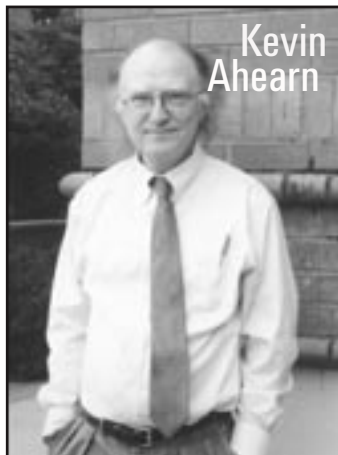


A master's degree for the **21st** Century

Many in higher education have long sought to create a master's degree that would do for the sciences what the M.B.A. did for business. Well, the search is over as a new Professional Master's of Science degree takes root at OSU.

by Bob Demyan



Photos by Melinda Luktsch

Science and business can be odd bedfellows. It's a symbiotic relationship: science drives innovation that creates new technologies; business brings those new technologies and innovations to the market and returns profits back to science for more research and innovation. It's a nice circle. Or that's the idea at least. Sometimes the distinct cultures of business and science don't always mesh. Scientists are often most at home in the halls of academia which provides a safe haven for research and exploration. Business looks to the bottom line, to capital flow, market conditions, and the economic balancing act that can make or break a company. It can often seem like the two worlds are speaking in different languages. The bottom line though, is business and science can't live without each other.

So how do people trained along the typical Ph.D. path typically fit into the business world? Not always easily and not always well. And there are other forces at work. Academia has produced an abundance of doctoral level researchers in recent years which has led to a glut of Ph.D.'s vying for a dearth of research positions in academia and beyond. At the same time, executives at high-tech companies are often begging to find business-savvy executives trained in the sciences. Why the paradox? Well a closer look at the traditional nature of advanced science training helps provide some insight.

Students pursuing Ph.D. programs set out on a tightly focused path—they don't call it a *discipline* for nothing. Interdisciplinary exposure is not especially encouraged or desirable—depth of knowledge and discovery within the discipline are. The traditional aim has been to produce scholars and experts who will continually fill the ranks of academia and non-profit research institutions.

And therein lies the rub. With such intense emphasis on discipline and research, many Ph.D. programs, by their very nature, can't provide the kinds of broad, interdisciplinary training that is so in demand in the business world. Such training just isn't on the menu.

Another drawback from the vantage point of industry and business is that doctoral level

programs typically keep students cloistered in academic settings for many years. The majority of Ph.D. students do not make their first foray into the job market until well into their 30's. Business needs people now.

Yes, many Ph.D.'s do find their way into industry, but by far and away, the biggest market for these people is still academia. In a very real sense, the system is set up to reproduce its own—academicians working within the free harbor of the university, pushing the frontiers of knowledge and discovery, producing more university researchers. As a result, business and industry, particularly in a newer area like the field of biotechnology, often go begging for qualified scientists with

“Everyone knows about MBA's and master's programs in architecture, engineering and journalism,” said Jesse Ausubel of the Sloan Foundation in New York. “Science departments too are now recognizing the good career opportunities a couple of years of soundly designed post-baccalaureate education can provide.”

business and communication skills.

Enter the Alfred P. Sloan Foundation. Established in 1934 by Alfred Pritchard Sloan Jr., then president and CEO of General Motors Corp., the Sloan Foundation set its mission as furthering scientific and technological research and education. In 1995, directors at the Sloan Foundation took note of a book titled, “*Rethinking Science as a Career: Perceptions and Realities in the Physical Sciences*,” by Sheila Tobias, Kevin Aylesworth and Daryl E. Chubin. Sloan, along with other organizations and foundations, had been concerned about the emerging need for more scientifically trained people to be leaders in business and industry, and this book, as the title suggests, looked at ways of rethinking science as a career. The people at Sloan absorbed these ideas

and developed what is quite possibly one of the boldest innovations in higher education in decades—a program that is the scientific equivalent of the M.B.A.

Called the Professional Master's of Science degree, the program aims to do for science what the M.B.A. did for business—create the next generation of skilled and diversified managers and directors. Through grants of up to \$400,000, Sloan has launched the program at over 30 universities across the country. Leading the charge in the Pacific Northwest is Oregon State University. Starting in the fall 2003, OSU will begin training the first students in three different program areas: Biotechnology, Applied Physics, and Environmental Science.

Instrumental in securing the grant for OSU was Stella Coakley, a professor of botany and plant pathology. Coakley's leadership and lobbying convinced Sloan that OSU was an ideal place to get the Professional Master's of Science degree off the ground in the Northwest.

Guiding the program's initial development while Coakley is on sabbatical in Washington, D.C., is Don Armstrong, also a professor in botany and plant pathology. Armstrong says OSU is in a good position to implement a program seeking to build closer ties between industry and academia because OSU's tradition is based on outreach. “The history of outreach that's associated with a land-grant institution makes this sort of second nature to us,” he said.

