



### MONTHLY MEETINGS

**SEP 26**

Snuffy's Restaurant  
Scotch Plains, NJ

Barbara Henke, President  
Today's World Learning Center  
Foundation, Inc.

*"Lessons on Learning from  
the Women of MIT"*

**OCT 24**

Ben's Deli  
New York City

*Annual Meeting*

**NOV 28**

*TBA*

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# The Chemical Consultant

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THE ASSOCIATION OF CONSULTING CHEMISTS & CHEMICAL ENGINEERS

*Scientific, Engineering, Business & Management Consultants*

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## ABOUT THE ASSOCIATION

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The Association of Consulting Chemists & Chemical Engineers (ACC&CE) is a network of senior-level consultants with a broad range of functional expertise and many years of experience in the chemical and allied industries. The purposes of the organization are:

- To furnish support to its members as they conduct their consulting practices.
- To offer prospective clients a "clearing house" which they can use to find the most qualified consultants or team of consultants whatever their particular problem may be.

This newsletter is intended to support those purposes as well as to educate prospective new members and prospective client organizations about ACC&CE, and how we can be most helpful to them.

The ACC&CE has an interactive website – [www.chemconsult.org](http://www.chemconsult.org), that allows prospective clients either to input their problem or to search for those consultants most skilled in their area of concern. This website also allows prospective members to access information on the organization, including back-issues of the newsletter, meeting notices, etc. It also obviously serves as a resource for the Association's members, including allowing each member to have his/her own webpage, which benefits from the visibility of the entire ACC&CE website.

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## IN THIS ISSUE

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In this issue, we are presenting descriptions of assignments carried out by a number of our members. The goal is to illustrate the wide variety of talent and experience contained in the membership of the Association. For our members, this should serve to help each of us better market our own portfolios of experience and expertise. For our non-member readers, who may from time to time need or be aware of needs for expert consultants, this should be an encouragement to keep the Association on his or her short list.

We are also taking an opportunity to recognize a significant achievement by one of our member consultants, Dr Vincent Venturella, who received an award from the American Chemical Society. We also are including in this newsletter our usual listing of new members who have joined us since the last newsletters. We welcome them to our group.

Please note our Annual Meeting, which will be held in New York City. We will review the past, discuss the future, and I will be turning the Presidency over to a new member. The two year term goes very quickly.

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## **Our Congratulations to Dr. Vincent Venturella, Certificate #831**

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Dr. Vincent Venturella, member # 831, received an award from the American Chemical Society for 50 years of continuous membership. The Awards dinner was held recently at Farleigh Dickinson University. His photo is included along with 6 others in attendance at the Awards dinner in the September 2006 issue of The Indicator.

ACS annually presents 50 yr. membership awards to those members achieving this level. The award consists of a congratulatory letter from the ACS, a special 50 yr. member pin and a card enabling free registration at all national and regional ACS meetings thereafter. The local section presents the award to each attendee at a dinner and reception for this purpose.

Many of our members have achieved this ACS membership level.

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## **Experiences of Some of our Member Consultants**

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**Dr. David Manuta, Certificate #882 submitted the following description of a lawsuit for which he furnished expert information.**

A toxicologist involved in a chemical exposure/release case contacted me. The Defendant had a leaking rail car containing an ester. The Plaintiff's illnesses were caused by an amide. Since the chemistry associated with esters and amides is often not the same, the Defendant's attorney told our client attorney that they **were not** responsible for the Plaintiff's illnesses.

Through the application of fundamental chemical principles, I was able to deduce that the ester reacted, via acid hydrolysis, to form an organic acid. The ester was non-volatile; so the majority of chemical released was liquid, not vapor. The liquid is much more concentrated than the vapor in the ester and the organic acid.

At the location where the chemical release took place, an estimated 10,000 semi-trucks go through per day. The diesel particulate matter produced formed a surface where a series of chemical reactions involving the oxygen in the air and moisture (as relative humidity) occurred forming droplets of dilute sulfuric acid. The ester was then hydrolyzed by the sulfuric acid to produce the organic acid.

The property where the release took place was previously the site of solid waste burial after sewage treatment. Years after this activity had ceased, there were still measurable quantities of ammonia coming out of the soil. A calculation revealed that more than 100 times the amount of ammonia needed to react with the organic acid was available to produce quantities of the amide determined to be hazardous to human health by the toxicologist.

It took 18 months to identify all of the chemical transformations involved in this exposure/release. The case settled immediately prior to trial. My client later told me that he included in his opening statement, "Dr. Manuta will testify regarding all chemical transformations." These "catalytic words" induced opposing counsel to favorably settle this case for the Plaintiffs.

