

So You Want to Work in Business?

Consider A Professional Science Master's Degree

By Eleanor L. Babco and Nancy Vincent

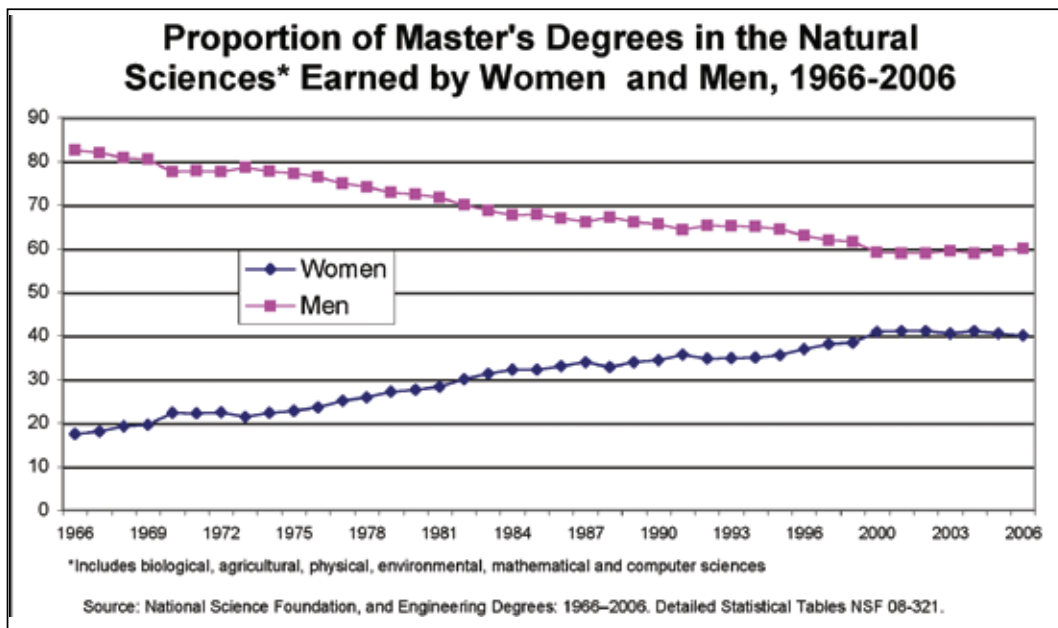
A desire for flexibility was one reason Kristen Eads gave for pursuing a Professional Science Master's (PSM) degree in Microbial Biotechnology at North Carolina State University as opposed to a PhD. In her senior year, she was uncertain what career option she wanted to pursue – academia or industry. Since the PSM promised her the ability to work in industry while at the same time pursuing academic research, she chose the PSM. Developed in 1997 by the Alfred P. Sloan Foundation, PSM programs

deliver workforce-ready individuals with a rigorous science or mathematics education in an emerging or interdisciplinary area by combining science with the sought-after business and leadership skills required in the 21st century technological economy. These innovative graduate degrees have already prepared about 2,500 students for science careers in business and government by providing technical training as well as internships and skills-based coursework in communications, management, policy, law, or other fields.

A 2006 PSM graduate, Eads is an Environmental Health and Safety Advisor for GlaxoSmithKline in Zebulon, NC. "The major benefits of a PSM degree for me have come from an enhanced ability to work cohesively with a wide range of professionals, each with a unique perspective on a project, each with different goals and objectives, and each with a different method of working and communicating."

Eads advises women who are pursuing non-academic careers in science to obtain an advanced degree, particularly through the PSM. She also recommends doing an internship or engaging in a co-op program. "I ultimately had my choice of companies to work for, who were very impressed with the work experience I had acquired while in the PSM graduate program, and I was able to accept a position that was a great fit with my goals."

Eads is only one of a number of women who are discovering another way to stay in science without getting a PhD. For many



years, the master's degree in the natural sciences was viewed as either a "stepping stone" toward a doctorate or a "consolation prize" for those unable to reach the end. While the PhD in the sciences is still viewed as the "gold standard" for those who want a research career in the Academy or industry, the PSM affords another option without the "stepping stone" or "consolation prize" label.

This innovative new degree combines technical expertise in the natural sciences with workplace skills sought by employers. It provides a pathway to a science career which can be combined with the many other roles that women embrace, including wife and mother.

While master's education is the fastest growing and largest segment of the graduate education enterprise in the United States, this is primarily due to the increasing number of degrees awarded in business, education, management, and marketing. The number of master's degrees awarded in the natural sciences has been decreasing over the past 40 years. In 1966, the proportion of master's degrees awarded in the natural sciences was 11.4 percent; by 2006, the proportion had dropped to 6.9 percent. And, it would have declined even more had it not been for women. As shown in the accompanying chart, women have earned increasing numbers of master's degrees in the natural sciences. In 1966, they earned 17.5 percent (2,765 out of 15,840). In 2006, they earned 40.1 percent (16,140 out of

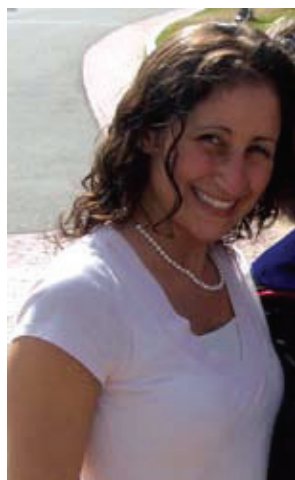
40,290). Women realize the value of advanced education in science fields.

The most recent data on the PSM find that women are embracing this new degree at even higher rates, earning about half of all PSM degrees awarded. So how are other women who hold this pioneering degree faring, and what do they say about the PSM?