Helping Armstrong and Coakley with the task of implementing the nuts and bolts of the program are program managers Ursula Bechert and Kevin Ahern. Bechert works with, Bill Winner, director of the Professional Master's in Environmental Science, while Ahern works with Steven Giovannoni who directs the Biotech Professional Master's program, and Bill Warren, director of the Applied Physics Professional Master's program. All are excited by this bold new approach and they praise Sloan's mandate that the program mix scientific disciplines with a range of cohort courses in areas like business and communication.

Enthusiasm for the program, both in business and academia, has been outstanding. Bill Warren says the Professional Master's

in Applied Physics has been well received by the people he's spoken with in industry. "We're hearing from industry that this is the kind of person they'd like to see. Still, he says, the proof of the program's success will be the kind of graduates it turns out. "People don't want to hire a concept," he said.

Like his colleagues, Warren believes in the fundamental logic behind Sloan's approach if bringing industry representatives in on the program's design. "Sloan

cohort courses," said Warren. His students want that wider background as well. "My own Ph.D. students would come back to me after graduation and say, 'Yeah, I'm doing great technically, but why didn't you ever teach me how to run a meeting?'"

It's a theme running through all the program areas. In the biotech area for instance, Giovannoni says that the industry needs real working scientists, but not necessarily someone who's spent years in a Ph.D.

and knows that a lot of the students he sees in molecular biology see their future in the biotech industry. As such, the traditional approach of pursuing a Ph.D. program on an extended timeline isn't really to their advantage. "Having a student in a Ph.D. program who doesn't want to be an academic scientist is probably not in anyone's best interests," said Giovannoni.

Bill Winner of the Professional Master's Program in Environmental Sciences sees



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another aspect of all this. Many of the students who enroll in his program, he says, will actually come from industry. These people will already be working in some capacity in the profession, but could benefit from the interdisciplinary training of the new Professional Master's program. "This program gives us an opportunity to allow people who are trained at some level in the environmental industry to come back to school and within a year, get a graduate degree that would allow them to take on new responsibilities," said Winner. "In many cases, it will allow people to redefine themselves as career professionals in the environmental industry."

Winner sees the program's shorter time commitment as a powerful selling point

for his program. "I think it's a great design because it's going to give people an opportunity to get a graduate degree without having to make the sacrifice of walking away from a job for a 2- to 3-year leave," he said. In many cases, said Winner, employers might even pick up the tab for their employees to go through the program.

recognizes the futility of a bunch of professors sitting around in a room on campus telling each other what industry needs," he said. Warren says that his discussions with industry have always come back to a real interest in the cohort courses. "Our industry people said, 'you guys are experts in curriculum and course design, that's your thing.' The thing we're really interested in are these

research track. "What you have to know and how you have to act in industry is different from an academic science," he said. From his perspective, providing this kind of accelerated master's program is just the kind of innovative response academia needs to provide for a changing world.

Giovannoni has his fingers on the pulse of the nascent biotech industry in Oregon

The Long View

Clearly, the Professional Master's Degree in Science has enormous potential to transform both Oregon State University and impact Oregon's economy. Kevin Ahern hopes it will help Oregon's nascent biotech industry by giving biotech companies a new reason to locate in the state. "For biotech, if you look at the three states on the west coast, we're the weakest of the three," he said. "So one of our hopes is that this can

forward. "Everyone knows about MBA's and master's programs in architecture, engineering and journalism," said Ausubel. But, he noted, this kind of success hadn't translated to the sciences.

Too often in the sciences, the master's degree had been seen as some kind of half-way house between a bachelor's and doctoral level degree. Many of the traditional master's programs in the sciences were more like feeder programs for Ph.D. tracks and never really gained traction as standalone

leaders found this approach lacking as most M.B.A. programs, by necessity, had to skimp on the science and math so fundamental to today's technology-driven business world. The Professional Science Master's degree will change that scenario for good.

As with anything new, it will take some time for the program to grow and prove its merit. After all, the M.B.A. took almost 40 years to gain universal acceptance after its creation in 1908. But if the people behind the program at OSU are any indication, the

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help jumpstart something in Oregon."

Jesse Ausubel, a program director at the Sloan Foundation in New York, expressed high hopes that this program not only moves Oregon in a new direction, but also builds upon the traditions of the past. "Both sustaining Oregon's traditional natural resource economy and growing its high-tech sector will depend on science-trained professionals," said Ausubel. For Ausubel, the development and growth of master's level education with a professional emphasis is a huge step

terminal degrees.

Sheila Tobias, currently the Sloan Foundation's Outreach Coordinator for the Professional Science Master's, found in her research that fewer than three percent of the master's degrees awarded in the U.S. were in the sciences. As a result, science students seeking a track into industry or business often found themselves pursuing an M.B.A., hoping to supplement their science background with training in business. Unfortunately, many recruiters and industry

future looks bright. "If this works the way we think it is going to work, there will be a lot more interaction between industry and these programs," said Don Armstrong. "That sort of communication and contact is bound to build other sorts of ideas and opportunities."