

THE

# TarHelium



A Publication of the North Carolina Section of the American Chemical Society

Vol 19 No 4

April -May 1989

## 103RD N. C. SECTIONAL CONFERENCE



April 15, 1989  
North Carolina Section

Venable Hall

University of North Carolina  
Chapel Hill



*Financial Assistance Includes the Generosity of:*

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*Revised Program  
April 15, 1989*

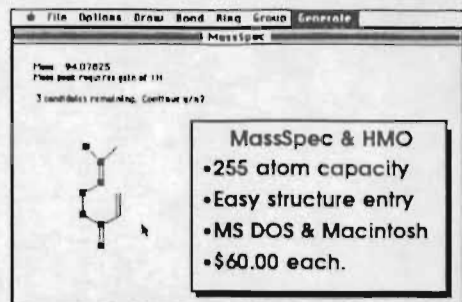
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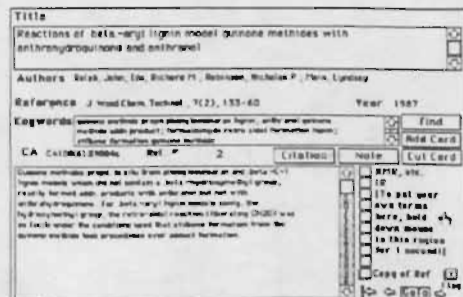
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# 103RD N. C. SECTIONAL CONFERENCE SCHEDULE

## REGISTRATION

8:30 am - Noon

Lobby, Venable Hall

## TECHNICAL SESSIONS

All Sessions in Venable Hall

9:00-11:40	Analytical Chemistry I Room 308
9:00-11:20	Analytical Chemistry II Room 310
9:00-11:20	Biochemistry, Bioanalytical Chemistry and Chemical Education Room 207
9:00-11:20	Inorganic Chemistry Room 221
9:00-11:20	Organic Chemistry I Room 223
9:00-11:20	Organic Chemistry II Room 224
9:00-11:20	Physical Chemistry Room 222
9:00-11:20	Polymer Chemistry Room 12-11

## AWARD PRESENTATIONS

12:00 Noon

Outside (weather permitting) or  
Lobby of Kenan Hall

Presentation of Fifty Year Certificates  
High School Teacher Award  
Centennial Scholarship Award  
Recognition of Former Section Chairmen  
Recognition of NC Sectional Conference Sponsors  
Luncheon  
Immediately following award presentation

# ANALYTICAL CHEMISTRY I

Dr. Charles H. Lochmuller, Presiding

Room 308

Venable Hall

- 9:00 *Clinical Applications of Tandem Mass Spectroscopy*, D.L. Norwood, N. Kodo, D.S. Millington, Medical Center, Duke U.
- 9:20 *Electrocatalytic Reduction of Cytochrome c peroxydase by adsorbed cytochrome c*, M. Collinson, E.F. Bowden, Chemistry Dept. NCSU
- 9:40 *Effect of Organic Solvents on the Emission intensity of Analyte signals*, M. Denker, J. Olesik, Chemistry Dept. UNC-CH.
- 10:00 Coffee Break
- 10:20 *The Influence of Double Programming (Simultaneous Temperature and Flow Programming) on Separation Efficiency in Capillary Gas Chromatography*, W.H. Reiss, L.A. Jones, Chemistry Dept., NCSU.
- 10:40 *Exploring the Limits of Resolution of Two Component Mixtures Using Excitation-Emission Frequency Arrays* D.W. Millican, L.B. McGown, Chemistry Dept, Duke U.
- 11:00 *Development of All Solid State Biosensor*, J.Zhao, R.P. Buck, Chemistry Dept., Duke U.
- 11:20 *High Gradient Magnetic Separation of Synthetic Goethites*, S.C. Dorman, L.H. Bowen, Chemistry Dept., NCSU.
- 12:00 Award Presentations, Outside or Lobby of Kenan Hall followed by luncheon



