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# The Slope Of The Curve

*The following is a guest editorial by Brian P. Coppola, Arthur F. Thurnau Professor and associate chair for educational development and practice in the department of chemistry at the University of Michigan.*

**IN A RECENT ESSAY** (*Change* 2015, DOI: 10.1080/00091383.2015.1053776), I reported on those I believe to be the first few native Western chemists, either fresh off a postdoctoral position or early in their careers, who have taken faculty positions in China.

I was compelled by the story of Simon Duttwyler, who, as a postdoc at Yale University, was searching for his first academic job back in his home country of Switzerland. He was frustrated by conditions there such as a lack of students, poor funding prospects, and inadequate space. Simon responded to a general advertisement in C&EN posted by the chemistry department at Zhejiang University. He had never stepped foot in China and did not speak the language.

I interviewed Simon in 2014, less than a year after he started at Zhejiang. I also spoke with his eight students, who were enthusiastic to be working with this foreign professor without being required to move to Europe or the U.S. They believed that the single best benefit from working with Simon, his Western perspective on doing science, was not dependent on where they were located.

For his part, Simon was interested in one thing: getting his science done. He has been the beneficiary of the collective enthusiasm of his department, his institution, and China's funding agencies, all of whom are committed to see this first generation of international faculty members be successful. When I asked him what the expected funding rate for his grant proposals was expected to be (which he reported to be around 40%), both of his senior colleagues simultaneously chirped "100%," a statement of their confidence in the degree of commitment the agency would show. And they were correct.

Graduate students and postdocs ought to keep Asia on their employment radar. Every major U.S. government and university report for the past five years predicts that China will continue its upward trajectory in technological and scientific advancement.

China has its problems. But in the 15 or so years that I have been working in China regularly, the chemistry enterprise has gone from underused and outdated scientific infrastructure and single-digit publication numbers in major Western journals to being recognized for competitive, contemporary research output poised to overtake the U.S. in key indicators in the next five- to 10-year period. What Westerners miss when they consider China is the underlying reality of this rate of change and its momentum.

The chemistry dean at Zhejiang told me he is aiming for 20% of new hires over the next 10 years to be people like Simon. The size of chemistry departments at Chinese schools could mean hundreds of positions. It is easy to speculate on the consequences of this kind of brain drain. As is the case for Simon's students, the drive to come to the U.S. for Ph.D.s will not be as high if they can join a foreign research group in their own country. The combined stress of losing students and faculty candidates, along with no prospect in sight for the U.S. funding situation to improve, will, I believe, cause chemistry Ph.D. programs at U.S. schools that are on the edge to close their doors entirely.

I have smiled politely at well-meaning skeptics whose understanding of China is based on a trip they took 10 years ago or on their grad-school benchmate. Journals have continued to fill with high-quality publications from China, and these only come about for one reason: high-quality science that was not happening 15 years ago, in a country that had no science happening whatsoever 15 years before that. The skeptics are not looking at the slope of the curve.

By 2025, there will be native Western faculty members all over China, matching the same internationalization of the faculty that has happened elsewhere in the developed world. There will be fits and starts, yet I assure you that, in 2005, the concept of a Professor Simon Duttwyler in the chemistry department at Zhejiang University was inconceivable. If the group of pioneers is successful in their tenure and promotion efforts, it will be because they were successful in getting their science done. By 2025, the first full generation of native Western faculty members, individuals who are just now starting graduate school, will rapidly emerge in China, as will the consequences in our own departments and programs.

**Brian P. Coppola**

*Views expressed on this page are those of the author and not necessarily those of ACS.*