been operating then, I would have been told pretty quickly to get that material also into the mainstream. Sorry, Mike.

Our development of SVL fluorescence techniques also opened another area that persists to this day, namely the study of state-to-state vibrational energy transfer in single collisions. Ken Tang’s benzene studies of the early ‘70s produced a blizzard of data that showed this energy transfer to be unbelievably state selective. The finding was big news in chemical physics, and the qualitative Tang-Parmenter selection rules that account for that selectivity are still used. This experiment was adopted in many other laboratories and is still active in our own. Now, however, we use crossed molecular beams and other special experimental conditions.

As is the case with many faculty, the first years are recalled with special fondness, and hence my emphasis is on these times. Bonding between graduate students and the new professor is enhanced by the fact that both are in a new world, one discovering how to do research, the other how to establish a group in the midst of teaching and endless service work. Additionally, while not the same age, both are at least of the same generation with abundant social contacts.

In my case, these were years with an unending succession of talented and energetic students, capped by the arrival of a remarkable postdoc, Alan Knight. With equal fluency in theory, spectroscopy, and experiments, Alan introduced us to new worlds as well as provided big advances in our ongoing projects. Alan incorporated the first tunable dye lasers into our work along with an in-house gated detection system (designed with Bob Ensman) that was the envy of more than a few other labs. With new fluorescence cells, new imaging strategies and improved electronics, our experimental capabilities took a quantum leap upwards. These accomplishments were matched by a remarkable intellectual virtuosity. In addition, Alan can write with elegance, and that has led to many joint papers. After leaving IU, Alan soon established a thriving university research group in Australia, and we collaborate to this day.

Since students talk about my curious ways, perhaps I can mention some of theirs. Consider Mike Schuyler in particular, the only student who ever built a car in my garage. He bought a Lotus Seven kit from England, having saved diligently from his student stipend. He saved by surreptitiously moving into his lab, a former storage room on the Annex fifth floor that he used all by himself. Mike was so fastidious, even while cooking on a grill mounted outside the window, that I learned about this domestic bliss only after the fact, even though I was in his lab every day. My wife and kids were entertained as he put his sports car together during three weeks while I was in Australia at a meeting — where Aussie friendships were made that yet persist. As a side issue, at that meeting I had the pleasure of being in the company of a famous...
Russian professor who was the origina-
tor and chief proponent of polywater.
Since this was before the bubble burst,
so to speak, that was exciting stuff. It
was real Cold War chemistry.

Research: the other years

Our group has been blessed not only
with many talented PhD students, but
with postdocs who brought special
dimensions to our research. To mention
some, Alan Knight was followed by
Swiss postdoc Berchtold Rordorf,
known as “Frank” in the U.S., who came
with a PhD from UC San Diego. Frank
showed us how to pump single rota-
tional levels in the excited electronic state
of glyoxal by tuning among the modes of
our argon ion laser. He then showed
how this opened the way to studying
rotational energy transfer in a nonpolar
polyatomic molecule. He not only
measured huge absolute cross-sections,
but also showed that strong state-to-state
propensity rules were not present. This
was big news since it defined the folklore
established by years of microwave study
of polar molecules. Frank had a delecta-
ably active social life. In its public aspects,
besides showing us how to make an
authentic Swiss cheese fondue (open a
box from Kroger’s that says “Authentic
Swiss Cheese Fondue”) and using lab
apparatus to set up a fireplace Raclette
cheese toaster for our kids, his parties
were never to be missed.

Frank left us with a mystery concerning
relative line intensities in this new single
rotational level fluorescence spectroscopy
that didn’t fit the standard Hönן-London
line strengths. A PhD student came to
the rescue. While I was enjoying a year
on sabbatical at the Joint Institute for
Laboratory Astrophysics (JILA) in
Boulder, Colo., Gary Loge called to say
in his quiet way that he had solved the
mystery. It was a subtle field-free
consequence of a phenomenon previ-
ously seen only in magnetic fields (the
“Hanle effect”). What a remarkable
discovery! Unknown to me, he was
working on this as a side issue to his
demonstration that isolated molecule
photochemistry occurred from the zero-
point level of an excited electronic state
of glyoxal. As have many in the group,
he opened a new world to me.

Both postdocs and PhD students have
been involved in highlights of discoveries
since these days. Mark Seaver’s graduate
studies culminated in a paper showing
extensive experimental support for a
theory he and others in the group
developed to relate cross-sections for
various collisional processes with
intermolecular potential well depths. His
thorough work did much to establish
this relationship as the standard in the
field.

Postdoc Rick Coveleski, from Illinois
(Urbana), was the second in my group
with a sports car but in this case, not
from a kit. It was a Corvette! Rick
introduced us to a “new” molecule, p-
difluorobenzene (pDFB) by means of a
classic spectroscopic study. The molecule
has since provided access to many novel
aspects of collisional and collision-free
molecular dynamics. But his most
spectacular achievement, along with that
of graduate student Dave Dolson, was to
develop “chemical timing,” a new high
pressure O₂ fluorescence quenching
method that enabled us to monitor
picosecond events with a nanosecond
laser or even with a cw laser. This
method has played an important role in
defining so-called “intramolecular
vibrational redistribution” (IVR), the
collision-free flow of vibrational energy
that is the precursor to reaction of an
activated molecule. The timing was
timely, so to speak, since IVR had just
again become a hot topic because of its
role in preventing bond-selective
dissociation of molecules zapped by IR
lasers. Chemical timing provided the first
measured IVR time scales in addition to
providing a pretty spectroscopic view
of the process. Their work was a big event
in our fifth-floor research.

Karl Holtzclaw finished his PhD research
with a tour-de-force use of chemical
timing to define the IVR time scales for
many vibrational energies in p-difluoro-
benzene. My admiration of Karl grew
and grew as he doggedly went after this
work, chasing down a long series of
possible artifacts to be sure that he got it
right. His performance remains with me
as the model of the care and thorough-
ness with which one should go after an
important problem. This one certainly
qualified as important, and Karl is the
one who put the method securely on the
map.

Another highlight came from the PhD
work of Brad Stone, who showed that
IVR rates were much enhanced by
adding a single degree of freedom, an
internal rotation, to the vibrational field.
He did this by “discovery” of p-fluoro-
toluene, a molecule in which a pDFB
fluorine atom is replaced by a methyl
group. Brad’s paper is among our most
cited works.

Our work with internal rotation still
continues. Graduate student Zhong-Quan
Zhao, for example, showed with
an amazing compendium of fluores-
cence spectra (and the theory) just what
the internal rotation looked like in the S₁
state and why it was so effective. His
work followed an earlier quantum
mechanical treatment developed by
David Moss, working in his early
graduate years with guidance from my
colleague George Ewing. A paper arrived
from David while I was in Munich on an
eight-month sabbatical, and there, laid
out in elegant prose and equations, was
the theoretical explanation of the internal
rotation effect complete with experimen-
tal comparisons. Not only was the
science sound, but the paper was suitable
for the Journal of Chemical Physics,
where it now resides with praise from the
referee. So in more ways than one, David
was a special graduate student. He, as
several others in the group over the
years, could write. This talent explains in
part why he is an author on more of our
papers than any other graduate student.

The remarkable glyoxal work of David
Moss, along with Rick Coveleski, Gary
Loge, and, much earlier, Larry Anderson,
during my year-long sabbatical in
Cambridge, England, proved that good
things happen back home when we are
away. It’s a good lesson for some of my
faculty colleagues who seem reluctant to
leave groups to their own devices during
a sabbatical. Bright young researchers
carry the day.

David Moss subsequently performed the
definitive internal rotation experiments
on IVR with two well-cited chemical
timing papers. The latter was in collabo-
rative with our most recent undergradu-
ate researcher, Peter Timbers, who was a
delight to have in our lab prior to
graduate school at the University of
Colorado. The first published under-
graduate researcher in our group was
John Rau, whose classy work in the late
16
tem crossing. John was so smart that he went to medical school instead of becoming a chemist.

We are currently heavily involved with the state-to-state study of collisional vibrational (more specifically rovibrational) energy transfer. What began with Ken Tang’s seminal graduate research of the early-70s blossomed further with David Cattlett’s energetic compendium of PhD studies on pDBF, coupled more recently with very-low-collision-energy supersonic jet studies of Chris Purcell, a postdoc from the University of Chicago.

