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The Chemical Bulletin

A publication of the Chicago Section of the American Chemical Society

ACS Local Section Chicago

In This Issue

ACS Chicago Section Office

Address: 1400 Renaissance Drive Suite 312, Park Ridge, IL 60068

(847) 391-9091

chicagoacs@ameritech.net

CHICAGO ACS SECTION VIRTUAL MEETING

Friday, October 16, 2020

7:00–7:05 PM Announcements & Introduction

7:05–8:00 PM Presentation by Dr. Boyd

Please register online at chicagoacs.org to receive meeting link

"Introducing STEM to Elementary-Aged Children"

Dr. Darryl A. Boyd

Research Chemist – US Naval Research Laboratory

Founder – Science Made Simple, LLC

ABSTRACT: An active focus on STEM outreach has become common in the past decade, as issues such as health crises and environmental preservation have captured the attention of many people. Therefore, introducing STEM education to youths in a fun and engaging way is crucial for the future of our planet. In this presentation, Dr. Boyd will discuss some of the ways in which he engages youths to take interest in science. He will also discuss what he believes are some of the best practices STEM educators can take while introducing STEM to children.

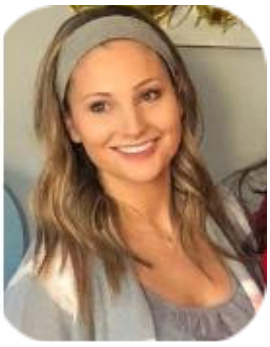
SPEAKER BIOGRAPHY: Dr. Darryl Boyd is a Research Chemist at the US Naval Research Lab in Washington, DC, whose primary work focuses on developing sulfur-based optical polymers. He was a member of the Chemical & Engineering News 2018 "Talented 12" class, and was recently recognized by Purdue University's College of Science as a Distinguished Alumni for his research accomplishments. He is the founder of "Science Made Simple LLC," a company through which he performs science outreach throughout the country. He is an active member of ACS, and the National Organization of Black Chemists & Chemical Engineers, and is currently serving as the President of the Chemical Society of Washington. Finally, he and his wife are the proud parents of an 11-month-old baby girl.

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

FRIDAY NOVEMBER 13, 2020 – VIRTUAL SECTION MEETING

The 2020 Gibbs Medal talk and award presentation, originally scheduled for May, will take place at the November meeting. **Gibbs Awardee Professor Zhenan Bao** of Stanford University will present a virtual lecture on "Skin-Inspired Electronics".

Rachael Swiercz Wins Teacher Excellence Award



The Chicago Section congratulates Rachael Swiercz of Niles West High School on being selected winner of the 2020 Teacher Excellence Award. Rachael is being recognized by the Section for her overall excellence in teaching high school students and, in particular, for her work on a research-oriented chemistry course. "I am extremely grateful to be recognized by the ACS," said Mrs. Swiercz on learning of the award. "It is a great honor and a humbling experience."

The purpose of the award, which is given annually, is to recognize, encourage and stimulate outstanding teachers of high school chemistry/chemical science in the Section's geographical area. Swiercz will receive a $1,000 award, a certificate and one-year membership in the American Association of Chemistry Teachers.

The courses taught by Mrs. Swiercz, who has been at Niles West for seven years, include Honors Chemistry and STEM Inquiry and Research (SIRS). For the Honors Chemistry course, "topics are covered in great depth with high achievement standards," according to her website. "Laboratory work constitutes an integral and important part of the course objectives." For the SIRS course, students work on independent research projects, thus providing them with "the opportunity to participate in the community of scientific research and scholarship." She also supports students involved in research by serving as the Illinois Junior Academy of Science coordinator.

When asked if she has any wisdom to share with others out of her experience, Rachael offers the following:

- "Students have taught me that providing them the ability to make choices and take ownership of their education can produce incredible connections, experiences, and deeper learning."
- Mrs. Swiercz advises her students to stay positive and to "do your part and practice." After all, "CHEM - IS - TRY!"
- "A piece of advice I would pass on to a new teacher is that it is okay to not have all the answers. It is powerful to show your students that true learning is not just about gaining knowledge, but also about being curious and willing to change and grow. Exploring ideas as a class, searching for answers, and making connections is an enriching way to learn."

