

THE

TarHelium



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

Vol 20 No 1

August - September 1989

BIOSENSORS SYMPOSIUM AND TUTORIAL

Tutorial

September 7, 1989

Social Hour and Dinner

5:30-6:15 pm

The Carolina Inn

Chapel Hill, NC

Tutorial Location

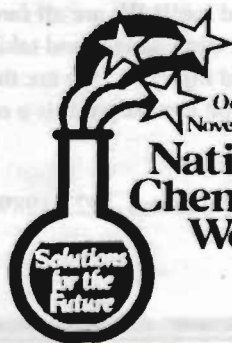
Room 207 Venable Hall

UNC-CH

Symposium

September 8, 1989, 9-5:30 pm

September 9, 1989, 9-1 pm



October 29-
November 4, 1989

**National
Chemistry
Week**

NOTES FROM THE EDITOR

Deadlines for the TarHelium

October 1, 1989

January 15, 1990

March 15, 1990

THE RICH POTENTIALITY OF CHEMISTRY TODAY

"This is threatened by people who exploit fear and sensationalism and ultimately, by a scientifically illiterate public with an urgent desire for protection from the unknown. I believe that a massive and ongoing campaign of public education is needed and that campaign must be launched and led by people who understand risk assessment, people who are used to dealing with uncertainty and tentativeness and by people who see the rich possibilities that might be lost. Who are those people?? They are— you and me!!! We are all familiar with chemical hazards— we are used to assessing danger and taking rational and appropriate measures to avoid injury . . . We are the individuals who can and must lead in this action campaign. It is a responsibility we cannot sidestep."

George Pimental 1922-1989

ACS MEETING PROGRAM

Professor Isidore Adler

Professor of Chemistry and Geology
University of Maryland

Geochemical Exploration of the Planets

7:30 pm

Wednesday, October 18, 1989

Lecture

Room 112 (Auditorium)
Hubbard Chemistry Building*
North Carolina Central University
Durham, NC

Social Hour

Immediately following the lecture in the
lobby of the Hubbard Chemistry Building

*Prior reservations are not required for the social hour;
this is not a dinner meeting.*

*see map on page 5

GEOCHEMICAL EXPLORATION OF THE PLANETS

Isidore Adler

Department of Chemistry
University of Maryland, College Park

No particular period in the history of science can surpass in excitement the last twenty years or so since the beginning of the conquest of space. The ramifications and offshoots of the program surround us on every side. Among the great accomplishments have been the manned landings on the Moon and the collection of over 400 kg of samples. These have been analyzed by the most modern analytical tools and the wealth of information that has flowed from occupies an enormous volume in the literature. In this period we have taken a close up look at Mercury, probed through the eternal cloud cover of Venus, learned something of the composition of the Venus soil, examined the chemistry of Mars and probed for life and examined the giant planets and their moons. The quantity of scientific data that has been accumulated is enormous as is the effort to interpret. Equally exciting are the number of questions that have followed.

BIOGRAPHY

Professor Isidore Adler is presently Professor of Chemistry and Geology having previously served as head of the Geochemistry Division in the Chemistry Department at the University of Maryland, College Park, Maryland. He is co-director of the Annenberg/CPB telecourse "The World of Chemistry."

Prior to the University, Dr. Adler was a senior scientist in the Laboratory for Space Physics at NASA's Goddard Space Flight Center. His work, mainly in the area of X-ray and electron spectroscopy, has included studies of the composition of Apollo lunar samples and he has acted as Principal Investigator for the X-ray Fluorescence Experiment for both Apollo 15 and 16. The X-ray Fluorescence Experiment, flown in the SIM bay of the Apollo Service Module was used to measure the composition of the lunar surface from orbit.

