

CHEMISTRY DISTILLATIONS

THE NEWSLETTER OF THE DEPARTMENT OF CHEMISTRY

SUMMER 1994

This mailing brings news about the state of affairs in the Chemistry Department at William and Mary, lists our latest graduates (B.S. and M. S.) and describes their accomplishments, and informs you about our faculty and changes in the department and its programs. Perhaps it will entice some of you to stop by when you visit Williamsburg. For those who graduated before the new building opened in 1976, we can be found on the "New" Campus close to Phi Beta Kappa Hall.

We see this newsletter as an important part of our attempt to offer academic programs of quality and value. We would be happy to hear from you; please send your comments to Editor, Chemistry Distillations, at the address on the back.

Remarks by the Chair

Once again I am pleased to have the opportunity to greet you via our departmental newsletter. We had a number of positive responses to the inaugural issue, and so have proceeded with a second. I thank last year's editor, Gary DeFotis, for an excellent job. We are fortunate that Mel Schiavelli, recently returned as Chancellor Professor of Organic Chemistry, agreed to serve as editor of this issue. And since he as editor will not mention it, I would like to use some of my allotted space to express to Mel the thanks of the entire department for the job he has done during the past twenty-six years at William and Mary. We are sad that he will be leaving us to serve as Provost at the University of Delaware, and hope that he will always keep a spot for us in his heart.

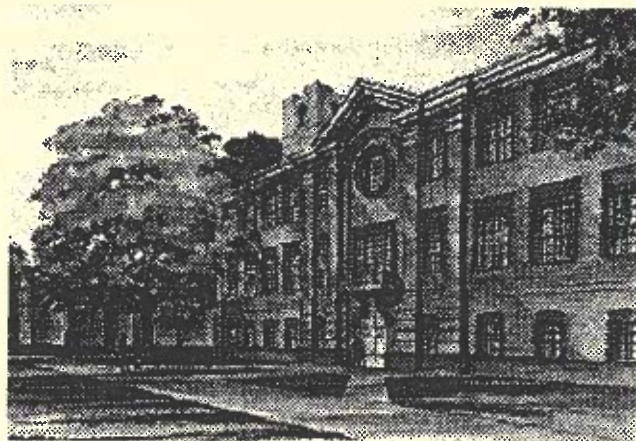
Last spring was a hectic time in the department, as we recruited a new permanent faculty member, Deborah C. Bebout, and three visitors, Gerald Hoffman, René Kanters, and James Kirby, to replace faculty on leave. This and the continuing large number of seniors conducting research projects within the department kept a hum of activity as the prevailing sound in Rogers Hall.

The department was fortunate to receive a number of gifts from individuals; we are grateful for this support. The additional flexibility which these sources offer is crucial in providing an otherwise unobtainable opportunity. Many thanks to those who continue to help us in this important way.

The most exciting item on the department's agenda this year is a proposal to the Commonwealth of Virginia to

renovate and expand Rogers Hall. Our department has grown substantially in the past decade, with more students at both lower and upper division levels. As a result, we are truly "bursting 'at the seams", with general and organic laboratories running three or four nights per week, and with senior research students crammed into the second floor research laboratories. After twenty years it is time to update our laboratories in accord with new views of teaching laboratory chemistry.

Although our space problem is severe, several projects on the horizon may serve to address the issue. First, we have received funding from the College, supplemented by the National Science Foundation, to convert several classrooms in Rogers Hall into laboratories. We expect to begin that conversion process within six months, so that we can hire permanent faculty to augment the research opportunities available to students. However, this will exhaust the exploitation of space in Rogers Hall, and no further conversions seem possible. A second bright spot is the designation of laboratories in Tercentenary Hall for use by chemists in the polymer track of the Applied Science Program. This provides a net addition of laboratory space which can contribute to the mission of the department, so the completion of the building, scheduled for next winter, is eagerly awaited.