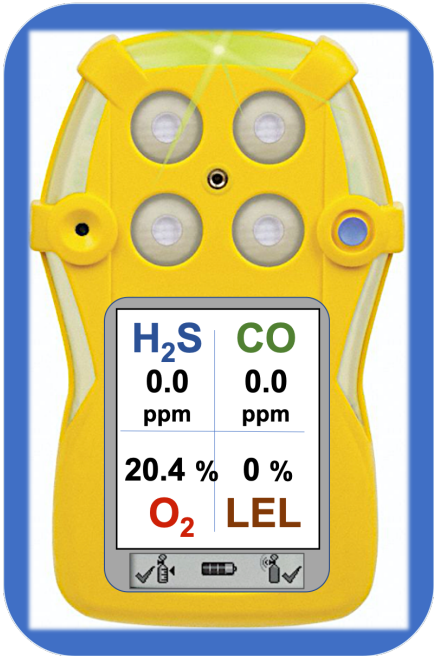
Margaret E. Schott

EVALUATING GAS HAZARDS

A "SAFETY FIRST!" MINUTE

THIS MONTH'S SAFETY FIRST! MINUTE is inspired by my curiosity and, full disclosure, ignorance, concerning a basic element of emergency response to accidents involving chemicals and hazardous materials (hazmat). News reports released in the immediate aftermath of hazmat incidents often include a statement such as "no hazardous gases were detected" in the vicinity. This always piques my curiosity. No hazardous gases? Really, none? How do they know? Or better, what do they know?

The most common instrument used to detect gases in fire or other emergency situations is a so-called "four-gas meter." Four-gas meters are rugged yet lightweight, portable devices that measure and simultaneously display the amounts of oxygen, carbon monoxide, and hydrogen sulfide, as well as combustible gases, in the environment. Gas meters typically also have built-in alarms to alert emergency personnel to dangerous levels of these gases that may be harmful to their health or pose an explosion hazard. Given the small size of these hand-held instruments, it's impressive how much sophisticated analytical chemistry is packed into them. A typical four-gas meter incorporates semiconductor technology to measure oxygen, electrochemical sensors for carbon monoxide and hydrogen sulfide, respectively, and a catalytic combustion detector for the amount of "LEL."



The LEL, or lower explosive limit display, is non-specific, a stand-in that may account for the presence of any combustible gas or solvent vapor. Pentane is commonly used as the reference for calibration of the LEL measurement, which is reported in units of percent LEL. A display reading of 10% LEL, for example, would correspond to a pentane concentration in air of 0.14% by volume, since the LEL for pentane is 1.4%. This is also generally the action level that will trigger an alarm, providing adequate time and warning for firefighters to assess the situation and take appropriate actions to protect personnel and the environment.

Widely available upgrades to four-gas meters include the addition of photoionization detectors (PIDs) to sense volatile organic compounds (VOC) and/or sulfur dioxide in five- and six-gas meters. Most multi-gas meters have slots for the insertion of interchangeable sensors, increasing both their versatility and specificity for use in diverse emergency response situations. Finally, gas meters are also customizable, allowing for the detection of single gases in various manufacturing or other commercial settings, including the petrochemical and mining industries, wastewater treatment facilities, and landfill management. At least 40 different gases can be monitored in this way.

What are you curious about when it comes to chemical and laboratory safety? Are there things you feel you should know, but don't, and are reticent to bring up or ask about, because you feel that, surely, everyone else already knows it? **Safety First!** requires that we acknowledge what we don't know and also recognize that we have not only the right but, truly, a responsibility, to ask questions when we don't understand something. Please submit topics and questions for future **Safety First!** discussions at our monthly meetings and in *The Chemical Bulletin*. To paraphrase an old adage, "If you see something, ask something!"

Submitted by Irene Cesa

As I write this (mid-September), at the college level, we have been back in school now for four weeks and are fortunate that our students have been present in person and there have been very few setbacks. Everyone is masking and we have already surpassed the expectations of most people in continuing to meet face-to-face. I do find it very difficult to put names to faces, though, since I can't see half of their face and it seems to be a much lonelier time than usual on the campus. Nonetheless, we do what we can to make things seem as normal as possible.

For those of you who are non-academicians, I presume even you have found the fall to be different than usual (particularly if you have kids who may or may not be attending school in person). If you have kids who are at home, my condolences on trying to manage that.

October brings excitement for National Chemistry Week. Sherri Rukes has arranged for a number of things through an Innovative Project Grant that she and the Section were awarded from the national ACS. Sherri would love to get your help in connecting with the teachers and students. I noticed that my kids' elementary teachers were often afraid of teaching science because they themselves felt uncomfortable with the material, and there is nothing worse than teaching a topic that you don't know very well. The teachers have it difficult in that they are responsible for knowing so many different science topics, and so Sherri is making some simple kits available so that they can bring them into the classroom, either in person or virtually. However, the teachers may need help and this is where you come in. If you could help by showing the teachers how this science-related material works, that would be of great benefit. It could be through a video or in person.

