

Yes, Virginia, There is Life Beyond the Bench

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There are unlimited ways to use your scientific training in rewarding work outside the laboratory. The belief that a trained research scientist pursues such career options because of professional shortcomings is declared officially (by me) wrongheaded. That there are pockets of resistance to the realities is regrettable--but these too shall pass.

The proliferation of workshops and panels on "exploring nontraditional careers" at the American Association for the Advancement of Science (AAAS) and other professional scientific meetings is one indication that such options are increasingly mainstream. The visibility of such activities, and their emphasis on the telling of individual stories, creates the impression that pursuing such careers is a bold and daring idea. **A Career by Any Other Name...**

In reality, there have always been highly valued, nonacademic options for scientists. In 1991 only about a third of individuals with science and engineering PhDs earned in the mid-1980s held what might be called research and development positions, and fewer than half were employed by four-year colleges and universities [\[1\]](#). What are some of the other career tracks pursued by scientists? Think National Institutes of Health (NIH) or National Science Foundation (NSF) program officers, National Research Council staff, science writers, and executives at organizations like the Juvenile Diabetes Foundation. [\[2\]](#)

Why we cling to the idea that these jobs are nontraditional or alternative puzzles me. These positions require the knowledge gained and the credentials earned via doctoral training and independent research.

The only true risk associated with pursuing nonacademic careers is that there is so much interest in them you can wind up making a career out of talking about "how I changed my career." Recently, after participating in my nth panel on this topic, I vowed to make this *AWIS Magazine* piece my last words on the subject. The telling and retelling has muddled too much myth into the reality of how I moved from A to B to, whatever letter I am at now, Q or R. I find my work so rewarding and enjoyable that I can no longer recall the angst of change (if there was any). The three women profiled in the [accompanying sidebars](#) have more recently navigated their transitions, and their stories more accurately recall the factors that influenced their decisions.

The Routes to Change--More Byways Than Highways

I think it is artificial to try to produce a neat package of "how to" advice. With the advantage of hindsight I know there is no road map. There are no right and wrong turns. All my colleagues on the "alternative" track have both a unique story to tell about how they got there and what it is that they do and a not so unique story that is about personal growth and the search for new challenges.

Truthfully, I believe the value of telling such stories has always been less about how to pursue nonacademic careers and more about affirming such decisions as valid. Once you decide a life in academia is not what you want and you start exploring the options, you will find there are as many paths as there are opportunities. And once you immerse yourself in the work, the need for validation becomes absurd.

It is unfortunate that the 4-7 years spent in graduate school, particularly in the life sciences, are often viewed as a preprofessional apprenticeship instead of a life-enriching period in the spirit of the Greek skhole (leisure). I agree with the National Research Council and the American Association of Medical Colleges recommendation [\[3\]](#) that life sciences PhD students be given broader exposure to career opportunities. In fact, why limit such exposure to life scientists? All scientists should be aware of the greater richness of career options available.

I am less keen on the idea that job markets determine access to graduate education--so long as graduate students know what they are getting themselves into and fully accept that pursuing a PhD does not guarantee a tenured faculty position. Advanced education is intended to broaden, not narrow, your options and a PhD in science should be no exception to that rule.

Positions for scientists aside from the stereotypical bench scientist come in a variety of shapes and flavors, but most share some basic characteristics. Because the scope of available positions is so varied, and there are probably positions I have never even heard about, I would be foolish to try to cover all the bases in a brief review. To me, positions like those I have and have had [\[4\]](#) and like those represented by the women profiled in the [accompanying sidebars](#) are particularly fun, challenging, and rewarding because, to paraphrase the famous Harvard psychologist William James, you "give science away"--meaning that you help those not formally trained as scientists understand, evaluate, and make decisions about complex issues that involve science and technology.

Civic Scientists: Use your science savvy serving society

Although positions at funding institutions, or in science policy and administration, are fun, rewarding, challenging, and demanding, they are--outside a few major hubs like Washington, DC, New York City, and other large urban areas--not numerous. At least, not yet. My dream is to see well-trained scientists serving in the office of every state governor and on the staff of every large city mayor. Along these lines, the U.S. State

Department is anxious to increase the scientific expertise of personnel at embassies and in the Diplomatic corps. To state the obvious, science and technology play an increasingly important role in our lives, and scientific training should be increasingly transferable to politics, government, business, law, etc [\[5\]](#) . It would be wonderful to see philanthropic organizations recruit more well-trained scientists into their executive ranks. Hopefully, efforts to grow awareness of the need for what may be called civic scientists [\[6\]](#) --scientists serving society in a variety of capacities beyond the bench--will increase opportunities.

Not surprisingly, the prerequisites for successful alternative science careers parallel in important ways those required for successful traditional academic careers. Positions at government funding agencies, private foundations, and policy institutes are competitively sought by highly talented individuals. Because you will, in some capacity, represent science, your credibility with both scientific and nonscientific constituencies requires strong academic credentials. More often than not, your prospective employer expects your PhD and postdoctoral training institutions to be prestigious with good name recognition and for your CV to list high-quality scientific publications, awards, honors, and other indications of recognition.