## ANALYTICAL CHEMISTRY II

Dr. William L. Switzer, Presiding

Room 310

Venable Hall

- 9:00** *Intelligent Instrumentation for the Correction of Matrix Effects in ICP Spectrometry*, E. Williamson, J. Olesik, Chemistry Dept. UNC-CH.
- 9:20** *Surface Analysis Studies of Chemically Modified Polymer Films*, C.L. Judy, R.W. Linton, Chemistry Dept. UNC-CH.
- 9:40** *XPS Studies of Metal Particles in Electropolymerized Films*, S.G. Maybury, M. Bakir, P. Sullivan, T.J. Meyer, R.W. Linton, Chemistry Dept., UNC-CH.
- 10:00** Coffee Break
- 10:20** *Metal Cation Effects on Sodium Taurocholate Aggregation and Probe Fluorescence*, S.M. Meyerhoffer, L.B. McGown, Chemistry Dept., Duke U.
- 10:40** *Surface and Depth Profiling Studies of Airborne Particles Using XPS*, J.T. Rickman, S. Maybury, R.W. Linton, Chemistry Dept., UNC-CH
- 11:00** *Identification of Semivolatile Organic Compounds in Air Sample Extracts by Gas Chromatography/Matrix Isolation-Fourier Transform InfraRed Spectrometry*, J.W. Childers, N.K. Wilson, R.K. Barbour, NST Tech Services and EPA, RTP.
- 11:20** *Fluorescence of Chemically Modified Papain Adsorbed to N-Butyl Modified Silica Gel and Its Relation to Reverse Phase Chromatographic Behaviour* A.W. Grobin, C.H. Lochmuller, Chem. Dept., Duke U.
- 12:00** Award Presentations followed immediately by luncheon

# BIOCHEMISTRY & BIOANALYTICAL CHEMISTRY & CHEMICAL EDUCATION

Dr. Robert W. Hemkins, Presiding

Room 207

Venable Hall

- 9:00 *Synthesis and Hypolipidemic Activity of Cyclic Imides: Semicarbazones, Alkyl Ethers, Thioethers, Sulfoxides and Sulfones*, O.T. Wong, J.M. Chapman, Jr., I.H. Hall, School of Pharmacy, UNC-CH
- 9:20 *Exchange Characteristics of Intercellular CO<sub>2</sub> monitored in vivo by C-13 NMR*, J. Stewart, R.W. Henkens, J.N. Siedow, Chemistry Dept., Duke U.
- 9:40 *A Drug/Calf Thymus DNA Study Using Electronic Magnetic Circular Dichroism*, M. Sitko, T. Policke, A.F. Schreiner, Chemistry Dept., NCSU.
- 10:00 Coffee Break
- 10:20 *Synthesis and Hypolipidemic Activity of Isoxazolidine 3-5-Diones*, D.L. Daniels, R.A. Izydore, I.H. Hall, Chemistry Depts. NCCU and UNC-CH.
- 10:40 *Preparative Isolation of Solonaceous Leaf Surface Compounds*, A.R. Butler, D.A. Danehower, D.R. Lawson, Crop Science Dept., NCSU.
- 11:00 *Taking Factor Label Beyond Mnemonics and can factor label bring back the Classics?*, J.E. Reissner, Physical Science Dept., Pembroke State U.
- 12:00 Award Presentations followed immediately by luncheon

## INORGANIC CHEMISTRY

Dr. William E. Hatfield, Presiding

Room 221

Venable Hall

- 9:00** *Magnetic Properties and Crystal Structure of Potassium Bisdithiooxalatonitrosyl Iron  $[K_2Fe(COS)_4 \cdot No.H_2O]$* , L. Qian, P.Singh, H.Ro, W.E. Hatfield, Chemistry Dept., UNC-CH.
- 9:20** *Oxidation of 2,6 Di-*t*-Butylphenol Catalyzed by a Copper (I) Catalyst*, P.K. Choo, A.L. Crumblis, Chemistry Dept., Duke U.
- 9:40** *Chemistry of  $C_6F_5GaOEt_2$ : Isolation and Crystal Structure of  $(C_6F_5)_3GA As(SiMe_3)$* , R.L. Wells, C.G. Pitt, A.T. McPhil, J.D. Johansen, R.B. Hallock, Chemistry Dept., Duke U.
- 10:00** Coffee Break
- 10:20** *The First Thin Layer Deposition of Tin Using an Argon Fluoride Excimer Laser Ablation Technique*, A.F. Schreiner, O. Auciello, T. Barnes, S. Chevachardenkul, G.E. McGuire, Chemistry Dept., NCSU and MCNC.
- 10:40** *Hydroxide Bridges in a Molybdenum Carbonyl Dimer  $[(PEt_3)_2 Br(CO) Mo (\mu-OH)_2]$* , L.Luan, J.L. Templeton, M.S. Brookhart, A.S. Gamble, Chemistry Dept., UNC-CH.
- 11:00** *Magnetic Susceptibility and Magnetization of  $S=1/2$  Next-Nearest-Neighbor Chains*, M.L. Kirk, L.Q.Qian, W.E. Hatfield, Chemistry Dept., UNC-CH.
- 12:00** Award Presentations followed immediately by luncheon