Let Sherri know if you can lend a hand at chair-elect@chicagoacs.org.

Although September is usually when we celebrate Education we have an outstanding individual to come in and talk about STEM for elementary children. Dr. Boyd is a nationally established chemist working at the US Naval Research Lab in DC and was in the 2018 "Talented 12" class put out by *C&ENews*. Check out his videos for kids at https://www.drboydthechemist.com/videos.html. I look forward to his insights on how we can improve elementary level education in STEM. I hope you can join us on October 16 for this talk.

Please remain safe and healthy.

Paul Brandt

2020 Chicago Section Officers

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Vice Chair	Josh Kurutz	vice-chair@chicagoacs.org
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Secretary	Tanya Ivushkina	secretary@chicagoacs.org
Past Chair	Tim Marin	past-chair@chicagoacs.org
Treasurer	Andrea Twiss-Brooks	treasurer@chicagoacs.org

* * * Election Slate for 2021 Officers * * *

Chair-Elect	Mark Cesa, Andrea Twiss-Brooks
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Councilors	Paul Brandt, Russ Johnson, Mike Koehler, Fran Kravitz
Alternate Councilors	Mark Cesa, Avrom Litin, Sherri Rukes, Becky Sanders

Bulletin Information

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ACS Chicago Section Office
Address: 1400 Renaissance Drive, Suite 312, Park Ridge, IL 60068
(847) 391-9091

Report of ACS Council Meeting held on August 19, 2020

The 260th National Meeting of the ACS was held virtually, August 16 – 20, 2020. The theme of this meeting was "Moving Chemistry from Bench to Market." Dr. H. N. Chang, ACS President-Elect, presided over the Council Meeting. The Chicago Section was represented at Council by the following eight councilors: Paul Brandt (Public Relations and Communications), David Crumrine (Constitution and Bylaws), Ken Fivizzani (Community Activities), Russell Johnson (International Activities), Fran Kravitz (Ethics), Margy Levenberg (Meetings and Expositions), Milt Levenberg (Senior Chemists), and Susan Shih (Society Committee on Education).

Finances: The Society's 2020 financial performance through July 31st yielded a Net from Operations of $55.7 million, or $25 million greater than the same period in 2019. Total revenues are $354 million, 5% ahead of last year, and total expenses are $298 million, or 3% below last year. Unrestricted Net Assets increased to $466 million. The most direct revenue impact to the Society related to the COVID pandemic has been to meeting-related revenues with the cancellation of the in-person Spring National Meeting as well as the in-person Green Chemistry Conference. Significant effort has been devoted to expense management. The Society expects to meet its budgeted net contribution of $41.3 million.

Governance: By electronic ballot, **t**he Council elected five new members for each of the following Council Committees: Council Policy Committee (CPC); Committee on Committees (ConC); and Nominations and Elections (N&E). Council approved the Petition to Clarify Amendments to the Standing Rules and disbanded the Joint Board-Council Committee on Chemical Abstracts Service by a vote of 272 to 84. Council also approved the creation of an ACS International Chemical Sciences Chapter in Israel by a vote of 283 to 10. The Board of Directors confirmed all of these actions on August 21.

Meetings and Expositions: As of Wednesday, August 19, 2020, the 260th ACS National Meeting had attracted 6,477 registrants, including 4464 regular attendees and 2013 student attendees. In addition, the virtual presentation uploads were as follows: All Inclusive (SciMtgs), 1,735; Virtual Platform Only, 1,655; Temporary Access Option, 640; and Presentation Uploads, 4,067. There were 70 exhibitors. Attendance was roughly half that of a typical national meeting. Attendance by industrial members was about 75–80% of a typical meeting. The drop in attendance was much greater for academic and student attendees.

Fall Elections: ACS will organize a virtual Meet and Greet session with the two candidates for 2021 President-Elect: Dr. Mary K. Carroll and Dr. Angela K. Wilson. All ACS Members may vote for the President-Elect. A town hall for the Director-at-Large candidates was tentatively scheduled for September 21, 2020; only councilors vote for Directors-at-Large.

If you have any questions or comments about the above information, please contact me or one of your other councilors. You may contact me at kfivizzani@wowway.com.