Top-notch academic credentials are only the beginning: the positions require demonstrations of superior communication and social skills. Still interested? The positions rarely come with any clear job description, requiring a high level of self-direction and self-motivation. In fact, you will often find yourself creating the job on the run. In some cases you will find yourself out in front, but more likely you will find yourself sole-authoring a committee report, drafting a speech someone else gets applauded for, or ghost-writing editorials and commentaries. So add self-rewarding to the list of desired qualities. Many of the positions I am familiar with require frequent travel and participation in special events held at nights and attendance at conferences spanning weekends, so they require some flexibility to mesh with a busy family life.

I recently heard the term "bench to curbside," a spin on the well-worn phrase "bench to bedside," used to describe rehabilitation research's reach into real life. It is also an apt description of career transitions away from the lab. So what is it like out there on the street? During my days as an executive with a public charity dependent on fund-raising for survival, I lived in never-ceasing reaction mode, adrenaline pumping, ending each day feeling as if I should have done more.

As a foundation executive, I enjoy a more leisurely pace and relish the time I have to read, think, and study. In many ways, I now live a more academic life than most academics! But it is harder to directly measure the outcome of my efforts, as it is often years before I know the impact of funding decisions.

Friends of mine who work in science policy positions describe their positions as somewhere in between--the pace often frenetic, the impact tempered by compromise, but the opportunities for continuing adult education abound. In considering a transition, it is important to think very carefully about the level of intensity you desire and the kind of feedback you require.

The Three Most Important Words in Career Transitions: Networking, Networking, Networking

Although I stated earlier that there are no tried and true road maps to guide your career transition, there are a few well-marked trails worth exploring. The AAAS fellowship program (<http://www.aaas.org/careers/fellowships.html>) is the most direct route to a career in science policy and administration. Once selected, you are connected to one of the most high-powered career networks around. Landing one of these coveted fellowships is not easy--the application process is rigorously competitive. Before applying, it is worth the effort to identify a mentor to guide you through the process. The National Research Council's Christine Mirzayan Internship Program offers a fabulous opportunity for graduate students and postdoctoral fellows to "get their feet wet" and explore opportunities offered by pursuing careers in science policy. The internship program lasts twelve weeks, with positions available with many projects at the National Academy of Sciences (information available at <http://www4.nationalacademies.org/pd/nrc-ip.nsf/web/homepage?OpenDocument>). The Chronicle of Higher Education is a good source of leads for openings with not-for-profit organizations. Science and Nature also carry an increasing number of advertisements for nonlaboratory positions. NIH, NSF, and the National Academy of Sciences Web sites all list available positions. Professional society Web sites and newsletters usually serve as clearinghouses for open positions. The Council on Foundations (www.cof.org) is a good source for learning more about private philanthropy. Don't be shy--the more you ask for information, the better informed you'll be!

Many of the skills you use in the lab are directly transferable. Scientists are quick learners, adept problem solvers, and accomplished jugglers. Still, a few concrete demonstrations that you communicate effectively with nonscientific audiences and have good administrative and organizations skills will enhance your resume. Write stories, editorials, and commentaries for general interest publications. Volunteer at a science museum. Organize a school science fair, a career day, or a series of public lectures at your university. Get involved with a local charity whose focus is health or the environment--they will welcome your scientific perspective. Become an active member of your local AWIS chapter! Pursuing such activities part time is also a good way to test the waters and discover the kinds of work you particularly enjoy--or don't! Just remember, the attributes essential to a successful career outside the laboratory are mirrored by the skills it takes to make a career transition: self-motivation, self-confidence, and self-direction. Thinking about making a change? Just do it!

References and Notes1. See Reshaping the Graduate Education of Scientists and Engineers, a report by the Committee on Science, Engineering, and public policy of the National Academy of Sciences (www.nap.edu/readingroom/books/grad/brief.html).

2. Remember there are numerous opportunities to pursue "alternative careers" within traditional academic settings. There are opportunities in academic administration, university advancement (fundraising), university presses, public affairs, etc. Academic administrative positions share many of the characteristics of the positions described in this article.

3. G. Shaw, February 1999, "Ph.D.issatisfaction: Is a rising tide of Ph.D.s swamping career opportunities?" AAMC Reporter, volume 6, number 4.

4. A brief biography is available at www.jsmf.org.

5. A good source of information about the characteristics, requirements, and salary scale for a variety of occupations is the Occupational Outlook Handbook published by the U.S. Bureau of Labor Statistics (<http://stats.bls.gov/oco/ocos066.htm>)

6. This idea was covered at the 2001 AAAS annual meeting in a session titled "Cultivating the Civic Scientist," organized by Carol Rogers (University of Maryland) and Deborah Ilman (University of Washington).

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