News & Comment

Strains in U.S.–Japan Exchanges

Americans complain that Japan has not reciprocated in transferring technology, as the Japanese open the door slowly

WHEN Tokyo University in May announced the endowment of four new faculty positions for foreign scientists, the news was meant to send an important message to the research community abroad, especially in the United States: Japan is sliding open its doors a little wider to let in *geijin* (foreigners). Frank Press, president of the National Academy of Sciences, says, however, of the new endowment: "It's a start. It's symbolic, but too small. It's laudable, but the Japanese have to do more."

Press and other leaders in the American scientific community contend that while laboratories here have been open about their research in science and technology, the Japanese have failed to reciprocate. They argue that hundreds of Japanese have studied at the best American laboratories, but only a trickle of Americans have been able to conduct research in Japan. They also contend that Japan has not contributed its proper share to the funding of basic research.

These complaints have taken on more prominence as the trade wars between the two countries and the protectionist rhetoric in Congress have escalated. The revelation that Toshiba sold submarine technology to the Soviets has stoked anti-Japanese sentiment in Washington, and the White House has been pushing for some aggressive measures designed to tilt the scales of U.S.–Japanese technical exchanges back toward the West.

The issue has recently been the focus of spirited debate at closed meetings of the government's senior interagency science and technology group, where officials presented two sharply different paths for redressing what is now widely considered a disturbing loss of U.S. scientific know-how to the Japanese. These meetings in turn culminated in discussions by the White House Economic Policy Council on 24 July, which decided not to adopt a set of tough measures pushed by White House science adviser William Graham. The council was persuaded that the actions would have damaged current joint scientific endeavors.

The proposals that Graham was pushing in the interagency deliberations indicate the depth of White House concerns about this issue, according to several officials involved. They included: a demand that the Japanese government commit itself to enlarging its support of basic research, which U.S. researchers might then tap; a demand that Japan pay for U.S. scientists to learn the Japanese language so they can keep abreast of cutting-edge research in Japanese laboratories; and a demand that research positions in those labs for U.S. scientists also be subsidized by the Japanese.

Graham proposed incorporating these provisions in the 1980 U.S.–Japan agreement on scientific cooperation, which is to be renewed by November. The agreement now encompasses several dozen small research projects spanning a variety of topics such as fish toxicology, crustal plate motion, and astronomy studies. (There are other bilateral scientific agreements with the Japanese that are individually negotiated by several federal science agencies, such as the National Science Foundation.) According to sources at several agencies, Graham also wants to broaden its scope to tap Japanese expertise in such hot areas as superconductivity, the supercollider, and a space station.

Marjorie Sun

Japan's scientific counselor Kaname Ikeda. *Dramatic reforms "require a national consensus and that takes time."*

While demanding that the Japanese open up their research to U.S. scientists, Graham recently decided to try to close a major conference on superconductivity to foreign researchers. The meeting, to which the press and thousands of American scientists were invited, was cosponsored by the science office and held in Washington on 28 July (see box).

The Japanese reaction to these fresh complaints of a technology trade imbalance has been a mixture of contrition and disdain.

Kaname Ikeda, science counselor at the Japanese embassy in Washington, D.C., says, for example: "in light of the atmosphere [the view in the United States] that Japanese are learning and stealing technology, Japan has to do something by herself." Gradually, he says, Japan will provide more entree to its laboratories and put more money into fundamental research.

At the same time, he says that "maybe it is a matter of productivity and effort, not capability" that enables Japanese firms to benefit from research sponsored by the U.S. government. "The same research is open to U.S. companies, too," he says. "Maybe the root of the problem is that Japanese companies are quick to commercialize findings" and U.S. firms are not.

Graham declined to respond to telephone inquiries from *Science* regarding the agreement with Japan; a spokeswoman said that he was "very busy." Deborah Wince, an aide to Graham, says that the science office is "disappointed with the Japanese" and their efforts to improve access. "We don't want to exclude the Japanese from American labs; we want the Japanese to open up."

Gaining such access is clearly complicated by cultural and sociological differences between the two nations. Japan and the United States support dramatically different levels of basic research and conduct it at different institutions.