Ken Fivizzani

CHECK THE CHICAGO SECTION'S WEBSITE for information about plans for a virtual event celebrating National Chemistry Week (NCW), which is scheduled to take place during **October 18-24th**. Please check the Section's website (chicagoacs.org) in mid to late September for details. Plans are underway for contests, activities, fun information and much more. A limited number of **free demonstration kits** will be available to educators or troop leaders to help teach children about adhesives and polymers.

NATIONAL CHEMISTRY WEEK POETRY CONTEST

Please consider having your child enter the 2020 National Chemistry Week poetry contest (aka the Illustrated Poem Contest). This contest is for any child in Kindergarten through 12th grade. For submission forms go to: K - 2nd grade, 3rd - 5th grade, 6th - 8th grade, and 9th - 12th grade. The **DEADLINE TO ENTER IS OCTOBER 25, 2020** at 11:59 PM (Eastern). Here are the **CONTEST RULES**:

All poems must be no more than 40 words, and in one of the following styles, to be considered:
HAIKU, LIMERICK, ODE, ABC POEM, FREE VERSE, END RHYME, or BLANK VERSE.

Entries are judged based upon relevance to and incorporation of this year's theme (Sticking with Chemistry), word choice and imagery, colorful artwork, adherence to poem style, originality and creativity, and overall presentation.

All entries must be original works without aid from others. Physical drawings may be scanned or captured via camera and submitted to the online form. Illustrations may be created using crayons, watercolors, other types of paint, colored pencils, or markers.

POSSIBLE TOPICS related to the theme include: **Adhesives, Cohesion, Glue, Geckos, Polymers, Slime, Tape, Adhesion**

The illustration may also be created electronically by using a digital painting and drawing app on a computer, tablet, or mobile device. The name of the digital painting and drawing app software must be included on the entry form.

The text of the poem should be easy to read and may be typed before the hand-drawn or digital illustration is added, Alternatively, the poem may be written on lined paper, cut out, and pasted onto the unlined paper with the illustration.

No clipart or unoriginal images may be used. Only one entry per student will be accepted. No spelling errors please!

Students must be sponsored by a school or another sponsoring group (e.g. Homeschool Association, Scout Troop, 4-H, etc.).

All illustrated poems and/or digital representations of poems become the property of the American Chemical Society.

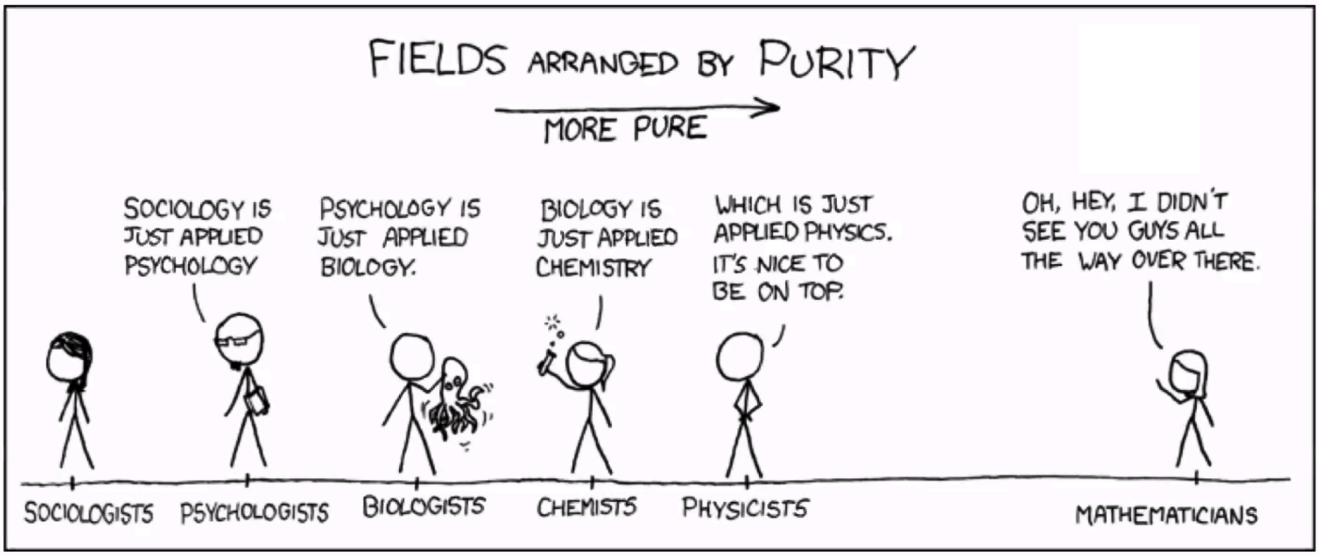
Acceptance of prizes constitutes consent to use winners' names, likenesses, and entries for editorial, advertising, and publicity purposes.