Our present emphasis is, however, a result of a new technique using crossed molecular beams that enables us to see rotational and rovibrational energy in detail far surpassing that of any other method. We can do this because of Doug Krajnovich, a postdoc from UC Berkeley. To use a term in its best sense, Doug was a “Great Leap Forward” guy, one of those people who generate a huge, permanent impact.

With unmatched experimental agility, unmatched grounding in chemical physics, an unmatched knowledge of the literature, and with unmatched hard work, Doug designed and built a crossed-beam machine and used it to complete an extensive study of $I_2$ and an even more extensive study of glyoxal. In addition to major input into a proposal, he wrote the papers as well as two thirds of a long review in Chemical Reviews. He too can write! All of this was done in about two-and-a-half years. He was later joined by a physics student, Hong Du, who did his PhD research in our group and completed a separate study of the effect of collision energy on vibrational energy transfer in iodine that won the annual prize for the best PhD research of a physics student. Bright energetic students make science exciting! (I am embarrassed to admit that polishing Hong’s manuscripts for publication has not yet been finished.) Another postdoc, Miles Wei, from JILA in Boulder, Colo., has recently worked out the theory and the preliminary laboratory demonstrations for controlling the geometry of the collision pairs in these crossed-beam experiments. When that experiment gels in the hands of current students, it will be another on the Great Leap Forward list.

Many former group members have not been mentioned. They also have been my teachers. I cherish their accomplishments and, even more, our interactions. So I hope that I am forgiven for the omissions that inevitably occur when setting down an abbreviated account. They have been a big part of my IU life and are very much in my thoughts as this is written.

— Charles S. Parmenter

So now you have it from the pen of Charles “S” Parmenter — a true jewel in the crown of Indiana University’s chemistry for 35 years. But have no fear, Charlie should be around for many years to come — thanks in good measure to his charming and loving wife, Pattie, who chauffeurs him to squash games and makes his sandwiches for lunch. Super people like Charlie deserve special treatment.

Among Charlie’s numerous honors that must be mentioned are the Spiers Medal of the Royal Society of Chemistry, the Humboldt Stiftung (Germany), the Earl K. Plyer Prize of the American Physical Society, along with, from Indiana University, the Sonneborn Award for Excellence in Teaching and Research and the Distinguished Faculty Award of the College of Arts and Sciences for excellence in teaching, research, and service.

— M.C.
Roger Beckman completed his year as chair of the Special Libraries Association Chemistry Division in June when the national SLA meeting was held in Indianapolis. The MLS/MIS Chemical Information Specialist Program continues to attract good students. This fall, five students are on campus. Deanna Caporicci will complete her degree in December. Sarah George began the program in January, and Rose Liang, Ted Baldwin, and David Shumaker are just starting their degree programs.

IU has joined a number of other universities that have subscribed to the new SciFinder Scholar Program for accessing the Chemical Abstracts databases. The Chemistry Library was one of the first in the world to take advantage of the CAS Academic Program when it was introduced in 1985. Free searching was available to all users for a period of 10 years, but budgetary problems have forced us to charge for online Chemical Abstracts searches in recent years. The SciFinder Scholar Program will once again allow searching of the CA files at no cost to the users. Electronic versions of journals are appearing for almost all of the print copies held in the library. We will be assessing the desirability and cost effectiveness of switching to the new format over the next few months.

The following is Gary Wiggins’ description of a recent visit to “Yugoslavia.”

Adventures in Yugosland

As part of our 25th wedding anniversary celebrations this summer, we decided to take the whole family for a visit to my wife’s homeland, Yugoslavia, (or as we discovered it is called on the State Department’s travel advisory Web page: Serbia and Montenegro). Given the troubles in Kosovo, it was with some trepidation that we left Bloomington on July 6 for the long journey to Belgrade.

Mia had found a tremendous deal on tickets, but one that had some potentially bothersome aspects. The first was that the journey to Amsterdam was via Northwest Airlines. I always wondered why my father, a Minneapolis resident, referred to the airline as “Northworst.” That became clearer as we sat in the Detroit airport for five hours beyond the scheduled departure time, waiting for the repair of the navigational computer. Having missed the connection to the Yugoslav (JAT) flight in Amsterdam, we found the Northwest transfer desk to be extremely helpful. Although I was somewhat skeptical, the attendant assured me that there was another flight leaving for Belgrade in less than an hour, so she promptly routed our bags to that flight. Hurrying to the gate, we found no JAT flight, but were surprised to learn that both we and our bags were on our way to Bergen, Norway. The first night in Europe we spent in a hotel near the Amsterdam airport at Northwest’s expense, and we also got four $100 vouchers from Northwest for the delay in Detroit. We can’t wait to use them.

Belgrade under Tito was a beautiful capital city, but today it is much in need of repair. Even the churches are marred with graffitti, and rubbish is all too visible. Certain things had changed dramatically since our last visit as a family in 1986. You could no longer buy Time magazine on the street corners of Belgrade, and the prices of most things had risen beyond the reach of the average Yugoslav. Pensioners held a protest march in July because they still had not received their April pension checks. City bus drivers went on strike the day we came back from a trip to the Adriatic coast, and the enterprising taxi drivers offered their services at four times the normal rates.

There are two avenues of public transportation in Belgrade, city buses and a fleet of private buses. The major difference between the two is the requirement to pay to ride the latter. When Mia tried to buy the 30-cent tickets from a city bus driver, his reply astounded us: “I don’t have any tickets today. You’ll just have to ride free.” There were no free tickets to the exhibition basketball game that the Yugoslav National Team played the week before the World Cup matches. My nephew (a physical chemistry student), my two sons (Alan and Tom), and I went to the game. My nephew and I were walking in front as we entered the arena. When I turned around, I was shocked to see the two boys being frisked by the local constabulary. It must have been Alan’s long hair!

Our three-week trip to Yugoslavia included some side trips outside Belgrade. To the north a short bus ride is the city of Novi Sad, where many residents of Hungarian ancestry can be found. In contrast to Belgrade, Novi Sad is a very clean city, with architecture that reflects
the influence of the Austro-Hungarian empire. The old fortress on the Danube is a favorite tourist spot and was quite different in style from the famous Turkish fortress, Kalemegdan, in Belgrade. Another side trip was to the tourist spot of Oplanac, east of Belgrade, where one of the last Serbian kings had built a very impressive Orthodox church. My brother-in-law decided to drive his 18-year-old Fiat on that trip. Yugoslavia on average has the oldest cars in all of Europe, the exceptions being the BMWs, Mercedes, and other more modern autos that made their way from places unknown through Montenegro to the hands of the new "owners." Montenegrans license plates are frequently seen throughout Yugoslavia, but I am told that they never venture outside the country. Gasoline was not hard to find in Belgrade. Practically every street corner in my brother-in-law's neighborhood had an "attendant" who was selling gasoline from plastic containers.

Our side trip to Montenegro was by bus, a 10-hour nighttime marathon ride with two 20-minute rest stops. It is unfortunate that we didn't see much of the countryside in Montenegro during those trips. It is a beautiful, rugged country that the Montenegrans are proud to tell you was never defeated in 500 years of fighting the Turks. We traveled by car to Ostrog, a monastery carved into the side of a mountain that is not too far from Mia's hometown of Niksic. It impressed us by the determination it must have taken to build and maintain it. Niksic is the home of two chemically-related Yugoslav industries: bauxite mines and beer. I never got close to the mining operations, but sampled the beer on numerous occasions, once starting at 8:30 in the morning. There is an old Montenegrant joke about a businessman from Niksic who had just consummated a business deal at 9 a.m. in Podgorica (the capital city of Montenegro, formerly known as Titograd). The Niksic man promptly suggested they go for a drink to celebrate. His shocked compatriot stated that it was far too early for that, but the visitor exclaimed, "What! Why, they are already throwing up in the streets in Niksic!" Rumors are that the workers in the Niksic beer factory are unhappy with the new Belgian owners. It seems they have forbidden the workers to drink the beer while at work and no longer allow them to take home all the beer they can carry.

