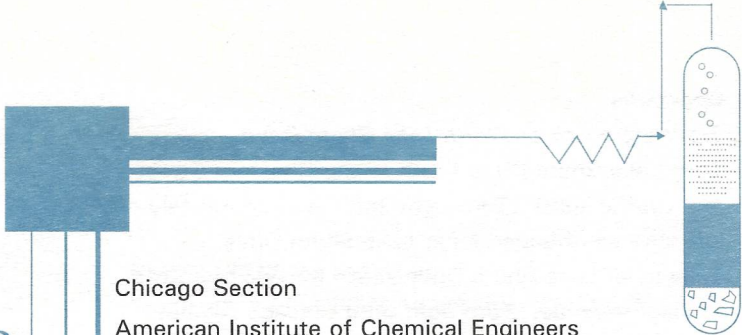


AIChESM

section

Chicago Columns



Chicago Section
American Institute of Chemical Engineers
www.aiche-chicago.org

January Meeting Notice

Tuesday January 20, 2004

Museum of Contemporary Art
220 East Chicago Avenue
Chicago, IL
312-280-2660

Mity Nice Grill
835 North Michigan Avenue
(Water Tower Place)
(312) 335-4745

Agenda

Meet and roam through the museum.....6:00 pm
A free guided tour of the MCA is available
Dinner registration and cash bar.....7:00 pm
at Mity Nice Grill
Dinner.....7:30 pm

Cost

\$25 for members
\$27 for non-members
No charge for AIChE student chapter members
(see your advisor).

Menu

Choice of Garlic Crusted Lake Superior Whitefish or Minute Chicken, Teri D with Garlic Potatoes, Lemon Butter, and Tomato Relish, or a vegetarian dish. Entrees include Mixed Green Salad with House Vinaigrette and Crème Brule.

January Social Night- An Evening Of Modern Art And Mity Nice Food

In the tightly woven relationship between viewer and artist lies what can be broadly understood as unease. In the unending cycle of new experiences we are pushed from a state of ease to unease to equilibrium and then to a new state of discomfort with each additional new experience. Join us at the Museum of Contemporary Art (MCA) as we explore the Chicago-based artist Kerry James Marshall exhibit: *One True Thing, Meditations on Black Aesthetics*. (This exhibit is in addition to MCA's permanent collection.) Marshall's work has often addressed social issues stemming from the Civil Rights movement, evoking the nostalgia and idealism of that era. This new experience promises to provoke and enhance one's ideas and perception of Black history, identity, and cultural tradition.

After the museum, join us at Mity Nice Grill, a straightforward 1940's style Chicago neighborhood grill with a warm, hearty, wholesome fare.

Reservations

Make your reservations by calling the AIChE Reservation Hotline at 847-588-3323 or emailing evalopez@teianalytical.com. Or register online at www.aiche-chicago.org. Deadline is noon January 16, 2004.

Directions

Traveling south on North Lake Shore Drive

Take Lake Shore Drive south to the Chestnut Street exit (traffic light). Turn right and then immediately left onto southbound Inner Lake Shore Drive. Take Inner Lake Shore Drive south for two blocks to Chicago Avenue. Turn right onto Chicago Avenue and go west for one block, past Fairbanks Court. The museum will be on your immediate right side, on the corner of Chicago Avenue and Mies van der Rohe Way.

Traveling north on South Lake Shore Drive

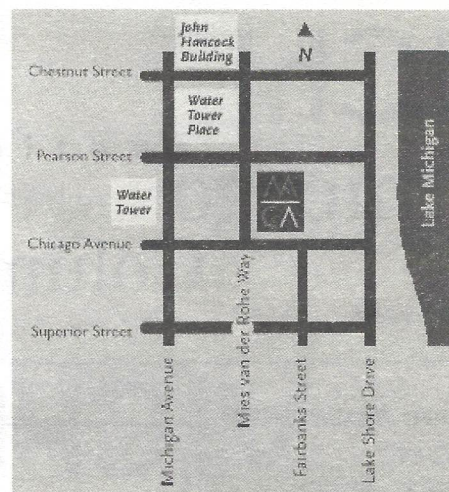
Take Lake Shore Drive north to Chicago Avenue. Turn left onto Chicago Avenue. The museum will be on your immediate right side, on the corner of Chicago Avenue and Mies van der Rohe Way.