# ORGANIC CHEMISTRY I

Dr. Robert Ghirardelli, Presiding

ROOM 223

Venable Hall

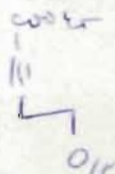
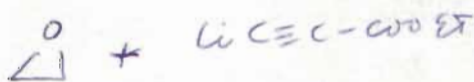
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- 9:00 *Synthesis of Fluoroesters*, D.L. Woodward, S.T. Purrington, Chemistry Dept. NCSU.  
*DIFLUOROKETENE DIPHENYLTHIOACETAL*
- 9:20 *Difluorodiphenyl Thioethylene*, N.F. Samaha, S.T. Purrington, Chemistry Dept. NCSU.
- 9:40 *Solution Structures for the Reactants and Product of a Unique Aldol Reaction*, M.S. Nichols, E.M. Arnett, F.J. Fisher, A.A. Ribeiro, Chemistry Dept., Duke U.
- 10:00 Coffee Break
- 10:20 *Selective Monoamine Oxidase Inhibitors-Chemistry and Biological Activity*, M. Harfenist, Burroughs Wellcome, RTP. *MAO Serotonin Tyramine etc neurotransmitter*
- 11:00 *Application of a [2+2] Furanone-Alkene Cycloaddition Toward a Total Synthesis of Bifurcarenone*, J.W. Perine, S.W. Baldwin, Chemistry Dept., Duke U.
- 12:00 Award Presentations followed by luncheon

*DOXANTHRAZOLE*

*Acce to acetylate instead of Ac<sub>2</sub>O HCO<sub>2</sub>?*

*How test anti dependence in animals  
what is animal model for \_\_\_\_\_?*





## ORGANIC SECTION II

Dr. Ernest L. Eliel, Presiding

Room 224

Venable Hall

- 9:00** *Solid State NMR Studies of Organic Reactions on Glass Surfaces*, J. Burgess, E.O. Stejskal, Chemistry Dept. NCSU
- 9:20** *Assymetric Synthesis of Butyrolactones via a 1,3-Oxathiane*, X.Bai, E.L. Eliel, M. Ohwa, Chemistry Dept. UNC-CH.
- 9:40** *Practical Large Scale Synthesis of Anhydro Sugars*, M.A. Zottola, R. Alonso, B.O. Fraser-Reid, Chemistry Dept., Duke U.
- 10:00** Coffee Break
- 10:20** *Is More Better?: Oxygen Stabilization of Carbanions*, M.T. Neumann, E.L. Eliel, Chemistry Dept., UNC-CH.
- 10:40** *Stereoselective Nucleophilic Additions to Chiral Acyliminium Ions*, S. Belmont, R. Polniaszek, Chemistry Dept., Duke U.
- 11:00** *Free Radical Reactions of Purine Nucleotides*, J.A. Raleigh, Chemistry Dept., UNC-CH.
- 12:00** Award Presentations followed immediately by luncheon

