SMALL SCHOOLS

Scientists Enjoy Life in the Not-So-Fast Lanes

Don Cotter was on the research fast track: He earned his Ph.D. in chemistry from the California Institute of Technology and followed it with a short postdoc at the University of Chicago. Then the track took a sharp turn. Cotter became an assistant professor at Mount Holyoke College, a small women's liberal arts school in South Hadley, Massachusetts. It was not a compromise job; he wants to be there. But the move, he says, has strained some friendships.

"It's not universal," says Cotter, "but [the feeling] is widespread among people who go on into universities that what I do isn't valuable, and that's really awkward when it's someone who's a friend and a colleague. You begin to sense that they really don't think that what you do is important." The implicit—if not often spoken—feeling among scientists, he says, is that if you're good you go to a research university: a big school that has graduate students to work for you, large equipment budgets, and a healthy dose of prestige.

Yet, at a time when such jobs can attract hundreds of applications, and many young Ph.D.s are stuck in a series of temporary positions, such expectations may have to change. If you're determined to stay in academia, one way of raising your chances of securing a post is to alter your sights—and perhaps target a job at a smaller, lesser known school, one that may not even have a Ph.D. program.

Officials at such schools say they are seeing more and more job applicants like Cotter, people who are enticed by the joys of teaching, or by the chance to have more control over their own research, or just because the schools are often more accommodating to families. Other job seekers, however, may not choose one of these schools until, confronted by hundreds of rejected job applications, they have no other option.

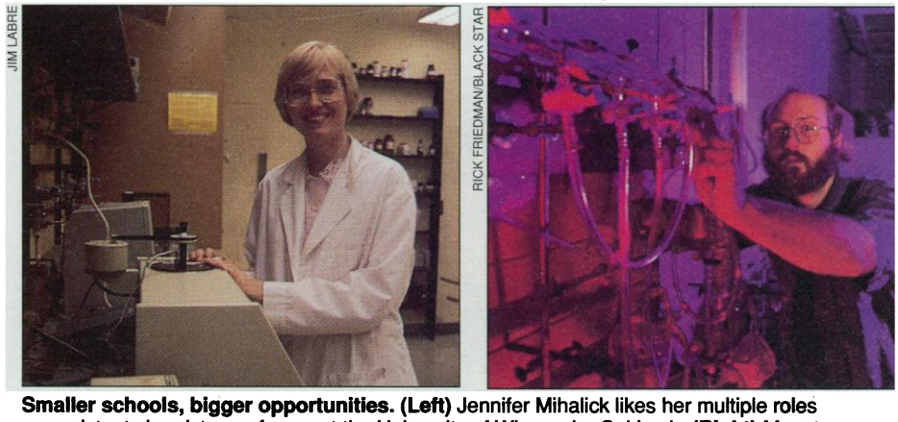
One such is chemist Peter Spielmann, who spent a grueling 2 years and 200 applications looking for a tenure-track job in a research university while finishing a postdoc at the University of California, Berkeley. It was, he says, "a totally demoralizing situation. You send out a whole bunch of applications, and you're lucky to get a form letter back." Spielmann finally accepted a position starting this fall as a structural biologist at the University of Kentucky's Chandler Medical Center in Lexington. But now he considers himself fortunate. He will have abundant time for his research, and he's protected from teaching for his first year. "I'm pretty psyched to go," he says. "It will be a wonderful opportunity, and at this point there's a lot of support for me to get what I need."

Whether going small was their first choice or, like Spielmann, a last chance, in 20 interviews with *Science*, highly pedigreed scientists swimming in these small ponds seem to find the waters to their liking. The workload can be heavy, with large course loads, skimpy research resources, and few or no graduate students to help with either. But the drawbacks seem to be outweighed by the benefits.

