

# theCHEMICALbulletin

APRIL • 2000

## CHICAGO SECTION AMERICAN CHEMICAL SOCIETY

### Distinguished Service Award Presentation

FRIDAY, APRIL 14, 2000

HOLIDAY INN NORTH SHORE  
5300 West Touhy Avenue  
Skokie, IL

#### DIRECTIONS TO THE MEETING

From the City: Take I-94 (Edens Expressway) north to Touhy Ave. Go west (left) on Touhy about three blocks to hotel.

From the west: Take 294 North to Touhy Ave East. Go east on Touhy to the hotel, which is on the left side on Touhy.

#### FREE PARKING

#### TOPICAL GROUP 5:00 - 6:00 PM

Dr. Gary Spedding, Siebel Institute of Technology, Chicago, IL, "Fermentation and Flavor Chemistry as Applied to the Brewing of Beer"

See abstract and biography on Page 2.

#### SOCIAL HOUR: 6:00- 7:00 P.M.

#### DINNER 7:00 P.M.

Dinner reservations are required and should be received in the section office (847/647-8405) by noon on Tuesday, April 11, 2000. Dinner cost is \$23.00 to Section members. Cost to non-Section members is \$25.00. Seating will be available for those who wish to attend the meeting without dinner. PLEASE HONOR YOUR RESERVATIONS. The section must pay for all dinners ordered. No-shows will be billed.

The menu consists of Homemade Soup Du Jour, Caesar Salad, Chicken Breast Marsala in a Marsala wine, peas & pearl onions, rice pilaf, rolls and butter, lemon sunburst cake, and beverage. A fish entrée (broiled Lake Superior Whitefish) is available upon request at the time of reservation.

#### DISTINGUISHED SERVICE AWARD 8:00 P.M.

PRESENTATION TO DR. ELLIS K. FIELDS

PRESENTATION OF 50-YR MEMBERS

#### GENERAL MEETING

##### THE TOPIC

Peter L. Maul, President of Nanocor and Vice President of AMCOL International, "Recent Advances in Clay/Plastic Nanocomposites".

The fundamental bases of clay/polymer nanocomposites are the clay utilized and the surface modification, which renders that clay compatible with the polymer of interest. Nanocor's surface modified clays are sold under the trade name, Nanomer. The selection of appropriate clay involves a number of variables including, among others, morphology, cation exchange capacity, cationic form, charge density, aspect ratio, color and degree of purity. The most critical of these are discussed in some detail as they relate to surface modification and ultimately the formation of nanocomposites. There are a number of surface modification options, including onium ion exchange, ion-dipole treatment and coupling agents. These chemistries are also briefly discussed. Performance properties for three clay/polymer nanocomposites, epoxy, nylon-6 and nylon MXD6 are presented.

##### THE SPEAKER

Peter L. Maul was born April 2, 1950, in Alton, IL and joined American Colloid Co. in 1976 as a product development specialist. He left the corporation and served as vice president and general manager of a California-based chemical firm from 1986 to September 1993,

then rejoined AMCOL as vice president of corporate development. In August 1995, he became president of AMCOL's Nanocor business unit upon its formation. Maul has a degree in

*(continued on page 2)*

#### PLEASE VOTE

(Ballots were mailed in March)

#### JOB CLUB

The next meeting of the Chicago Section Job Club will be held on Friday, April 14 at the Holiday Inn North Shore at 5 p.m. The Job Club provides a continuing opportunity for unemployed members of the Section to meet with one another, share their experiences and develop a network that may help in identifying employment opportunities. Bring plenty of resumes and business cards to distribute to your colleagues.

Should you wish to attend the Section meeting following the Job Club, the fee for unemployed members is only \$13 and you can continue your networking activities. Please call the Section office for reservations and indicate that you are eligible for a discount.

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(continued from page 1)

physiology from Southern Illinois University in Carbondale, and a master's in business administration from Northwestern University's Kellogg Graduate School of Management in Evanston, Ill.

