

The Chemical Bulletin

A publication of the Chicago Section of the American Chemical Society



ACS Local Section
Chicago

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CHICAGO ACS - CHICAGO AICHE JOINT VIRTUAL MEETING

THURSDAY, JANUARY 14, 2021

7:00 - 8:30 PM

Register online at chicagoacs.org to receive meeting link



RICHARD G. RATEICK, JR.
Owner, REXP2 Research LLC

"INTERESTING
TOPICS
IN 19TH
CENTURY
IRON AND
STEEL
MAKING"



ABSTRACT: The 19th century was a time of great change in iron and steel making. Massive productivity improvements in iron making occurred starting early in the century with the invention of the hot air blast for the smelting of iron in the blast furnace. By mid-century, steel moved from being a luxury item, made manually and arduously in puddling furnaces, to becoming a commodity by way of invention of the Bessemer converter and the Siemens-Martin or open hearth furnace. These technologies resulted in the building of great industrial empires. In this talk, I will use historical drawings and photographs to present this fascinating and sometimes sordid history along with the chemistry which added science to the art.

ACS SECTION JOINT MEETING WITH THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

PROGRAM AGENDA

THURSDAY, JANUARY 14, 2021

7:00 - 7:15 pm	Announcements Welcome in the New Year Welcome to our joint meeting partners AIChE welcome
7:15 - 8:15 pm	Rick Rateick – “Interesting Topics in 19th Century Iron and Steel Making”
8:15 - 8:30 pm	Time for Questions



McIntyre Blast Furnace (Tahawus, NY)

SPEAKER BIOGRAPHY: Richard G. Rateick, Jr., PE is a registered engineer in Indiana. He graduated from Valparaiso University with a Bachelor of Science Degree in Mechanical Engineering with a second major in Chemistry, and then from The University of Notre Dame with a Master of Materials Science and Engineering. He performed materials R&D at Honeywell Aerospace for 33 years. Now he owns REXP2 Research LLC, a consulting and R&D firm, and is an Adjunct Assistant Research Professor at the University of Illinois at Urbana-Champaign. His professional interests are in the mechanical, corrosion, and tribological properties of metals, ceramics and carbon-carbon composites. He holds 15 patents and has authored or coauthored 46 papers in the peer-reviewed literature.

MONTHLY MEETING PROGRAMS ON VIDEO

Videos of recent presentations can be accessed at the Chicago ACS Section website [chicagoacs.org / Events / [Videos of Past Meetings](#)] or by going directly to <https://www.chicagoacs.net/videos/index.html>. The section's archive home page (<https://www.chicagoacs.net/>) can also get you to the list. Professor Bruce Fouke's December 10 outstanding presentation on biomineralization will be available soon. Thanks to Milt Levenberg for working out the video technology.

2020 PROGRAMS AVAILABLE ONLINE

2020 PROGRAMS AVAILABLE ONLINE		
May	Sean Casten	A Conversation with a U.S. Representative (audio only)
June	Dwight Chasar	Chemistry is for the Birds
September	Sherri Rukes	Poly What? Applications of STEM Using Polymers
	Josh Kurutz	125 Years of Chemistry in Chicago
October	Darryl Boyd	Introducing STEM for Elementary-Aged Children
November	Zhenan Bao	Skin-Inspired Electronics
December	Bruce Fouke	Universal Biomineralization

FUTURE PROGRAM MEETINGS WINTER / SPRING 2021*

Thursday, February 11
Friday, March 12
Friday, April 23
Friday, May 21
Friday, June 18

* Check chicagoacs.org for the most up to date information

A "SAFETY FIRST!" MINUTE

What is Safety First?

This article marks the start of the third year of the *Safety First* initiative for the ACS Chicago Section. In January 2019 the Chicago Section adopted the best practice of "starting with safety," beginning meetings with brief safety moment presentations or discussions led by the Environmental and Lab Safety Committee. The resulting *Safety First* reports are also published monthly in *The Chemical Bulletin*. The goal of *Safety First* is to model awareness of safety at the forefront of section activities and embed that awareness within the culture of chemistry.

