

JAMES S. NOWICK

STARVING AT THE BANQUET

Students' enthusiasm holds the key to a bright, prosperous future for chemistry

LIFE IS A BANQUET, AND MOST poor suckers are starving to death!" proclaims the protagonist and title character of the 1958 movie "Auntie Mame."

As we salute the American Chemical Society for 125 years of service to the chemical enterprise, I fear that our students are starving despite the rich banquet that the field of chemistry provides. Whereas exciting challenges and advances in areas such as chemical synthesis, chemical analysis, the chemistry of materials, and the chemistry-biology interface nourish the minds and souls of those of us at the cutting edge of research in academia, they have little effect on what we teach our undergraduates.

We rarely show students in our introductory classes that chemistry is a dynamic field that is continuously acquiring new knowledge and solving new problems. Instead, we typically present the subject as a static, monolithic body of knowledge. In my own specialty, I find nearly two dozen textbooks titled "Organic Chemistry" that differ little in content from those published 30 years ago. Modern concepts such as stereochemical control in reactions, metal-mediated catalysis, and supramolecular chemistry permeate my thinking and

that of my organic chemistry colleagues, yet they are considered too specialized or too advanced for presentation to undergraduates. What a pity that the topics our students are learning are far removed from the problems we are studying and that the process of introducing students to our field does little to challenge us to convey its cutting-edge excitement.

By not inviting our students to partake of the banquet, we may present chemistry as a mature, dry field of little interest to them compared with more visibly dynamic areas such as biology, computer science, and medicine. This disconnect between the frontiers of research and the introductory course curriculum has already occurred in mathematics and in physics and may help explain the small numbers of students who choose to pursue advanced study and careers in these areas. If fewer talented students join us in our research pursuits, then the challenges that we face in research will become greater and the advances will be harder to attain. Losing the best and brightest to other fields will diminish the ranks of not only our graduate students but also eventually our colleagues, because fewer talented Ph.D. chemists will be available to pursue careers

in academia. Funding for chemical research also will be affected because policymakers provide better funding for the more visibly dynamic sciences.

To help ensure a strong future for chemistry, we must connect with our beginning students by sharing with them more of what excites us about our field. What is required is not some grand campaign but a grassroots effort in which we each try a little harder to bring the excitement and relevance of chemistry to our students. My own efforts in this area seek to attract, retain, and captivate talented students into chemistry through an outreach chemistry program to high schools, innovative content in my undergraduate chemistry classes, and a graduate recruitment initiative in chemistry that targets students earning degrees in biology.

Since my days in graduate school, I have developed and run outreach programs in which graduate and undergraduate students visit K through-12 classes to make exciting presentations with flashy demonstrations. In my undergraduate courses, I try to introduce exciting modern topics ranging from structure-based drug design of HIV protease inhibitors to asymmetric synthesis. Some of the undergraduates in my classes catch my excitement and become undergraduate researchers in my laboratory or in those of my colleagues. This year, I started a graduate recruiting program in chemical biology aimed at bringing students whose interests lie in biology into our graduate program to earn Ph.D. degrees in chemistry. None of these efforts has been particularly hard to implement, and I have found the challenge and creativity associated with developing and implementing them to be a lot of fun.

I look toward the future of the chemical enterprise with both excitement and concern. Chemical science and technology are developing at an increasingly rapid pace, making it a truly thrilling time to be a chemist. The realization of the potential afforded by these scientific and technological advancements depends on a steady stream of talented young people. We cannot afford to lose these students by allowing them to starve while we feast at the banquet.

James S. Nowick joined the chemistry faculty at the University of California, Irvine, in 1991. He received a bachelor's degree from Columbia University in 1985. He received a Ph.D. from the Massachusetts Institute of Technology in 1990 and completed a postdoctoral fellowship there.



CAPTIVATING Nowick knows that professors must convey their excitement to students to keep them interested.