From Niksic, we went to the Montenegrant Adriatic coast, to the old city of Budva, a destination that is probably not as well known to outsiders as its more famous neighbor to the north, Dubrovnik. Budva also has an old walled city that juts into the bay and has mostly been converted to shops and restaurants. The Archeological Museum and the Historical Museum had apparently been closed for several years, but the air-conditioned Versace shop (the only one to have AC) was quite crowded. It was a pleasant visit, and one that made the bus trip back to Belgrade quite bearable.

Yugoslavia is not on most tourists' lists of places to visit now, but all in all, the Wiggins family had a very good time there. The many relatives and friends were quite hospitable, and, despite being in a country where even a VISA card can't be used at present, the trip was well worth it.

— Gary Wiggins

STAFF NEWS

At the annual Chemistry Staff Awards Dinner, held in the Tudor Room on May 18, two special awards were presented. Pat Stapleton, administrative assistant for graduate affairs, received the Leo F. Solt Distinguished Service Award. This recognition is given annually to a member of the IU faculty or staff who has contributed significantly to the excellence of graduate education at Indiana University. Amy Van Pelt, manager of the scientific stores, received the 1998 Chemistry Staff Award. This prize is given to a staff member who is cited for exceptional contributions to the department.

Also at the dinner, the following staff members were recognized for their IU employment anniversaries: John Dorsett, supervisor of the mechanical instrument service, for 35 years; Don Chatten, lab attendant, for 30 years; Judy Johnson, manager of personnel and grants, for 25 years; Delbert Allgood, research machinist, for 20 years; Stacy Felton, administrative secretary for professors Campagne, Gajewski, Shiner, and Williams, for 15 years; Brian Crouch, computer

Pat Stapleton
specialist, for 15 years; Amy Van Pelt, scientific stores manager, for 10 years; and John Poehlmans, senior electronics engineer, for 10 years.

Canan Aker, office services assistant in the business office, left with her husband, David (PhD'98, Ewing), to relocate in Vermont, where he has accepted a faculty position at Middlebury College. Nicole King is Canan's replacement. Nicole worked at IU Campus Card Office for more than a year while completing her degree at IU. Brenda Brinton left her position as secretary for professors Richardson, Scott, and Stone to relocate in Davis, Calif., where her husband, Jeff, accepted a faculty position. She is replaced by Cheryl Johnson, who formerly worked for professors Crandall, Montgomery, and Ellington. Laura Flanigan has replaced Cheryl Johnson and is working for professors Crandall and Montgomery, while simultaneously working on her degree in environmental ethics.

Ulli Werner-Zwanziger, NMR spectroscopist, was on extended leave during the summer, working as a visiting scientist at the Max Planck Institute, while her husband, Josef Zwanziger, was on sabbatical there. Richard Landgrebe, computer specialist, received IPC C.I.D. certification in printed wiring circuit design after attending classes at the Raytheon factory school.

Vince Distasi accepted a faculty position at Grove City College in Grove City, Pa., and left his position as manager of instructional computing in June. Mike Squires assumed responsibility for instructional computing, and Becky Hanson is now responsible for administrative computing as systems analyst programmer. Mike had been systems analyst programmer and Becky's former position was as accounting associate in the business office.

Finally, Gina Vertrees has returned as technical services' secretary, a position she formerly held before transferring to the School of Music. She replaces Katherine Mann who left the department for medical reasons.

— Loyd Hudson

GRADUATE NOTES

The graduate program in chemistry is directed by two faculty committees. The Standards Committee, responsible for the graduate program in the department, was chaired this year by graduate adviser Professor Jack K. Crandall. Other members of the Standards Committee were professors Malcolm H. Chisholm (inorganic), Lawrence K. Montgomery (organic), Milos V. Novotny (analytical), James P. Reilly (physical), and John P. Richardson (biochemistry).

The Admissions Committee, also chaired by Crandall, included professors David E. Clemmer (analytical), Martha G. Oakley, William G. Scott, and Martin J. Stone (biochemistry), Jeffrey M. Zaleski (inorganic), Joseph J. Gajewski and Lawrence K. Montgomery (organic), and Romualdo T. deSouza and Charles S. Parmenter (physical).

Fellowship Holders

Three industrial fellowships were awarded to chemistry graduate students for the 1997–98 academic year.

The General Electric Fellowship went to Kyle P. Starkey, who completed his undergraduate studies in chemistry and physics at Southwest State University in Marshall, Minn. Starkey joined Professor Lawrence K. Montgomery's research group during summer 1994, where his research involves the design, synthesis, and characterization of new organic conductors and superconductors. His efforts have resulted in the synthesis of a new electron donor, bis(ethylenedithio)tetrathioannaphthylene, and are now focused on the electocrystallization and characterization of its radical cation salts.

Christopher T. Houston, the recipient of the Lilly Fellowship in Analytical Chemistry, received his BS in chemistry from the University of Michigan–Flint in 1994. Upon his arrival at Indiana University, Houston joined the research group of Professor James P. Reilly. The focus of his research is the use of matrix-assisted laser desorption/ionization time-of-flight mass spectrometry to study biochemically relevant modifications of proteins. By taking advantage of the enhanced resolution made possible by time-dependent ion extraction fields, he has been able to monitor the covalent modification of proteins by small, reactive molecules. Recently, he has demonstrated the utility of MALDI-TOFMS as a simple, rapid screening method for discovering diseases caused by hemoglobin mutations. Presently, he
is pursuing this technique as a means to detect enzyme-substrate intermediates that, otherwise, cannot be directly observed. Such data can be used to derive kinetic information that is typically obtained only by indirect methods.

The Procter & Gamble Fellowship was awarded to Steven R. Emory, who received his undergraduate degree from California Lutheran University in 1993. After working in industry for one year, Emory entered the chemistry graduate program at Indiana University. An analytical PhD student in the laboratory of Professor Shuming Nie, he has been involved in several projects, including single molecule detection and the manipulation of DNA molecules. Presently, he is working on Raman spectroscopy of single nanoparticles and single molecules. This work aims to characterize the optical and electronic properties of quantum confined materials and to develop single-particle nanodevices.

Graduate Assistance in Areas of National Need Fellowships were presented to Angelica D. Brown, Joseph N. Coalert, Jessica J. Hollenbeck, David C. Kammler, Scott A. Lehn, and Lisa M. Schwartz.

Other fellowship winners were Peng Chen, American Chemical Society Analytical Division Summer Fellowship; Kathleen E. Renkema, American Heart Fellowship; Guillem B. Aromi, Suri Iyer, and Kyle P. Starkey, Collaborative Graduate-Undergraduate Research Fellowships; Lukás Zídek, College Research Fellowship for fall semester; Guillem B. Aromi and Bradley W. Fravel, College Research Fellowships for spring semester; Sheila C. Henderson, E.M. Kraft Fellowship; Marcella J. Sackett, Genetics Training Grant; and Angelica D. Brown and Jo Ann Currey, Outstanding Teacher/Scholar Fellowships.

Annual Awards

At the Chemistry Honors Banquet in April, these students received Teaching Excellence Recognition Awards: Todd A. Brugel, Kent A. Davis, Jonathan A. Karty, and Tucker D. Maurer.

Cherokee S. (Hoaglund) Hyzer, who is doing research with Professor David E. Clemmer, was awarded the C500 Research Award; Dmitriy V. Yandulov (Caulton) received the Felix Haurowitz Award and William Nebergall Memorial Award; Kevin G. Meyer (Williams) received the Wendell P. Metzner Memorial Award; and Stephen J. Valentine (Clemmer) received the Reilly-Pharmacia and Upjohn Award.

— Pat Stapleton

Research fellowship winners are, front row, from left: Kyle P. Starkey, General Electric Fellowship; Sheila C. Henderson, E.M. Kratz Fellowship; Guillem B. Aromi, College Second Semester Research Fellowship; and back row, from left: Bradley W. Fravel, College Second Semester Research Fellowship; Christopher T. Houston, Eli Lilly Fellowship; Lukás Zídek, College Research Fellowship for fall semester; and Kathleen E. Renkema, American Heart Fellowship. (Not shown: Marcella J. Sackett, Genetics Training Grant, and Steven R. Emory, Procter and Gamble Fellowship.)

Teaching Excellence Recognition Awards winners are, from left, Todd A. Brugel, Kent A. Davis, Tucker D. Maurer, and Jonathan A. Karty.