Health and safety concerns continue, of course, to be uppermost in our minds as the coronavirus pandemic maintains its unprecedented grip on society. *Safety First* is not a catchphrase—it is an acknowledgment that effective decision-making relies on a thorough and balanced understanding of hazard and risk. This is true in the lab, at home, in our workplaces, and for our communities. Throughout 2020 the ACS has served its members and society at large by ensuring free and open access to its scientific information and reports

concerning COVID-19. As we await with hope the promise of vaccines to help end the pandemic, let us continue to work together to raise awareness of chemical, health, and environmental safety. Some of the COVID topics we discussed in *The Chemical Bulletin* in 2020 include the properties of disinfectants used for hand sanitization and surface disinfection, the effectiveness of face coverings and masks in controlling asymptomatic infection, and how ventilation can reduce or prevent airborne transmission of viruses and disease.

Safety moments are a recognized best practice across the chemistry landscape. Members of the Chicago Section are invited to suggest topics for future *Safety First* reports based on their personal interests or questions. Topics may deal with any aspect of chemical, environmental, and lab safety, or be of general public interest. What do you want to hear more about in 2021—we welcome your ideas and suggestions. Thank you for your continued support!

Submitted by Irene Cesa



ALL K-12 EDUCATORS can receive Continuing Professional Development Units (CPDUs) for attending our Monthly Meetings. Register for the meeting as a "CPE" or "CPDU" attendee at chicagoacs.org



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Letter from the Chair

Hello 2021 and Happy New Year!! I know many of us would like to forget 2020. But as an organization there is so much to be thankful for and pleased about. Under the leadership of Paul Brandt, we overcame the challenges of the pandemic and succeeded in many ways. We owe a big THANK YOU to Paul Brandt for his leadership last year. He has been such an inspiration and I hope to continue in his footsteps.

It is such a gift to be able to serve in this capacity for an amazing organization. Since joining the board, the Chicago Section has become an especially important part of my chemistry world. I am continuously reminded of the ways the Chicago Section weaves its mission into all aspects of our everyday lives. I have been impressed with how well it operates, and the great programming put forth by the group to serve the Greater Chicagoland and Northwest Indiana area. It is my intent to continue that great tradition.

If you too want to be more involved, here are some ways you can be a part of this wonderful organization:

- **VOLUNTEER:** We have many ways to get involved. You can create videos for educators, volunteer at outreach events, participate on committees – such as the Education, Younger Chemists, Women Chemists, Senior Chemists, Awards, and Programming committees – just to name a few.
- Check out our website and see all the wonderful **OPPORTUNITIES** for our members. The YCC has created amazing programming in the past. New ideas are in the works, such as social events and science cafes.
- Please consider making a donation to **PROJECT SEED**. It is a wonderful program to give underprivileged high school students a pathway to do research and potentially receive scholarships based on their research.

- Bring yourself and your friends to our upcoming **MONTHLY EVENING MEETINGS**. For now, they will still be virtual. But sometime in the future, we will meet in person once again.
- Share your passion for chemistry with someone. It is so inspiring to show youth and the community how chemistry touches our lives in so many ways.



I believe a leader needs to show empathy and compassion, have vision, and be transparent. I look forward to rising to this occasion and leading the organization with a fresh pair of eyes. There are four goals I would like to champion during my tenure as chair. The 1st is to continue and expand the section's science outreach activities. The 2nd is to increase participation of the section's membership at outreach activities and section functions. The 3rd goal is to think outside the box and create programming and opportunities to grow the section, build bridges between K–12 education and industry, as well as become partners with the community. Through successful execution of those first three goals, the 4th goal is to successfully land a ChemLuminary Award from the American Chemical Society (ACS), in recognition of our Chapter's efforts in spreading the joys of chemistry to our members and the community.

As we enter the new program year, I encourage anyone wishing to provide feedback, suggestions, or simply to learn more about the Chicago Section to contact me at chair@chicagoacs.org. Thank you for your involvement, interest, leadership, and support of the Chicago Section's mission and vision.

I look forward to serving you in the coming year. I look forward to meeting you all. And I look forward to having a wonderful year as your section's Chair. Here's to seeing you virtually, and one day soon in person, in 2021!