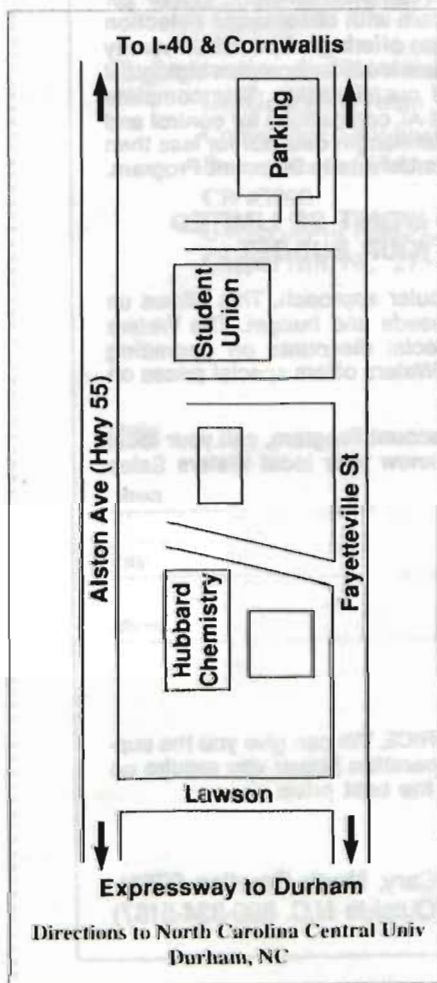
Dr. Adler came to NASA in 1964 from the U.S. Geological Survey where he was a Project Leader in X-ray spectroscopy. Before this, he was a chemist and spectrographer for the U.S. Customs Laboratory in New York. From 1943 to 1945 he served as a Lieutenant in the U.S. Air Corps, specializing in meteorology.

Born in Brooklyn, New York, Dr. Adler graduated from Brooklyn College in 1942 with a B.A. in chemistry. He received a B.S. in meteorology in 1944 from New York University. He received a M.S. in chemistry in 1947 and a Ph.D. in chemistry in 1952 from the New York Polytechnic Institute.

Dr. Adler is a member of the American Chemical Society, the Society for Applied Spectroscopy and Sigma Xi. He has also served as an associate editor for the journal Chemical Geology.

Publications: Three books, X-ray Emission Spectrography in Geology. Geochemical Exploration of the Moon and Planets, and The Analysis of Extraterrestrial Materials. In addition, Dr. Adler has about 100 published technical papers in X-ray spectroscopy, electron spectroscopy and lunar studies.

Awards: Tobin Award—Brooklyn College; NASA Exceptional Scientific Achievement Medal; Lindsay Award—Goddard Space Flight Center.



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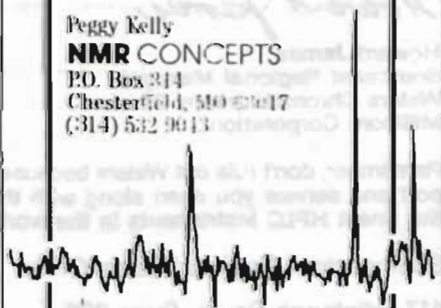
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**GLAXO-UNC FRONTIERS IN CHEMISTRY
AND MEDICINE SERIES**

Registration Form

- A registration fee only of \$10.00 is included
- A check for \$35.00 for registration and the Symposium Banquet is included
- Checks should be made payable to:
Department of Chemistry, UNC-CH
- Deadline for registration is **September 15, 1989**
- Registration should be sent to:
Dr. George Wyman
Conference Coordinator
Department of Chemistry, Venable Hall
CB #3290
University of North Carolina
Chapel Hill, NC 27514

name _____

street _____

city _____

state _____

zip _____

phone _____

GLAXO-UNC PRESENTS
FRONTIERS IN CHEMISTRY AND MEDICINE

SYMPOSIUM ON RECEPTOR AND ENZYME-BASED DRUG DESIGN

October 22-24, 1989

University of North Carolina
Chapel Hill, NC

PRELIMINARY PROGRAM

SUNDAY, OCTOBER 22

7:00-10:00 pm Registration and Wine and Cheese Reception
Carolina Inn (on campus)

MONDAY, OCTOBER 23 (Morehead Planetarium Building)

8:45 am Introductory Remarks

9:00 am *Three-Dimensional Structure of HIV-Protease*
Dr. Manuel Navia
Merck, Sharp & Dohme Research Laboratories
Rahway, New Jersey

10:15 am Coffee Break

10:45 am *Structure-Derived Strategies for the Design of
Biologically Active Compounds*
Dr. Paul A. Bartlett
University of California, Berkeley
Berkeley, California

12:00 noon Lunch

2:00 pm *Intramolecular Forces and Protein Folding*
Dr. Alan R. Fersht
Cambridge University
Cambridge, England

3:15 pm Refreshment Break

3:45 pm *Control of Enzyme-Substrate Interactions by the Reaction Medium*
Dr. Alexander M. Klibanov
Massachusetts Institute of Technology
Cambridge, Massachusetts