**Topical Group Abstract:** Dr. Spedding's presentation will cover the basic brewing process with an emphasis on yeast metabolism and the process of fermentation. ("One vast chemical soup with multi-component reactions leading to the production of a potable beverage").

While we will not be tasting beer, Dr. Spedding will bring 5 or 6 key Aroma Bottle Samples to illustrate the key Flavors (produced during fermentation). Dr. Spedding will present chemical structures and some chemical implications with respect to each flavor component. Some flavor components will be highly desirable components, and some not so dependent upon the style of beer under consideration.

**Topical Group Speaker:** Dr. Gary Spedding spent 12 years in biochemistry research and taught college-level biochemistry and general chemistry for 6 years. After taking the 67th Short Course in Brewing Technology, he joined the Siebel Institute in 1999 as Laboratory Director. As a long-term homebrewer, Dr. Spedding has a fascination with historical recipes and has published papers on early and novel beer flavor ingredients. In addition to his lab work, microbiological media production, consulting, and teaching duties, Dr. Spedding maintains research interests in beer flavor stability. He also serves on the review panels of chemical and brewing journals.



## DESERT ANALYTICS

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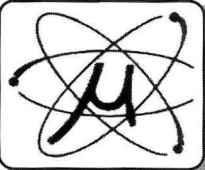
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
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## "CHEM SHORTS" For Kids

The Elementary Education Committee presents this column. They hope that it will reach young children and help increase science literacy. Please cut it out and pass it on to your children, grandchildren, or elementary school teachers. It is hoped that teachers will try to incorporate some of the projects in this column into their lesson plans.

Past "ChemShorts" are on the internet at: <http://membership.acs.org/C/Chicago/ChmShort/kidindex.html>

### A Shape Memory Metal

Kids, did you ever imagine that there might be chemistry involved in braces? How about eyeglass frames? There is a special metal alloy called Nitinol that is often involved in both of these applications. It is a nickel-titanium (Ni-Ti) alloy developed by chemists at the Naval Ordinance Lab (NOL) -hence the name of NiTiNOL. This unique metal displays the very rare phenomenon of the shape memory effect. It seems to remember its original shape after being bent.

Let's see how it works in braces. The bracket part of braces is a tiny metallic or porcelain anchor glued to a tooth. As many as 12-14 of these minihandles are fastened in each jaw. Next a thin flexible Nitinol wire is fastened to each bracket and bent back and forth as necessary to connect the misplaced teeth. This special wire is elastic (actually, "superelastic") and wants to, very slowly, return back to its original straight shape. Moving at about one millimeter per month, the wire brings the teeth with it. Eventually, a stronger stiffer wire is needed to move teeth into their permanent final alignment, and orthodontists often use stainless steel for this. Both Nitinol and stainless steel (an alloy of iron and carbon with some chromium and nickel) are resistant to acids and corrosion. You never see rust on braces even though they are in a wet environment and exposed to weak acids (citric acid, decomposition of sugars, etc.).

Another example of Nitinol's properties is in the springs of eyeglass frames whose arms can flex slightly out, away from the body, without damage. One of the most amazing demonstrations of shape memory is when it is temperature dependent. Nitinol can do this as well. A straight wire can be wound into a tight coil, put into hot water, and

instantly it springs back to its straight shape. Eyeglasses with this Nitinol in the temple piece can be squashed or severely bent, but restored by immersing in hot water. This effect is caused by a change in the crystal form of the metal. It transforms between the high temperature phase called austenite and the low temperature form called martensite. Because the phase change occurs with just a simple shearing motion of the atoms, and no diffusion or large atomic movement is required, the transformation occurs virtually instantly and can cycle many times.