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## **Experiences of Some of our Member Consultants – Cont'd.**

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**Richard M. Goodman, Certificate #747, submitted the following description of his entry into the consulting field, and several specific experiences.**

After a successful career as a research manager in medium to large corporations spanning several applications of surface science, I set up my consulting business, Richard M Goodman Consulting LLC. (Catchy name, eh?) My major client is Kodak's Graphic Communications Group and I do some adjunct professor gigs, but these are not the subjects of this short piece. Among my other assignments the most interesting one concerns a medium-sized (very) specialty chemical supplier. I used the term "very" deliberately because this company sells a natural product from renewable resources. It is generally used in the food industry. However, they have been looking for other applications in order to expand their sales of their one major product, a high MW hydrocolloid.

Working together with a major printing industry funded research foundation; we found an application in offset lithography for their product. To wit: as an additive which makes water wet the non-image areas more efficiently without interfering with the ink lay on the image areas. The results are highly encouraging and should lead to a commercial opportunity. Further, we will continue to look for suitable opportunities to minimize the use of petroleum-based materials; replacing them with materials made from renewable resources. Win-win-win all around: for RMGC LLC, for the natural products company and for the global environment.

**John C. Bonacci, Certificate #821, submitted the following descriptions of several of his assignments.**

A. A European company desired to debottleneck and expand their soda ash plant in Eastern Europe. They also wanted to add a facility for making medical soda (sodium bicarbonate). The ACC&CE consultant team recommended design changes to allow more production. They also developed a complete technology package for the medical soda line. This package is suitable for use by any engineering company to provide detailed design-build packages.

B. Our ACC&CE consultant worked as part of an international team of experts to review how to eliminate greenhouse gases in various countries. The specific area of expertise provided by the ACC&CE consultant involved methods for removing nitrous oxide (N<sub>2</sub>O) from nitric acid plant tail gases. Suppliers of equipment were sought out and technologies reviewed by vendor data and by United States Patents. Quotes were obtained from suppliers so that the client could determine the best solution for the operating companies. The work applied to the European area and Mid-East and Far-East where countries are participants in the Kyoto Treaty of the U.N.

C. Our ACC&CE consultant has taken plant emission readings for YOC's exhausted from a plastics coating plant. These readings are used to verify the proper operation of a catalytic oxidizer and to show compliance for annual checks required by various state Departments of Environmental Protection. Our consultant also arranges for others to do the formal EPA tests under methods 25 and 25A when they are needed.

**Dr. Merrill Cohen, Certificate #920, submitted the following description of some of his consulting activities:**

Monthly or quarterly reports and occasional consulting visits for three companies on latest developments in nanotechnology, composite system technology and new polymer developments to improve properties of interest to each company. Applications include solar energy films, aerospace material applications and conducting transparent films for flat panel displays and other applications via carbon nanotube technology.



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## Experiences of Some of our Member Consultants – Cont’d.

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**Gerry J. Reimer, Certificate #940, submitted the following description of a particular cost-benefit analysis that he made on the subject of Laboratory Automation: Example of EDCs in Water**

There has been a constant drive toward laboratory automation, from the introduction of autosamplers for chromatography instruments to lab-on-a-chip devices. Summarized below is a comparison of the economics of manual solid-phase extraction (SPE) and on-line automated SPE methods for the analysis of endocrine-disrupting compounds (EDCs) in water. There are several instruments currently on the market that can perform automated SPE, as listed in

**Table 1.** The instrument selected in this example (referred to as *xyz*) automatically performs the SPE steps of conditioning, extraction, washing (cleanup) and elution, and has a price tag of about \$100,000. To examine whether this cost can be justified, both manual- and auto-SPE methods were modelled on spreadsheets. Costs of labour, consumables, apparatus and instruments, were weighed against revenue to generate net revenues and profit margins.

A comparison of these economic parameters showed that in the higher-throughput case of 5 batches of 20 samples per week (for 45 weeks of the year), the auto-SPE method provided an additional \$58,000 in annual net revenue (over the manual method) due to labour-saving automation. This additional revenue could be applied to the cost of the *xyz* instrument. On the other hand, if a reduced throughput of 2 batches per week was plugged into the spreadsheet model, although the calculated profit margin of the auto-SPE method was still higher than the manual method, the auto-SPE method generated only \$11,000 in additional net revenue per year compared to the manual method. This additional revenue would likely not provide sufficient justification for purchasing instrument *xyz*. Even if a laboratory has sufficient business to maintain the higher-throughput scenario, purchasing the *xyz* still requires a leap of faith because 1) there is insufficient information on the “ruggedness” of this instrument in a commercial environmental laboratory setting, 2) there may be a substantial “learning curve” in bringing the instrument on-line, and 3) the instrument would require validation to ensure that the auto-SPE method can handle the typical range of matrix interferences encountered by the laboratory. On the positive side, there are benefits of the automation instrument *xyz* other than those fiscal. For example, as the autoinjector has improved the precision of analytical results, instrument *xyz* will likely do the same by automating many manual SPE steps (while also reducing the drudgery of manual SPE). In addition, instrument *xyz* can automate method development: Sequences can be setup on the instrument to establish optimum SPE conditions by varying parameters such as SPE adsorbent, solvent, volume and flow rate.