5:00 pm Adjourn

6:30 pm Reception and dinner (Carolina Inn)

Reception and Dinner in Honor of the 1988 Nobel-Laureates in Medicine
Sir James Black
George Hitchings and Gertrude Elion

TUESDAY, OCTOBER 24 (Morehead Planetarium Building)

8:30 am *Experimental and Theoretical Determination of the Receptor-Bound Conformation of Drugs*
Dr. Garland Marshall
Washington University School of Medicine
St. Louis, Missouri

9:45 am Coffee Break

10:15 am *Platinum Anti-Cancer Drugs: How Might They Work?*
Dr. Stephen J. Lippard
Massachusetts Institute of Technology
Cambridge, Massachusetts

11:30 am *Tyrosine Phosphorylation in the Mechanism of Insulin Action*
Dr. C. Ronald Kahn
Joslin Diabetes Center
Harvard Medical School
Boston, Massachusetts

12:45 pm End

CALL FOR OFFICER NOMINATIONS AT SEPT. 7TH MEETING

The Nominations Committee (Robert Ghirardelli, Chairman: (Ph 549-0641) will present a slate of officers at the September 7th meeting of the Section. At that time, additional nominations from the floor will be accepted. Anyone wishing to make a nomination should contact their nominee to confirm his/her willingness to serve if elected. Candidates for the following Section offices will be elected for one year terms by mail ballot in October: Chairman-Elect and Program Chairman; Secretary (two year term); Councilor, Alternate Councilor. The strength of our Section depends on input from the membership.

FALL PROGRAM

- September 7** **Biosensor Symposium and Tutorial**
The Carolina Inn, Chapel Hill
Room 207, Venable Hall UNC-CH
- October 18** **Prof. Isidore Adler (Univ. of Md.)**
Geochemical Exploration of the Planets
NCCU
Lecture 7:30 pm
Social Hour immediately following lecture
- November 13** **Prof. Daniel T. Longone (Univ. of Mich.)**
The History of Wine and Vine in America
Time and Location TBA
- December 5** **11th North Carolina Distinguished Speaker**
Dr. Royce W. Murray (UNC-CH)
*Cryoelectricity and Ceramic Superconductor
Electrodes*
Meredith College
Dinner - 6:30 pm
Lecture - 7:30 pm

BIOSENSOR SYMPOSIUM AND TUTORIAL

Thursday, September 7, 1989

Tutorial

Social Hour

Dinner

5:30-6:15 pm

The Carolina Inn, Chapel Hill

Location

Room 207 Venable Hall, UNC-CH

7:30-8:15

Richard P. Buck (UNC)

Electrochemical Sensors and Biosensors; Some Connections with Optical Chemical Sensors

8:30-9:15

Jay Zemel (U. Penn)

Microfabricated Chemical Sensors

9:30-10:15

Ray Dessy (Va. Tech.)

Swords into Plowshares - The Way Waveguide, SAW and Piezoelectric/Pyroelectric Sensors Work

Friday September 8, 1989

9:00am - 5:30 pm

Session Chrman

C. Edgar Cook, B. L. Shigekawa

**Microelectrodes and Microelectronic Devices*

**Modified Electrodes, Amperometric, Potentiometric Sensors*

**Optical and Acoustic Wave-Based Sensors*

Saturday September 9, 1989

9:00am - 1:00 pm

Session Chrman

David Lewis

**Optical and Acoustic Sensors*

Reservations for the Symposium on Biosensors can be made by calling: Linda Caulder or W.E. Hatfield (919) 966-2296 or 2297. Registration: \$35 for ACS members \$10 students, \$50 for non-members, can be paid at the symposium. For planning purposes for breaks, seating, etc., we would like to know how many people are coming by September 6.

HAZARDOUS WASTE MANAGEMENT COURSE OFFERED

NCSU is sponsoring four workshops titled *Management and Minimization of Hazardous Waste under RCRA*.

September 5, 6, & 7	Hyatt Hotel, Winston-Salem
October 16, 17, & 18	Shell Island Resort, Wrightsville Beach
October 23, 24, & 25	Sheraton Airport, Charlotte
November 7, 8, & 9	McKimmon Center, Raleigh

For more information or to register, call Dora Shell or Pat Hillsgrove at (919) 737-2261.