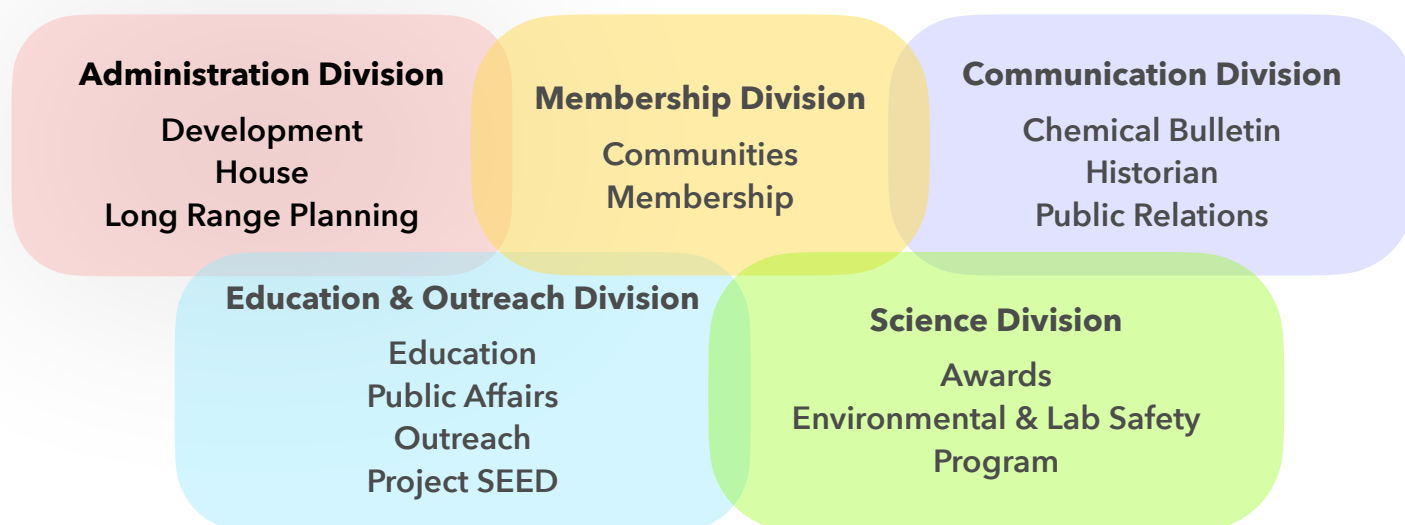
Sherri C. Rukes

Officers

Chair	Sherri Rukes	chair@chicagoacs.org
Vice Chair	Michael Koehler	vice-chair@chicagoacs.org
Chair-Elect	Mark Cesa	chair-elect@chicagoacs.org
Secretary	Aleks Baranczak	secretary@chicagoacs.org
Past Chair	Paul Brandt	past-chair@chicagoacs.org
Treasurer	Jason Romero	treasurer@chicagoacs.org

For additional information see:<https://chicagoacs.org/board.php><https://chicagoacs.org/Committees><https://chicagoacs.org/Volunteer>

After several meetings of the Strategic Planning ad hoc Committee, the organizational structure of the section now has a new look. Many thanks to the team for taking the time to come up with the modified structure. The restructuring serves the purpose of allowing more collaboration and communication among the various committees. In reality, the work of many of the committees intertwines and, instead of being separate silos, they will now be set up for more effective collaboration. In the next few months we will be spotlighting the various committees within the various divisions under the new structure and talk about the many opportunities that are possible. We hope our members will consider joining a committee and lending their talents to make our section even better.



