OCTOBER MEETING

http://fuze.me/26627658 (detailed directions on page 7)

THURSDAY, OCTOBER 23, 2014

ELECTRICITY AND THE ENVIRONMENT

9:00 pm EDT, 8:00 pm CDT, 7:00 pm MDT, 6:00 pm PDT;

UTC/GMT 0100 on 24 October 2014

Abstract: Electricity generated by fossil fuel is generally a stable and low-cost commodity. Globally, electricity is being utilized in more areas of life than ever before, and the environmental impact of its generation is being minimized through various technologies. This month's meeting is a review of some of those technologies including generation, non-catalytic and catalytic reduction of NOx, electrostatic precipitation, fabric filtration, desulfurization and acid gas control, mercury control, and carbon dioxide capture. Many of these technologies are inter-related, and the focus is on the system as whole. While these unit operations are sufficient for existing electricity generation, future technology development is also discussed.

Our Speaker: *Noah D. Meeks, Research Engineer, Southern Company Services, Inc., Birmingham, Alabama.* Noah received his B.S. in Chemistry from Northern Kentucky University, and his Ph.D. in Chemical Engineering from University of Kentucky. At Southern Company, Dr. Meeks has led research efforts for environmental controls on coal-based electric power generation and oversees projects at the Mercury Research Center at the Plant Crist in Gulf Power, and a state-of-the-art Pilot High-Sulfur Baghouse facility at Plant Bowen in Georgia Power, in addition to a Wet Electrostatic Precipitator with Membrane Plates, located at the Water Research Center, also at Plant Bowen.

Dr. Meeks is a Director of the Environmental Division and member of the Separations Division, and has been a member of AIChE since 2005. He is currently Chairman of the AIChE Virtual Local Section, having served in other roles since the VLS founding in 2011, as well as a member of the Young Professionals Committee. In addition to AIChE, he is a member of the American Chemical Society.

JOB SEEKING AT THE ANNUAL MEETING

Fall 2014 Virtual Career Fair

November 5, 2014
12:00 – 3:00 p.m. EST
Special student hour:
3:00 – 4:00 p.m. EST

Whether you're an active job seeker or just at the point where you are willing to explore new opportunities, AIChE is the best source for jobs that are targeted to your career goals and experience. Connect with leading process industry and other employers seeking talent, from entry-level BS engineers to experienced PhDs. Through the online format you can visit online booths to review company profiles and find out about job openings, chat live with recruiters, create custom job alerts and build or upload your resume. Don't forget to register for the event early!

MARK YOUR CALENDAR

VLS Meetings on the third Thursday of the month for Holiday Season:
Thursday, November 20th
Thursday, December 18th

VLS Elections late November

FROM THE CHAIR: MAKING THE MOST OF THE AICHE ANNUAL MEETING

Noah Meeks

When I attended my first AIChE national conference in the Fall 2005, I was completely fascinated and bewildered as a first-year graduate student. I don't think my reaction to the meeting as a first-time attendee was very unique. There are so many talks, meetings, socials, and people--it is sometimes a challenge for first-time attendees to make the most of the conference. At the same time, with so many folks that seem to know what they're doing, and so many different parts of the Institute working at once, the national conferences are also fascinating. To help first-time meeting attendees make the most of the conference—here are a few tips that I've used with some success over the last ten national conferences.

First, a basic understanding of AIChE's structure will help attendees navigate the national meeting. There are three Operating Councils in AIChE which oversee various activities —the **S**ocietal **I**mpact **O**perating **C**ouncil (SIOC) which directs many of the outreach activities of the Institute, the **C**areer and **E**ducation **O**perating **C**ouncil (CEOC) which directs local section governance and many other aspects related to chemical engineering education and profession, and the **C**hemical Engineering **T**echnology **O**perating **C**ouncil (CTOC) which coordinates (among other things) the various Divisions within AIChE. Depending on its size and activity, each division may further be divided into various technical Areas. The Divisions/Areas are responsible for the technical programming at the national meetings. In addition to technical programming, each Division and sometimes individual Areas will have administrative meetings where they will discuss leadership, upcoming programming, ancillary meetings/webinars, and ongoing activities through the year. All members of AIChE are welcome at these meetings, even if they haven't been involved with that Division (or any Division) before.

Second, plan ahead. The meeting website has a very good online programming guide which can be broken down chronologically or by Division/Area. Attendees can search for areas of interest/availability and plan ahead which helps avoid confusion and lost time once arriving on-site.