Challenge. To start with, these institutions are beginning to put more emphasis on high quality research. Chemist John Miller, for instance, is finding that what he thought was a compromise is looking more like a great opportunity. Miller, who earned his doctorate from Princeton University in 1992, wanted a job at a research university. But after a 2-year postdoc at Advanced Technology Materials in Danbury, Connecticut, and 50 unsuccessful job applications, he accepted an offer from Western Michigan University in Kalamazoo. The school has only a master's degree program, but it's got big plans. "This is a real opportunity to be part of a department in the process of building. They are really trying to become active [in research] both within the department and university-wide," he says. The school is aiming to re-establish a chemistry Ph.D. program and is putting more money into lab facilities across the board, and Miller is right in the middle of all the activity.

Fast advancement. A similar push to expand the geology department at Central Washington University in Ellensburg, Washington, landed geologist Meghan Miller a job as associate professor 4 years ago—and now she's chair of the department. Miller, who earned her Ph.D. from Stanford in 1987, was recruited, along with her husband Charlie Rubin, to the university when a new provost initiated a program to pull in more female and minority scientists. Miller already had a job at the Jet Propulsion Laboratory in Pasadena, California, but was attracted to Washington by the chance to teach and to work in the same department as her husband. There, she found a bonus: Older faculty members turned out to be happy to hand over the reins to the young couple with new ideas. "I feel really lucky to be in a department where the senior faculty just said run with it. I have friends in different places who are very frustrated that they can't do what they want to," says Miller. The Millers have lured other topnotch young researchers to the department, have attracted $1 million in grant money for renovations, and have helped pilot a master's program in geology that will start next year—the first new master's program at Central Washington in 15 years.

Freedom. People who like teaching are particularly happy at small schools, where they often get the chance



JIM LABRE

RICK FRIEDMAN/BLACK STAR

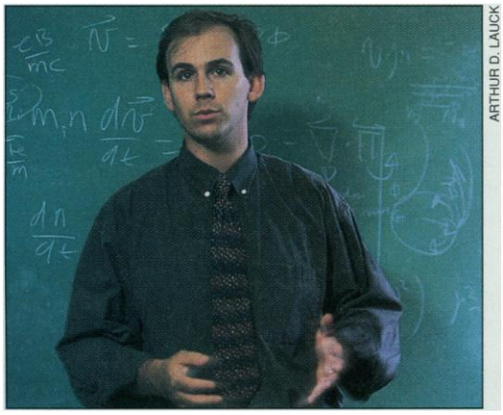
Smaller schools, bigger opportunities. (Left) Jennifer Mihalick likes her multiple roles as assistant chemistry professor at the University of Wisconsin, Oshkosh. **(Right)** Mount Holyoke chemist Don Cotter relishes the chance to put together a new course on environmental chemistry.

to shape some of their own courses. "In the spring I'll be teaching an environmental chemistry course," says Holyoke's Cotter. "It's a new thing for me, I've never even studied it, but I'll be developing it with another professor, and I'm really looking forward to it. I don't think this could happen for me at a university." Cotter believes that at a research university he would be under pressure to be writing papers rather than being allowed the time to put together a new course.

Despite the greater emphasis on teaching, smaller schools offer more freedom to do the research you want to, says physicist Michael Brown at Swarthmore College in Pennsylvania. After getting his Ph.D. from Dartmouth College, Brown spent 7 years as a postdoc at Caltech. "It began to dawn on me that I can really do the most research at a small college. ... I have complete autonomy to do whatever I want." Brown, who works with magnetofluids, says that at a big university he had to choose his research based on what grants were available: "I found myself shoehorning my ideas into what DOE [the Department of Energy] could fund. To pull in lots of money you have to meet the needs of the funding agency." And he needed big grants, he says, because large schools take a lot to cover overhead. At Swarthmore, the school pays the undergraduates who work in his lab, as well as technicians. "At a smaller college I can follow my nose," he says. "I really think I can do science the way 19th century scientists did it: on a shoestring."

For more info on this topic, see *Science*'s Next Wave World Wide Web site: **http://sci.aaas.org/nextwave/**

Autonomy often translates into flexibility. Jennifer Mihalick, who has been an assistant professor of physical chemistry at the University of Wisconsin, Oshkosh, for the last 2 years, says that where she is, faculty members get to wear lots of different hats, from teacher to administrator to technician. "I get to do my own lab work, I write grants, I teach labs. I get in there and teach people how to run the equipment. ... Professors at big labs just write grants."