SECTION CONTACT INFORMATION: The following email addresses corresponding to committee roles should be appended with: chicagoacs.org (e.g., a-v-support@chicagoacs.org)

Elected Officials

chair@
chair-elect@
past-chair@
vice-chair@
secretary@
treasurer@
directors@
councilors@
altcouncilors@

Finance

budget@
comptroller@
trustees@

Communication Division

coordinator-communication@
editor@
historian@
pr@

news@
social@
web@

Membership Division

coordinator-member@
communities@
minority@

seniors@
wcc@
ycc@
membership@
jobs@
nominations@

Education & Outreach Division

coordinator-education@
education@
aact@
collegeed@
continuing-ed@

cps@
k12@
publicaffairs@
outreach@
community@
statefair@
seed@

Science Division

coordinator-science@
awards@
hs-teaching@
stieglitz@
safety@

program@
glrm@

Administrative Division

coordinator-admin@
development@
house@
a-v-support@
gibbsarr@
hospitality@
office@
programarrangements@
lrp@
policy-bylaws@

Teacher Kit Information & Updates

The Chicago ACS Section has 50 K - 12 educator experiment kits. These kits will have supplies and instructions for teachers to use in their classroom. Please fill out the [linked form](#) to sign up to receive a kit. Kits will be available in late January / early February at several locations. Videos about the activities will be linked on the website for teachers to be able to understand the 'how' and 'why' about an activity.

There are over 12 experiments that can be performed multiple times. Topics with this kit include:

- STOICHIOMETRY •
- INTERMOLECULAR FORCES - MAKING A LAVA LAMP •
- GAS PROPERTIES AND LAWS - GROWING MARSHMALLOW, INFLATING A BALLOON, FIRE EXTINGUISHER •
- DENSITY • CRYSTAL FORMATIONS • SOLUTIONS •
- TYPES OF COMPOUNDS •
- STATES OF MATTER AND PROPERTIES OF MATTER •

More kits will be available throughout the year for teachers to do demonstrations and labs with their students. Please stay tuned for more information about the forthcoming kit, which is tentatively scheduled to be out in late March / early April.

FOLLOW US ON:

<https://www.instagram.com/ChicagoACS/>

<https://www.facebook.com/ChicagoACS/>

<https://twitter.com/ChicagoACS>

Bulletin Information

JANUARY 2021, Vol. 108, No. 1

Published by the Chicago Section of the American Chemical Society, monthly, September - June (10 issues)

Editor: Margaret E. Schott, editor@chicagoacs.org

Online version: Josh Kurutz

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Updates from Your ACS Local Section

◆ **Spring National Meeting (April 5-16, 2021)** – The abstract submission period is December 16, 2020 to January 19, 2021. New lower fees for the online meeting include: ACS Members, \$99 • non-members, \$149 • students and high school teachers, \$29 • members who are unemployed or retired and 50-year members attend at no cost. The all-online program will include 10 weekdays of live sessions, followed by two weeks of on-demand content. This format will allow for a maximum amount of science to be shared with the widest possible audience. For more information see the [FAQ page](#) on the meeting website.

◆ **December Program Recap** – The last program for 2020 took place virtually on December 10 with an outstanding presentation on biomineralization by Professor Bruce Fouke (UIUC). Participants were treated to a geologist’s-eye view of hot springs, microbes, and mineral formations in Yellowstone National Park. Dr. Fouke also discussed his interdisciplinary work on coral formation, the mineralization of kidney stones and his work with the Mayo Clinic in Minnesota. For more information see <https://geobiology.web.illinois.edu> and especially the short video called “Yellowstone Overview Full Version”. Highly recommended!

◆ **Grant Funding for Outreach** – Congratulations to Sherri Rukes and Ken Fivizzani, who wrote grant proposals and received funding from ACS for new initiatives. Sherri’s project is for the creation of teacher kits to foster enhanced relationships between AACT (K-12) members and ACS. See page 5 for more information and how to get involved. The project is supported by the Innovative Projects Grant initiative.

Ken’s project was funded by the ACS Senior Chemists Committee Mini-Grant for Local Sections. The proposal call was for “an event or activity that will increase the engagement of senior members and encourage innovative activities that will benefit the local community, schools, or legislative government.” The grant proposed one or more sessions with senior chemists together with younger chemists (and also women chemists) to share ideas and concerns about broader issues relating to

chemistry careers. Ken has developed a series of questions as discussion starters, for example, *What is the most rewarding thing you have done in your career? What was the most fun? What do you want to do in your career? What have you learned about yourself that will influence your career?* Ideally, these sessions would be held prior to the dinner at our “dinner meetings” once they can be resumed.