Selected letters of the Greek alphabet are used in chemistry and physics. Here is a list for reference or use in the (virtual) classroom. - Ed.

Upper Case	Lower Case	Letter Name
A	α	Alpha
B	β	Beta
Γ	γ	Gamma
Δ	δ	Delta
E	ε	Epsilon
Z	ζ	Zeta
H	η	Eta
Θ	θ	Theta
I	ι	Iota
K	κ	Kappa
Λ	λ	Lambda
M	μ	Mu
N	ν	Nu
Ξ	ξ	Xi
O	ο	Omicron
Π	π	Pi
P	ρ	Rho
Σ	σ	Sigma
T	τ	Tau
Y	υ	Upsilon
Φ	φ	Phi
X	χ	Chi
Ψ	ψ	Psi
Ω	ω	Omega

TEACHERS!

All K-12 Educators can receive Continuing Education (CE) credits for attending our Monthly Meetings. Register online as a "CE" attendee at chicagoacs.org



This cartoon is available online at Creative Commons http://xkcd.com/435/

From the Editor's Desk

Dear Readers,

For their excellent contributions to this issue I would like to thank Darryl Boyd, Paul Brandt, Irene Cesa, Rachael Swiercz, Robert Pike, Mark Cesa, Sherri Rukes, Russ Kohnken, Josh Kurutz, Andrea Twiss-Brooks, Jason Romero, Russ Johnson, Ken Fivizzani, Helen Dickinson, all of our advertisers, and the editor of the 1920 bulletin.

As we are all aware, the ongoing pandemic continues to disrupt our lives. It seems a paradoxical situation: In the midst of hardships for many across a constellation of spheres including economic, educational, medical, social, political and more, technological hardware and software innovations have allowed many to be connected across the miles. The term "virtual reality" has branched out from the existing category of three-dimensional viewing goggles to include everyday meetings with co-workers, family, friends and care-givers. The presence of "masked" or "maskless" groups of individuals can stir up eddies of anxiety. Restaurant windows proclaim "Keep calm and carry out." I'm sure you can add to the list of pandemic-speak!

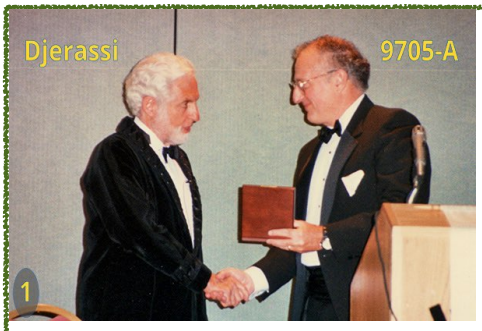
To paraphrase PBS Newshour's Judy Woodruff, "Thanks for reading, please stay safe and we'll see you soon."

~~ M. E. S. ~~

ACS moles manufacturing sticky stuff in preparation for **National Chemistry Week (NCW) 2020** (see additional information in this issue)

WHO IS THIS? 1997 Gibbs Ceremony for Carl Djerassi

GIBBS MEDAL CEREMONIES offer a chance for Chicago chemists to hobnob with eminent figures in our field. Photos from these events often show some of the greatest scientists of the day, but oftentimes we need help matching their names with their faces. In this entry of the "Who Is This?" series, we focus on the 1997 Gibbs meeting honoring Dr. Carl Djerassi. Djerassi earned fame for his contributions toward the first oral contraceptive pill, organic synthesis, and physical organic chemistry. In his later years, he bridged science and the arts, writing books and plays in the "science-in-fiction" genre. Djerassi's Gibbs ceremony was held on May 16, 1997, at the Chicago O'Hare Marriott, and the Section Historian could use some help identifying people in the photos. If you have any insights, please share them at: historian@chicagoac.org.



In the first photo (above left), we see Djerassi receiving the medal. Normally, it is presented by the ACS President, who was Paul S. Anderson that year. However, the visage of the presenter strikes the historian more like Roald Hoffman, who was on the Gibbs Award Jury that year and may have stood in for Anderson. Does anyone know whether Anderson looks like Hoffman or, if Hoffman presented the medal, why he was designated for the role? Who is 9705-A?