ARTHUR D. LAUCK

Teaching time. Dan McCarthy, a physicist at Southeastern Louisiana University, spent four times as much time teaching as doing research his first year.

Happier marriages. Another advantage of smaller schools comes in solving the dreaded "two-body problem"—how both members of a couple can find good jobs and still stay together. A number of young scientists have found smaller schools to be more flexible, as the Millers' experience at Central Washington University attests—she was the one they recruited, but they agreed to make new positions for both of them. "Dual-career couples are becoming a much more significant issue, and the smaller schools will often be exceptionally understanding of those requirements," says John Wheeler, an analytical chemist at Furman University in Greenville, South Carolina. He was allowed to start teaching midyear so he could stay in his postdoc at the University of Cincinnati until his wife, Sandy, finished her Ph.D. She was eventually hired by Furman as a part-time researcher and to oversee the department's instrumentation.

The down side. Small ponds are not entirely unruffled, however. Although money may go further, there is undeniably less of it to go around. Where top schools might offer a new professor $100,000 or more to start up a research program, the scientists at smaller schools say their average is closer to $20,000 or $30,000—although a well-endowed private school like Swarthmore can offer much more. And poorer schools offer no start-up money at all.

After a second postdoc at the University of Chicago, biochemist Edwin Rivera, for example, was offered a tenure-track job teaching three classes at the University of Puerto Rico, Mayagüez. But the deal included no start-up money and no equipment for his research, which required the purchase of a spectrometer. Rivera says he won't be able to accept the job without a commitment to acquire the necessary equipment. As things stand now, he thinks he may end up looking for an industry job.

More pressure. While many of these schools are stepping up their research capabilities, they are also vigilant about keeping up their teaching standards. That can mean severe stresses on the time and energies of faculty members, especially because these schools don't necessarily have teaching assistants.

Dan McCarthy, a theoretical physicist who earned his Ph.D. from the University of Maryland, just finished his first year of teaching at Southeastern Louisiana University. He taught 6 hours of lecture and six of lab per week, had no teaching assistants, received no start-up funds, and yet is expected to do research or lose the job. "The person interviewing me was very clear: Do this, do that, and if you don't, you don't get tenure ... and in 6 years they expect five publications." During his first year, McCarthy says he spent about 40 hours a week teaching, 10 hours on research, and 10 to 15 hours on grant-writing. While McCarthy survived and expects his second year to be easier, another colleague hired at the same time decided he couldn't take the heat and quit at the end of the first semester.

Erik Hendrickson, who earned his Ph.D. in physics from Michigan State University in 1994, is another one who received a baptism by fire—he replaced two professors when he accepted his job at the University of Wisconsin, Eau Claire. That meant everyone's teaching load was increased, and no slacking was allowed. Teaching evaluators attend classes several times a semester—"You know you're in trouble if they're taking more notes than the students," says Hendrickson. All of his exams, quizzes, and homework assignments are evaluated as well. In Hendrickson's first year he spent 10 hours a week lecturing and four teaching lab. "For every hour of class there's an hour or two to prepare for the lecture," he says. "And we don't have teaching assistants or graders [to help with tests and quizzes]. ... It just doesn't happen at a school this size." That means his work week adds up to about 80 hours.

Despite all the drawbacks, scientists such as Hendrickson and the others generally seem satisfied. For they are still in academia, still doing research, and that, for them, is more important than prestige or money. "Some people complain about the situation," says Louisiana's McCarthy, who tended bar after earning his Ph.D., "but I'm not complaining. I expected it to be this way. ... And after you waiter for a while you don't mind. Throwing drunks out of the bar at night is worse than dealing with faculty."

–Karen Celia Fox

Karen Celia Fox anchors the radio program Science Report *for the American Institute of Physics.*