Tercentenary Hall (architect's sketch)

While each of these projects is important, the only long term solution is to expand Rogers Hall. "New Rogers" is beginning to show signs of age, and current health and safety standards suggest it is prudent to consider a renovation of existing upper and lower division labora-

tory spaces. Only by such an effort can we continue to provide the kinds of opportunities that have been offered to students in the past. The College administration agrees with our position, and has placed the Rogers Hall renovation-expansion project as the second highest priority item on its capital improvement list (following expansion and renovation of Swem library). The project contemplates renovating completely the laboratory space on the first and second floors, and adding both a third floor, with laboratory space for senior research, and a two-story wing on the west end of the building, with modern classroom space. This is an ambitious project, and expensive. We are convinced that it would provide facilities in which we can continue to offer the high quality undergraduate program for which your department is recognized. There is as yet no clear time frame for the project; the chemistry program will operate under very cramped conditions until that expansion does occur.

Nevertheless, I am optimistic about the long term outlook for our department. The Dean authorized a new faculty member. While we have converted the position to temporary status because of our lack of research space, we look forward to the additional expertise which will ultimately be brought into the department. We hope to formalize the growing strengths of the department in polymer chemistry and biochemistry by offering certified programs in these areas. Most importantly, each year newly entering students re-invigorate the program each year because of their enthusiasm and their ability. Because of their accomplishments as alumni, we all remain proud of our program.

Steve Knudson

Current Faculty

Debbie Bebout, biochemistry
Randy Coleman, biochemistry (Director, Fresh/Soph Advising)
Gary DeFotis, physical (Garrett-Robb-Guy Professor)
Gary Hollis, organic
Gerry Hoffman, physical
René Kanters, inorganic
Dick Kiefer, polymer/radiochemistry
Jim Kirby, inorganic
Steve Knudson, physical
Dave Kranbuehl, physical
Bob Orwoll, physical
Bob Pike, inorganic
Ted Putnam, departmental administrator
Gary Rice, analytical
Mel Schiavelli, organic (Chancellor Professor)
Bill Starnes, polymer (Gottwald Professor)

Dave Thompson, inorganic (Chancellor Professor)
Jon Touster, organic (Dreyfus Fellow)

Emeriti

Alfred Armstrong, 1976 (adjunct); **Ed Katz**, 1979;
Trevor Hill, 1992 (adjunct); **Cirila Djordjevic**, 1992

Departmental Doings

Faculty Changes

On leave for 1993-1994:

Gary DeFotis (CEN-Saclay, France, and The Royal Institution, London, England) - spring 1994

Dick Kiefer (University of Queensland, Australia)

Dave Thompson (NASA-Langley, Hampton, VA)

Visiting faculty for 1993-1994:

Gerald Hoffman, physical (Ph.D., Cornell U., 1989)

René Kanters, inorganic (Ph.D., U. of Nijmegen, Netherlands, 1990)

James Kirby, inorganic (Ph.D., Georgetown U., 1993)

Welcome!

Debbie Bebout (B.S., Harvey Mudd College (1985), Ph.D., Cornell University (1991)) joins the department following a postdoctoral experience at Penn State. Her biochemical research problems already have attracted students, four of whom are working as research colleagues in her laboratory this year.

Bon Voyage!

Jon Touster (B.A., Bard College (1985), Ph.D., Wesleyan University, 1991) leaves the department after two years as Visiting Assistant Professor and Camille and Henry Dreyfus Teaching Fellow. Professor Touster will join the faculty of the department of chemistry at Washington and Jefferson College in Pennsylvania.

Mel Schiavelli leaves the department after 26 years at William and Mary to become university provost and professor of chemistry and biochemistry at the University of Delaware this summer.