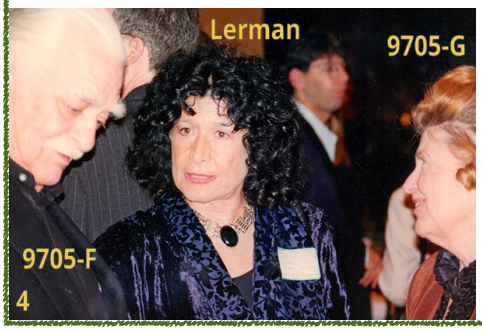
The next questions concern the identities of some tuxedo-clad attendees (above, center and right) who were probably invited guests, possibly prominent chemists on the Gibbs Jury or officers of national ACS. In the hallway photo with Djerassi in the center, we can't identify the people labeled 9705-B and -C. The faces of diners 9705-D and 9705-E are known to the Historian from photos of other Chicago ACS events, but we still need help identifying who they are.

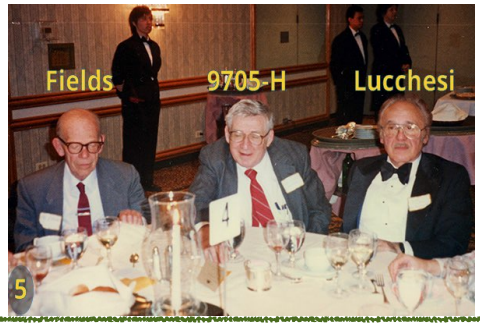
Chicago luminary Zafra Lerman, President of the science diplomacy-focused Malta Conferences Foundation and recurring Section meeting speaker, made an appearance that was captured in the fourth photo, but we would like to know who she was talking with, 9705-F and -G. In Photo 5, attendee 9705-H is seated between Ellis Fields (1985 ACS President and 1971-72 Chicago Section Chair) and Claude Lucchesi (1977-78 Chicago Section Chair and co-founder of the Analytical Laboratory Managers Association, ALMA), and we would like to know who he is.

Photo 6 shows a number of unidentified attendees, and the Historian has a tentative notion of who 9705-M is but does not want to bias potential help with a suggestion.

Assistance in all these identifications, as well as stories and additional photos, would be most welcome. Please correspond using historian@chicagoacs.org. Thank you.

– Josh Kurutz, Section Historian





The ACS National Awards

ADVANCING CHEMISTRY SUPPORTING RESEARCH PROMOTING CHEMISTS

Nominate a Noteworthy Chemist for a 2022 ACS National Award by November 1, 2020! Submit a Nomination

The ACS National Awards program is designed to encourage the advancement of chemistry in all its branches, to support research in chemical science and industry, and to promote the careers of chemists.

Local section members are being encouraged to submit nominations for ACS National Awards for 2022. In particular, nominations are welcomed for persons who are from **groups not commonly recognized** in the ACS National Awards program, including women, underrepresented racial and/or ethnic groups, chemists from industry and national laboratories, and faculty members at universities not well represented in the program.

For example, only 5% of the nominees for awards in the 2021 awards cycle were chemists or chemical engineers working in industry, and only 14% of nominees were women.

The ACS strives to recognize, promote, and honor outstanding contributions in the chemical sciences regardless of the researcher's gender, race, ethnicity or employer.

Please consider nominating a **deserving candidate** (hopefully from the Chicago Section!) for an ACS National Award.

Nominations can be submitted at: www.nominate.acs.org, and more information on the 44 ACS National Awards can be found at: https://www.acs.org/content/acs/en/funding-and-awards/awards/national.html and https://www.acs.org/content/acs/en/funding-and-awards/awards/national/bytopic.html.

Mark Cesa, Chair, ACS Chicago Section Awards Committee

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https://chicagoacs.org/Committees
https://chicagoacs.org/Volunteer

From the Archives: September 1920

The following article, published 100 years ago in The Chemical Bulletin, records a presentation given at the University of Chicago during a National ACS Meeting. The speaker delivers a rather harsh critique of the research training available to chemists at that time. Although the focus is on the training of male chemists, female chemists were also being trained in chemistry, albeit in lesser numbers, around 1920. The article is included here to provide a glimpse into the Section's history and not to advocate for any particular stance in the training of chemists. – Ed.

Research Training from Infancy

American Industry Demands More than Passive Education

Defects in the American schools were sharply criticized in a paper, "The Education of the Research Chemist," read by Dr. Robert E. Rose, a research chemist connected with the E. I. du Pont de Nemours Company of Wilmington, Del., before the Dye Division of the American Chemical Society at the University of Chicago.

"The education of the men," said Dr. Rose, "who are to lead the dye industry to future successes is a matter of vital interest to us. The subject is equally of interest, in its general aspects, to all who teach and to all who are concerned with commercial enterprises founded on the technical application of the results obtained by research.