# PHYSICAL CHEMISTRY

Dr. Robert W. Shaw, Presiding

Room 222

Venable Hall

- 9:00 *Data Reductions in Complex Impedance Measurements*, K.M.K. Abbey, Cary Tech. Inc.
- 9:20 *NMR Chemical Shifts Using Optimized Geometries*, C.G. Phung, D.B. Chestnut, Chemistry Dept., Duke U.
- 9:40 *Solid State Transformations of  $Fe_2O_3$  by Thermal Reduction and Reoxidation*, A.M. Bryan, L.H. Bowen, Chemistry Dept., NCSU.
- 10:00 Coffee Break
- 10:20 *Vibrational Spectroscopy and Reaction Dynamics*, K. Ratanaphruks, R. MacPhail, Chemistry Dept., Duke U.
- 10:40 *Time-Resolved Spectroscopy with Step-Scan Fourier Transform Interferometry*, J.A. Rzepiela, C.J. Manning, R.A. Palmer, J.M. Widder, J.L. Chao, Chemistry Dept., Duke U.
- 11:00 *Photothermal Phase Angle Measurements Using Step-Scan FTIR*, S.S. Bains, C.J. Manning, R.A. Palmer, J.L. Chao, Chemistry Dept., Duke U.
- 12:00 Award Presentations followed immediately by luncheon

# POLYMER CHEMISTRY

Dr. C. Maurice Balik, Presiding

Room 12-11

Venable Hall

- 9:00** *Multiple Transitions in a Dimethacrylate Network: Poly(Triethylene Glycol Dimethacrylate)*, T.W. Wilson, Dental Research Center, UNC-CH.
- 9:20** *Characterization of an Acrylic Containing Co-Polymer by C-13 Solid State NMR and ESCA and the Effects of Acid Deposition on Structural Changes*, R. Schadt, D.R. Patil, S.S. Sankar, R.D. Gilbert, R.E. Fornes, Physics & Textile Chemistry Depts., NCSU.
- 9:40** *Effects of Acid Deposition on the Properties of An Acrylic Containing Co-Polymer*, D.R. Patil, D. Wernsman, R.D. Gilbert, R.E. Fornes, Physics and Textile Chemistry Depts., NCSU.
- 10:00** Coffee Break
- 10:20** *Acid Deposition Effects on Latex Paints Studied by FTIR*, J.R. Xu, C.M. Balik, Materials Science & Engineering Dept., NCSU
- 10:40** *Molecular Weight Dependence of the Isotactic and Gradient HPLC of High Molecular Weight Polymers*, M.B. McGrath, C.H. Lockmuller, Chemistry Dept., Duke U.
- 11:00** *Solubility and Diffusivity of SO<sub>2</sub> in Latex Paint Films*, B.T. Hendricks, C.M. Balik, Materials Science and Engineering Dept., NCSU.
- 12:00** Award Presentations followed immediately by luncheon

## POSTER SESSION

### 1. Organic Chemistry

*Hypolipidemic Activity of Cyclic Hydrazide Derivatives; Structure-Activity Studies*, R. Simlot, I.H. Hall, R.A. Izydore, School of Pharmacy, UNC-CH and NCCU.

### 2. Inorganic Chemistry

*Synthesis and Characterization of High Tc Bismuth-Class Superconductors*, T. Realini, Chemistry Dept., UNC-CH.

### 3. Polymer Chemistry

*Formation of Oxo-Bridged Dimer in Polymeric Thin Films*, X.Chen, A.Guadabye, T.J. Meyer, Chemistry Dept., UNC-CH.

**Next deadline**

**for the Tarhelium**

**August 15, 1989**



## ACS MEMBERSHIP DRIVE

The 1989 membership drive is now underway. Current members should have received a mailing with a membership application enclosed. If you enroll a new member by April 15 you receive a free ACS brass letter-opener. Please be sure to mark North Carolina under the section commission claim so that our section receives its commission on this new membership. If you have prospects for new members and want additional forms, contact any of the membership committee listed below. However, you must use the Special Handling application you were sent (or a photocopy) to receive your gift. Last year our section received commissions for 9 new members or reinstatements. We should be able to increase this number in 1989 with your help.

### Membership Committee

Larry Bowen, NCSU (Chairman), 737-2939

Dr. George Brine, RTI

Dr. Michael Crimmins, UNC-CH

Dr. Robert Higgins, Fayetteville State

Dr. Robert Izydore, NCCU

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Dr. Steven Baldwin, Duke Univ.