Most applications of Nitinol are in aerospace engineering and hydraulics. For \$35, Shape Memory Applications, Inc. will supply a kit of demo wires and springs (2380 Owen St., Santa Clara, CA 95054, (408) 727-2221; [www.sma-inc.com](http://www.sma-inc.com)). The demo wire is especially fun - bend it, dip into hot water, and bam! it snaps back to straight, over and over again. Their website also has a very helpful review document. Also published for demo purposes is the "Thermobile" (G. Kauffman & I. Mayo, J. Chem. Educ. 1998, 75(3), 313), an engine with no visible power source that converts thermal energy to mechanical energy using a Nitinol loop wrapped around two pulleys. I encourage you to research this amazing metal. Some other alloys showing this effect are gold-cadmium (Au-Cd) and brass (copper-zinc).

-----  
References: M. W. McClure, *Chem-Matters*, American Chemical Society, 2/00, p. 7.

K. A. Carrado  
Elementary Education Committee.

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Published by the Chicago  
Section of the American Chemical  
Society, Sanford Angelos, Barbara  
Moriarty, Editors, Gayle E. O'Neill,  
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## Elections for 2000/2001 Chicago Section Officers

The Nominating Committee would like to report that they have put together the following slate for officers for the Chicago Section for the coming year. Officers elected will begin their duties on July 1, 2000. Note that because Bob McGorin has left the Chicago area, we have to elect a Chair. The slate is given below. Please be sure to vote when you receive your ballot. Ballots will be counted on Friday, April 14, 2000. Results will be announced at the Section meeting that evening.

Angela Kowalski  
Chair, Nominating Committee

Chair (To begin 7/00, replacing Bob McGorin)  
Sharon Northrop, Adele Rozek

Chair-Elect  
Charles Cannon, Herb Golinken

Vice-Chair  
Daryl Prater, David Crumrine

Secretary  
Keith Kosteka, Marty Landorf

Treasurer  
Allison Aldridge, Angela Kowalski

Directors (7 to be elected)

Sandy Angelos  
Inara Brubaker  
Daria Darczak  
Jennifer Horne  
Marilyn Kouba  
Charlotte Lee  
Margaret Levenberg  
Avrom Litin  
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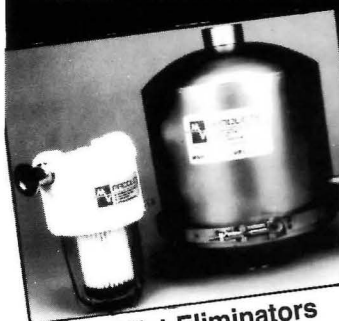
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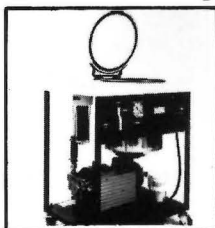
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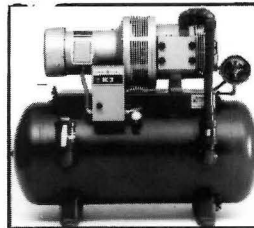
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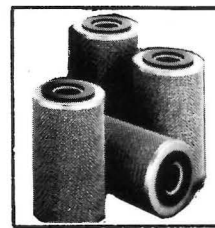
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## Dr. Ellis K. Fields, Distinguished Service Awardee, 2000

I feel proud that I was invited to write an account of the contributions of Dr. Ellis K. Fields in honor of his selection as the Distinguished Service Awardee for 2000. I am also awed by the challenge of trying to say in a few words just what needs to be said in order to do justice to his many contributions and achievements. My task is eased somewhat by the fact that the award is given for support of and contributions toward the mission of the Chicago Section. Although I shall use this guideline to limit my remarks, one cannot ignore completely all of the many contributions that he has made nationally, internationally and in the public arena. For, indeed all of his activities have contributed, directly and indirectly, toward the success of the Section. Ellis received his Ph.D. in physical organic chemistry from the University of Chicago at the very young age of 21. After spending some time at UC as a research associate, he joined Standard Oil (Ind.). He eventually retired from Amoco Chemical Co. in 1992 with the highest rank that could be achieved by a researcher, research consultant. Along the way he received 232 patents and was responsible for 126 publications - a truly remarkable research career!