Other award winners are, from left, Kevin G. Meyer, Wendell P. Metzner Memorial Award; Dmitriy V. Yandulov, William Nebergall Memorial Award and Felix Haurowitz Award; Stephen J. Valentine, Reilly-Pharmacia and Upjohn Award; and Cherokee S. (Hoaglund) Hyzer, C500 Research Award.
During 1997–98, Professor Dennis G. Peters, Briscoe Professor of Chemistry, continued as director of undergraduate studies, and Steven M. Wietstock continued as the coordinator of instructional programs. In September, Mike Squires once again took on the position of manager of instructional computing when Vince DiStasi left IU for a faculty position at Grove City College in Pennsylvania. The other members of the Instructional Support Office are Ann Clegg, student records assistant, Alice Dobie-Galuska, general chemistry assistant coordinator, and Judy Summerville, scheduling and registration manager. The ISO supports academic advising, maintaining undergraduate student records, recruiting, scheduling of classes, providing undergraduate academic computer support, supporting the freshman laboratories, and coordinating information on curricular and pedagogical reform in undergraduate chemical education.

This year’s Chemistry Honors Banquet was held in the Frangipani Room of the IMU on April 16, with 224 students, faculty, and guests attending. Awards went to the these undergraduate students:

- First-Year Class Awards to top students in first-year chemistry courses taken during Semester I, 1997–98 — for C105: Darrell Lee Sharp; for C125: Katherine Marie Macy; for S105: Bao Thien Huynh; for S125: Jennifer C. Hsia; for C106: Zahra Shereen Ahamed; and for C126: Zahra Shereen Ahamed

Class of 1999: Nathan Ray Crisel, Tom Gregory Driver, Jason Scott Knight, Jennifer Eryn Sprague, Andrew Zhuang Wang

Class of 1998: Jason Michael Ford, Sarah Christine Manitsas, Andrew Q. Tran

- Bill Mays Award for 1997–98 — Jeremiah Bwatwa
- Lubrizol Scholarship for 1997–98 — Michele Min-I Fang, Van Anh Thi Huynh, Michael Stephen Metrick, Neeraj Surana
- Ira E. Lee Summer Scholarships for 1998 — Adrienne Leigh Goerges, Kevin Trotter
- Harry G. Day Summer Scholarships for 1998 — Tom Gregory Driver, Jason Michael Ford, Manas Jain, Jason Scott Knight, John Thomas Krug, Lisa Marie Laws, Penelope Anne Lewis, Jeff Neil Stuart, Greg Jeffrey Williams

- William Klinkenberg Award for 1998 — Jeff Neil Stuart
- Earl Strudvert Summer Scholarships for 1998 — Joshua Lawrence Goodman, Marc David Kohli, Jason Andrew Mears
- Votaw Undergraduate Summer Research Scholarship for 1998 — Christine Caryn Jones, Jennifer Eryn Sprague
- Frank Mathers Undergraduate Summer Research Scholarships for 1998 — Samson Chan, Chris Hughes, Bao Thien Huynh, Nathan A. Long

- The Procter and Gamble Co. Summer Research Scholarships for 1998 — Greg Jeffrey Williams
- The Lilly Undergraduate Summer Research Scholarship for 1998 — Manas Jain

- Honors Division Summer Scholarships for 1998 — Tom Gregory Driver, Jason Michael Ford, Jason Scott Knight, John Thomas Krug, Lisa Marie Laws, Penelope Anne Lewis

- Russel and Trula Sidwell Hardy Scholarship — Greg Jeffrey Williams
- Merck Index Awards — Nathan Ray Crisel, Jason Scott Knight, Phillip W. Raess, Andrew Zhuang Wang

- Analytical Chemistry Award — John Thomas Krug
- Enola Rentschler Van Valer Trafford Scholarship Award — Jennifer Eryn Sprague
- Courson-Greaves Prize — Michael Lance Pacold

- William H. Bell Awards — Tom Gregory Driver, John Thomas Krug
- Alpha Chi Sigma Award — Rueben Gene Lidster
- Hypercube Scholar Award — Van Anh Thi Huynh
- Joseph B. Schwartzkopf Award — Michele Min-I Fang
- ACS Award — Martin Karl Pettersson
- Mary Frechting White Award — Rebecca Michelle Vestal
- James C. White Award — Neeraj Surana

We appreciate all the sponsors who have made these awards and scholarships for our undergraduate students possible. We congratulate these students on their achievements and express our best wishes to all of our graduating seniors for a long and successful career.

Our fall recruiting program is under way. It looks as if we will once again have a full schedule of interviews. If you or your company is interested in recruiting at IU, please contact Steven M. Wietstock at (812) 855-2700 for additional information on the Chemistry Placement Program at IU. We are also interested in setting up internship (summer and academic year) opportunities for students. If you are aware of positions, please contact the ISO at the above number. It is the support of the department’s alumni that continues to strengthen our placement and internship programs.

— Steven M. Wietstock
Profile: Outstanding Alumnus
Mansukhlal C. Wani

Mansukhlal C. Wani, PhD’61, has been much in the news in recent years. His claim to fame rests mainly on his work, with Monroe Wall, on natural products at the Research Triangle Institute in the Research Triangle Park, North Carolina. In 1971, he and his colleagues reported the isolation and structure of Taxol® (now known as paclitaxel) from the bark of the Pacific Yew tree. Taxol® has been shown to attack a wide range of cancers in a different way. Leading oncologists consider its use standard for breast and ovarian cancers, and other types may be affected.

Even earlier, Wani and his colleagues had isolated and proved the structure of Camptothecin, an alkaloid with antitumor activity, from the bark of Camptotheca acuminata, a Chinese tree. Side-effects limited interest in Camptothecin for human use, and it was not developed, but recent work, much of it in the laboratories of Wall and Wani, has shown much greater activity or lower toxicity in synthetic analogs.

Wani’s areas of research include organic photochemistry, total syntheses of a variety of heterocyclic compounds and steroids and, most important, isolation and characterization of antitumor agents from terrestrial and marine natural products and fermentation broths. For the past three decades at RTI, Wani has been actively involved in the total synthesis of flavonoids, indenopyridines, diterpenoid analogs, silicon steroids, abeo steroids, and pentacyclic bridged steroids as potential female and male contraceptive agents. He has also worked on the synthesis of new retinoids as potential chemopreventive agents and polyfunctional iron chelating agents for the treatment of Cooley’s anemia. In the area of natural products research at RTI, Wani has been involved in the isolation, purification, and characterization of a wide variety of antineoplastic agents and inhibitors of carcinogenesis including alkaloids, terpenoids, quasinoids, ansamycinic acids, and anthracyclines. In addition to this ongoing work on plant-derived antitumor and antimutagenic agents, he has directed continuing efforts towards the synthesis of potent water-soluble camptothecin analogs and metabolism of paclitaxel and camptothecin. His other projects include synthesis of conjugates of proprietary drugs and substances of abuse for use in drug treatment. He is the author or co-author of more than 160 research articles and patents.

Wani graduated from the University of Bombay, India, in 1947, with a chemistry major and a minor in physics. He continued his studies in chemistry at Bombay, receiving an MS in organic chemistry in 1950. From 1950 to 1958, he served as instructor in chemistry at Bhavani’s College, Bombay, teaching both graduate and undergraduate courses. In 1958, he arrived at Indiana University as a graduate assistant in chemistry, and later as a research fellow in the laboratories of E. Campeigne, worked on certain nitrogen-sulfur heterocycles as potential antiradiation agents, under a contract with the office of the Surgeon-General, U.S. Army Medical Research and Development Command. Following receipt of his PhD in 1961, Wani became a postdoctoral fellow in the laboratories of Howard 1


Zimmerman at the University of Wisconsin, working on the photochemistry of organic compounds.

In 1962, Wani joined the Research Triangle Institute, working on the synthesis and photochemistry of actinomycin analogs and, in the following year, joined forces with Monroe Wall, who was establishing the Natural Products Laboratory at RTI. The collaboration between Wall and Wani has been extremely productive since that time, a period of more than 35 years. Wani currently holds an appointment as principal scientist in the Chemistry and Life Sciences Section of the Research Triangle Institute.