TRENDS IN THE CHEMICAL INDUSTRY

The following is an excerpt from an executive summary of a recent survey of the American Chemical Society's Corporation Associates which was presented to the ACS Board of Directors in June. The survey is a part of the national ACS efforts in strategic planning. Corporation Associates is comprised of about 140 companies and represents the formal link between the ACS and the chemical industry. I think you will find the summary of interest.

A. L. Crumbliss, Chairman NC/ACS

1. INDUSTRY

Corporation Associates (CA) member companies are clearly optimistic about the outlook for the U.S. national economy, the chemical process industries, and their own businesses.

In 1988, responding member companies spent over \$8.15 billion on R&D. The majority produce specialty chemicals, followed by plastics, pharmaceuticals, consumer products, electronics, and food. Most companies are not subsidiaries of large corporations. During the next six months, little change is expected in accounts receivable, inventories, or workforce levels. Their 1989 capital spending will either increase slightly or remain the same.

The majority of CA member companies were not a part of a takeover in the past 5 years. Of those who were involved in a takeover, most reported that the effort strengthened and broadened R&D capabilities with no significant downsizing. In fact, they reported slight increases in available corporate resources - including technical headcount. A few companies reported significant R&D spending cuts and elimination of many new ventures. Although takeovers produced short-term reduced R&D focus, the general consensus is that the long-term effort will produce greater synergies within the company and lower total research costs.

Increased foreign investment in the U.S. chemical process industries was not seen as negative. Respondees suggested that it will accelerate the trend toward a global market, and perhaps relax restrictive trade barriers. The majority of respondents suggested that increased foreign investment will encourage healthy competition, since foreign companies tend to plan better for the longer run. This should produce fewer, but tighter companies, with strong R&D growth.

2. MANPOWER AND TECHNICAL SKILLS

A significant majority of the CA member companies are generally satisfied with the quality of recent graduates in the chemical sciences and engineering. Technical preparation has improved, and so has knowledge of computer applications. It was frequently observed that a broader education is needed, with extensive work in written and oral communication, as well as work in peripheral disciplines.

The majority of respondents expect their company's requirements for chemical professionals to remain the same or slightly increase over the next three years. The largest growth is expected in the need for chemical technicians, BS/MS chemists, and BS/MS chemical engineers.

The following technical disciplines are projected to increase in utility over the next few years: material science/ceramics/polymer, analytical and biological chemistry. The other areas of specialization are expected to remain the same or slightly decrease.

When rating the value of technical skills among existing professionals and those who will be hired during the next three years, the respondents most valued knowledge of computers, experimental design, molecular modeling, followed by instrumental analysis, physical testing, product formulation, product scale-up, separation techniques, basic research, organic synthesis, catalysis, experimental design, and electronics.

An advanced technical or engineering degree is seen as a significant qualification for upward mobility to top management positions.

3. INFORMATION NEEDS

Approximately 76% of technical information is currently received via print, versus 24% by electronic means in the surveyed member companies. On average, 73% of member company employees and 39% of top management use personal computers.

In the future, CA respondents identified a variety of information needs including better information on competition and customer needs; greater interactive capabilities; cross-disciplinary referencing; user-friendly databases to search literature at lower cost and integrated among manufacturing, accounting, technical and intellectual property; better quality peer reviewed; numeric databases; and development of a clearinghouse on commercial and research safety data.

4. PUBLIC IMAGE

The consensus of CA member companies is that the public opinion of the chemical process industries has remained the same or slightly worsened over

the past year. The majority of companies actively promote a positive image of chemistry through formal public relations programs and community involvement.

5. INTERNATIONAL PERSPECTIVE

Slightly more than half of the new hires in 1988 were U.S. nationals.

Respondees agreed that the place of birth is not as important as the proper qualifications to do the job. The influx of nationals adds a diversity and strength to R&D capabilities and provides a breadth of concepts and thoughts, if properly managed. The downside is the cost of dealing with cultural, language, and immigration problems, and the short-term loyalty these employees represent. There was a call to change the U.S. immigration laws to facilitate hiring foreign nationals, as well as a call to encourage more U.S. born students to enter the profession of chemistry.

Two-thirds of the responding companies had no scientist exchange programs with other countries. A few companies exchange scientists with their foreign plants. Of the rest, Europe, Japan, and Mexico led in the number of scientific exchange efforts, with fewer efforts noted in Venezuela, Turkey, Korea, China, Hungary, and Saudi Arabia.