Third, attend the featured events. There are some major events at each annual meeting which should be on every attendee's list. The most prominent of these is the Institute Lecture, but there are many other featured events in the front of the program or highlighted on the meeting website. These are usually of broad interest to chemical engineers and delivered by very prominent voices in the Institute.

Fourth, attend the ancillary events. Each attendee should receive a list of ancillary programs along with their main program book. This is an important guide for locating the administrative meetings of Divisions/Areas, as well as the meetings of various committees within all three Operating Councils. Most importantly (especially to graduate students!) is the list of social events and receptions hosted by various companies, universities, and communities within AIChE. Some of these are ticketed events and attendees should inquire at the registration desk about tickets to them (such as Division dinners). However, many are just receptions for alumni and friends of these universities, or clients and friends of the companies. These are a great time to make new friends or catch up with old ones, so I recommend packing several of these into the first couple evenings of the meeting. Even if there isn't much connection to that university or company, all attendees are welcome at these receptions. If the Division(s) of interest have a dinner or event, I definitely recommend participating in those events.

Fifth, be a little spontaneous. With all the emphasis on planning and lists of programs, with a basic idea of how AIChE is organized, it's also fine to just drop in on a talk that sounds interesting or a session title that's intriguing. It's a mind-expanding practice to allocate a portion of the meeting time to catching up with new friends, or roaming the convention halls looking for a session to just drop in and hear a few talks. If they are interesting, ask questions, meet the speakers or chair, and stay for more. If not, it's OK to politely leave particularly between speakers. If an attendee is going for most of the meeting, it can get tiring sitting for so long and constantly being able to talk business coherently—spending an afternoon or two away from the venue exploring the city can be very enjoyable as well.

VLS ELECTIONS UPDATE

The VLS Nominating Committee is still accepting nominations for open offices in the section. Members are encouraged to nominate themselves or others by contacting our Chair-Elect, Amanda Scalza, for more information.

The current election plan is to post the election slate about 24 October, have an election issue of the newsletter with candidate statements and voting instructions, and have electronic voting from 15 November until 30 November.

NATIONAL AICHE INVOLVEMENT OPPORTUNITY

As part of the AIChE's focus on our grass roots local sections, volunteers are needed for a 6 to 9 month assignment to work with committees of the President's Blue Ribbon Task Force to Improve Local Sections. Contact Dan Lambert if you are interested.

LIFE IS SMOOTHER THANKS TO CHEMICAL ENGINEERING

J. I. Brand

Wrinkles! I stared in horror, not at the "smile lines" on my face, but at my trousers! Irritated at myself for abandoning my favorite denim attire for all but the most formal occasions, I peevishly asked my hostess if she had an iron. I was relieved when she shrugged and said, "Sure, but why?" because in many homes I visit, I knew the answer would have been "A what?" I sheepishly confessed that I had just discovered that my new grey cotton pants were apparently NOT wrinkle-free, whereupon her immediate, no-nonsense response was "Straight to the Goodwill with them."

Ah, how times have changed! We can thank chemical engineering, using an early alias of "applied physical chemistry", for the current attitude that the drudgery that was ironing is just so last century. Even if you consider no-iron clothing a trivial technological advancement, the consequences of the inventions are impressive: the same polymer engineering that vanquished wrinkles led to advances in flame-retardant and stain-resistant fabrics, improved laboratory glassware, and "active" wound dressings, as well as reviving, in the 1970's, the seriously flagging cotton industry, a major economic sector in the southern US.

The War on Wrinkles has ancient, cross-cultural roots. The Romans, with their pleated garments, must have eliminated unwanted wrinkles and reinforced the desired ones along the pleats, but the details of the techniques are elusive. Whalebone smoothing boards and smoothing stones have been found among ninth-century Viking grave goods. Numerous 19th-century patents for clothes stretchers and hangers, improved irons, and other pressing paraphernalia promised to ease the burdens of inherently wrinkled fabric.