In conclusion, through computer modelling of analytical methods it is possible to win the tug-of-war between the benefits of automation and economic realities.

**Table 1. Available auto-SPE instruments.**

Manufacturers Link	Instrument
<a href="#">Caliper</a>	Rapid-Trace; off-line SPE
<a href="#">CTC Analytics</a>	Combipal; SPME-GC
<a href="#">Gerstel</a>	MPS 2; SPME-GC
<a href="#">Gilson</a>	215; On- and off-line SPE
<a href="#">Perkin Elmer</a>	MultiPROBE II HT; off-line SPE
<a href="#">Spark Holland</a>	Symbiosis; on-line SPE
<a href="#">Tomtec</a>	Quadra 3; off-line SPE

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## ANNOUNCEMENT – SEPTEMBER 26 PRESENTATION

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"Lessons on Learning from the Women of MIT and Resultant Community Outreach Activities"

*(Tapping the Source of Tomorrow's Leaders in Math, Science and Engineering – Women)*

Speaker --- Barbara Henke, President - Today's World Learning Center Foundation, Inc.

Barbara will have the assistance of her daughter who is a graduate of Pingry and has 3 degrees from MIT and of a current Pingry student. Her presentation tells the interesting story of young women in Science and Engineering and current efforts to facilitate the young women who want to pursue these careers.

Members of the ACS and AIChE as well as parents of these young women are invited to attend the presentation at Snuffy's in Scotch Plains, Tuesday evening September 26, 2006. The presentation starts at 7:30 p.m. and there is no charge to attend only the presentation. Dinner at 6:00 p.m. is optional at a \$40 per person charge.

**Meeting Date: September 26, 2006**

**Place: Snuffy's Restaurant, Park & Mtn Ave (Route 22 East), Scotch Plains, NJ**  
**Telephone: 1-908-322-7726**

6 p.m. Networking/Cash Bar, 6:30 p.m. Dinner, 7:30 p.m. Presentation

Registration: \$40 ACC&CE Members, \$50 Non-members

To Reserve: Call Linda B. Townsend at 1-973-729-6671 or e-mail:  
accce@chemconsult.org

Advanced registration is required.

Cancellations must be made 24 hrs in advance or be invoiced.

Please visit our web site for more details: [www.chemconsult.org](http://www.chemconsult.org).

## NEW MEMBER INFORMATION

Dr. Gerry J. Reimer, member #940  
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Information on Dr. Reimer will be available in the next issue of this newsletter.

Dr. Willis B. Hammond, member #941  
Hammond Associates  
128 Center Avenue  
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Willis Hammond completed his Ph.D. in Organic Photochemistry at Columbia University in 1968. After teaching organic chemistry at Yale, he joined the Corporate R & D staff of Allied Chemical Corporation in 1975. In 1997 he moved to the Corporate Analytical Department at Hoechst Celanese. Recently, he has formed his own consulting firm W. B. Hammond Associates, LLC. Areas of expertise include monomer and polymer synthesis and characterization and problem solving for new polymer development, applications and manufacturing.

Dr. Oscar A. Moreno, member #942  
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Information on Dr. Moreno will be available in the next issue of this newsletter.



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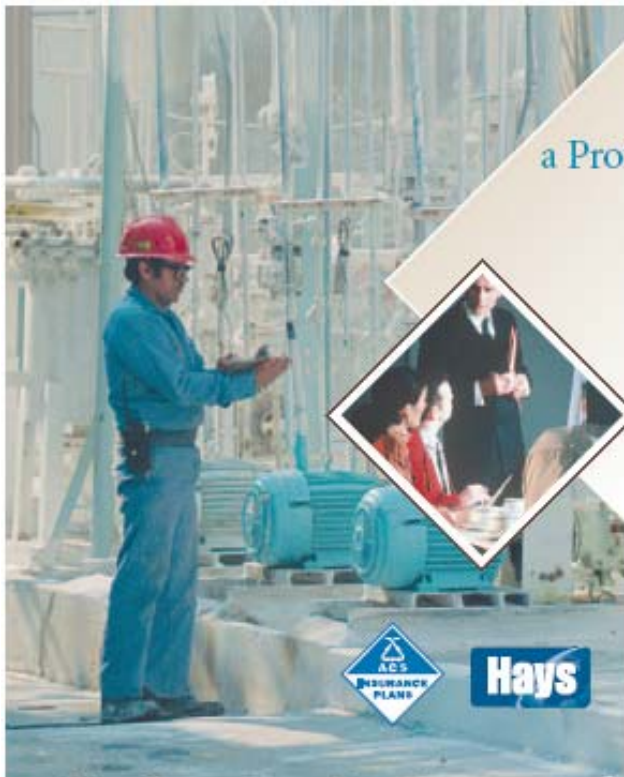


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### NOTE TO OUR READERS

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