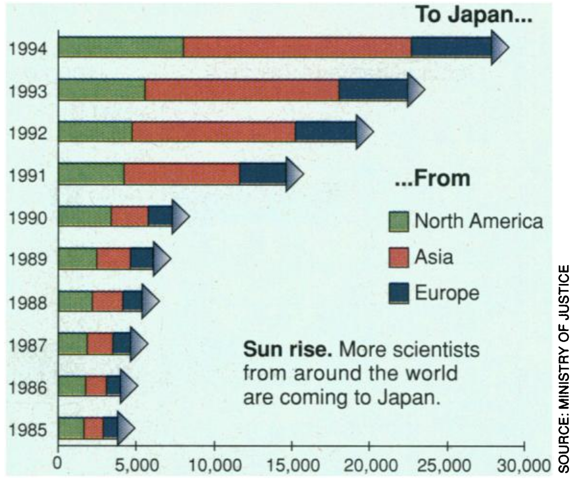
Gaijin Find Balmy Climate For Cutting-Edge Science



Sun rise. More scientists from around the world are coming to Japan.

British physicist Peter Parbrook looks back on the 4 years he spent as a foreign researcher in Japan as a turning point in his career—and his life. In fact, he was so enamored of the experience that he has compiled information for a book,* which he hopes will entice others to follow in his footsteps. As a postdoc at Toshiba Corp., he did cutting-edge research in optoelectronics and built up a record of publications that has helped him snare a lectureship in electronic and electrical engineering at Sheffield University in the United Kingdom. He also had the good fortune to meet his future wife.

Parbrook's experience may have been unusually sunny, but his tale is common enough to make many Western government officials wonder why so few of their young compatriots take advantage of the many positions available to foreign researchers in Japan—and why their numbers pale in comparison with the flow of Japanese researchers going abroad (see chart).

* *Gaijin Scientist*, P. Parbrook, Ed., British Chamber of Commerce in Japan, 1996. Information on opportunities in Japan can be found on the NSF Tokyo office's Web page: http://www.twics.com/~nsftokyo/home.html

"The majority report having a professionally rewarding experience," says Larry Weber, former head of the National Science Foundation's (NSF's) liaison office in Tokyo. "On top of that, most say emphatically that it was a culturally rewarding experience."

Historically, foreign scientists have avoided working in Japan because of the high cost of living and the sorry state of many university labs. But Parbrook and other visiting researchers say those reasons are no longer valid. Although Japan is an expensive place to live, many grants are paid in yen by Japanese governmental agencies or host companies, and most scientists say the stipends or salaries are more than adequate. David Yamaguchi, an American dendrochronologist who recently completed a 2-year visit at the governmental Forestry and Forest Products Research Institute in Sapporo on a Japan Science and Technology Agency fellowship, has managed to save roughly $1800 a month, more than enough to finance some traveling and still build a nice nest egg. "Almost all foreign researchers I've met here are happy [with their financial situation]," he says.

Another outdated notion is that state-of-the-art equipment is hard to come by. Bridget O'Neill, a U.S. geophysicist working on high-pressure mineral physics at the University of Tokyo's Institute for Solid-State Physics, says her lab is "very well equipped" and that she has access to specialized facilities at other institutes, including a synchrotron beam line at the National Laboratory for High-Energy Physics. When it comes to arranging access to such facilities, says O'Neill, who received her Ph.D. from the University of California, Berkeley, "the level of cooperation between different groups here makes it very easy."

That is not to say that all obstacles have

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Risky Career Move Pays Off

Marc Lamphier is a research associate at the University of Tokyo School of Medicine. Born in the United States, he received his doctoral degree in biology from Harvard University in 1992. He has worked in Japan for 5 years and holds a grant from the Research Development Corp. of Japan's Presto program. His e-mail address is: lamphier@m.u-tokyo.ac.jp.


EIJI MIYAZAWA/BLACK STAR

I knew it was a risky career move, and my graduate adviser thought I was a little crazy. But a postdoc in Japan seemed like an interesting cultural experience and a chance to explore some unique career opportunities. Having majored in Japanese as an undergraduate at Earlham College in Indiana, I felt comfortable with the language. And two grants, both funded primarily by the Japanese government, paid my way.

The initial problem was finding a good lab. I spent a lot of time searching scientific journals and writing to prospective hosts. My hard work paid off with an invitation to Tadatsugu Taniguchi's lab at Osaka University, internationally renowned for its work in studying the cellular responses to cytokines.

When I arrived in March 1991, the 20 or so members of the lab made a genuine effort to welcome me. However, because I was the only postdoc—of any nationality—it took time to fit in. Much of the research was organized in groups directed by the three assistant professors, and for several months I felt I wasn't consulted about research, nor given any real responsibilities. Fortunately, as the sole U.S.-born scientist in the lab, I was consulted extensively by colleagues writing up their results for publication. This interaction sparked ideas that led to new research, of which I became a part.

Five years after I arrived in Japan, I'm surprised to find myself still here. I had intended to return to the United States after finishing my postdoc, but a generous 3-year grant from a government-funded research corporation has enabled me to pursue independent research into the regulation of cell growth by transcription factors. I'll face another hard choice next fall, when my grant expires. Although Japanese universities and companies seem eager to internationalize their staffs at the entry level, it is not clear if foreign scientists will be promoted to positions of genuine responsibility.

Regardless of what I decide to do, I'm glad I came. Living in a different culture and working in a world-class lab, I've learned that doing research in Tokyo isn't much different from working anywhere else.