Mansukhlal Wani is a member of the American Chemical Society, Sigma Xi, Phi Lambda Upsilon, American Society of Pharmacognosy, American Association for Advancement of Science, and the New York Academy of Sciences. He has received a number of awards for outstanding work: the Pride of India Award, 1992; Indo-American Pharmaceutical Award, 1993; Bruce F. Cain Memorial Award of the American Association for Cancer Research, 1994; City of Medicine Award, 1994; National Cancer Institute Award of Recognition, 1996; and the Research Triangle Institute Circle of Champions Award, 1997. He has been an invited speaker at a number of international symposia in the area of drug research.

HELP WANTED We're looking for some alumni assistance in arranging AIUC get-togethers at ACS meetings. AIUC members living in the vicinity of the ACS meeting place could advise us on the location and nature of such get-togethers and cooperate on hosting the event. A list of the next seven ACS meeting sites is given below. Members living in any of these areas who are willing to help at a get-together should telephone Mary Swarthout in the chair's office at (812) 855-6230.

<table>
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<tr>
<th>Meeting</th>
<th>Year</th>
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<tr>
<td>219th</td>
<td>Spring 2000</td>
<td>March 26-31</td>
<td>San Francisco, Calif.</td>
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<tr>
<td>221st</td>
<td>Spring 2001</td>
<td>April 1-6</td>
<td>San Diego, Calif.</td>
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<tr>
<td>222nd</td>
<td>Fall 2001</td>
<td>Aug. 26-31</td>
<td>Chicago, Ill.</td>
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Alumni Letters: Delbert E. Philpott

Earlier this year, Delbert E. Philpott, BA'48, MA'49, visited our Alumni Office and spoke with Elizabeth Greene. She encouraged him to recount his career activities, which prompted Del to send her the following most informative letter:

July 27, 1998

Indiana University, Chemistry Department, Bloomington, IN 47408-1521
Attn: Elizabeth Greene

Dear Elizabeth,
What a real pleasure to meet you again after 50 years. To have you remember a conversation we had about your getting airsick was most astounding. I really enjoyed being remembered. As you will also no doubt remember, I mentioned that I had not sent much personal news to the IU Chem Department because I really didn't think that I was strictly into chemistry although my profession of Electron Microscopy had directly resulted from my work with Dr. Robert Fischer at IU. I promised you that after I returned home I would fill you in on some of the professional events of my life. I hope this will be along the lines of interest to you and possibly the Department.

I left IU to take a position at the U. of Ill. Med School against the advice of the Department Chairman, who told me I would starve trying to put all my eggs in one basket; i.e., tie myself to one unproven instrument. At this job, I was to help develop electron microscopy into a useful biological tool. They put me on both the medical and dental staff where I had rather free rein to knock about and try to develop ideas. My first paper, Portrait Shadow-Casting, made the cover of the J. of Applied Physics. The chairman was right about starving, as I was paid so little I had to have a budget for food. However, making the cover of a prestigious science magazine seemed to make starving worthwhile. I also published a paper on muscle that a Nobel prize winner saw. He had a friend interview me and off I went to Woods Hole, Mass. My decade with Dr. Albert Szent-Gyorgyi was like going to heaven compared to living and working in Chicago.

In Woods Hole, I developed and ran the electron microscope (EM) operation. Dr. Szent-Gyorgyi's small Institute of Muscle Research ran the year around. However, we opened the EM lab in the summers to visiting professors from around the world. I not only ran the lab, but did the electronic repair as well. When I arrived, I had already developed plans for an ultra-microtome to cut extremely thin sections for electron microscopy. My microtome proved to be so sensitive that I discovered the specimen advance could be controlled by running the window shade up and down. From then on, whenever a site visit was planned, we brought the inspectors into my lab when the sun was shining through the window. I would control the thickness of the specimens by raising and lowering the window shade which I had marked off in Angstrom units. This so impressed the site committee people that they never asked about my scientific work.

I also purchased my first airplane and helped build a small airport in Falmouth, Mass. The visiting scientists got to see Woods Hole from the air and I often flew to scientific meetings.

One day, Dr. Szent-Gyorgyi was chatting with me and said, “You have been here for about a decade and we have a lot of fun and success. With me, it doesn’t matter whether you have a Ph.D. or not. However, in the outside world, it will matter. Perhaps it’s time you went back part time and got one.” His support made it possible to attend Boston University and obtain my Ph.D. in biology. When I applied to go to that University, I was proud to enter into my CV that I had 50 publications. Not bad for a student.

From there I moved to Denver, Colorado, to a position in the Department of Biochemistry. Again, I worked at developing the electron microscope lab and doing research with it. After two years there, I accepted a position as Co-Director of the Institute of Biomedical Problems at Mercy Hospital in Denver. That was great, but an offer from NASA to come to Ames Research Center in Mountain View, California, was too good to refuse. At the interview, I was told that part of my job would be to look for any present or past life in lunar soil. “Man,” I thought, “I wouldn’t go to some places if they gave me the moon. Here, I get a piece of it.” I was so impressed I started to walk out without even asking if I would get paid. Getting and working with lunar soil was a great thrill and the world wanted to know what we were doing.

Life at Ames was wonderful. I was given a blank check and taken to an empty basement. I was told to design and build an EM lab that would serve NASA and be a show place for people to visit. That was truly a dream come true. In the heyday of space operations, it was common to have congressmen drop by my lab to look into the microscope. The planning and development of that lab was so successful that it is still in operation.

I participated in flying 5 pocket mice to the moon on Apollo 17. It was a radiation experiment and I was to look for any damage to the eyes from cosmic rays. The newspapers were really kind. They said we were sending the mice to the moon to see if it was made of green cheese. Recovery was being made by an aircraft carrier off American Samoa. To protect the aluminum capsule from excessive heat on its trip from the carrier to the hospital on the island where we had set up shop, I suggested we have the ambulance drive it from the airport to the hospital. They were the only ones who were allowed to drive faster than 35 mph on the island. That worked great except for one flaw. Thirty minutes after their arrival at the hospital, the press called us. They wanted to know, since the mice were sent to the hospital in an ambulance, how come they had become sick. Sometimes you just can’t win.

In the early '70s, three of us flew to the magnetic north pole to instigate studies of cosmic rays. The magnetic lines of force concentrate some of the charged particles as they head for earth. We were told there was a girl behind every tree. When we arrived, we found out there weren’t any trees! We went there in August when the jet stream was turning around. This was to get data on how we could launch a gigantic balloon and not have the jet stream slice off the top of the balloon as it went up. Unfortunately, one of the radio balloons headed for Russia. My prediction was that the balloons
would hover near our base. Wrong. To make matters worse, the Cold War with Russia was still in full swing. They were shooting down anything that came over Russia. What to do?

I argued that the only option we had was to invite the Russians to place an experiment on board our balloon. Then if it went over Russia, we could call and say, “The experiment is heading your way. Would you please retrieve the balloon?” That way we would get our experiments back as well avoid a nasty international incident. This reasoning and possibly others wound their way up to headquarters.

The Russians were invited to participate in the balloon experiment. However, human basic nature then took over. Since we had invited them to participate in a space experiment, they felt that they could do the same. They offered to place their Cosmos 782 flight. Arguing that they had a better deal, they stated that they would know how high it would be, how long it would be up and where it would come down. They correctly pointed out that we did not know that information about our balloon. It was decided that the U.S. would accept their offer.

Apollo-Soyuz flew in July of '75 and Cosmos 782 flew in December. I was selected to represent the U.S. space program and flew over to also work on my flight experiment. The fact that I had been in the link-up in 1945 when the Russian 69th Infantry Division met the Russians on the banks of the Elbe River made me a hero in the eyes of the Russians. They kept pointing out that I was the only one they knew who had participated in two link-ups between these “two great countries.” The one military medal I had that impressed them the most was my purple heart. They said that proved I was in the thick of it. I believe I could have had Moscow if I had asked. Indeed, to accommodate NASA’s wishes, they made Lufthansa fly me out of Moscow with only one or two other passengers. This is an incredible story that needs to be told in another letter by itself. Indeed, it makes up part of a lecture I’m often asked to give; “A Warm Relationship in the Cold War.”