FIGURE 1 ONE OF MANY WAYS TO SPEED UP THE TEDIOUS IRONING PROCESS WAS TO ALWAYS HAVE AN IRON ON THE FIRE, READY TO USE, WHEN THE ONE IN USE COOLED OFF. [PHOTO BY KUERSCHNER, 2008 VIA WIKIMEDIA COMMONS]

Clearly, throughout human history, considerable time and vigilance have been necessary to combat wrinkles. As good engineers, we can estimate the minimum time spent on personal ironing before

wrinkle-free fabrics. Assuming simple garments, without ruffles or other hard-to-press features, and a modern electric iron (which heats up quickly and eliminates reheating delays between garments, unlike the older irons in Figure 1), it takes about 7 minutes of actual ironing time per garment. That means each simple change of clothes (a shirt and pair of pants or simple skirt) would require at least 14 minutes at the ironing board. For a family of four, this means nearly an hour of ironing every time the family changed clothes.

The ironing itself was not the only time-consuming task necessary for conquering wrinkles, though. Clothes did not go straight from the washer to the dryer and then to the ironing board. Clean laundry would have been starched, hung out to dry, and then, to achieve a uniform dampness for good ironing, sprinkled, rolled, and stored for several hours in a cool place to await ironing. No wonder clothes were worn longer between washings than today and detachable collars and cuffs were popular!

Nor was the ironing effort limited to clothing. The sheer quantity of textiles we use has always made caring for them a daunting task. Well into the last century, households were filled with shirts, skirts, trousers, bedclothes, undergarments, draperies, household linens, and even neckties and cravats, which were all ironed after each laundering.

A key player in the successful anti-wrinkle cotton campaign was Dr. Ruth Mary Rogan Benerito (January 12, 1916 - October 5, 2013), a physical chemist by training, whose early research successes included applying her colloidal chemistry expertise to develop absorbable intravenous nutritional supplements that saved the lives of many seriously wounded servicemen in the Korean War. Benerito, whom the New York Times eulogized as the person “who made cotton cloth behave”, called herself a chemist, but her career looks like that of a highly successful R&D chemical engineer of today. She was co-inventor on over 50 patents, a dedicated teacher, and an enthusiastic and talented researcher who understood the importance of solving practical problems.

Supporting King Cotton was a serious practical and economic problem in the middle of the 20th century. Synthetics like polyester were cutting deeply into cotton textile markets. Cotton was breathable, lightweight, and comfortable, but polyester was easy: wash-and-wear, wrinkle-free, stain-resistant and available in the unfading Psychedelic Paisley Palette so popular after *Yellow Submarine*. Cotton sales faltered; cotton’s share of the retail market plummeted by half as the cheap, easy-care synthetics took off in the 60’s and 70’s. Yet cotton was still a major economic product in the South. Taming the wrinkles was the remedy and the research was well-funded.

Early methods to battle wrinkles were surface treatments. In 1824, Shakers in Maine made wrinkle- and water-resistant cloth by applying heat and pressure to wool or cotton in contact with paper treated with zinc chloride. Early 20th century surface treatments such as urea-formaldehyde

resins and melamine-formaldehyde condensates worked to some degree, but often introduced additional problems, like yellowed, embrittled, or weakened fabrics, and formaldehyde residues.

Dr. Benerito's contributions began in the 1950s. She recognized that cotton is primarily a cellulosic polymer, so she and her team of researchers focused on cross-linking the cellulose molecules, analogous to the processes used for curling hair with "permanents" and for vulcanizing rubber. The cross-linking process lends itself to the introduction of functional organic constituents along the polymer backbone, as well; hence, the later developments, like flame-retardant and stain-resistant clothing, are direct consequences of taming wrinkles with cross-linked cotton fabrics. Incorporating other functional groups is leading to even more technology advances, including bandages tailored to help clotting or to heal wounds more cleanly and quickly.

So, thanks to chemical engineering, ironing is all but extinct. And what about my new grey pants? My hostess was right: ironing is passé. I hung them in the steam while I showered. They came out just fine.

ATTENDING A VLS MEETING

Go to http://fuze.me/26627658 and follow directions. (The "name" requested would be the name displayed to other meeting participants.)

- For audio only: (If prompted, enter the meeting number: 24120303, then press #)
  - From a browser, select the internet audio option after joining.
  - From a phone:
    - US: +1 201 479 4595 or +1 855 346 3893
    - International access numbers https://www.fuzebox.com/extras/symphony
- Having problems? Follow the meeting link from our website virtual.aiche.org
- Need more help? You can connect to the Customer Support Team or access self-help tools at www.fuzebox.com/support.

Attendance at a Virtual Section Meeting is open to AIChE Virtual Local Section Members, AIChE members and other interested people.