◆ **Section Bylaws** – Last month the committee received approval of the updated bylaws from the ACS National office. This is the last step in what has been a lengthy process, led by chair Russ Johnson.

◆ **Quasiquicentennial** – This multisyllabic word represents a long way of saying that during 2020 our Section celebrated the 125th anniversary of its founding in 1895. We stand on the shoulders of giants – namely, the section’s membership and its many leaders over these twelve and a half decades. For a look at some historical highlights see Josh Kurutz’s video presentation (page 2).

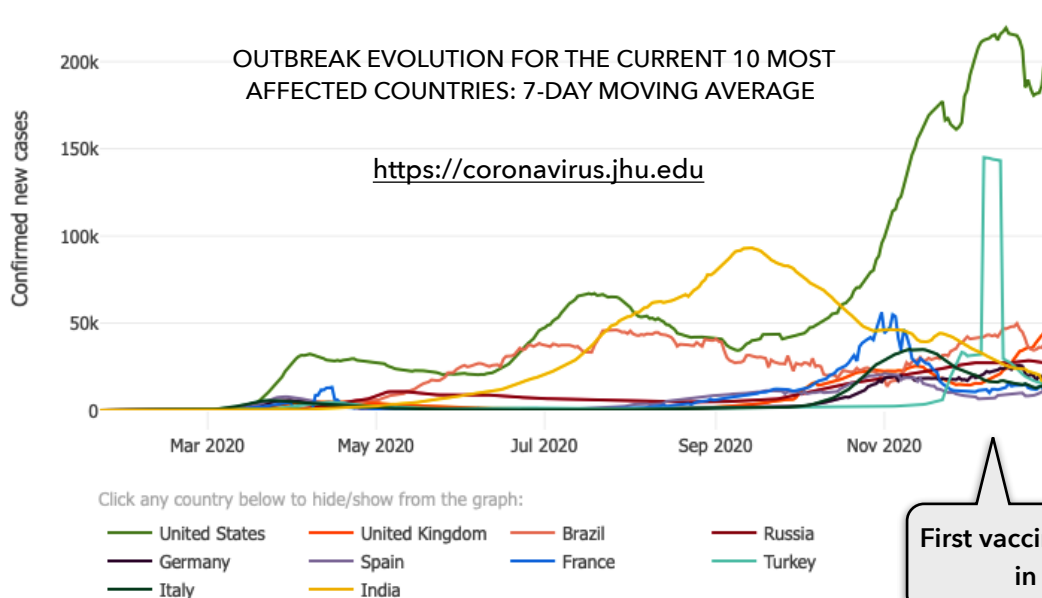
◆ **Younger Chemists Committee** – The Chicago Section’s YCC held the last event of their fall professional development series on November 10. Dr. Matthew Grandbois, chair-elect of the ACS Division of Business Development & Management and immediate past-chair of the National ACS Younger Chemists Committee, led a workshop on building and leveraging strong interpersonal relationships with supervisors, mentors, and sponsors for personal growth and professional advancement. This collaborative event also included participation by the St. Louis and Nashville YCCs. The eleven attendees were students/postdocs and early career industrial chemists. Dr Grandbois gave an outstanding talk on stakeholder analysis, establishing a Professional Development Attitude, and creating honest and authentic relationships with higher-ups to help advance one’s career.

The YCC had a great year of programming in 2020!

In addition to the above-mentioned program, the committee joined forces with the Women Chemists Committee to put on a career panel and was able to connect with many extraordinary chemists – both locally and across the US. The YCC coordinating team (Katie Gesmundo, Jana Markley, Katie Moga) is excited to continue cultivating a welcoming, diverse, and interactive community of young chemists in the Chicago area.

State of the COVID-19 Pandemic

DATA AS OF JAN 1, 2021

Global Confirmed
83,689,541Global Deaths
1,822,467U.S. Confirmed
19,995,070U.S. Deaths
346,043

First vaccine (Pfizer) administered
in early December

The mission of the Chicago Section of the ACS is to advance the chemical sciences and their practitioners for the benefit of Earth and its people

UPCOMING EVENTS

For information on future meetings and events please refer to the Section's website chicagoacs.org, Social Media, and future bulletin issues.