"The dye industry in this country was established with the aid of research men who were not trained for this special line of work; they were men of general training and their adaptability to their new duties throws a very interesting light on the educational system of which they are the products.

"They were very successful, let that be emphasized, but at the same time let us study such faults as were apparent in order that we may learn how to improve the training given in our schools.

"The worst failings were a tendency to overlook trifling indications such as slight differences in color or structure or smell, and a disregard for the necessity for reasoning precisely and understanding clearly before doing any experiments, that is, there was a lack of exact observation coupled with rather vague reasoning.

"Of course, this was not true of the mature men, but rather of those fresh from the training of the university. The causes of these faults lie very far back in our methods of teaching. Research is nothing strange; it is simply the use of the results of well trained powers of observation by a mind capable of clear reasoning. The child who, by the careful examination of a mechanism, learns how it works, is applying the methods of research. The chemist examines the substances of which the world is composed, finds how they are put together and learns how to make new ones. The essential of this kind of work is well trained senses, and the development of the senses is very largely determined during the years of early childhood. It is for this reason that we may say that the research man is made or married during childhood and adolescence. However, we do not make a great effort to train the senses during childhood; instead, we put a premium on developing the memory and formal methods of reasoning. Later, in high school and university, we continue to give the student too many second-hand facts instead of making him observe for himself. We teach him to reverence the opinion of others rather than his own and thereby kill that healthy skepticism which is the essence of research.

"The courses in chemistry are apt to call for an exercise of memory rather than of reasoning, though they are better in this country than in any other. The future dye chemist is called upon to learn many formulas by eye without being given a good understanding of their real meaning. Finally, the research work in our universities is hampered by the routine duties placed on the teaching staff and therefore we find very few institutions which can be regarded as great schools of research where many men learn from each other the enthusiasm of the true investigator. We are too apt to regard research as fulfilling, in part, the requirements for the degree of Doctor of Philosophy, instead of adding to the sum of human knowledge.

"The remedies are easy to state but hard to apply—the teaching of observation, the training of the senses can be done properly only by really efficient grade school teachers, with the co-operation of parents. Some day we shall recognize the facts that the school teacher is of more importance to our supply of research men than is the college professor. Some day we shall admit that schooling, though intangible, is worth more than railroads, mills, and all other material things save only food and that it is worth paying for. Then we shall have better dye chemists.

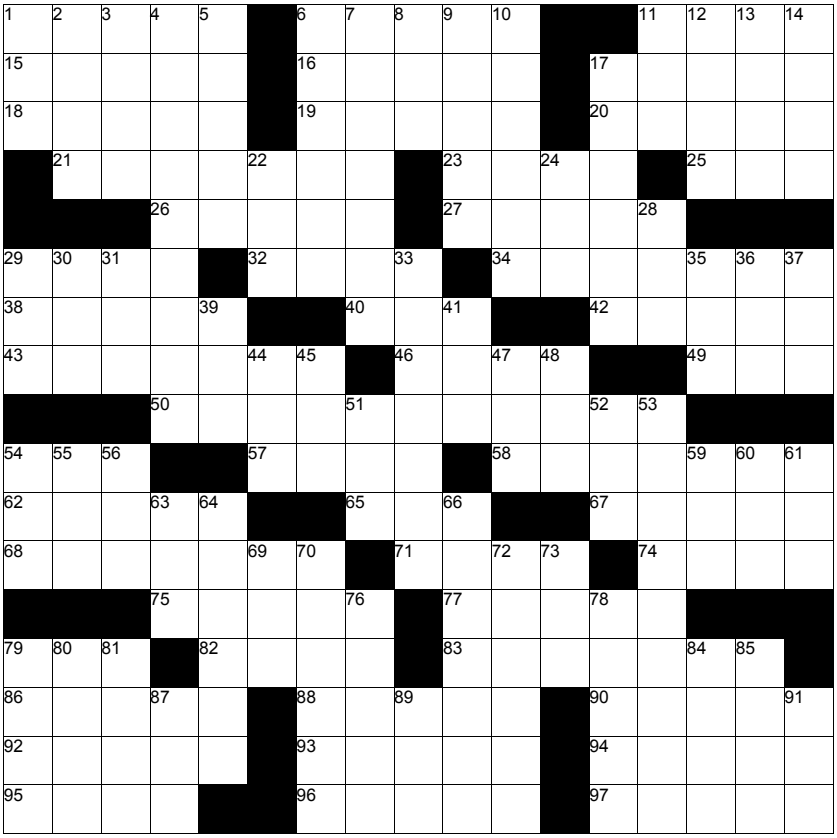
"In the high schools and universities, we need a higher average of excellence in the teaching staffs—there are very many extremely able men, but there are also many unambitious, rote teachers who teach because they find it easier to do that than anything else, men who are never up to date. We need better text-books, especially of organic chemistry—we have nothing in this line which is in keeping with the modern development of applied organic chemistry. I do not mean a technology, but a text giving due emphasis to the applications made of knowledge expressed in the facts and theories of the class room.