Directions from the Kennedy Expressway (I-90/94)

Take the Eisenhower Expressway (I-290) east until it ends and becomes Congress Parkway. Take Congress Parkway east past the river for about one mile to Columbus Drive. Turn left onto Columbus Drive. Take Columbus Drive north (name changes to Fairbanks Court). Take Fairbanks Court north until it ends at Chicago Avenue. Turn left onto Chicago Avenue. The museum will be on your immediate right side, on the corner of Chicago Avenue and Mies van der Rohe Way.

Directions from the Kennedy Expressway (I-90/94)

Take the East Ohio Street/600 North exit (exit number 50B). Turn slightly left onto Ohio Street. Take Ohio Street east for about one mile, two blocks past Michigan Avenue, to Fairbanks Court. Turn left onto Fairbanks Court. Take Fairbanks Court north for five blocks until it ends at Chicago Avenue. Turn left onto Chicago Avenue. The museum will be on your immediate right side, on the corner of Chicago Avenue and Mies van der Rohe Way.



Parking

Convenient discounted parking for MCA visitors is available in our parking garage. The garage is adjacent to the museum and may be entered from Chicago Avenue. Visitors must have their parking tickets validated at the admissions desk. Members receive a \$4 discount for parking and non-members receive a \$3 discount for parking.

Public Transportation

The MCA is located four blocks east of the Chicago Avenue rail stop on the Howard Red Line, and is easily accessible by the #10 Museum and #66 Chicago Avenue buses, as well as several Michigan Avenue bus routes.

Chair's Corner

Dennis O'Brien
Chair 2003-04
Chicago Section AIChE

November meeting

The meeting was held at the excellent facilities at BP Cantera in Warrenville. The meeting topic was expected to be the future of refining in the Chicago area. Due to scheduling difficulties, we were able to schedule three speakers on Sustainable Growth. Ms. Keisha Benjamin was invaluable in completing the arrangements at site.

The three speakers were Greg Thompson, Director of Strategic Planning, UOP LLC, Dr Urmila Dweikar, Professor UIC, and John Forgac, Senior Research Associate, BP. Greg's presentation is discussed further below.

Dr. Dweikar discussed some of the research work that she has directed on the issue of uncertainty of design parameters. The brief overview showed that it is important to consider this issue carefully. There will be more information on this issue in an upcoming newsletter.

John Forgac is chair on the Green Chemistry topical at the National meeting. He provided a quick look at some of the papers given at the Spring 2003 meeting. He will provide an update in early 2004.

Sustainable Development at UOP

Sustainable growth is part of the new UOP vision statement and is being integrated into the strategic planning process. Measures of land use, energy, and toxic waste production are some of the metrics that other companies currently use. UOP is in the process of identifying the items that it will track for sustainable development.

As a design engineer, I have seen the following three requirements become important in the last two years:

1. Governmental policies are beginning to have an impact on design practice.
2. Emission limits have already had an impact on the design energy efficiency.
3. Land use limitations are beginning to require more compact plot layouts, even in countries where there is plenty of vacant, inexpensive land.

Clients - CO2 tax in Europe

Licensors are beginning to consider the impact of a CO2 tax on the design of refinery and petrochemical units and the utilities that required to run them. Changes to design and operation may be justified as the cost of fuel fired becomes greater due to this new cost. These changes may include more heat recovery in the heater, larger exchangers to reduce the amount of fired heat required, and more efficient electrical motors to reduce the power consumption.

Clients - Low NOx requirements

A few months ago, UOP designed a complex in a Middle Eastern country. The cost of fuel was low. However the owner of the plant had a very strict NOx limit that had to be met. The design that was produced is the same as one that you would produce as if the cost of fuel was high.

January Meeting

In January we will have our social meeting in downtown Chicago. The dinner is reasonably priced and a tour of the Museum of Contemporary Art is planned. Please see details elsewhere in the newsletter.