Each nation spends roughly 2.5% of its gross national product on R&D, of which a far higher proportion in the United States is allocated to military research. The U.S. government funds about half of the nation's total R&D budget, while the Japanese government funds only 20%. U.S. industry accounts for roughly one-third of the total, while Japanese industry funds 80% of the total.

More significantly, in the United States, about 12.5% of R&D expenditures go into basic research, while in Japan, only 3% does, according to Richard Samuels, director of the Massachusetts Institute of Technology–

Japan science program. These striking differences complicate the issue of mutual access because they make it hard to find equivalent Japanese labs in which to place American scientists; they raise special problems of proprietary secrets; and they tend to impair strictly government-government talks as a means of addressing the issue.

Although Graham's desire to petition the Japanese for a commitment to additional spending on basic research would obviously ease one of these difficulties, it was seen by many other U.S. science officials as an unwarranted intrusion into Japanese domestic affairs. An official at the Commerce Department, for example, asks: "Can you imagine how we would feel if Japan made the same demand of us? For a country that's knocking our socks off, it's insulting."

Similar criticism greeted Graham's proposal to force the Japanese to pay for language training of U.S. scientists and translate Japanese journals into English. Says one NSF official, "I'd like to see the U.S. spend an equivalent amount that the Japanese spend to learn English. I see nothing intrinsically wrong with the Japanese translating into English. But, in the end, we're the ones that can do better translations. I'd rather see us do more of it."

Everyone agrees that ignorance of the language is a major obstacle to learning important news from Japanese scientific conferences. Hiroshi Inose, a former dean of engineering at Tokyo University who now directs the country's National Center for Science Information Systems, says it is also a barrier to working in Japanese labs. "Companies don't want to treat foreign researchers as guests," he said in a telephone interview from Tokyo. "They want them to be members of the group."

But many U.S. experts see this as a problem of American origin, which demands an American solution. Mitchell Wallerstein, acting director of the new Office of Japanese Affairs at the National Academy of Sciences, says, "The language barrier is really our problem. We don't pay for translation of journals in English into Japanese."

Graham's additional proposal to force the Japanese government to subsidize new positions for American scientists in Japanese laboratories attracted more mixed reviews. Again, everyone agrees that Japanese regulations have been a barrier to access. Until 1983, the Diet prohibited foreigners from holding permanent faculty positions. For years, the Ministry of Education barred industry from endowing faculty positions at national universities to prevent improper influence on professors. Under Inose's initiative, this rule was overturned last year, which paved the way for four private Japanese companies to endow the new chairs for foreigners at Tokyo University.

But White House science office officials are particularly upset at the disparity between modest progress in Japan, and the fact that more than 300 Japanese researchers a year conduct research at the National Institutes of Health (NIH). These researchers are inappropriately being subsidized at the American taxpayers' expense, in the view of the science office.

A senior official in NIH's office of intramural affairs disagrees, pointing out that the foreign participants in the international program at NIH are selected on the basis of merit and that the program has no quota system. "The Japanese are contributing here. They publish. NIH scientists find them diligent," the official said. "If the Japanese weren't here, it would be someone else."

But the picture is complicated by the fact that the Japanese receive proportionately more support from NIH than scientists from other countries. According to NIH

Stumbling on Superconductors

A decision by William Graham, the President's science adviser, to exclude noncitizens from a mass meeting on superconductivity on 28 July upset some of the sponsors and offended foreign diplomats who wanted to attend.

The program, aimed at interesting U.S. corporations in superconductivity, was sponsored by the White House Office of Science and Technology Policy, four federal agencies, the National Academy of Sciences (NAS), and the National Academy of Engineering (NAE). Frank Press, president of the NAS, and Robert White, president of the NAE, urged Graham to open the door to foreigners.

Roger Meyer, a spokesman for the chief coordinating agency, the Department of Energy (DOE), says: "The conference was organized for U.S. commercial interests, so we did not invite foreign commercial interests."