January 19, 2021 - Deadline to submit abstracts for the ACS Spring National Meeting

April 5 - 16, 2021 - ACS Spring National Meeting (virtual): 2nd Century of Macromolecular Chemistry

June 6 - 9, 2021 - Great Lakes Regional Meeting (GLRM) - Minneapolis, MN (dates are tentative)

June 14 - 16, 2021 - 25th Annual Green Chemistry & Engineering Conference - "Sustainable Production to Advance the Circular Economy"

August 22 - 26, 2021 - ACS Fall National Meeting: Resilience of Chemistry

CURIOUS ABOUT OTHER EVENT RESOURCES? CHECK OUT:

- American Institute of Chemical Engineers (AIChE) <https://www.aiche.org>
- Illinois Science Council: <https://www.illinoisscience.org> and subscribe to emails

JAWSCHEM = Just Another (Chemistry) Webinar Series

JAWSCHEM is a brand-new chemistry seminar series designed to give a platform to **YOUNG RESEARCHERS** from all walks of life to share their work. One of the series' founders is Dr. Craig Fraser, currently a postdoc at Northwestern University. Sign up to submit an abstract!

<https://jawschem.wixsite.com/home/about-us>

Did You Mean Wolcott Gibbs? No, Willard!

Yale had in Willard Gibbs one of the very greatest mathematical physicists of his generation. He was born in New Haven: his father was a professor at Yale. He himself was first a student, then a Tutor, and, from 1871 to his death in 1903, a Professor in that university. I do not know of any case of a more intimate connection between a man and a university. It was long, however, before his university recognised that he was a great man. He had not been a success as a teacher of elementary [undergraduate] students. Indeed it is said that there was at one time a movement to replace him. A prophet is, however, not without honour save in his own country, and Clerk Maxwell in 1876 called attention to the vital importance of Gibbs' work. Maxwell was so impressed with it that he constructed with his own hands a model of Gibbs' thermodynamic surface and sent a copy of it to Gibbs. The original is now in the Cavendish Laboratory. In 1901 the Royal Society of London awarded him the Copley Medal, the highest honour it is in their power to bestow: then at last Yale realised how great he was. It should be in justice be

said that his papers are by no means easy reading and would hardly be intelligible to those who were not experts in the subject. I had myself personal experience of how little his work was known in his own country. When a new University was founded in 1887 the newly elected President came over to Europe to find Professors. He came to Cambridge and asked me if I could tell him of anyone who would make a good Professor of Molecular Physics. I said, "You need not come to England for that; the best man you could get is an American, Willard Gibbs". "Oh," he said, "you mean Wolcott Gibbs," mentioning a prominent American chemist.* "No, I don't," I said, "I mean Willard Gibbs," and I told him something about Gibbs' work. He sat thinking for a minute or two and then said, "I'd like you to give me another name. Willard Gibbs can't be a man of much personal magnetism or I should have heard of him."

Excerpted from Recollections and Reflections by J. J. Thomson (1936) Macmillan, Toronto, pp 184-186.

* Oliver Wolcott Gibbs (1822-1908) was an American chemist and a charter member of the National Academy of Sciences. He is known for performing the first electrogravimetric analyses, namely the reductions of copper and nickel ions to their respective metals. N.B. - Your editor came across this paragraph by J. J. Thomson while doing some research on early women researchers working with Ernest Rutherford at The Cavendish Laboratory.

From the Editor's Desk



Dear Readers,

For many of us the dawn of a new year represents a time of promise and new possibilities, a time to renew hopes and dreams and perhaps set goals. Now, as we enter the new year called *anno domini* 2021, there is both the promise of new beginnings and more than a tinge of sadness about family members, friends and colleagues who are ill or have passed away during the pandemic. It seems ironic that, for a political administration not especially tuned in to science and its technological benefits, a science-based solution has emerged in the form of vaccines to slow or thwart the spread of the new coronavirus.