After the success of our interaction with the Soviets, they continued to offer space on their spacecraft. Indeed, the chance for open dialogue between the Soviets and the Americans was possible. We set up a monthly phone call between Ames and the Institute in Moscow. This was kept open through the ups and downs of the political climates. Of the many things I’ve done, the opening of dialogue between the Soviets and Americans is something I’m very proud of because I know I played an important role. A few years later, I was flown to Washington, D.C., and presented with a space medal and another medal for my participation in the Great Patriotic War by Russian Major General S. Bougov. The Russians appreciated what I had done.

During one of my trips to Russia, I crossed most of Russia on the Trans-Siberian Railway. What a trip! Even Disney couldn’t have planned it better. Part way across, two of the compartments in our car were robbed. Mosquitoes kept us busy and we seemed to continually reset our watches for the changing time zones.

On another trip, the Russians arranged a special escort for me to go to a military air base. They knew of my interest in aviation and qualifications as a pilot and thought that would be something special. Indeed it was. To my amazement, I was even cleared to use my camera. At one point, I stood staring with astonishment at the remains of Gary Powers’ U-2. I’m sorry I didn’t have nerve enough to take a picture of it.

Russia has changed a lot since I traveled there. The communists are no longer in charge and the world is better off. However, when I was there, the level of crime was quite low. Now I get reports of a much higher crime rate in Moscow. Nothing stays the same.

The Russians continued to fly my experiments on their spacecraft. After I retired in 1990, they would ask for me to work with them whenever they came to Ames, so I temporarily came out of retirement at those times.

I’ve published over 200 scientific publications and had my pictures on the covers of scientific journals and textbooks. I’m also listed in several Who’s Who type publications. I have received over seven space awards. The first was for the “Biocene” flight of pocket mice to the moon. Five were for joint American/Russian work flown on Russian spacecraft. One was from the Russian space agency for 15 years of joint Biosputnik Cosmos work. I represented NASA in many foreign countries. Indeed, the springboard provided by Dr. Fischer at IU propelled me into a most exciting career. Dr. Fischer paid me one of the greatest compliments of my career. When I gave a key-note address at the 50th anniversary celebration for the Electron Microscope Society, he seemed to materialize out of thin air. How he found out about my talk and then made it all the way to Boston, I’ll never know. He said he really enjoyed my talk, “Her Garter Snapped; Problems and Solutions,” adding, “I see you still have your sense of humor.” I got his business card and sent him my heartfelt thanks. That made me feel like he had provided bookends for the start and finish of my scientific life. I don’t know of a better compliment than what he provided.

Donna and I edited a book called, Hands Across the Elbe, published by the Turner Publishing Co. in Paducah, Ky. It chronicles the stories of a number of Russian and American veterans who participated in the linkup at Torgau, Germany, in 1945, and even a few Germans. My participation in that link-up led to a number of TV appearances and newspaper articles around the 50th anniversary of WWII.

I hope what I have written is of some interest. I believe you can tell that my time at IU provided a window into professional life that was exciting and most rewarding.

Sincerely,

Dr. Delbert E. Philpott

“A later note to Elizabeth adds the following comment: “The Russian government recently awarded me a 50th-anniversary medal for my participation in the war against the Fascists. I mention this only because a letter accompanying it stated that the paperwork was personally signed by Boris Yeltsin. I thought you might get a smile out of that.”
Alumni Letters: Gennaroo J. Gama

The following letter was reviewed by the editor of the College of Arts and Sciences alumni magazine, Anne Kibbler, who gave us permission to print it here. The spring 1998 edition of The College featured two of our own: Malcolm Chisholm and Don Garvin.

Oct. 13, 1998
Anne Kibbler, Editor
The College
IU Alumni Association
Virgil T. DeVault Alumni Center
100 E. 17th St.
Bloomington, IN 47408

Dear Ms. Kibbler:

As an IU alumnus, it was with great pleasure — and a great deal of emotion — that I read the articles “Inventive Genius” and “The Art of Glassblowing,” published in the spring issue of The College. These emotions and the memories associated with them compelled me to write you this letter. Due to my recent move from South America, only recently had I this issue forwarded to my new address.

I completed my PhD work in 1994 under the guidance of Professor Malcolm Chisholm. It was for me a great honor to be a member of his research group in the period spanning from 1990 to 1994. Not only I found in Malcolm a great mentor but also an exceptional person. Not only was he an excellent research adviser, a very eloquent lecturer, but was also always concerned about his student’s needs. These are qualities almost absent in people of his scientific stature nowadays.

I remember one special episode. I was supported throughout most of my doctorate by a fellowship granted by the Brazilian National Research Council (CNPq). This fellowship meant to cover not only living expenses but all tuition and fees. The 1991–92 period was especially harsh on the Brazilian economy, causing the Council to default on the payment of the tuition of the majority of the Brazilian students abroad, including of those at IU. We were then faced with the prospect of having our registrations canceled, a severe situation not only for graduate students, but especially for foreign ones, with no one to “run to.” I expressed my concerns to Malcolm, and asked if he could intercede with the University in my specific case. A few hours later, Malcolm came by to the lab and told me that the Bursar’s Office had agreed not to cancel not only my registration, but also that of all Brazilian students sponsored by the same Council. The University would wait. He had gone on to plea to the university in favor of all of us!

His personality, together with his ever inquisitive mind certainly made his research group a very active scientific incubator, and also a group you feel pleasure to be associated with. For instance, in your article (page 9, second paragraph), Malcolm says: “So one of the things I’ve always tried to do is to identify the needs and aspirations of the students and try to match what I can do to fulfill those needs. … It’s important to recognize at a university that we are not just dealing with teaching an average, but we are striving to teach everybody what they need to know and to show some people that they can be truly excellent and fulfill their potential.”

Very true! Either during our group meetings or during individual discussion sections with Malcolm, we were always guided to discover by ourselves the “direction to go.” Specific aspects of each student’s work, or approach to a given question, were discussed by the group as a whole. Through discussion we were led to discover what next step to take, which routes would lead to a dead end, which wouldn’t. We were being taught to become scientists!

Malcolm is internationally recognized by the scientific community, as can be verified by the number of scientific awards he has received along his career. He has always led the ways to advanced research and new endeavors are undertaken constantly by his group. Research in collaboration with groups outside IU and abroad are also a constant in his career, further expanding the recognition of Indiana University. Malcolm certainly helps IU to be an internationally recognized institution through his excellence in teaching and research.

The article on Chemistry’s glassblowing shop also helped to bring up some good memories. Some of us used to call it by the affectionate nickname “Don & Don’s Shop,” after Mr. Garvin and Mr. Fowler. Indeed, both were to all of us great pals, in addition to extremely competent artists/craftsmen.

We, while students, were known from time-to-time to come up with the craziest and weirdest design for a glass apparatus, that we thought would work better than anything else ever built. After proudly introducing both Dons to our creation (for us sometimes, The Eighth Wonder) they, in a very diplomatic way, showed us how to cut down the number of components in the design by about 70% and that it would still work with a much smaller risk of failure. We, as graduate students, and sometimes postdocs, were being taught during those moments how to keep things simple and efficient. But more important than that, Mr. Fowler and Mr. Garvin were fulfilling a role expected from someone associated with an academic institution. They were teaching! Also, any design brought in would become a real piece of artwork within 24 to 48 hours.

We never had to delay our work because of the glass shop. It was for me a great disappointment, after I left IU, to realize what was left behind. I never again had a similar experience with any other glass shop staff in the other academic institutions I was associated with. Surely, it would have been impossible for any graduate student to complete his/her work without the professional services of the glass shop staff.

For these and several other reasons, I feel honored to have been an IU student. IU’s Chemistry staff and faculty certainly were an important component in making the 1990–94 period the best four years of my life. I am also proud to continue my association with IU through IUAA, as I can keep up-to-date with the events that take place in my alma mater.

Sincerely,

Gennaroo J. Gama, Ph.D’94
Fifty Years Ago

Warner to head Carnegie Institute of Technology

In 1949, our department was pleased and honored by the election of one of its alumni, John Christian Warner, as president of Carnegie Institute of Technology. J.C. (Jake) Warner received his BA ('19), MA ('20), and PhD ('23) from Indiana University. He was an instructor here (1921-24), and after some industrial experience, joined the faculty of Carnegie Tech in 1926. He served as head of the chemistry department there from 1938 to 1949, when he was elected vice president, to become president in 1950.