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- Microscopy
- CHNO • GC/MS
- Organic Method Development



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#### ENVIRONMENTAL ANALYSIS

- GC/MS
- PCB/Pesticide Testing
- Organics, Purge & Trap
- Priority Pollutants
- Metals, Trace

## CALL FOR NOMINATIONS CHARLES H. STONE AWARD

The Charles H. Stone Award, administered by the Carolina-Piedmont Section, was established by the will of the late Charles H. Stone "as an incentive for outstanding and valuable achievements in chemical research, application or accomplishments". The award, consisting of a Plaque, a sum of one thousand dollars, and travel expenses is presented not more than once annually to a chemist in the Southeast Region upon selection by the Stone Award Committee.

This Committee is now accepting nominations for the 1989 Award. A notice should appear in C&E News early in March. Please forward your nominations to the Committee Chairman with the following:

1. Letter of nomination
2. Seconding letters
3. Biographical sketch of nominee
4. Other supporting documents

**All materials must be sent no later than May 1, 1989 to:**

**Ralph W. Gable**

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## SYMPOSIUM ON BIOSENSORS

The third annual symposium to be organized by the North Carolina Section will be on Biosensors. The symposium will be held September 8 and 9 in the Old Well room of the Carolina Inn in Chapel Hill. A tutorial on Biosensors to be held on Thursday evening, September 7, will constitute the regular monthly meeting of the Section.

Symposium topics have been chosen because they are based on more than one branch of chemistry, because they involve physics, materials research and engineering, and because they are applicable in industrial, bio- and medical-technologies, and in related fields such as physiology and pharmacology. In other words, these are topics in which the chemistry is decisive, but the impact and relevance are universal and generally interesting in the Section and elsewhere.

The symposium will be divided into three half-day sessions. These being:

- I. Modified Electrodes, Amperometric and Potentiometric Sensors
- II. Microelectrodes and Microelectronic Devices
- III. Optical and Piezoelectric Effect-based Sensors

These sessions will be preceded by the tutorial on Thursday night in which the elementary and basic fundamentals will be presented. The tutorial is aimed mainly at non-practitioners in sensors and biosensors. Each session will include four speakers covering the topics: **A.** Current fundamental issues and "what's new", **B.** Embodiment of principles into devices and tests, **C.** Applications to real systems possibly outside of pure chemistry, and **D.** The future and long range prospects.

A poster session for contributed presentations will be held Friday evening. The speakers invited for the symposium include Professors John Albery (Imperial College), Jiri Janata (Utah), Harden M. McConnell (Stanford), Mark Wightman (Indiana), Royce Murray (North Carolina), and Masuo Aizawa (Tokyo Institute of Technology), although not all of these have responded to the invitation. It is planned to have 15 invited presentations in the symposium and tutorial.

The symposium is being organized by William E. Hatfield, Chairman of the Section Symposium Committee, Richard P. Buck, and Mirtha Umana, and has received financial support from the North Carolina Section, the North Carolina Biotechnology Center, and AKZO. Additional funding has been requested from other sources.

Tentative registration fees are \$50 for non-ACS members, \$30 for ACS members, and \$10 for students.



## 41st SOUTHEAST REGIONAL MEETING

The Central North Carolina Section of the American Chemical Society cordially invites all chemists, interested scientists, chemistry teachers and students to participate in the 41st Southeast Regional Meeting of the American Chemical Society, which will be held in Winston-Salem, North Carolina on October 9-11, 1989. The Benton Convention Center-Hyatt Winston-Salem-Stouffer Winston Plaza complex in downtown Winston-Salem will be the site of all sessions, the chemical exposition, and most of the special events and housing.

Nineteen symposia have been organized to address a broad range of scientific, educational and public affairs topics. Complementing the symposia will be ten areas of general technical sessions and poster sessions for contributed papers from academic and industrial professionals and students. In addition, tutorials will be conducted in four major areas. A substantial exposition of laboratory equipment, chemical supplies and educational tools is anticipated. Special events will include a reception, barbecue dinner, mixer and women chemists' luncheon. Hospitality lounges will be provided. There will also be opportunities to visit local historical and cultural attractions. Winston-Salem has excellent airline service via the regional Greensboro/High Point/Winston-Salem Airport and is readily accessible via Interstate highways 40, 77 and 85.