Curriculum

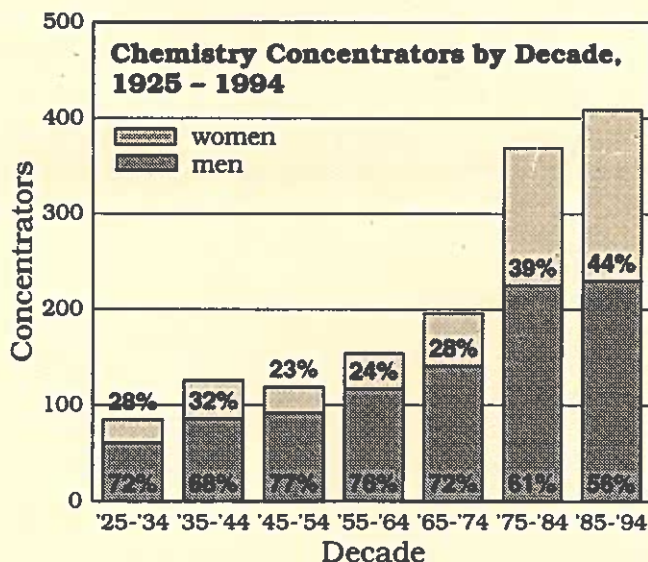
In 1992, the American Chemical Society endorsed five new certified degree opportunities for baccalaureate graduates. In addition to the traditional ACS-certified degree in chemistry, students may now work to earn an ACS-certified degree in biochemistry, chemical physics, chemistry education, materials and polymers. While these certifications are not yet available to students in

our department, the department is working to add the course offerings necessary to award them to our graduates in the near future.

Enrollment Update

Studying chemistry continues to be a popular choice with William and Mary undergraduates. Since 1986, enrollments in first-year chemistry courses have doubled. Enrollments in organic chemistry and physical chemistry have increased by 145% and 130% respectively. This year over 430 students took the first-semester course in organic and nearly 100 students enrolled in physical chemistry.

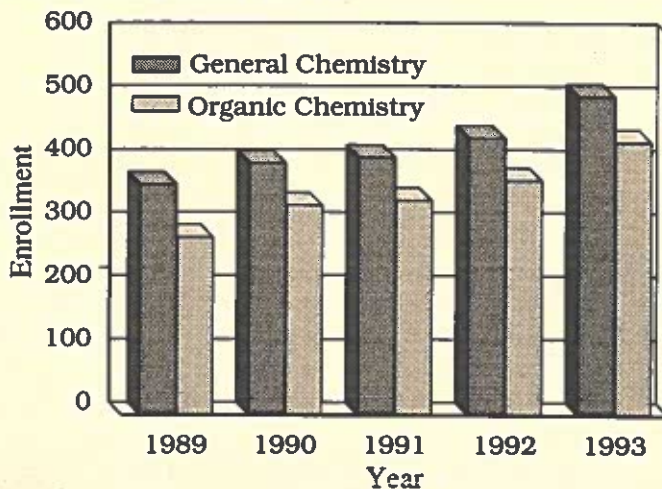
The William and Mary chemistry department ranks 4th among top producers of ACS-certified chemistry majors in the U.S. — ahead of Indiana University (Bloomington) and the University of Wisconsin (Madison) and just behind the University of Texas (Austin), the University of California (San Diego) and the University of Illinois (Champaign-Urbana). Our growth is shown in the 70-year profile of chemistry concentrators at William and Mary.



Interestingly, the department's new success in attracting concentrators over the last two decades has occurred among undergraduate women at William and Mary. Through 1975, 27% of the department's graduates were women. Since that date, 42% of our chemistry concentrators have been women. We are proud of this contribution to the U.S.'s pool of scientific talent.

The department's popularity with students is gratifying but not without its challenges. We still occupy the same building we did in 1975. The increased number of students seeking a laboratory experience in chemistry at all levels has taken its toll on the "new" Rogers Hall.