Science counselors at the British, French, Japanese, and West German embassies say that the cold-shoulder treatment went beyond omitting an invitation. When they called DOE for permission to attend, they were told first that there was no room for them, and second that this was a "domestic" meeting at which they were not welcome.

Kaname Ikeda, Japan's science counselor, was "very disappointed" with the rejection. However, Margot Bellman of the British embassy's science information office, who was rejected at first, received a call a few days before the meeting to inform her she might attend. "I don't understand the policy," she said. "Apparently the foreign press is not excluded." Heinz Seipel, West Germany's science counselor, said, "I don't understand why it's important to have the foreign press but not the science representatives of foreign governments."

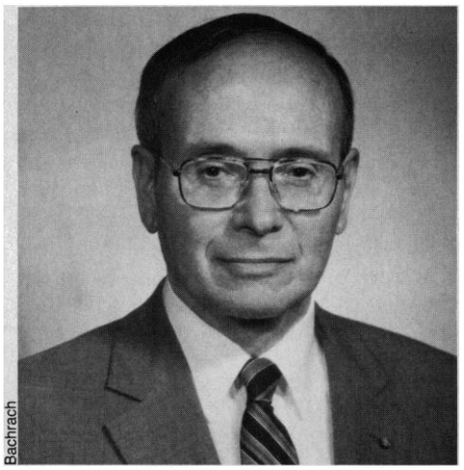
Indeed, DOE and the White House papered the town with press releases announcing that "President Reagan will keynote" the event. Cabinet members, members of Congress, and scientific leaders were on the speakers list.

"This was a terribly unfortunate decision," says one leader of a scientific society. "We are trying to interest our allies in participating in the space station and the supercollider and other would-be international projects. To do this at this time is incredible." The motivation apparently was to deny information to America's competitors in trade. Another official involved in scientific exchanges is concerned that the Japanese and Europeans may retaliate by closing some of their meetings.

A House science subcommittee staff member said that the decision to block foreigners from the meeting was embarrassing, given that top Japanese researchers in superconductivity recently invited Americans to attend a meeting they sponsored in Japan last month. "There's no logic to what [the science office] is proposing," the staff aide said.

Graham could not be reached for comment. However, Frederick Leavitt of Graham's staff said he was aware of concern about foreign attendance and felt that it was exaggerated. "This is one meeting," he said. "There will be many others in the passing of time."

Solomon Buchsbaum, chairman of the White House science council and executive vice president of AT&T Bell Laboratories, says, "There have been lots of conferences on superconductivity that are international in nature and scope." He mentioned one scheduled for September at which Russian scientists will speak. "To single this one out and make a cause célèbre isn't justified." ■ **E.M. AND M.S.**



Academy president Frank Press
says the Japanese "need to do more" in providing Americans access to labs in Japan.

figures, 327 Japanese conducted research at NIH in the past year. The stipends of one out of six researchers in this group were paid by Japanese sources; the rest was footed by NIH at a cost of $6.8 million. In contrast, more than half of the 72 West Germans and about one-third of the 68 French studying at NIH paid their own way.

Ikeda says, "Personally, I think that Japanese should increase the ratio [of Japanese-supported researchers to those funded by NIH]. The ratio paid by Japan is smaller than West Germany. We accept such a message."

NSF officials say that U.S. access to Japanese labs would increase if the foundation had more funds for grants support. Charles Wallace, head of NSF's exchange program with Japan, says, "Last year I had enough funds to support 20 out of 60 proposals to do research in Japan that were peer-reviewed by outsiders and ranked high priority by another branch of NSF. A lot of good stuff is not being supported." But other U.S. and Japanese officials say the answer also lies in changing the attitude of U.S. researchers who are unwilling to subject themselves to such a different cultural environment.

Inose, reached by telephone at his Tokyo office, says that until recently, "American scientists have had almost no interest in Japan. We have had much difficulty in getting Americans here." He notes several difficulties for foreign scientists in Japan, including the strength of the yen (which cuts into stipends and exacerbates the expense of housing), and the modest living accommodations. He also says "it is hard for wives of foreign scientists to find jobs here."

