

## FRANK CLIFFORD WHITMORE (1887-1947)

Born, Oct 1, 1887, Frank (Rocky) Whitmore received his bachelor's and Ph.D. degrees from Harvard University. After short stays at Williams, Rice, and Minnesota, he moved to Northwestern, where he spent 10 years, most as head of its chemistry department. His research focused on organomercurials for which he authored the classic monograph.

In 1929, when he became dean of the College of Chemistry and Physics at Penn State, the scope of his research expanded. He is most famous for introducing the carbocation as a reaction intermediate to explain whole classes of rearrangements ("Whitmore 1,2-shifts"). A major application of this research was the "reforming" process used to make higher octane gasoline. Valuable in many areas, the theory even explains how the body synthesizes cholesterol. Whitmore also made key contributions in organometallics and discovered the organosilicon beta effect. He directed the Ph.D. theses of 118 students and wrote the first important American text on advanced organic chemistry. For his achievements, he was elected to the National Academy of Sciences and received the Nichols and Gibbs Medals, the two classic research awards of American Chemical Society (ACS) local sections.

While Dean, Whitmore always taught two courses taken by all physical science undergrads. He began these classes by telling the students that the purpose of the course was to help get them through Penn State and through life and to do both well. On the first day, the students wrote down why they were taking the course and what they expected from it. Each received a multi-page critical reply from Whitmore.

His service to the ACS began in the Central Pennsylvania Section and the Organic Division. As division secretary, he introduced abstracts of papers at national meetings. He became division chair, councilor, and ultimately 1938 ACS president. While president, he addressed 72 of the 102 local sections. He was a leader in the "struggle for the independence of the clinical chemist" and in establishing chemistry requirements for nursing degrees. He also was chemistry's *de facto* public spokesman for over a decade.

Whitmore was one of the 20 leading chemists who met with Roger Adams at Illinois in August 1940 to divide up critical chemistry problems which had to be solved to win WWII. Later, with Adams and James Conant, he coordinated the organic chemistry war effort in the United States. At Penn State, over 200 chemists and physicists were involved. His responsibility to maintain scientific manpower included speeches, publications, and over 7000 letters to draft boards on behalf of technically trained workers. The war effort took its toll and on June 24, 1947, this "true casualty of war" died. The ACS passed a resolution calling his contribution to science "immeasurable," and he was posthumously awarded the Presidential Certificate of Merit. Soon after, Whitmore Laboratory was built and dedicated to his memory.

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## 2012 Frank Whitmore Lecture

**CHEMICAL AND ENGINEERING NEWS**

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As an able and unusually versatile leader, you have become known to all. As an inspiring administrator, teacher and advisor to young men you fill an enviable place in the academic world. As an original and skillful investigator, your contributions in the field of organic chemistry have brought you recognition among scientists....Your friends will always remember you for your unflinching interest in and continual devotion to their welfare."  
Roger Adams

FRANK C. WHITMORE

18, 19, 20 → 21, 22

The shift of the electron pair... The new frequency... arranged product... If atom B in the rearranged... the system may lose a proton... A and B, the remaining... that obtained by the loss of a proton...

**FRANK CLIFFORD WHITMORE**  
Distinguished Scientist, Teacher, and Friend of Chemists (Page 2074)

Bassam Z. Shakhshiri is the 2012 president of the American Chemical Society. He also is the first holder of the William T. Evjue Distinguished Chair for the Wisconsin Idea at the University of Wisconsin-Madison. A native of Lebanon, Shakhshiri earned his A.B. in chemistry from Boston University and his M.S. and Ph.D. from the University of Maryland. After three years at the University of Illinois, he joined the UW faculty in 1970.

In 1977, he became the founding chair of the UW System Undergraduate Teaching Improvement Council, in 1983, the first director of the Institute for Chemical Education, and in 2002, founded the Wisconsin Initiative for Science Literacy. From 1984-90, as assistant director of the National Science Foundation, Shakhshiri led the rebuilding of NSF efforts in science and engineering education. His NSF strategic plan launched the systemic initiatives and most of the other NSF education programs of the last two decades.

He is famous internationally for his leadership in promoting excellence in science education at all levels and especially for his development and use of demonstrations in the teaching of chemistry in both classroom and other settings. His multivolume series, *Chemical Demonstrations: A Handbook for Teachers of Chemistry*, has been translated into several languages. The Encyclopedia Britannica calls him the "dean of lecture demonstrators in America." Shakhshiri has given over 1300 invited lectures and presentations worldwide and received over 35 awards including the James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry (1983) and the ACS George Pimentel Award in Chemical Education (1986). He is an elected fellow of the Alabama, New York, South Carolina, and Wisconsin Academies of Science and has received seven honorary doctoral degrees.

Like Whitmore, Shakhshiri has been an outstanding spokesman for chemistry including areas of public policy and education. Among his other awards are the 2002 American Association for the Advancement of Science Award for Public Understanding of Science and Technology, the ACS Helen M. Free Award for Public Outreach, the Chemical Pioneer Award of the American Institute of Chemists, and the National Science Board Public Service Award where he was cited for "extraordinary contributions to promote science literacy and cultivate the intellectual and emotional links between science and the arts for the public."

**Bassam Z. Shakhshiri**



*Sunday, July 29 at 5:30 p.m. in Eisenhower Auditorium*

*2012 Frank Whitmore Lecture on  
Chemistry Education and Public Policy*

*and*

*First Plenary Lecture  
2012 Biennial Conference  
On Chemical Education*



*Chemistry: A Key to Human Progress*

*Dr. Bassam Z. Shakhshiri  
William T. Evjue Distinguished Chair for the Wisconsin Idea  
University of Wisconsin-Madison*

*The opening reception in Alumni Hall (HUB) follows the lecture*

*Sponsored by:*  
*Central Pennsylvania Section,  
The American Chemical Society*

*Hosted by:*  
*Department of Chemistry  
The Pennsylvania State University*



The **Frank Whitmore Lecture on Chemistry Education and Public Policy** honors Frank C. Whitmore, dean of the Penn State College of Chemistry and Physics from 1929 until his untimely death in 1947. Sponsored by the Central Pennsylvania Section of the American Chemical Society and hosted by the Penn State Department of Chemistry, this lecture honors Whitmore's service to the ACS which began in the Central PA Section and the Organic Division and culminated as 1938 ACS president. The award also honors his service to chemistry as its chief public spokesman for over a decade and as one of the three coordinators of the WWII organic chemistry war effort. Finally, it recognizes Whitmore's contributions as a teacher, educator, and formulator of policy in chemistry education and curriculum reform. Previous Whitmore Lecturers included Ronald Breslow and Richard Zare.