Substantial renovation will soon be imperative. While planning is underway for both renovation and addition to the chemistry building, Virginia's stagnant economy has slowed prospects for these projects somewhat. The number of faculty in the department has increased only modestly since 1986 (to a total of 14 full-time instructors). The rate of addition of new faculty has not kept pace with increases in enrollment. This means larger classes, night lab sections, increased teaching loads for junior and senior faculty and overcrowded student research labs. Nevertheless, the quality of instruction remains high. Our student concentrators still receive excellent offers to graduate schools, medical schools and industrial employment.



Many alums invest in the future of the chemistry department. For their support we are grateful. The next time you consider a gift to the William and Mary Annual Fund, please think about increasing it and earmarking the increase for your departmental *alma mater*.

Undergraduate Research

Many of you reading this newsletter will recall participating in an important curricular opportunity as William and Mary students. Undergraduate research activities still thrive in the department. Guided by a member of the faculty, a student begins his or her investigations in the junior year. This year about 40 qualified students elected to undertake an independent study or Honors project. Papers on student research are presented at professional meetings and frequently published in leading scientific journals. Over each summer about 35 undergraduates work alongside faculty and graduate students on projects supported by the National Science Foundation, the Jeffress Memorial Trust, the Petroleum Research Fund, the Howard Hughes Medical Institute, the Dow Corporation and DuPont. We are grateful for the external support which allows us to continue this significant enhancement in our curriculum.



Alfred R. Armstrong

Early in the fall of 1928 a young "Texan" arrived in Williamsburg ready to begin study at the College of William and Mary. That event marked the beginning of a 66-year long association with W&M which continues to this day.

Alfred Armstrong was born in Washington, D.C. in 1911, but at age 5 moved to a cross-roads town called Asherton, Texas to live with his great uncle. In 1927 Armstrong returned to Virginia where he completed high school and where he met Martha Barber, his spouse-to-be. He finished his chemistry major in 1932 and was asked to continue as an instructor in the department. After a few years Professor Armstrong decided to undertake graduate studies at the University of Michigan. He returned to W&M to continue teaching in 1936 after a year in Ann Arbor because the department needed him. In 1944 he received his Ph.D. from the University of Virginia and then returned permanently to his "academic home" with Martha, whom he had married in 1934.

Professor Armstrong continues to teach. Students still experience the rigor of his instruction in the introductory laboratory courses. "The laboratory experience is essential in science", says Armstrong. "Where else does one learn the inordinate cussedness of inanimate objects?" We salute Professor Alfred Armstrong, the "Ironman of Chemistry at William and Mary".



The College Of
WILLIAM & MARY

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Undergraduates

Kirsten Adams	Michael Manetas
Vineeta Ahluvalia	Leslie McCullough
Deborah Bacon	Carl Meyer
Rhonda Barksdale	Courtney Morgan
Kathryn Beers	Bridget Murphy
Meredith Brendley	Beth Ogura
Michael Brown	Michael Paci
William Bryant	Brenton Ream
Jaydee Cabral	Keith Reinhardt
Caryn Carson	Susan Ritenour
Guy Cartwright	Robyn Roarke
Allison Choy	Kenn Sandlin
Craig Cinquina	Wendy Anne Sauer
Gregory Coffey	Christopher Shaffer
Kathryn Everberg	Beatrix Slomiany
Virginia Fairchild	Alan Tai
Mary Ann Forrest	Scott Thompson
Brian Hubbard	Eric Travis
Robert Hudgins	Vike Vicente
Derek Jackson	Kenneth Williams
Traci Jensen	Stephen Willson
Anne Katzenberger	Seth Wilson
Panagiotis Kourtesis	Michael Wittkamp
Cheryl Laslo	Joshua Young
Kimberly Lyons	Neil Zimmel
Stephen Mahoney	

Student Honors and Awards for 1994

This academic year the following students did senior honors research and graduated with honors:

