



Double Bond

The Newsletter of the Western New York Section of the American Chemical Society

Volume 80

September 2008

CALL FOR OFFICER NOMINATIONS

The Western New York section is actively seeking nominations for the following executive officer positions for terms starting January 2009:

Chair
Vice Chair
Chair-elect
Secretary

If you are interested in becoming more active in our section yourself, or wish to nominate someone else, we urge you to contact a member of the current executive board listed at the end of this publication.

Nominations, including contact info for you and the nominee should be sent to Timothy Gregg by email at greggt@canisius.edu or (716) 888-2259 before September 30, 2008.

Elected officers must be members of ACS.

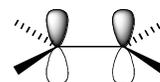
Details concerning this year's elections will be posted in a future issue of the *Double Bond*.

ACS SPONSORS LOCAL UNDERGRADUATE RESEARCH SYMPOSIUM

The local section aimed its time and resources directly towards the future this April by showcasing the first-class research done by undergraduates from area colleges and universities. The First Annual WNYACS Undergraduate Research Symposium brought 40 students and faculty together on April 19, 2008, to hear oral presentations and discuss 20 research posters. The keynote speaker was Dr. Paul Weiss from the Department of Chemistry at Penn State.

Students and faculty research advisors attending the symposium came from 7 SUNY schools, Canisius College, Ithaca College, Niagara University and Brock University. Jeffrey St. Denis, of Niagara University, gave an oral talk on his synthesis research entitled "Methoxyisopropylfurano[4,5:6,7] isoflavone; An antiproliferative isoflavone isolated from the species *Erythrinia variegata*". Thomas Fitzgibbons, of the University at Buffalo, described his work "The sensitization of a TiO₂ semiconductor with novel rhodamine dyes" in the second oral presentation. The oral session culminated with Dr. Weiss's amazing electron micrographs in his talk "Exploring and controlling the atomic-scale world".

The day included a well-deserved lunch for participants, many of who expressed their appreciation for the efforts of the Chemistry department at UB and of the local ACS section. A 2nd Annual Undergraduate Research Symposium is planned in early April, 2009 to be hosted at Canisius College in Buffalo.



BRING TOGETHER KIDS & CHEMISTRY

Share educational resources from ACS with your favorite teacher this fall

It's back-to-school season and teachers are gearing up for a new year. As a chemist, you are in a unique position to help teachers and students learn and love science. After all, you enjoyed learning science so much that you chose to devote your career to it! Help the teachers you know by introducing them to the outstanding resources developed by the American Chemical Society.

To help you spread the word, ACS has created a flyer you can give to teachers describing ACS education resources. They're also offering some of their best resources at a discount during the months of September and October. Your favorite middle school teacher might benefit from Inquiry in Action, a teacher's guide to inquiry-based investigations that teaches chemistry principles through experimentation and hands-on learning. Or, a local high school chemistry teacher in your area might benefit from a gift subscription to ChemMatters, a publication that investigates the chemistry of everyday phenomena for high school students. Other resources can be accessed for free! Consult the ACS educational resources website (go to portal.acs.org/portal/Navigate?nodeid=1036) for more information.

In addition to sharing resources, you can improve science education by offering your time and expertise. You could volunteer to give a presentation about science in a local classroom or answer chemistry questions from a class throughout the year. Visit the Kids & Chemistry section of the ACS website for ideas and sample activities that you can use to introduce chemistry to students in your community. Your gifts and time will definitely be appreciated by teachers and students alike this year and for years to come!

Ways you can help K-12 teachers with ACS resources:

- Give a teacher the flyer summarizing ACS resources
- Purchase a book or magazine subscription and give it to a teacher
- Introduce a teacher to free online resources
- Answer science questions from a class throughout the year
- Teach a science lesson
- Give a career talk
- Suggest a high school textbook
- Mentor a high school chemistry club
- Sponsor a professional development workshop for local elementary and middle school teachers

Visit the Kids & Chemistry website above for links to examples of activities such as:

(continued)

Pre-K to 2

Apples, Bubbles, and Crystals
Sunlight, Skyscrapers, and Soda Pop

Grades 3-6

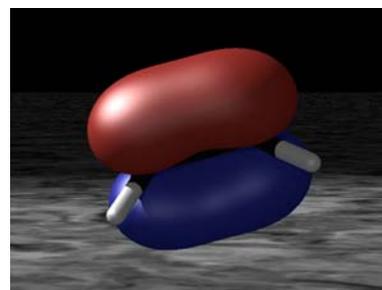
Science for Kids: www.acs.org/kids
The Best of WonderScience