WEB

Problems have continued with reactivating the web. The host machine that we have been using at Northwestern had a full hard drive. Since May we have had difficulty upgrading it and getting moved over to a new machine. In mid November we opened a new hosting account with a service. The necessary paperwork has been completed and the new account is about ready to go on line. The new site was brought online on Sunday Nov 22. There are a few repairs that need to be made to the site.

Future Cities Competition

This competition is coming up in January. AIChE has provided judges for several years. Please contact Don Wittmer at dwittmer@hntb.com if you would like to attend and/or participate in the judging. Last year there were over 20 schools (junior high) that sent in cities to the competition. A number of the cityscapes were very imaginative. The judging is Saturday morning, January 24, 2004.

Soup

J. Peter Clark

This is the second in a series of short articles on foods in which chemical engineering principles are prominent. The others are sausage, olive oil and bread.

Soup, in my opinion, is one of the more complicated processed foods to make. I rarely do it at home, preferring to leave it to the experts. The variety possible is nearly endless, and to extend the commercially available choices, there are the combinations one can make from easily available ingredients.

Manufacturing soup commercially is primarily a material handling challenge. A glance at any commercial soup can label will show a long list of ingredients, including meats, pasta, vegetables, flavors and seasonings. One example of vegetable soup, typically an inexpensive variety, has about twenty listed ingredients.

Commercial soups may be condensed, meaning they are concentrated but fluid and should have water added in preparation; ready to eat, meaning they do not need to have water added; dry, meaning they must be reconstituted with water; or frozen, meaning they must be thawed and are usually ready then to eat.

Condensed and ready to eat soups are preserved by canning, which is thermal treatment after filling in metal, plastic or glass containers to kill pathogens and spoilage microorganisms. Dry soups are preserved by low water activity and are usually formulated from dry ingredients. A few may be made by mixing as fluids and then drying or freeze drying. Freezing of ready to eat soups prevents microorganisms from growing but does not kill them.

The complexity in soup making comes from all the steps involved in preparing the many ingredients. These have to be coordinated with scheduling of manufacturing to be sure that all the components needed are available in the correct amounts at the correct time. It is a similar problem to that of auto

assembly except that in soup, the ingredients or components are perishable and are made from perishable and seasonal raw materials, rather than from steel or plastic.

Here are some examples. Potatoes and carrots are two of the most widely used ingredients in commercial soup. There might be a dozen or more separate ingredients made from these two materials, varying primarily in size. For instance, there may be 1/4 inch cubes, 1/2 inch cubes, 1 inch by 1/4 inch strips, 3/4 inch chunks, and so forth. This variation arises as chefs and food scientists create new products with the consumer in mind. They try to achieve a "homemade" look and feel by hand cutting vegetables and then specifying the resulting mixture. Pieces that are too large are subject to breaking in pumping and cooking. Pieces that are too uniform are considered "too machine made".

Commercial producers start with raw agricultural materials, potatoes from the ground, carrots, beets, rutabagas, peas, etc. Some are partially preserved, such as beans, lentils, rice and pasta, by drying. Others may be frozen, such as meats. Tomato paste is stable because of its lower water activity, but often is frozen also.

The raw agricultural materials must be sorted, washed, peeled, and size reduced. Examples, in addition to potatoes and carrots include mushrooms, celery, onions, turnips, spinach, parsley, and other herbs.

Because of the wide differences in properties, each material may need specialized equipment for washing, peeling and trimming. Some materials are seasonal, so products requiring that material must be made for the entire year in a relatively short time. This creates the need for large inventories. To avoid this, manufacturers may try to source those materials from other parts of the world, such as South America, where the seasons are opposite to ours. Alternatively, the materials may be

preserved and stored, especially when they are used in many final products. This avoids creating finished products in quantities that may be inconsistent with market demands.

Size reduction is typically by slicing and dicing using equipment that cuts in one, two or three dimensions. This equipment uses fixed and rotating knives to make dices, chunks and pieces as required. Since a typical machine is set up for one material and one size piece, there are many such machines. At any one time, many may be idle, but it is more efficient to leave them set up than to reconfigure them for a new function.

Traditionally, cut ingredients for soup were filled into large stainless steel tubs or buckets and taken to mixing kettles by hand. There, they were dumped into the kettle, water, salt and other ingredients were added, and then the mixture was pumped to the fillers. A recent development is to automate the delivery of these containers of ingredients using an overhead monorail system.