Upon retirement, he was appointed to the Alva Todd Chair of Chemical Engineering at Illinois Institute of Technology. Since the end of this appointment he has continued his teaching career as an adjunct professor of chemical engineering, currently teaching a course in industrial catalysis.

Ellis has been a member of the American Chemical Society and the Chicago Section since 1939. For the section, he has served in many capacities: Chair of the Program, Long-Range Planning, Gibbs Arrangement, National Affairs, Nomination, and Bylaw Committees; Chair of the Section in 1971-72, Councilor since 1969. The list could go on and on. At the national level he has been equally active in representing the section, the division of petroleum chemistry and the society. He served the Division as chair in 1981. The membership of the society gave him its highest honor by electing him to the presidential succession in 1983 as president-elect. He served as president in 1985. Ellis has received many awards and honors, including the ACS Award in Petroleum Chemistry in 1978. He deserves to be in the Guinness Book of Records for what is a truly singular achievement: He has attended every ACS National Meeting since he was 18 years old!

I cannot end this tribute without mentioning his wonderful wife, Jeannette. Long before the Clintons presented themselves as a "twofer," Ellis and Jeannette had laid claim to that title in making their mutual contributions to the American Chemical Society. Jeanette has had a career of her own, serving as executive director of Glessner House from 1970-76, where she coordinated and led architectural tours and gave lectures for the Chicago Architectural Foundation. She still leads tours and gives lectures in Oak Park - River Forest. Ellis and Jeanette live in a Frank Lloyd Wright House - the Arthur E. Davenport House - in River Forest. They moved in about thirty years ago, restored it to its former glory and have been great stewards of this architectural landmark since. One of my wonderful memories is of the time when the Long-Range Planning Committee, which Ellis chaired, would meet in the Fields home (Davenport House). Jeanette would prepare a wonderful meal for us and Ellis would open some of the wine he had made. It couldn't have been any better than that.

In honoring Ellis, we are recognizing a loyal, dedicated member of the section who has been there whenever we needed him and called on him; steadfast, committed and true to the section's mission. He is truly deserving of the Distinguished Service Award for 2000.

Jim Shoffner

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## Long Range Planning Task Forces

The Chicago Section of the ACS has a committee that evaluates what the section is doing today and what the section needs to do in the future so that the Chicago Section meets the needs of its members and stays vibrant. Over the past few years the Long Range Planning (LRP) Committee has focussed on financial considerations to ensure that programs and services are adequately funded. This year, LRP has shifted some of its focus to non-financial planning for the future. Four task forces were created by LRP to formulate plans for the future of the Section. The task forces are:

Mission Statement  
chaired by Barbara Moriarty  
Member Services  
chaired by Herbert Golinkin  
Governance  
chaired by James Shoffner  
Program  
chaired by Cherylnlavaughn Bradley

We need to have input from you, the members of the Chicago Section. Members who are interested in these important areas of concern and wish to contribute ideas that the task forces should

consider, should contact the Section office (847/647-8405) and indicate on which task force they are interested. As the task forces continue their work, more details will be provided to you, the members.