Grades 3-8

Inquiry in Action
Inquiry Matters

Grades 9-12

ChemMatters Magazine
ACS Chemistry Clubs
Green Chemistry
ACS textbook, *Chemistry in the Community*
Workshops for teachers
Exams Institute
Chemistry Olympiad
Project Seed



THIS MONTH IN CHEMICAL HISTORY

Harold Goldwhite, California State University,
Los Angeles (hgoldwh@calstatela.edu)

The word "chemurgy" was not in my vocabulary until a couple of months ago. Perhaps that just shows my limitations. Let me flash back to the occasion when it was thrust upon my consciousness. I was browsing the 25 cent table at my local public library sale (last of the big-time spenders) and encountered a must-buy title: "Modern Chemists and their Work" by Christy Borth, published by the New Home Library, New York in 1943. It's actually a "New Enlarged Edition" of an earlier book by this author; "Pioneers of Plenty" was first published in 1939 and the Publishers' foreword refers to the events of 1939 through 1943 that make the book even more timely.

A Google search on Christy Borth yielded no direct biographical information, but plenty about the books he published. (His gender, even though Christy is ambiguous, is clarified by reference to him in the Publishers' foreword). He seems to have been a successful author of popular books on technology and science. His titles include "True steel; the story of George

Matthew Verity and his associates”; “Masters of mass production”; and “Mankind on the move; the story of highways”.

The introduction to “Modern Chemists and their work” is titled simply “Chemurgy” and the whole book, despite its title, reads as a propaganda piece for chemurgy. The word seems to have been coined by William J. Hale, a chemist, and was first publicized in his book “The Farm Chemurgic” published in 1934. It means applied chemistry aimed at making industrial products from agricultural raw materials derived from both animals and plants. Hale gets three full columns in Wyndham D. Miles “American Chemists and Chemical Engineers”, ACS, 1976. Born in 1876 he received bachelor’s and master’s degrees from Miami University of Ohio, and a Ph.D. in chemistry from Harvard in 1902. He traveled to Germany on a fellowship and returned to the University of Michigan, rising through the ranks to Associate Professor. Recruited by Dow in 1917 he headed their organic chemistry research division. He was awarded 45 patents while at Dow, including one for the Dow process of converting chlorobenzene to phenol.

In 1935 Hale retired to become a consultant, and devoted much of the rest of his career to chemurgy. In that year he founded the National Farm Chemurgic Council which involved such prominent figures as Henry Ford and Francis P. Garvan. The Council stimulated the U.S. Department of Agriculture to establish four regional agricultural research laboratories to explore industrial applications of farm crops.

While Hale was undoubtedly influential in reinvigorating chemurgy, we should not forget perhaps the greatest pioneer of this area, George Washington Carver. I have written previously about Carver, and I will just remind my readers that Carver used cotton, sawdust, peanuts, and sweet potatoes as far back as the first two decades of the twentieth century to make products as varied as insulating board, synthetic stone, washing powder, bleach, and glue.

Discussions of chemurgy have an interesting resonance in 2008. Hale, among others, back in 1935 saw the important potential of ethanol as an additive or substitute for gasoline in automobile fuel. There are some striking passages in this book that seem relevant to current concerns with the lessening availability of oil, and the steadily increasing prices of oil-based products including gasoline.

In a reported discussion with Charles Franklin Kettering, Vice President for Research at General Motors, the following exchange occurs: Kettering (K): How do we run[automobiles] now? Respondent (R): With gasoline. K: Where do we get gasoline? R: We distil it from petroleum. K: What is petroleum? R: Oil that is in the earth. K: How did it get there? R: The chances are that it came from decaying plants and so forth. K: Where did the plants come from? R: They grew. K: How did they grow? R: The sun made them grow. K: So we’re running

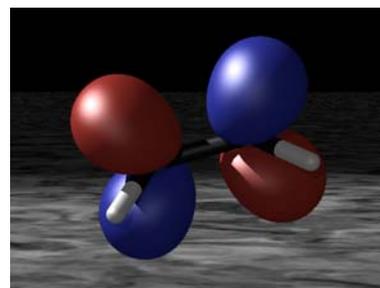
[automobiles] now by “radio” – by radiation of the sun, seasoned forty million years in the ground. Maybe we can learn how to pick up our sun-energy direct, instead of going along on that long-drawn-out process. ... I’m sure we can grow all our fuel after a while, because all of the fuel that we have has been grown.

One of the first endeavors of the chemurgic movement was to introduce ethanol as a blending agent in gasoline (sound familiar?). They supported a pilot plant for Agrol, a gasoline-ethanol blend. The petroleum industry was not amused. By 1938, because of financial and administrative problems, the Agrol plant was closed.