Again, by tradition, soup mixtures were often heated to dissolve ingredients, remove air, and soften ingredients. There really is no need for cooking, because canned soups are thoroughly cooked in the subsequent canning process. Modern soup processors mix most ingredients cold or near room temperature.

Some familiar soups are actually the result of a complex assembly process. For example, chicken noodle soup starts with an empty can. Into this, fresh noodles are directly extruded, made from a dough of flour, egg and water; then a slurry of diced cooked chicken in starch is added, precisely controlling the most expensive ingredient; finally, a broth of chicken stock and salt is added and the can is sealed.

Broths or stock are satisfying but tedious to make. They typically involve boiling bones, scraps of meat and herbs for long periods of time, skimming

coagulated protein that rises to the top and straining to remove insoluble solids. One can make or buy stocks of chicken, beef, vegetable, and fish. Commercial manufacturers make stock in large quantities, using much for their products but also selling some as a product itself.

There is constant pressure for new products in the soup market, so new preparation processes are introduced, such as grilling or roasting for meats, and hydration for new dry pastas; and less stressful preservation processes, to protect the larger particles.

Commercially prepared soup, in my opinion, remains a good value in the market compared with the labor and time involved in trying to duplicate them at home, especially when one appreciates the complexity of the manufacturing process.

The objectives of the AIChE are to advance chemical engineering in theory and practice, to maintain a high professional standard among its members and to serve society, particularly where chemical engineering can contribute to the public interest(dot) If you have any questions, comments or snide remarks regarding the newsletter, please contact the editor at polarbear4x@yahoo(dot)com(dot)

Chicago Section Columns is published eight times a year by the Chicago Section AIChE(dot) Opinions expressed herein are those of the authors and are not necessarily those of the officers of the Chicago Section(dot) Articles for inclusion in the next Chicago Section Columns must be received no later than December 26, 2003(dot)

**Nominations Requested For
The Ernest W. Thiele Award**

The Ernest W. Thiele award is sponsored by BP and recognizes the outstanding contributions to our profession by a Midwest region chemical engineer. This award was established by the AIChE Chicago Section and is presented annually to a Midwest region AIChE member. This internationally recognized award consists of an engraved plaque and \$1000 honorarium presented at our sectional meeting.

Nomination forms and additional information can be obtained from the Thiele Committee Chair. Completed nominations are due to the committee chair no later than March 01, 2004.

One of the highest honors a distinguished chemical engineer can receive is our Chicago Section Thiele award. Please consider nominating a deserving engineer for this prestigious award.

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Naperville, IL 60566
Ph 630-420-5936
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**Mentors and Judges Needed for
2004 Future City Competition**

This nationwide contest asks Chicago regional seventh and eighth-graders to design and build cities of tomorrow. For the past eleven years, junior high and middle school students from across the country, including the Chicago area, have designed their versions of a city of the future for the National Engineers Week Future City Competition. This year Chicago is getting an early jump on the contest. In preparation for the competition, Don Wittmer, regional coordinator for Chicago, is requesting Chicago area teachers and engineers to demonstrate an interest in the program. Many of the schools that have participated in the program in prior years have now incorporated the Future City Program in to their science curriculum.

The non-profit competition asks seventh - and eighth-graders to design -- first on computer, then in large three-dimensional models -- a city of the future. The students work with their teacher and a volunteer engineer mentor from the community. Though they may sound like a fantasy, the designs are far from pie in the sky. The students must take into account real city problems such as pollution, crime, traffic, and unemployment and then solve them. Students from the Chicago area will begin work on their future cities in September, and will compete in regional finals in January 2004 at the University of Illinois - Chicago.

The area's first place team wins a trip to Washington, D.C., for the national competition to be held during National Engineers Week, February 22-28. (National Engineers Week is always celebrated around the time of George Washington's birthday, since, as a surveyor, he was one of the nation's first engineers.)

More than 30,000 students from 1040 schools in 31 regions participated in the 2003 competition. It is sponsored by the National Engineers Week Committee, a consortium of engineering associations and major U.S. industries. Co-chairs of 2004 National Engineers Week are The Institute of Electrical and Electronics Engineers (IEEE) and Fluor Corporation.