Despite the challenges of the past year, the Chicago Section continued to put into practice its mission of advancing and advocating for "the chemical sciences and their practitioners for the benefit of Earth and its people." We have much to be proud of – and to be grateful for. Section members continued to teach chemistry, conduct research, engage in meetings, and come up with new ways to communicate science to the wider community. Practically without skipping a beat, our membership continued its monthly program meetings and reached wider audiences in the process. With Chair Paul Brandt at the helm, we made the most of our 125th year as an ACS Local Section, despite the lack of an opportunity to raise a glass of champagne together.



For their contributions to this issue. I would like to thank Sherri Rukes, Josh Kurutz, Milt Levenberg, Richard Rateick, Jr., Irene Cesa, J. J. Thomson, Andrea Twiss-Brooks and the member-volunteers working on our multifaceted communications technology.

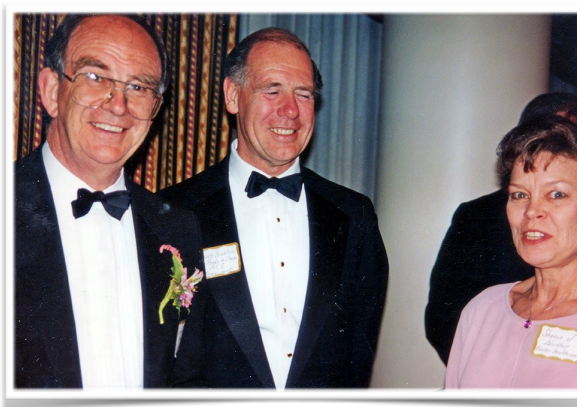
Thanks for reading, and Happy New Year! ~ ~ M. E. S. ~ ~

Obituary: Dr. Sharon J. Northup (1942 - 2020)

Dr. Sharon J. Northup (nee Carlson), MBA, DABT; of Northbrook, Illinois, passed away on October 25th, 2020 at the age of 77 years. Northup twice served as Chair of the Chicago Section of the American Chemical Society, in 1994-95 and 2000-01. A Diplomate of the American Board of Toxicology, one can get a sense for her work from her 2005 Topical Group presentation "[Ensuring the Safety of Pharmaceutical Products](#)". She earned her PhD in Chemistry from the University of Missouri and her MBA from University of Chicago. Prior to her independent consultancy, she was a scientist for the R&D Division of Baxter Healthcare.



LEFT: Northup (rightmost) at the 1994 Chemistry Day event with colleagues including Richard Cornell (2nd from R), Adele Rozek (2nd from L).



RIGHT: Northup (R), serving as Chair at the 1995 Willard Gibbs Medal ceremony honoring Sir John Thomas Muerig (L), with 1995 ACS President Dr. Brian Rushton.

LEFT: Northup (R) presenting a member her certificate for 50 years of ACS service, with Section Chair [Dr. Cherylnavagh Bradley](#)



RIGHT: Northup (C) attending the 1997 Willard Gibbs Medal Ceremony, with 1998-99 Section Chair Margaret Levenberg (R).



Counting each Chicago Section office and concurrent committee chair position separately, she logged a remarkable 61 years of service. In addition to her years as Chair/Chair-Elect/Past-Chair, she served seven years as Trustee (2004-10), ten years as Director, fifteen years as Alternate Councilor, three years as Treasurer and one term as Secretary. At various times, she was Chair of different committees, including House, Bylaws, Gibbs Arrangements, National Affairs, Awards, Distinguished Service Award, Hospitality, Nominating, Policy, and Tellers. She also advertised her consulting services in the [Chemical Bulletin](#).

She was preceded in death by her husband, William C. Northup and her sister, Cheryl Abraham. She is survived by her siblings Janet Shreve, Gladys Tapia, Kenneth Carlson and David Carlson, nieces and nephew, Elizabeth Carlson, Anna Macdonald, and Laurence Shreve and stepchildren Ren Willis and Richard Northup. Northup was a long-time resident of the north shore suburbs of Chicago, but she never forgot her roots on a farm in Union, Missouri. All are invited to make donations to the [Alzheimer's Association](#) or the food pantry of your choice. For more information, please contact Kelley & Spalding Funeral Home, 847-831-4260 or www.kelleyspaldingfuneralhome.com.