### CALL FOR PAPERS

Abstracts of contributed papers to be presented either orally or in a poster session should be submitted as early as possible for best assignment to an appropriate session. Papers in areas related to symposium topics are especially welcome. Abstracts must be on the standard ACS abstract form and submitted in triplicate (one camera-ready original and two copies) to the Program Chairperson, Dr. Susan J. Jackels, by June 1, 1989. Abstract forms may be obtained from Dr. Jackels. At least one author of each contributed paper must be an American Chemical Society member unless all coauthors reside outside the United States or are non-chemical scientists. Chalkboards and 35mm slide projectors will be furnished for all technical sessions and symposia.

Additional information regarding the meeting, program or chemical exposition may be obtained from the appropriate Chairperson listed.

### 41ST SOUTHEAST REGIONAL MEETING

#### AMERICAN CHEMICAL SOCIETY

October 9-11, 1989

#### Call for Papers

#### Abstract Deadline

June 1, 1989

Hosted by Central NC Section ACS

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Marco-Tech  
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#### Program Chairperson

Dr. Susan C. Jackels  
Dept. of Chemistry  
Box 7486  
Wake Forest University  
Winston-Salem, NC 27109  
919-761-55 14

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## NORTH CAROLINA DISTINGUISHED SPEAKER AWARD

Members of the section are invited to nominate a N.C. chemist for the 1989-90 award.

### Past recipients are as follows:

E. L. Eliel  
G. Elion  
E. M. Arnett  
M. E. Jones  
N. A. Porter  
G. H. Hitchings  
R. G. Parr  
P. Cuatrecasas  
V. T. Stannett  
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Submit your nominations along with a short supporting statement and biographical information on the candidate to:

**Prof. D. M. Preiss**  
N. C. State University  
Box 7907  
Raleigh, NC 27695

## SIXTH TRIANGLE CHROMATOGRAPHY SYMPOSIUM AND INSTRUMENT EXHIBIT

May 18, 1989

Sponsored by the Triangle Chromatography Discussion Group, the Symposium will take place at the Jane S. McKimmon Center on the NCSU campus and will feature invited papers on a wide range of topics in chromatography as well as exhibits by a variety of vendors. The speakers will be Phyllis Brown, Leslie Ettre, Bob Freeman, Ronald Majors, Nelson Cooke, and Douglas Later. For further information, contact Robert Whiton, NSI-ES, PO Box 12313, Research Triangle Park, NC 27709; 541-4197.

# THE SORCERER



## THE SORCERER

The Durham Savoyards, Ltd. will present Gilbert and Sullivan's **THE SORCERER** on April 28, 29, and May 5, 6 in Reynolds Auditorium in the Bryan Center on the Duke University campus. This delightful comic opera, set in early 20th century England and staged with full orchestra and chorus, tells the tale of J. Wellington Wells, a Professional Practicing Magician who is hired to develop a love potion to an entire village.

This he does, using

rather unusual manufacturing practices and limited quality control procedures, but the outcome of his product turns out to not be quite what his clients originally had in mind.

Richard Palmer, of the Duke Chemistry Department, will be responsible for much of the pyrotechnic special effects in **THE SORCERER**. Several Triangle area chemists are involved either as cast members or in the production crew, including include Jim Buresu and Cathy Lambe from Burroughs Wellcome, Beth Fowler at Ciba Geigy, Dora Schnur at UNC, and Pat Mize, Barb Whittaker and Jim Parmentier at Becton Dickinson. Other Duke based science professionals working with the show are Shiangtai Tuan, of the computer center, Donald Fluke in the Biology Department, Patrick Kenan from the Medical School and David Smith in the Mathematics Department.

**THE SORCERER** was the first of thirteen Gilbert and Sullivan collaborations in musical theater. While Gilbert never again returned so clearly to a scientific subject, the continued success of **THE SORCERER** over the years reflects the deeply rooted fascinations (and misconceptions!) of the lay public with science and its possible applications. J. Wellington Well's efforts in chemical synthesis and product development should prove to be of interest to many regular readers of the **TARHELIUM**. Tickets are available from Duke's Page Box by calling 684-4444.

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American Chemical Society  
1989**

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Section Symposium	Dr. William E. Hatfield

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B. A. Whittaker, Ph.D., *Editor*  
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*Please direct all correspondence and submissions to the attention of the editor:*

**B. A. Whittaker, Ph.D.**

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**Executive Committee:**

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