Jake Warner received many honors in his lifetime, more than can be listed here. He served on the Atomic Energy Commission in 1946 and was a member of the National Academy of Sciences. He won the Pittsburgh Award of the American Chemical Society in 1945 and later served as president of the ACS (1956). Warner's research contributions include kinetics of reactions in solution, vapor-liquid equilibrium, and equilibrium and rates of corrosion of metals, among others. He was certainly an outstanding alumnus.

— E. Campaigne

ALUMNI NEWS

Donald R. Ansers, BA'91, completed a doctorate in podiatric medicine from Scholl College of Pediatric Medicine in 1995 as well as a BS in biological science the same year. After completing his residency in Chicago at Rush Presbyterian St. Luke's Medical Center, he has located in Louisville, in private practice.

Stephen M. Bonsib, BA'72, MS'76, MD'78, is now professor and associate director, anatomic pathology at the University of Arkansas Medical Research.

John A. Bornmann, PhD'58, is now officially retired from teaching at the Lindenwood College at St. Charles, Mo. For some time he had been on disability leave because of visual impairment. For many years he served as chair of the Division of Natural Sciences and Mathematics. He is still an officer and the editor of a monthly newsletter for the St. Charles County Council of the Blind. He has various diverse activities that keep him productive in the large community, including singing in the church choir. In March, he received the Distinguished Service Award from the St. Louis Section of the ACS. Over the years he has chaired several committees as well as serving on the Board of Directors and holding the chairship of the section. He still writes a monthly column for the section's newsletter, The Bond.

James E. Cornning, PhD'84, continues as an assistant editor with Chemical Abstracts Service.

As reported in the May 1998 issue of Update (Endowment Campaign for Indiana University Bloomington): “Charles H. Davis, BS'60, MA'66, PhD'69, and his wife, Debra J. Shaw, PhD'83, have endowed a professorship in the School of Library and Information Science. Named in honor of Professor Emeritus Victor H. Yngva of the University of Chicago, it is the first gift of its kind in the school’s 30-year history.” The couple has lived in Bloomington since his retirement in 1993 from the University of Illinois at Urbana where he became distinguished in library and information science. During most of the intervening time he has been an adjunct professor in his field at IUB, and in February he was appointed Senior Fellow. Both Charles and Debra are members of the IU Alumni Association and they remain productively active in library and information science both at IU and elsewhere.

Donald J. Cook, PhD'44, is chair of the History Section of the Indiana Academy of Science. He and many others will welcome the presentation of good Indiana science history reports at the annual academy meetings and publication of the resultant articles in the Proceedings of the Academy. There are many such subjects that should be so reported. Jack's address is 625 East Washington Street, Greencastle, IN 46135.

Standiford Cox, BA'57 has been outstanding in many ways since he graduated as valedictorian of the 1953 class of the Brazil, Ind., High School and as a 1957 Phi Beta Kappa — plus other recognitions — graduate of this department. Recently his loyalty to his alma mater was expressed through a large donation. From IU he promptly began his professional career at Eli Lilly and Co. as an associate chemist. By
1965 he had been named to the corporate trainee program. When he retired in 1989 he had become director of personnel in production operations in the company and headed Lilly's MBA recruiting program. In retirement he does keep usefully busy. Naturally he has been a member of the IU Alumni Association for a long time.

Richard DiMarchi, PhD'79, and three colleagues at the Lilly Research Laboratories were recognized together in 1997 by being joint recipients of the ACS Award for Team Innovation. As reported in C&EN (Jan. 19, 1998) the team's research has made it possible for "people with diabetes (to) have a superior means to manage mealtime (blood) glucose fluctuations." This is through the team's development of Humalog (insulin lispro). Richard is now vice president for research technologies and proteins at Lilly. At IU his research in protein biochemistry was directed by E.R.N. Gurd.

Miriam Foshay, MS'77, after her family were grown, returned to graduate work in chemistry and has been studying kinetics and molecular biology with Jim Erman at Northern Illinois University, DeKalb, Ill.

Alan M. Golichowski, MD'74, PhD '76, became the fourth faculty member at the IU School of Medicine to hold the William H. and Sallie E. Coleman Professorship in 1996. He is a professor of obstetrics and gynecology; associate professor of medical and molecular genetics; and director of the Maternal-Fetal Medicine Division at the school. His major interest is in the latter field. The Coleman have made a major donation to the medical school to build a maternity hospital and endow departmental chairs in gynecology, ophthalmology, and surgery.

Andrew T. Graham, MS'74, with Fredric Buchholz, were co-recipients of an award for work in the development of the technology and commercial success of Drytech (trademark of the Dow Chemical Co.) superabsorbent polymer, a key component of highly absorbent diapers. They are also co-editors and co-contributors of a comprehensive textbook titled Modern Superabsorbent Polymer Technology.

Leslie Mormol Green, M.D., BA'85, is in family practice in Columbus, Ohio, where her husband is an obstetrician/gynecologist.

Caryn Jo Coles Hall, BS'96, is now an associate chemist at Hauser Inc., in Boulder, Colo.

James Hickie, PhD'77, is the senior contaminant hazard chemist at the U.S. Geological Survey, Great Lakes Science Center, Ann Arbor, Mich.

Mark Allen Krockover, BA'93, is teaching chemistry at the Maine East High School in Park Ridge, Ill. and has been listed in Who's Who among America's Teachers in the last three issues.

Bruce Jay Lanchot, BA'79, DDS'83, moved his practice into a beautiful new office building in Scottsdale, Ariz., last year.

Debra Ruth Luffer-Atlas, PhD '90, spent two years as a postdoc in the College of Pharmacy at the University of Arizona and five years as a senior research chemist at Merck before returning to Indiana as research scientist in drug disposition at Eli Lilly. She is working on drug development projects for diabetes and cancer.

Mary Beth (Jones) Maurer, BA'79, has completed her second year as a chemistry and physics high school teacher, and it has given her much enjoyment.

Robert C. Mann, BS'45 and his wife Marjorie Miller Mann, BS'43, have recently expressed their gratitude to IU through the establishment of three chairs in chemistry. The record of this couple as students in this department through a portion of the World War II years — a portion of his time in military service — and later through his completion of his PhD in 1949 at Minnesota, is indeed notable. The couple returned to Indianapolis, where his productive professional life was spent at the Eli Lilly Co. An outstanding contribution was made with a colleague, D.O. Woolf, on the structural determination of Lilly's antibiotic hemoglobin. The inseparable Bob and Marjorie will continue to be gratefully remembered for their achievements as students and as productive alumni of IU.

John W. Morgan, BA'63. After earning his PhD at Princeton University, he began his professional career at PeG. In 1997, he was elected to a two-year post as VP for communications in the Regulatory Affairs Professional Society. For several years, he has been with the dynamic Glaxo-Wellcome Co. at the Triangle Research Park in North Carolina. He is the director responsible for managing certain of their U.S. products that require Food and Drug Administration approval.

Salvador A. Pedicini, M.D., BA'38, MA'39, is retired but keeps busy with carpentry, electronics, and gardening. He is an avid swimmer and diver and frequently travels to Europe.

Mark James Pellerite, BS'77, is completing his seventh year as a research specialist at the
3M Co. in St. Paul. His research emphasis has been on preparation and characterization of fluorinated surface treatments dealing especially with organofluorine-based ultrathin film protective coatings for specialty optical substrates.

Daniel W. Seregely, BS'49, is the owner of Pacific Poly Crafts in Ventura, Calif. and has developed and manufactures various types of writing ink for ballpoint and marker pens. He has developed various fragranced novelty items and manufactures coatings for the printed circuit board industry.

James X. Sheaffer, PhD'70, is chemistry coordinator in the Department of Engineering Computer and Physical Science at Mohawk Valley Community College, Utica, N.Y. Also he teaches forensic chemistry. He is active in volunteer work, collecting commemorative and foreign stamps for disabled veterans, and running a recycling program to benefit dialysis patients at St. Luke's Hospital in Utica.

