

Achieving Gender Balance in the Chemistry Professoriate Is Not Rocket Science

Chemistry World warns us that [the pipeline of US female chemists is in doubt](#), reporting on a diversity symposium held at last month's ACS National meeting in San Diego. Apparently, major research universities are not hiring women at a pace that would achieve a critical mass (e.g., 30%) in my lifetime, and at some top-flight universities the numbers remain so low that you can count them on one hand. This has not changed much over the last few decades, raising alarm bells and begging the question, why is it so hard to populate the ranks of chemistry department faculty with women?

It is a subject that many groups and individuals both wiser and more informed than I have written about. Some put blame on an underrepresentation of women in chemistry graduate programs—their numbers hover around 27%. But even compared to this pool, women's representation in academia remains stubbornly low, especially in the upper ranks where many departments still boast numbers of tenured female faculty between zero and two. Looking at this situation from the outside, you can understand why a graduate student might suspect that she will run up against an extraordinary effort to exclude women from the chemistry academy. I mean seriously, in an age when we fly by Pluto and send President Jimmy Carter's metastatic melanoma into remission, how is it that we cannot figure out how to hire and promote female professors of chemistry?

When I posed this question to the Twittersphere, some interesting statistics came to light. One follower reported that his chemistry department held a faculty search this year, and of the 91 applicants, 12 were women—that's a mere 13%. Other anecdotes suggest this is a common outcome in chemistry faculty searches. Such figures are consistent with a report by Jessica Lober Newsome for the UK Resource Centre for Women in Science, Engineering and Technology and the Royal Society of Chemistry: "[The chemistry PhD: the impact on women's retention](#)". She notes that men and women in UK PhD programs start their graduate work enthusiastic about the prospect of a career in the chemistry professoriate, but "by the third year, the proportion of men planning careers in research had dropped from

61% to 59%...for the women, the number had plummeted from 72% in the first year to 37% as they finish their studies." And these numbers include research careers in both academia and industry. The proportion of female advanced PhD students who saw academia as their preferred choice? Just 12%. This paltry figure prompted Curt Rice reporting in *The Guardian* to ask the question, "[Why are universities such unattractive workplaces?](#)"

This is a question best answered by the women who considered academic careers and then, ultimately, chose other paths. Lober Newsome's interviews revealed the recurring theme of "supervision issues, which they felt powerless to resolve". What that essentially boiled down to was difficulty dealing with advisors with poor management skills, interactions with whom eroded their students' self-confidence and morale. Whereas male students saw this as a transient rite of passage, women were simply demoralized and saw life outside academia as a reprieve from such oppression. Other common themes were feelings of isolation and exclusion and concerns about a culture of extreme work patterns and intragroup competition. And women are bombarded with negative messaging about the challenges they will face and the sacrifices they will make should they pursue the academic path: the price you will pay for [work-life balance](#), the "[mom penalty](#)" and the ironic disadvantage that befalls [those who capitalize on family friendly tenure policies](#). With such expectations, I am not sure I would have wanted this job either!

So indulge me as I counter this ominous messaging with an alternative perspective. Graduate school is where you learn about yourself as a scientist—your strengths and weaknesses, how you think about problems, how to interact with and motivate your colleagues, and how you can make impact in this world. You might also learn that certain styles of management lie in opposition to your needs. Those are data points that will inform how you interact with your own junior colleagues as you mature into leadership roles yourself. Many women pursue PhDs in the first place because, like me, they crave autonomy—autonomy of

Published: April 27, 2016

thought, of expression, of schedule. It is hard to achieve in most professions, especially for women, but priceless and worth the pursuit. That very autonomy makes it easier, I would argue, to integrate work and family within academic settings compared to many other environments.

With autonomy comes responsibility, of course, and many people will count on you to keep the ship afloat and headed in the right direction. Occasionally women articulate to me that such responsibility looms large in their mind, that their aversion to academia is rooted in a fear of judgment and failure. In response, I share with them what my dad said to me when I once admitted these feelings. First, he reminded me of the first time he handed me the keys to the car, and I peeled out of the driveway without concern for the depth of my qualification. Then the conversation went like this:

Dad: "You got your own lab? Go for it. What do you have to lose?"

Me: "What if I can't get grants funded?"

Dad: "So what, as long as you still get paid. Try again."

Me: "What if I don't get tenure?"

Dad: "So what, it is still a good starter job that builds skills for many other (higher paying) jobs."

He was right about that. My friends who didn't get that coveted promotion jumped into high-level industrial positions they could never have acquired had they started their career in that same company. You see, after six years running a lab in academia, they had project and budget management experience. They had done HR, PR, and built a valuable network of colleagues and collaborators. No age-matched bench chemist in industry could develop that portfolio of skills at the same pace.

The young professor whose starter job in academia *does* turn into a life-long pursuit can continually morph her job to suit her evolving interests—that is why no two professors are alike in their "typical" day. Have an idea for a book? You can find a way to write it and someone to publish it. Want to consult for industry, government, law firms? Go ahead. Want to develop a new course, graduate program, institute or center of excellence? Collect a few faculty friends and you can have fun building and brainstorming together. Still scarred from past mistreatment in graduate school? Pay it forward with your own students and, in doing so, shift the culture toward a new light.

On that note, here are a few bits of advice for PIs who want to be part of the solution. Acknowledge that the goal of academia is to generate knowledge and innovations, and to produce the next generation of human capital to wield them. For the advancement of their careers, your students need one truly inspired idea brought to life with high-quality

research and scholarship. How they might best achieve that goal is as individual and idiosyncratic as the ideas themselves. Granting your students and postdocs freedom to manage their own time and find their own muse is a sure way to promote creativity, and it may boost productivity as well. Remember that one really great experiment, which took time to research, plan and vet with colleagues, is more valuable than a dozen ill-conceived or boring experiments. We should not confuse graduate training with widget-making, where, unlike the research lab, hours clocked may indeed correlate linearly with production.

The respect and trust that are inherent in granting students control of their daily lives pays dividends in their effort and loyalty. Consider Netflix (you know, the outrageously successful company with the happy employees and the \$45B market cap). [Employees at Netflix are no longer required to account for vacation days](#). They are entitled to up to one year of paid parental leave if they need it. As a consequence, the best people want to work there, and the company gets to select the very best of the best. To be sure, long hours are sometimes necessary in any job; that is not unique to the professoriate. But it is certainly nothing to brag about. Neglecting health or family is not honorable, and we shouldn't criticize students, postdocs or faculty when they make principled choices.

I think we can, in my lifetime, increase the proportion of women on chemistry faculties. We can start by promoting a forward-looking view of those benefits the professoriate might offer, and then, we make it so. And, if adherents to the status quo protest, as my dad would say, "so what."

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