- Vineeta Ahluvalia, *4-Phenyl-3-Butynol Acid: A Potential Suicide Substrate for Peptidyl α -Aminoacyltransferase* (Bebout)
- Deborah Bacon, *Application of Manganese-Mediated Nucleophilic Addition to the Synthesis of Ibuprofen and a Study of the Regioselectivity of the Addition Reaction* (Pike)
- Kathryn Beers, *The Effects of Deuteration on Ferromagnetic Properties: A Study of Single Crystal $Fe(S_2CN(C_2D_5)_2)_2Cl$* (DeFotis)
- Caryn Carson, *Synthesis and Characterization of Mixed Ligand Nickel Azide Complexes and Structural Analysis of $[Ni(N_3)(PMe_3)_4]BF_4$* (Pike)
- Craig Cinquina, *Experimental Studies of the Spin Glasses $CoCl_2 \cdot H_2O$ and $FeCl_2 \cdot H_2O$* (DeFotis)
- Kathryn Everberg, *Participation of Alkenyl Boronate Esters in Paternò-Büchi Reactions with Aromatic Ketones and Aldehydes* (Hollis)
- Brian Hubbard, *The Synthesis and Physical Comparison of Two Dicyanoanthracene- β -Cyclodextrin Ethers* (Abelt)
- Traci Jensen, *A Study of the Low Temperature Magnetic Properties of $Fe(S_2CNC_4H_8O)_2X$ ($X = Cl, Br, I$), and a Study of $Fe(S_2CN(C_2H_5)_2)_2I$* (DeFotis)

- Anne Katzenberger, *Characterization of Poly(Arylene Ether)s, Poly(Arylene Ether Imidazole)s, and their Copolymers by Multi-Angle Laser Light Scattering* (Orwoll)
- Stephen Mahoney, *Development of an Intelligent, Automated Cure Resin Transfer Molding Process for Shell 1895 and PR500 and Study of the Flow Properties of the LaRC IAX Polyimides* (Kranbuehl)
- Leslie McCullough, *In Situ Monitoring of the Degradation of Rilsan Pipe* (Kranbuehl)
- Susan Ritenour, *Detection of Organochloro- and Bromo-Compounds Using a Modified Helium Discharge Detector for Gas Chromatography* (Rice)
- Wendy Sauer, *The Synthesis of m -Hydroxyalkylated Benzophenones* (Abelt)
- Christopher Shaffer, *Characterization of Untoughened and Toughened Dicyanate Bisphenol A Resins* (Kranbuehl)
- Beatrix Slomiany, *Detection of Organosulfur and Iodo-Compounds Using a Modified Helium Discharge Detector for Gas Chromatography* (Rice)
- Vike Vicente, *Understanding Molecular Motion in Confining Molecular Dimension Pores* (Kranbuehl)
- Neil Zimmel, *Synthesis and Characterization of 6-(9,10-Dicyanoanthracene-2-Sulfonyl)- β -Cyclodextrin* (Abelt)

The following students also received awards at graduation:

- Deborah Bacon**, William G. Guy Prize in Chemistry
- Kathryn Everberg**, American Chemical Society Distinguished Achievement in Chemistry Award
- Allison Choy**, American Institute of Chemists Achievement Award
- Brian Hubbard**, Alumni Association Undergraduate Research Award

Special Honors

Guy Prize winner **Frank Probst** was awarded the Bottetourt Medal at the 1993 Commencement ceremonies. This year's Guy prize awardee, **Deborah Bacon**, was selected to receive the Bottetourt medal at the 1994 Commencement. The Bottetourt Medal was established in 1772 and is awarded to the graduating senior who has attained the highest distinction in scholarship. It is named after Norborne Berkeley, Baron de Botetourt, Colonial Governor of Virginia. The department of chemistry is proud of the distinction awarded to our student colleagues and looks forward to a "three-peat" at the 1995 Commencement.