"To foster pure research, we should have institutions set aside for research, institutions to develop, as the years pass, into great schools wherein the advance of the science will be aided by all the resources of the nation.

"The teaching of research is a subject of interest to all, because the measure of the success of a nation is the quality and number of her trained specialists. It is of special interest to us because the industry to which we are devoted needs, more than any other, a great number of capable research men. It is for that reason I address this paper to the Dye Section of the American Chemical Society."

CHEMISTRY CROSSWORD

Nobelists Robert D. Pike



ACROSS

1. Physics 1915, X-ray diffraction
6. Chemically convert
11. Batch of product
15. Chemistry 1918, catalysis
16. Additional
17. Mythological namesake of an element
18. Angle variable
19. Chemistry 1990, synthesis
20. Carboxylic acid derivative
21. Prepared for microscopy
23. Apple pesticide
25. Trig. function
26. Famous firth
27. Daybreaks, poetically
29. See 32 across
32. With 29 across, "Mr. Mom" costar
34. Inactive
38. Condensation type
40. Wife's title
* 42. Long-time W&M Chemistry Chair
43. Foggy weather
46. A transition metal
49. Busiest U.S. hub
50. Physics 1933, orbital theory
54. Sneaky
57. An oval has two
58. Lakefront Canadian city
62. Honks
65. A dicarboxylic acid, abbrev.
67. Gather leftovers
68. Chemistry 1954, bonding
71. Interactive computer game
74. Poet Pound
75. Untarnished
77. Vamoose
79. Beginning of a series
82. "Don't ____ me bro!"
83. Having extra genetic material
86. One who overindulges EtOH
88. Physics 1903, radiation
90. Figure of speech
92. Play guitar well
93. Salicylic acid, e.g.
94. Chemistry 1936, dipole moments
95. Scary dinosaur
96. Had a picture taken
97. ____ y la luna

DOWN

1. Antioxidant food additive, abbrev.
2. Cheers
3. Assist
4. Convey
5. Holy ____
6. Fade away
7. Outer skin
8. FTIR technique
9. "White Room" band
10. The 12th U.S. president
11. Alkene geometry
12. Type of 35 down
13. Serve
14. Suspect
17. Chemistry 1920, electrochemistry
22. The Grey Lady, abbev.
24. Part of to be
28. Swine home
29. Band ____
30. Bass, e.g.
31. Vitamin need, abbrev.
33. A transition metal
35. Savings vehicle, abbrev.
36. Amount after taxes
37. Western blot, e.g.
39. ____ cit.
41. ____ Lanka
44. Old TV band
45. Not am.
47. Prov. of 58 across
48. Type of assn.
51. Mil. school
52. Energy unit
53. Shining example
54. 0 deg. C, 1 atm.
55. Mauna ____
56. Not I
59. Pince ____
60. Roundbottom flask residue?
61. "Three ____ match"
63. Separation techn.
64. Became shallower
66. Sulfur-containing amino acid
69. Teachers org.
70. Tank topper
72. Tirade
73. Prefix with lateral
76. Surgeon prefix
78. It's made sotto voce
79. Type of Prof.
80. Physics 1922, orbital theory
81. Remedy
84. Marbles
85. It has its ups and downs
87. Fruit fly distinction
89. Latin thing
91. Brooks or Gibson

The names of nine Nobel laureates in chemistry or physics are among the clues in this puzzle. Enjoy!

This puzzle was created by Professor Robert Pike for the *Distillations* newsletter at The College of William and Mary in Virginia. http://rdpike.blogs.wm.edu/crossword-puzzles/ Used with permission of the author.

The solution will be published in next month's bulletin

* Answer to 42 Across is TYREE

Element Matters:

No Js or Qs!

Periodic Table Letter Frequency				
A	16		N	14
B	14		O	7
C	15		P	10
D	8		Q	0
E	13		R	19
F	7		S	15
G	8		T	11
H	9		U	7
I	7		V	1
J	0		W	1
K	3		X	1
L	7		Y	3
M	11		Z	2