John W. Sloan, BS'39 keeps in fairly close touch with the department. A major preoccupation is the expansion of his lifetime interest in photography. This includes his efforts in the restoration of old faded photos. Recently he has made prints of some negatives he made during his service in World War II. When he wrote in February 1998, he planned to enter some of his work in this area at the Suncoast Camera Club at Bradenton, Fla., where he and his wife, Nadine, have lived since 1987.

Robert L. Stoddard, BA'50, tells us he retired in 1987 after teaching science and mathematics in Orange and Los Angeles School Districts 15 years. He spent several years in industry working for Magnavox, Goodyear Atomic, Hughes Aircraft, Teledyne, and Autonetics.

John C. Vanatta III, BA'41, MD'44, in 1997 completed his 50th year of lecturing in physiology at the University of Texas, Southwestern Medical School in Dallas.

Angee Walberry, BA'86, was the subject of an article in the May/June 1998 issue of the Indiana Alumni Magazine (p. 59). Attention focused on an attractive picture of Angee and a headline proclaiming: "A chemist's arbor for the arbor yields unusual fruit." After earning the BA at Bloomingston and a master's degree in social work at IUPUI, Angee became strongly attracted to innovative wine making and competition for quality recognition of her products in various exhibitions under the name Gaia Wines. As stated, in part: "With her life's savings, Walberry opened Gaia in May 1996, naming the small winery for the Greek goddess of the earth. But she emphasizes that female ownership influences more than just the winery's name. Each wine is a reflection of its creator, she says, so her wines are bound to be affected by her female touch. And her chemistry background." As reported, she won six medals at the 1997 International Wine Competition, held in Indianapolis. Angee's philosophy and vigor are reflected in her summation, as quoted by Megan Briscoe, the author of the article: "When life gives you lemons, you make lemonade. Life gave me grapes, so I made wine."

Craig E. Watson, BA'70, became interested in Navajo rug restoration and has studied with a Navajo weaver to learn the weaving. He has also worked as an amateur archeologist with the Grand Gulch-Wetheroll Research Project.

Bernard Wolnuk, PhD'43, was substantially referred to and quoted in a recent lead article: "Chemical makers try biotech paths" (C&EN, June 22, 1998, pp. 13-19). In referring to such paths it was stated: "Change, though, has been slow in coming, say advocates of enzyme chemistry and fermentation processing. Bernard Wolnuk, who runs a Chicago-based consultancy that bears his name, says introducing fermentation into the organic chemistry-oriented chemical industry has been a hard sell. ... 'The organic chemist doesn't have much exposure to biological inputs,' he says. 'Generally the organic chemist likes to move the molecules around in a big pot and make them jump through the hoop as he wants it.'" Concerning this C&EN study, in 1993 Bernard's company held one of their conferences under the title "Enzymes, a Billion Dollar Business by 2000: Fact or Fiction." The C&EN article five years later shows that the title for the 1993 conference was well chosen.

Julie C. Yang, MA'52, earned a PhD at Illinois in 1955. After retirement she moved to Palo Alto, Calif., and is thus near Stanford U. Only months before, she had been in her native China, where she was a notable participant in the dedication of an imposing statue memorizing her father, Shih-Hsien Yang. Her father, under the sponsorship of the Eli Lilly Co., was the first ranking chemist to serve in a postdoctoral role in this department. This began in October 1945, but because of the catastrophic political changes then occurring in his country he had to leave in less than a year, and return to China, where he became president of Nankai University in 1957. In this country Julie spent all of her postuniversity years in industry. At the time of her retirement she was research manager in the Construction Products Division of the WR. Grace & Co.

IU-connected chemists honored for 50-Year ACS memberships

Each year the American Chemical Society honors its members who have reached 50 years of membership in the society. Each received a certificate, a special pin, and a permanent badge good for free registration at all national and regional meetings. The names of each were reported in the Aug. 31, 1998, C&EN (pp. 41-48). Those who at some time were substantially connected with this department include at least the following:

- Thomas L. Allen, Davis, Calif.
- William O. Beavers, Tampa, Fla.
- Merton H. Brooks, Albuquerque, N.M.
- K. Wayne Chambliss, Riverview, Fla.
- Hsieh Fu (Frank) Cheng, Iowa City, Iowa
- John W. Chung, Sacramento, Calif.
- Frank P. Gay, Hockessin, Del.
- William Hodges, Winchester, Mass.
- Jay K. Kochi, Houston, Texas
- Irving Rosen, Tucson, Ariz.
- Vernon J. Shiner Jr., Bloomington, Ind.
- Herbert Siegel, Las Vegas, Nev.
- Charles H. Stammer, Athens, Ga.
- Robert W. Stelznier, Oak Ridge, Tenn.
- James C. White, Knoxville, Tenn.

(We regret any oversight in omitting anyone who had been affiliated with IU from this list.)

— Harry G. Day and Elizabeth Greene
Necrology

It was with deep regret that we learned of the death of Meredith Pleasant Sparks, BA27, MA28. She died in Houston, Texas, on Jan. 2, 1998.

For a year after graduation, Sparks taught high school chemistry at Rochester, Ind., and then until 1934 she was a library chemist in the DuPont Electrochemical Division at Niagara Falls, N.Y. One of her products during that period was a notably thorough book on the nature and use of sodium.

Then for two years under the direction of Roger Adams at the University of Illinois, she received the PhD degree in 1936. Having been married for several years to her classmate at IU, WJ. Sparks, she devoted her time to industrial chemistry and to their household and children. But by 1958 she had received her JD at Rutgers University and in the same year was admitted to the Florida Bar Association.

In due time she was admitted to practice in several jurisdictions including the U.S. Patent Office (Washington), U.S. Court of Customs and Patent Appeals, and the U.S. Supreme Court. Along with these authorizations she soon held various professional affiliations including the ACS, American Bar Association, International Bar Association, and American Patent Law Association.

Having moved to Coral Gables, Fla., for retirement living in the 1960s, the Sparks continued to be busy in their individual pursuits. Meredith maintained a law office in Miami, where she specialized in patents, trademarks, and copyrights. Her emergence as an accepted and sensible proponent of rights and equal opportunity for women became vigorous in 1973 when she became the legislative chair of the Miami Branch of the AAUW. Soon she became director of the Southeastern Regional District of the National Association of Women Lawyers. By 1981–82, she had become president of the association.

This elevation to the highest position in NAWL was special in that there were only three other women lawyers in this country who were known to have a doctoral degree in chemistry, and she was the only doctoral chemist to be president of NAWL since its founding in 1899. Also, in 1981, she had the unique distinction, as NAWL president, of presiding at a notable “Salute to the First Woman Justice on the United States Supreme Court.” This, of course, was for Justice Sandra Day O’Connor, and it was an extraordinary occasion for NAWL and for Meredith Sparks.

Meredith was distinctive in so many significant ways. At IU, she was elected to Phi Beta Kappa and Sigma Xi. In the few years taken to organize and establish the Association of Indiana University Chemists, in 1950–51 she became its first president. In the following two decades there were no other women who held this responsibility.

In this remembrance of Meredith it helps to consider the following paragraph from a section of “Rise of H.T. Briscoe” in H. G. Day’s book The Development of Chemistry at Indiana University 1829–1991 (p. 169):

“The year 1928 was especially memorable for him (Briscoe) personally and of immense interest to his friends. Up to that time he seemed to be almost totally preoccupied by work. But in May a graduate student in chemistry, Meredith Pleasant (Sparks), arranged for her roommate, Orah Cole, to have a blind date with the bachelor Briscoe. The ignited romance swept the couple along and on 15 September they were married. Perhaps this was aided by his promotion to Professor that summer.”

Finally in remembering this role model in constructive actions it is important to recognize, as an example, that from the beginning of the AIUC Meredith Sparks gave encouragement to the strengthening of relationships with alumni, a movement that has spread to many departments at IU. Yes, Meredith was a thoughtful, generous, and wise builder in many beneficial ways.

We have received notices of the deaths of several other of our alumni but with no further information:

Bernard W. Cooper, MS’66;
Adalene J. Eaton, BA’31, died on March 12, 1998;
Vincent Parker, PhD’40;
Philip H. Ravenscroft, MA’42, died on May 29, 1998;
Peter L. Rosamilla, BA’38, died on Jan. 30, 1998;

— H.G.D. and E.G.
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