For women desiring an academic research career, pursuit of a PhD remains the best option. But for women like **Kali Bogaard** who received the Applied Genomics degree from Connecticut, the PSM provides a rewarding alternative. She wanted to continue her education past her baccalaureate but wasn't ready to commit to a PhD program. "This program was geared toward those of us

who did not want to pursue a PhD and move into academia but still wanted an advanced education in a science field to develop the skills necessary to obtain a career in a non-academic industry." Bogaard found the three-credit internship that was incorporated into the graduation requisites the favorite part of the PSM program. "This provided me with a better understanding of how the industry functioned and where my course learning could help me in the 'real world.'" A 2007 graduate, she is now a Clinical Research Scientist for Genomas, Inc working with the Illumina Infinium Genotyping format to study the genetic influences on statins. "As a woman who has always been interested in areas of study that aren't necessarily gender 'traditional' I have found that the PSM has provided me with a great way to pursue science in a non-traditional role that blends with my interests and ambitions."



Heather Nelson wanted a career in a professional laboratory setting rather than in academia and thus sought a degree that would provide her with the necessary skills and experience. She found the PSM in Applied Genomics at the University of Connecticut was a perfect fit for her. It provided a curriculum that was well rounded with seminars and lab courses, and through the lab internship she felt better prepared for her career than she would have with a traditional master's degree. Nelson's advice to young women looking to pursue a career in professional science would be "to go after their passion and not let anything stand in their way. It is no longer a 'man's world' and

there are increasing numbers of women currently in the professional science world and many more interested. The competition will become fierce in the coming years and those well-suited with the proper preparation will become successful. I myself found such preparation and success in the PSM program." Nelson, a 2004 PSM graduate, is currently employed as a Criminalist at the New York City Office of the Chief Medical Examiner Forensic Biology Laboratory.



Most PSM degrees are interdisciplinary, ranging from industrial and/or financial mathematics to environmental decision making, and have produced graduates eagerly sought by non-academic employers. Coming out of undergraduate school after studies in mathematics and computer science and not finding the traditional jobs in those fields appealing, **Jennifer Hardy** needed to learn how to market herself to the business world and found the PSM in Industrial Mathematics from Michigan State University to be precisely what she was seeking. The 2006 graduate describes her road to the PSM as follows: "Hearing that the program required mathematics, statistics and business courses I was interested; hearing about the weekend business modules that exposed students to everything from economics to presentation skills encouraged me to apply; hearing about the requirement to work with a business on a real world project caused me to accept." Hardy is currently a Senior Statistical Analyst at American Greetings Interactive and says that "my graduate studies prepared me for this opportunity by increasing my logic and reasoning skills, enhancing my statistical knowledge, and developing some much needed business familiarity. I look back on my graduate experience as a needed step in my career; the step that took me from student to business woman."

Cheril Abeel, a 2001 PSM graduate from the Industrial Mathematics program at Michigan State University, originally considered teaching as a career. However, she also wanted the option of finding a career outside academia and the PSM in industrial mathematics was the ideal degree for her. She particularly liked the fact that the PSM was interdisciplinary and that she would get to take classes in different departments. She was intrigued by the "idea of having the whole university as my playground." Abeel notes that "as skills increase, so do your oppor-



As skills increase, so do your oppor-



tunities." She is employed by *Urban Science*, a consulting company headquartered in Detroit with offices worldwide, where most of her work is in automotive dealer network analysis. She feels the PSM gave her the "flexibility to do almost anything I decide to do next."

For women with a family, the flexibility and short time to degree provide a welcome option. A PSM in Environmental Analysis and Decision Making from Rice University in May 2008 allowed Native American mother of two, Rachelle Petrovic, to land a position as a Technology Investment Associate at Element Markets, LLC investigating renewable energy, energy efficiency, and pollution abatement control technologies for potential investment, development, and marketing.

Job market projections indicate that most new jobs will be created in business and industry, not in the Academy. While employers still want workers with advanced technical expertise, they also want workers who can write, communicate, manage, and lead. The Professional Science Master's degree provides just such skills by incorporating subjects such as communications, business fundamentals, project management, and intellectual property into the science degree. At present, over 120 PSM degree programs are offered at more than 60 universities across the country. There are currently more than 1,300 students enrolled, with more than 500 degrees awarded each year. If you have just finished your undergraduate degree in a STEM field and want to work in management in a non-academic environment, you may want to consider a PSM degree like the women featured in this article. Further information about the PSM can be found at www.sciencemasters.com. ■

International Conference



In July 2008, I had the pleasure of attending and presenting a paper at the 14th International Conference of Women Engineers and Scientists (ICWES) in Lille, France. Titled "A Changing World: New Opportunities for Women Engineers and Scientists," the conference was enthusiastically attended by over 500 women from 60 countries representing North America, South America, Europe, Asia, Africa, and Oceania. Interacting with such a diverse group of women in science, technology, engineering, and math (STEM) fields was inspirational and energizing for me.

The triennial ICWES conferences, which have taken place since 1964, are organized under the auspices of the International Network of Women Engineers and Scientists (INWES) (www.inwes.org). The goal of INWES is to "build a better future worldwide through full and effective participation of women and girls in all aspects of STEM." This will be accomplished by promoting exchange of information, networking, and advocacy, increasing the presence of women in mainstream STEM decision-making bodies, and becoming an influential voice on STEM issues for the benefit of women, gender equity, and society. There is significant overlap between AWIS' and INWES' missions.

The 140 oral presentations and 50 poster presentations at the conference addressed the themes of sustainable development, strategies to attract girls into STEM, women in science and engineering education, careers of women in STEM, women and leadership, women and entrepreneurship, gender issues in sci-