

Seeking, sometimes finding, that elusive chemistry

Despite all the discipline's achievements, opinion is divided as to whether chemistry is getting the recognition it deserves — and needs — in order to keep attracting new talent.

Sir — The Opinion article “A discipline buried by success” (*Nature* **411**, 399; 2001) and News Feature “What’s in a name?” (*Nature* **411**, 408–409; 2001) in the 24 May issue are correct in their analysis of the lack of recognition of chemistry, in and outside the international scientific community. Scientists, policy-makers and the general public should take note of these timely messages.

I would like to add that the lack of recognition for the breadth of modern chemistry in China is hurting chemistry and related fields.

On 12 May 2001, the Nobel laureate Harry Kroto delivered a lecture titled “Science: a round peg in a square world”, at the Great Hall of the People at Beijing, in which he passionately called for both better understanding of the role of basic research and better public understanding of scientific ideas. I was delighted to serve as Professor Kroto’s translator, and accompanied him to a discussion with 50 high-school students at No. 4 High School in Beijing, one of China’s few elite schools.

One student asked why, with biology in the ascendant, she should study chemistry. Part of Kroto’s answer was that understanding and controlling chemistry at the molecular level is the key to the success of molecular biology and molecular electronics. This information was new to these bright young students, who will soon be choosing their careers.

In China, the lack of recognition of the breadth of chemistry is alarming. Biochemistry, for example, has never been a discipline within chemistry. The Chinese Chemical Society (CCS) does not have a biochemistry division, and the chemistry division of the National Natural Science Foundation does not support biochemistry research. The recent hype about state projects on the human genome sequence and related fields (*Nature* **410**, 10–12; 2001) excludes the involvement of chemists. The president of the American Chemical Society told me in Beijing that more than 50% of the society’s members are industrial chemists: in contrast, there is not even a Chinese word for ‘industrial chemists’. China does have ‘chemical engineers’, but they are not covered by CCS membership.

Modern chemistry is about much more than beakers and flasks. The

discoveries of buckminsterfullerene (C₆₀) and carbon nanotubes have reminded us that chemical synthesis can be done with sophisticated machines. The widely used technique of electrospray mass spectrometry in medical screening and biological analysis was developed and perfected in physical chemistry laboratories.

Yet the Chinese science community and China’s educational administrators have failed to recognize many of these facts — which is largely why the country’s undergraduate and graduate chemistry programmes are outdated.

One of the direct consequences is that my laboratory cannot find students with decent training in modern physical chemistry.

Graduate students and postdocs from China have become a sizeable part of the research force in many US and European research institutions, so China’s lack of modern chemistry skills is also a loss to the world at large.

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Researchers are popular, even if the industry is not

Sir — Your disappointing Opinion article and News Feature (*Nature* **411**, 399 and 408–409; 2001), bemoaning the poor public image of chemists and chemistry, do not refer to a recent survey carried out by Wirthlin Worldwide and sponsored by the American Chemical Society (see <http://www.acs.org/wirthlin.html>). This research indicates that the US public views chemists favourably in many ways, associating them with being visionary, innovative and results-oriented.

Although concerned about the effects of chemicals on their everyday health and safety, respondents also had positive feelings about a range of chemistry’s contributions to everyday life, from agriculture to cleaning products. And although your articles suggest that chemistry achievements such as new pharmaceuticals are “being

appropriated by other disciplines”, more respondents to our survey credited chemists with that achievement than with any other.

Nearly 18,000 international scientists attended the ACS meeting that was featured in your Opinion article, not 1,000, as *Nature* reported.

Denise Graveline

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We apologize for the inadvertent error in our reporting of the number of scientists at the meeting, which was introduced during editing — Correspondence Editor, *Nature*.

Time to shout about the benefits of chemistry

Sir — In your interesting Opinion article on chemistry (*Nature* **411**, 399; 2001), you comment that in my Perspective article “The Quiet Revolution in Chemistry” (*Chemical and Engineering News* 64–65, 7 August 2000), I stop short of identifying potential applications. This is not so.

In my Perspective I identify how, by achieving one or more of the objectives on my ‘wish list’, chemists could contribute significantly to improving the human condition.

I list three of many possible applications in an ‘imagine’ list: imagine bridges that do not corrode; imagine Rome, Bangkok and Los Angeles with no air pollution, and with tap water that you would enjoy drinking; and imagine learning the entire health profile of a person from a drop of blood.

My point was to highlight some of the grand challenges of fundamental chemistry, which many believe are as exciting and important as similar challenges in our sister fields of biology and physics.

I used the term “quiet” in the sense that the science media are not fully aware of these revolutionary objectives, and *Nature* is to be applauded for helping to make the revolution more noisy.

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