Regional first place teams receive a free trip to Washington, D.C. for the national finals during National Engineers Week. Prizes for the 2004 competition winning Future City team include a free trip to U.S. Space Camp in Huntsville, Alabama. Other prizes include scholarships, computers and savings bonds. In addition, teams will be eligible for special awards and recognition sponsored by engineering societies and other organizations.

Schools wishing to sign up for the 2004 Chicago Regional Future City Competition, or engineers interested in volunteering as mentors should contact Don Wittmer, Chicago regional coordinator, at (312) 930-9119 or via e-mail at dwittmer@hntb.com.

More information on the competition can also be found at the Future City Competition home page at <http://www.futurecity.org>.

Chemistry Day - October 25, 2003

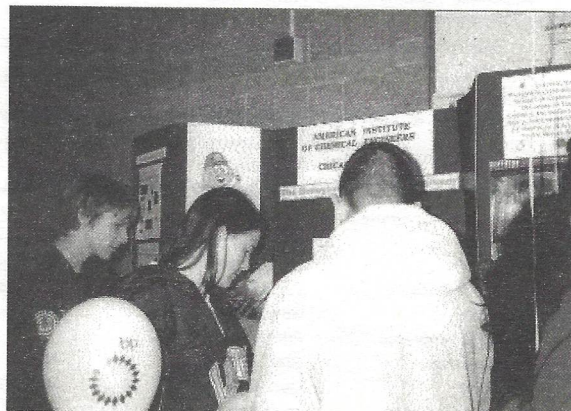
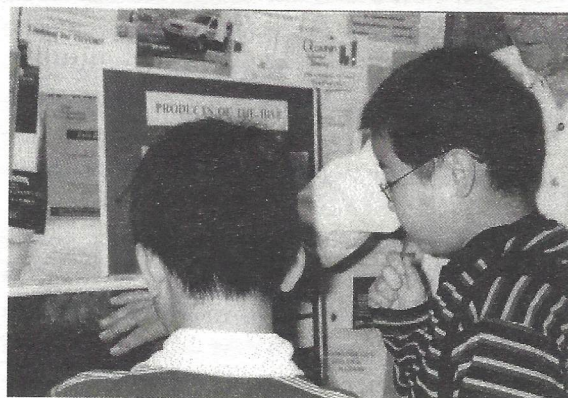
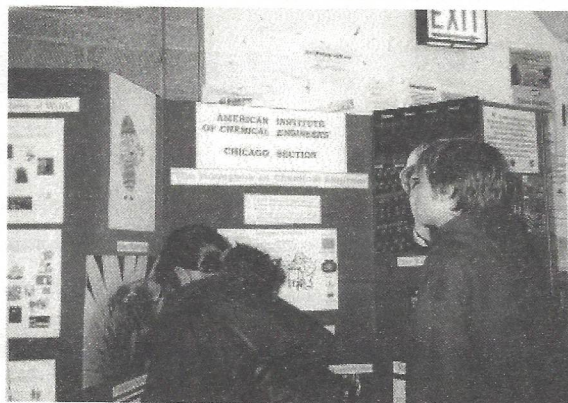
A. Zagoria

UOP

Chemical Engineering was well represented at this year's annual Chemistry Day celebration. The Chicago Section AIChE introduced hundreds of children to a "bees eye view" of chemical engineering. We asked and answered the question, "How is a honey bee like a chemical engineer?" Not only did we ask and answer the question, we SHOWED them how bees are like engineers! John Hansen of the Illinois Bee Keepers Association brought a hive so that the kids could see the little engineers for themselves. This stirred up lots of interest and excitement, even without any escapees from the hive.

Our display talked about turning raw materials into finished products, teamwork, and careful control of operating variables to ensure quality of the finished product. All our volunteers had fun. We are planning a totally new display for National Engineers Week in February. Please come and join us.

To participate, please contact Alan Zagoria at Alan.Zagoria@uop.com. Thanks to our volunteers: Bryan E Golf (UOP), Brooke Lynch (UOP), Christine Owsley (UOP), Steve Schade, Verneta Simon (EPA) and Alan Zagoria (UOP).



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