The idea that American scientists are at least partly to blame is supported by recent surveys by NSF, which found there are unexploited research opportunities in Japan. According to a January 1986 report, 124 Japanese companies that employ at least 30 researchers said they have already hosted or are willing to receive foreigners. But only 45 Americans had worked at these companies in the past year and most of this group had worked in four companies, according to a subsequent NSF report published in May. The 124 Japanese companies included Hitachi, Nippon Telegraph and Telephone Corporation, and NEC Corporation.

An NSF official says, "The basic problem is that the science office is approaching this agreement with a presumption that the Japanese are doing things that are sneaky. It's not the fault of the Japanese that American companies aren't taking advantage of American laboratories. The science office is tying a lot to the [science and technology] agreement without thinking it through."

One modification of the agreement, proposed by the Commerce Department, which has had the general support of the agencies, is to include a provision protecting intellectual property rights of the American agencies and individual researchers participating in joint projects under the agreement. One source said that the draft text could be ready to present to the Japanese in September.

An approach advocated by the National Academy of Sciences may provide a model for successful negotiations. Meeting last November under the auspices of the Academy and the Japan Society for the Promotion of Science in Kyoto, top business and science leaders from both countries produced a joint statement pledging new efforts toward "symmetrical access," a concept that contrasts sharply with tit-for-tat equivalence in the number of U.S. and Japanese visiting scientists. Press says the Academy has broad goals that involve joint cooperation not only in research but also in trade-related issues, including the commercialization of high technology, such as market barriers and capital financing. "We want to trade access to MIT for similar work at Fujitsu," Press says. "Japan should have a more substantive program in exchanges. It's good politics; it's good science."

Somewhat remarkably, the Japanese conceded in the joint statement that Japan has "underinvested in the past in the overall support of basic scientific research, and, in a sense, has withdrawn more from the store of scientific knowledge than it has contributed." Press says, "We have a piece of paper now and we're working on the action." The two groups are developing a list of six of the most significant research fields in each country and the people and institutions involved in hopes of fostering research exchanges.

Both the Academy and NSF also have plans to gather and provide more information about research opportunities in Japan to help America help itself. Wallace said that NSF would like to act as a "broker" for American scientists. Wallerstein said that the Academy eventually would like to provide information on housing and schooling in Japan. According to Frank Press, Secretary of State George Shultz said in a meeting with him that the department's language training program could be used to help train U.S. scientists who want to go to Japan.

The Japanese, meanwhile, are talking up a new project called the Frontier Research Programs, which intends to fill one-third of its 140 research positions with foreigners. The new 15-year program was budgeted at $20 million for fiscal years 1986 and 1987 and is run by the government's Institute of Physical and Chemical Research, known as RIKEN. The institute is funded by the government's Science and Technology Agency, which started the program after the widely publicized, multimillion-dollar plan of a similar name, the Human Frontiers Program, got bogged down last year in a regulatory turf battle.

The program has recruited two Americans to serve among its top advisers. Kevin Ulmer, the former head of research at the biotechnology company Genex in Maryland, heads a laboratory for bioelectronics, and Anthony Garito, professor of physics at the University of Pennsylvania, directs a laboratory for nonlinear optics and advanced materials.

Ulmer says that the institute has built new, subsidized housing and laboratory facilities and has state-of-the-art equipment. "Language isn't a problem," he says, and stipends are comparable to those in the United States.

Lewis Branscomb, former chief scientist at IBM who is now a professor at Harvard's Kennedy School of Government, praises the efforts of Inose in persuading the Ministry of Education, Tokyo University, and corporate sponsors to support the newly endowed chairs for foreigners. Branscomb says, "What Inose has done represents a tremendous effort. The motivation was to demonstrate openness. However modest Americans may view that, [the endowment] is significant because it indicates their sincerity to do something concrete." Inose notes that other universities may follow suit.

Japan is changing its ways step by step, but Ikeda cautions that the process will be slow. Dramatic reforms require "a national consensus and that takes time," he says. "They will not happen overnight." And, as one American official says, "Whether we push them or not, the Japanese will do more basic research." It will be in their own self-interest to do so. ■ MARJORIE SUN