—Marc Lamphier

LEAVING HOME

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Futoshi Shibasaki, who turned down an assistant professorship at the University of Tokyo for a postdoc at Harvard Medical School.

The loose structure of U.S. labs also improves the flow of information, he says: "In Japan, you can't get information before a paper is published. Here there's lots of personal communication prior to publication." Similarly, Suzuki finds that her colleagues at Johns Hopkins communicate more freely than those in Japan. "Here the lab is smaller, only about 10 people, while in Japan, the lab has many people—more than 30 where I was—so they break up into groups and overall communication gets poor."

SAM KITTNER

Speak up. Noriko Suzuki says lab interactions work best in English.

Openness may not always be enough, however. In some fields, such as high-energy physics, poor job prospects in the West can make the grass seem greener at home. "Most of my colleagues and classmates don't want to go overseas," says Tsuyoshi Nakaya, a particle physicist working at Fermi National Accelerator Laboratory outside Chicago. "Most of them want to work on the B-meson factory [under construction at the Institute of High-Energy Physics in Tsukuba]." Conversely, even in fields where opportunities in Japan are more limited, many young scientists are reluctant to go abroad because they fear losing out in the competition for jobs back home.

Yet the idea of studying abroad remains an irresistible challenge to Japanese scientists like Nakaya, who are suspicious of security. "My American friends ask me, 'Why are you here?' In Japan, research jobs are very stable," he says. "But if you have to find a new job every few years, you must think of new things all the time. If I got a job for 10 years, I don't think I'd do any new science."

–June Kinoshita

WORKING IN JAPAN

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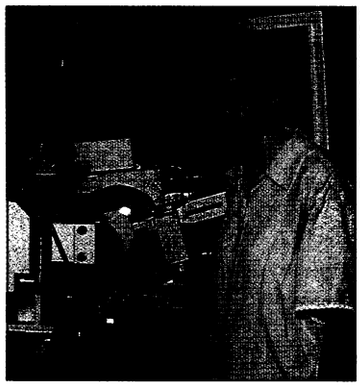
been removed. The language barrier is real. Alisa Erika Koch, a professor at Northwestern University Medical School in Chicago who was a visiting researcher for a year at the University of Tokyo's Institute of Medical Science, recalls being stymied by some cautionary instructions posted on a centrifuge she wanted to use. "It's like being a child again if you can't read," she says.



EIJI MAYAZAWA/BLACK STAR

Topnotch. Bridget O'Neill says her Tokyo lab is very well equipped.

There is also the question of the professional payoff from a stint abroad. U.S. physicist Douglas Tweet found that his experience working at NEC Corp.'s Fundamental Research Laboratories in Tsukuba "wasn't seen as an asset" by most U.S. companies he contacted as his 3-year postdoc was coming to a close 2 years ago. Fortunately, he was able to satisfy his desire to learn more about Japan by taking an open-ended position at the national Electrotechnical Laboratory in Tsukuba.

Patricia Gercik is managing director of the Japan Program at the Massachusetts Institute of Technology, which places science and engineering students in Japanese laboratories for up to a year. She says that the increasing number of joint ventures between Japanese and American firms is raising the value to U.S. companies of people with both technical and cross-cultural skills. But many companies still "don't get the picture," she says.

Despite the inherent difficulties of working in a strange country, Western officials say that recent trends are positive (see graph). Some programs, such as a U.S. "Summer Institute in Japan" scheme which places U.S. graduate students in private and public labs in Japan, are already oversubscribed. One reason for the increased interest, says Weber, is simply a greater awareness of the level of work being done here.

Sheffield's Parbrook agrees. "What really counts is the science you do while you're there," he says. "As information [about the quality of Japanese research] becomes more available," he predicts, "people are going to be more aware of the value of coming here."

–Dennis Normile

PRECOLLEGE EDUCATION

Reformers Fight to Draw More Students Into Science

TOKYO—On a hot and muggy evening this summer, a classroom at Shotoku Gakuen High School began to fill up with people carrying wires, tubes, and chunks of metal. They each took turns demonstrating simple experiments and discussing how to work them into classroom activities. One illustrated the concept of phase change—and demonstrated basic metalworking techniques—by showing a new metal alloy that melts in hot water and can be cast into molds. Another showed a videotape of how a simple homemade accelerometer could measure the change in *g* forces experienced during amusement-park rides. "It's a way of studying while playing," the presenter said.

It was a typical monthly meeting of the Galileo Workshop, an informal group of high school physics teachers formed in 1985 to discuss innovative approaches to teaching their subject. These gatherings are more than a forum for exchanging ideas for novel experiments, however. The participants hope such grassroots efforts will stave off the harmful effects of a drop in the number of hours spent on science in the classroom and shore up declining student interest in science, especially physics. Part of the problem, they say, is that Japan's long-standing emphasis on education has degenerated into a narrow focus on passing tests, particularly the university entrance exams. "Science is covered in the curriculum," says Yutaka Furuta, a physics teacher at the private Tokyo-area Rikkyo High School and a workshop regular. "But there is little chance for students, let alone ordinary citizens, to learn the joy of scientific experiments."

Yoji Takikawa, a physics teacher at International Christian University High School and a driving force behind the Galileo Workshop, worries that these trends will undermine not only the government's plans to boost basic research and increase graduate enrollment, but also the country's economic health. "I have to wonder about Japan's future," he says.

Takikawa may be more pessimistic than most science teachers, but he is hardly alone in his concerns. A few years ago the Physical Society of Japan found "various problems with primary and secondary science education," says Toshio Hyodo, a professor of phys-