6. ACS IMAGE

Overall, corporate management is aware and supportive of the American Chemical Society, even though they feel that the Society is only somewhat responsive to industry's needs. There is a strong concern that the ACS is too academically oriented, since less than 40% of ACS members work in academe.

The ACS Chemical Abstracts Service and ACS Books and Journals were cited as the most valuable ACS product or service, way above the rest, followed by C&EN and ACS national meetings. Continuing education, local section meetings, Corporation Associates, regional meetings, and the Employment Clearinghouse were recognized and perceived as somewhat valuable. The respondents indicated they knew little about or were totally unaware of ACS public communication activities or special services.

Only two respondents knew if the ACS radio show "Dimensions in Science" was played in their locale, and had ever heard it.

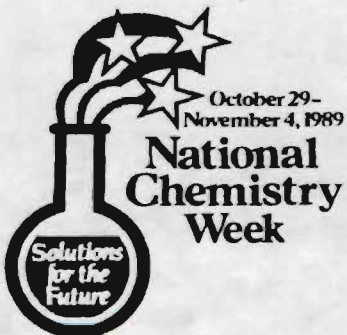
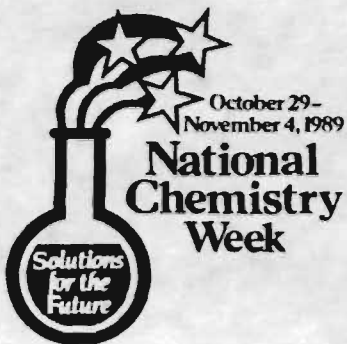
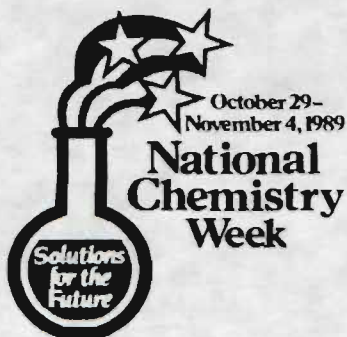
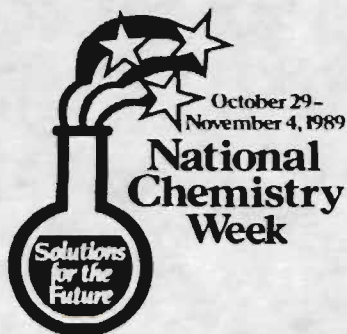
7. WHAT ARE THE KEY CHALLENGES FACING THE CHEMICAL PROCESS INDUSTRIES OVER THE NEXT TEN YEARS?

Environmental issues and related government regulations led the list of key challenges facing the chemical process industries over the next ten years, followed by foreign competition and retaining technical leadership, lack of qualified chemists in the pipeline, and the public image of the chemical process industries and their benefits to society.

Maintaining profitability and improving productivity were also major issues of concern, as were innovation, professional training, the state of the U.S. educational system, and safety and health issues.

**NATIONAL
CHEMISTRY WEEK
OCT 29 - NOV 4**

The American Chemical Society has declared the week of October 29 - November 4 to be National Chemistry Week (NCW). The Local Section is planning to organize events to publicize the profession during this week. Efforts will be made to reach the general public through chemistry magic shows and to reach students in schools hopefully at all levels. If you are interested in planning or participating in this event, please contact the Chairman of Local Section activities for NCW, William L. Switzer, Chemistry - 8204, North Carolina State University, Raleigh, NC 27695. Phone 737-2954 (W) or 847-7471 (H)



The TarHelium is a publication of the North Carolina Section of the American Chemical Society. The views expressed herein are not necessarily those of the Section.

B. A. Whittaker, Ph.D., *Editor*
Jeff Wilson, Ph.D., *Advertising Manager*
W. Switzer, Ph.D., *Mtg. Announcement Editor*

Please direct all correspondence and submissions to the attention of the editor:

B. A. Whittaker, Ph.D.

3108 Anderson Drive
Raleigh, NC 27609

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Next deadline for the TarHelium will be October 1, 1989.

Contributions should be on PC disk in WordPerfect, DW 4, RFT, DCA, Wordstar, XYWrite, Microsoft Word or ASCII format or on Macintosh disk in any format.

If you wish to change your membership status or your *TarHelium* mailing address, please submit your new address along with your old address in the form of a recent C&EN or *TarHelium* address label to:

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