1994 Master's Candidates and Their Destinations

Maria Argiariadi (Kranbuehl)	Aug. 94 completion
Sharon Fitzhenry (Bebout)	Dec. 94 completion
Michael Wassel (Rice)	Peak Technical Services
Daniel Williams (Abelt)	Ph.D. program in chemistry, McGill University

Undergraduates

Alexander Adduci	Karen Harrington
Sheeba Ahmed	Christine Heath
Scott Andrews	Brian Hogg
Maria Argiriadi	Merete Johansen
Jennifer I Badiang	Karen Jones
Rex Biedenbender	Bryan King
James Booker	Brian Kipp
Gordon Brown	Wendelyn Kraus
William Brubaker	Benjamin Latimer
Robert Brush	Uyenlinh Li
Melissa Bunin	Josephine Magbanua
Sarat Chandarlapaty	Vienne Murray
Alice Chen	Jeffrey Neal
Daria Comuzzi	David Olmeijer
Loriann Davide	Anjana Patel
Karrie Dyer	Nga Phan
Mary Evans	Albert Pierce
Steven Farraher	Daniel Polls
Sharon Fitzhenry	Francis Probst
Noah Gay	Jennifer Reichl
Matthew Gemmel	Michael Shea
Michael Gibson	Saroj i Sheshadri
Sarah Gleason	Richard Vachet
Kameron Goldsmith	Mark Weisman
Bhavesht Gupta	Daniel Williams
Mark Hawkins	Christopher Woleben

Student Honors and Awards for 1993

In academic year 1993 the following students did senior honors research and graduated with honors:

William Brubaker, *The Preparation and Study of $Fe((C_2D_5)_2S_2CN)_2 Cl$ and a Study of $Ni(SCN)_2$* (DeFotis)

Melissa Bunin, *Vacuum Ultraviolet Detection from a Helium Discharge Detector* (Rice)

Sarat Chandarlapaty, *A Study of $Fe_{1-x}As_xS_2CN(Et)_2$, $Ni(SCN)_2$ ($t-C_3H_7OH$)₂ and Some Other Systems* (DeFotis)

Brian Hogg, *Zero-Field Splitting and Antiferromagnetic Exchange in $Fe(S_2CNC_4H_9O)_2 X$ ($X = Halide$) and Spin Glass Behavior in $Co_{1-x}(SCN)_2(CH_3OH)_2$* (DeFotis)

Brian Kipp, *Time/Temperature Dependence of the Physical Properties in a Thermotropic Liquid Crystal* (Orwoll)

Vienne Murray, *The Use of Alkenylboronate Esters as Dipolarophiles in Cycloadditions with Nitrones and Nitrile Oxides* (Hollis)

Christopher Woleben, *Participation of (*E*)-1-Alkenyl boronate Esters in [2+2] Enone-olefin Photocycloadditions* (Hollis)

The following students also received awards at graduation:

Frank Probst, William G. Guy Prize in Chemistry

Melissa Bunin, American Chemical Society Distinguished Achievement in Chemistry Award

Brian Kipp, American Institute of Chemists Achievement Award

1993 Master's Candidates and Their Destinations

Stacie Cook (Hollis)	chemist, Smith, Kline, Beecham
Heather Creswick (Abelt)	technician, Medical College of Virginia
David Faddis (Kranbuehl)	Ph.D. program in material science, University of Akron
Kevin Gwaltney (Hollis)	Ph.D. program in chemistry, North Carolina State University
Theodore Kim (Kranbuehl)	not reported
Sean Hart (Kranbuehl)	consultant, Arthur Anderson
William Lappenbusch (Hollis)	chemist, Rohm and Hass
Suchi Sharma (Abelt)	M.S. program in public health, University of Michigan
Christina Short (Kranbuehl)	chemist, A. H. Robbins
Robin Southward (Thompson)	Ph.D. program in applied science, College of William and Mary
Setven Terranova (Starnes)	M.D. program, Medical School of Virginia
Kerri Robillard (Kranbuehl)	Ph.D. program in molecular biology, Princeton University
Tamara Tieman (Rice)	Ph.D. program in immunology, Columbia University
Heather Ripley Yarashus (Kane)	homemaker