Chemurgy was prominent during World War II; synthetic rubber ingredients were processed from corn, and other plants such as guayule were studied for rubber production. But after the war the surge in petrochemical production swept aside chemurgic products, and the National Farm Chemurgic Council, founded by William J. Hale in 1935, was wound up in 1977. And now we need it – or something like it.

Many current processes being researched by the chemical industry and academics are examples of what would have been termed chemurgic studies in the old days. One example is the quest for biodegradable packaging materials derived from natural products. These could beneficially replace polyethylene, an omnipresent nuisance which contaminates our waterways and the oceans and is a hazard to wildlife. Now that even the petroleum industry has (grudgingly?) embraced ethanol blends with gasoline, many studies are under way on processing materials that are relatively waste agricultural products (corn husks, sawdust) into ethanol. Borth’s book is visionary for many possible applications of chemurgy: plastics from soy beans that could replace many metal body-parts in automobiles, lightening the cars and improving their mileage standards; and fibers and fabrics from casein obtained from the whey in cheese manufacturing.

With current concerns about the increasing prices of foodstuffs around the world, perhaps it is time to call for a New Chemurgic Movement. This would have as its object making useful products from plant and animal materials that have no use as foodstuffs. That’s a challenge for chemistry in the 21st century.



60 YEARS AGO IN THE DOUBLE BOND

The following excerpt is from the September 1938 issue of the Double Bond

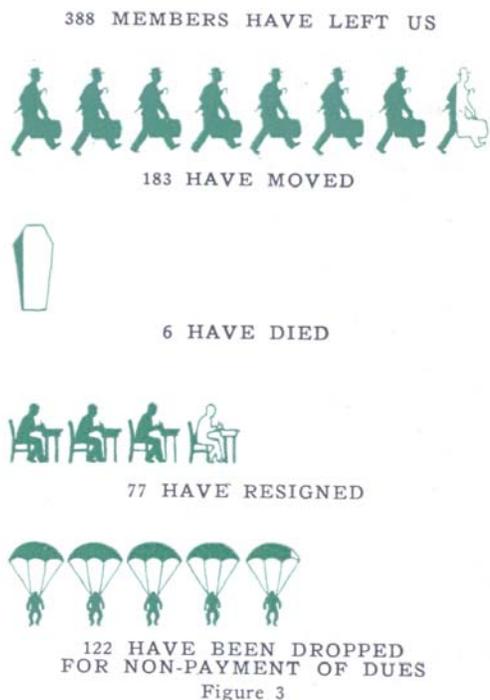
Ten years ago this month the first issue of the Double Bond was received by the then 255 national members of the Western New York Section of the American Chemical Society, while this issue will be received by approximately 600 people, including over 415 national members.

The growth of the Section has been very erratic. Our best year was 1937 when we gained 53 members, and our second best was 1934, when we acquired 40 members. It is hard to account for these gains since both of them came in periods of low business activity. The migration of chemical industry, particularly research, to Niagara Falls, and the activity of the Chairmen of the membership committees for these years are our only explanation.

In addition to the present members, approximately 390 members have at some time during the past 10 years been members of this Section. These people have either died, resigned, moved, or been dropped from our rolls for non-payment of dues. The average annual turnover for this period was 11%. So if you have been in this Section more than 10 years, you are an Old Timer, as you have seen a group of chemists, nearly as large as the present Section, come and go. As Figure 2 shows, one out of every five members leaves our rolls within two years. The significance of this high turnover in connection with the management of the affairs of the Society is too obvious to require comment.



As may be seen from Figure 3 the greatest loss of members in the past 10 years was due to the moving of members from the Western New York Section. Wilmington seems to be the favorite destination of our emigrants. A few members have resigned, and a considerable number were dropped for non-payment of dues. Both of these groups should constitute one of the chief objectives of any membership campaign, as most of these men still reside within the Section. What is the significance of this? Why have so many chemists affiliated themselves with the American Chemical Society and then dropped their membership – food for thought? We think so!



It is our hope that the facts and figures presented in this short statistical resume of the rolls of the local Section of the American Chemical Society may be of some value in connection with the planning of the activities of the Society. All too often important policies have been adopted without due regard to the make-up and changing character of the National membership of the Section. Perhaps a further study of the desires and interests of the membership would result in activities more logically calculated to reduce our high current turnover.

JOIN THE ACS MEMBER NETWORK

Want to connect with members in your local section? Join the ACS Member Network! The ACS Member Network is an online networking tool that facilitates more effective collaboration among ACS members and scientific professionals. You can:

- Build your own personal scientific network.
- Share research and publications information.
- Find friends and colleagues faster and easier than ever before!

It's safe. It's searchable. It's FREE. And it's a great way to stay connected with the best and brightest. Visit www.acs.org/MemberNetwork to sign up today!

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