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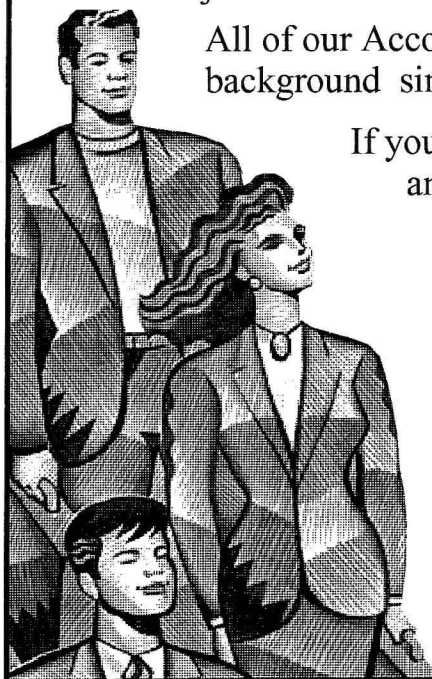
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link members directly to the Legislative Action Center on the ACS Web site, where they can review action alerts, edit sample letters online, and send e-mail messages to their Representative and two Senators within minutes. In addition, Legislative Bulletins are sent monthly to keep Network members up to date on priority issues.

Because members of Congress respond to constituents and value non-partisan technical expertise, local section members are urged to join the Network to ensure that our lawmakers take our views into account before key votes. If you have Internet access, simply send your name, e-mail address, and ACS member number to [grassroots@acs.org](mailto:grassroots@acs.org). You can also sign up on the Web site at <http://www.acs.org/government/action/>. If you have questions, please contact Brad

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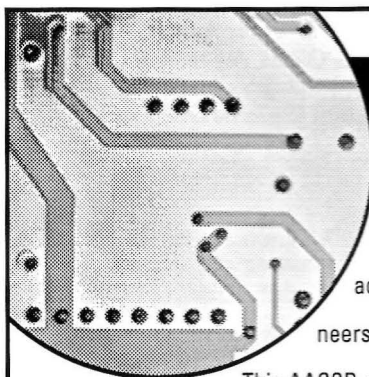
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## CALENDAR

**April 27-28, 2000.** Professional and Analytical Consulting Services (PACS) will present a conference on Environmental Laws in Pittsburgh, PA. For more information contact Barbara Sherman, PACS at (724) 457-6576 or (800) 367-2587.

**April 28-30, 2000.** The ASTM Committee C-28 on Advanced Ceramics will meet in conjunction with the American Ceramic Society in St. Louis, MO. For more information contact Gloria Collins, ASTM at (610) 832-9715.

**May 9, 2000.** The Chicago Section of the Society for Applied Spectroscopy presents Dr. David Lankin on "NMR - Where We've Been and Where We're Going." For more information/reservations contact (630) 603-5579.

**May 15-17, 2000.** MARM 2000 (the 33rd Middle Atlantic Regional Meeting) will be held at John M. Clayton Hall on the University of Delaware campus in Newark, Delaware. The theme and plenary symposium are on Accelerating Drug Discovery and Development. For more details visit their website at [www.dca.net/marm2000](http://www.dca.net/marm2000)

**May 19, 2000.** The Chicago Section American Chemical Society presents the Willard Gibbs Award Banquet to be held at Windows Restaurant in Skokie. For additional information call the Section Office at (847) 647-8405.

**June 4-7, 2000.** The 32nd Great Lakes Regional Meeting will be held in Fargo, ND.

**June 11-13, 2000.** The 48th American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, will be held in Long Beach, California. For more information contact the American Society for Mass Spectrometry, 1201 Don Diego Avenue, Santa Fe, New Mexico 87505, at (505)989-4517 or e-mail: [asms@asms.org](mailto:asms@asms.org).

**June 23, 2000.** The Chicago Section American Chemical Society presents the final meeting of the 1999-2000 year to be held at Steven's in Elmhurst. The speaker will be David Piazza of Naperville Surgical Assoc. on "Why palms are pink and poop is brown." For additional information call the Section Office at (847) 647-8405.

**August 20-24, 2000.** The 220th American Chemical society National Meeting will be held in Washington, DC.

**October 19-20, 2000.** Professional and Analytical Consulting Services (PACS) will present a conference on Sampling, On-Site Analysis and Sample Preparation in Pittsburgh, PA. For more information contact Barbara Sherman, PACS at (724) 457-6576 or (800) 367-2587.

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