Harry C. Kelly: An Extraordinary Ambassador to Japanese Science

The United States–Japan Committee on Scientific Cooperation met in Washington, D.C., this month, and for the first time since its inception 9 years ago, Harry C. Kelly was not on hand to lead the American delegation. Probably few readers are even aware that the U.S.–Japan Committee exists, and probably fewer still have ever heard of Kelly, who is currently provost at North Carolina State University. But, however obscure he may be in his own country, Kelly has played a key role in improving relations between academics in the United States and Japan, and he has become a figure of considerable stature in Japanese scientific circles. His departure from official liaison duties closes an unusual chapter in personal diplomacy—a chapter which indicates that a man of good will, sincerity, persistence, and courage can do much to help restore amity between two nations that have been at war.

Kelly's ties with Japan date back to the period of the American-run Occupation immediately after World War II. As a young 37-year-old physicist, Kelly was plucked from the M.I.T. Radiation Laboratory, where he had worked during the war, to become a science adviser to General Douglas MacArthur. From 1946 to 1950 he waged an enlightened and generally successful fight to save Japanese science from mindless destruction at the hands of the Occupation bureaucracy. His efforts, which are discussed more fully below, won him numerous friends and lasting gratitude from the Japanese scientific community. Thus it was only natural, when the United States and Japan launched a new committee in 1961 to guide cooperative ventures in science, that Kelly was chosen to serve as co-chairman from the American side. His counterpart, the co-chairman representing Japan, was Kankuro Kaneshige, a member of the Prime Minister's Council for Science and Technology and one of the leading statesmen of science in Japan. "Dr. Kelly thinks more like a Japanese than most Japanese do," says Kaneshige, bestowing one of his highest accolades.

The esteem with which Kelly is held in Japan shows up in numerous official and personal honors that he has received. Although Kelly does not rank on anybody's list of the world's leading physicists, in the early 1950's he was awarded the first honorary membership ever granted by the Physical Society of Japan. More recently, in 1969, Kelly was awarded the Order of the Sacred Treasure, Second Class—the highest honor the Japanese government bestows on foreigners (with the exception of an occasional prime minister). The award was ostensibly given for Kelly's work in fostering scientific cooperation, particularly his work with the U.S.–Japan Committee, but high Japanese scientific sources say Kelly's extraordinary service during the Occupation was also a major, though unmentioned, factor (the Japanese government prefers not to honor its military occupiers openly). At the meetings at which Kelly's nomination for the award was discussed, not even the extreme left-wingers, who are generally critical of the United States, raised a murmur of objection to honoring Kelly, according to one high-ranking participant.

On a more personal level, Kelly has formed close friendships over the years with many of Japan's most eminent scientists. He is a foster parent to the two sons of the late Yoshio Nishina, an eminent physicist whom Kelly rescued from a purge by Occupation authorities. And he is a long-time friend of such Japanese statesmen of science as Kaneshige and Seiji Kaya, president of the Japan Society for the Promotion of Science and former president of the University of Tokyo (Japan's Harvard). Kelly's popularity is particularly evident when he flies into Tokyo and is met at the airport by a gaggle of friends, official greeters, and reporters. "It's like Christ descending," says J. E. O'Connell, staff man for the U.S.–Japan committee.

Kelly's success with the Japanese does not seem to stem from any deep knowledge he has of the country. Oddly enough, for a man who has been close to the Japanese for almost a quarter century now, Kelly can speak only a smattering of Japanese words and he can barely find his way around Tokyo. He grumbles that he is always so "overprotected" by his Japanese hosts, who ferry him around and see to his every need, that he has had only one opportunity to ride on the Tokyo subways. On one recent visit, he says, "I wanted to take my family out one afternoon and, dammit, I didn't know how to get

Kankuro Kaneshige (left) and Harry C. Kelly

anywhere. I was just shocked that I didn't."

The chief ingredient in Kelly's success appears to be his personal character. He is so obviously sincere and so thoroughly friendly that he wins the trust of many of the Japanese with whom he deals. Hiroshi Tamiya, who played a major role in the postwar reorganization of Japanese science, recalled the confidence that Kelly inspired during the Occupation. In a nostalgic speech, Tamiya described the young Kelly as "a white-slim and a little nervous man. He was the type of man who never changed his mind unless he understood things and was very sincere. Also a man who started all over again without any hesitation as soon as he recognized that his idea was wrong." Kelly is also very down-to-earth and loves to sing, drink, and talk into the wee hours with his Japanese hosts. And he is endlessly patient—willing to spend long hours in conversation to make certain that understanding transcends the language barrier.

Mysterious Hand

Kelly is still somewhat mystified as to why he was picked to go to Japan after the war. He has little doubt that the decision to send MacArthur some scientific advisers stemmed from the "hue and cry" that developed in the American scientific community after U.S. military authorities destroyed several Japanese cyclotrons for fear they might provide Japan with future war-making potential. But he is not sure just why he was chosen. All he knows is that the military approached Gerald Fox, then head of the physics department at Iowa State University, who was working at the Rad Lab during the war, and Fox insisted on taking along Kelly. "Why us, we never did find out," Kelly says. "I think they wanted someone from the Rad Lab rather than some of the A-bomb people."

Fox and Kelly had originally intended to stay in Japan for only 90 days, but they found the job a lot bigger than they had envisaged. Fox stayed about 4 months and Kelly stayed for 4 years. Kelly still remembers, with vividness, his first glimpse of Tokyo through the plane windows—long stretches were almost totally flattened except for chimneys and safes. He also recalls the "great respect we had for those people who seemed to be crawling back on their hands and knees to start building again . . . with tin cans and anything else they could find."

Kelly's initial mission was mostly negative: to prevent research and development in such militarily useful fields as nuclear energy and aeronautics. But it quickly became apparent that two American scientists could not hope to keep close surveillance over the entire Japanese research effort. How could they possibly know whether some Japanese scientist was whomping up a biological weapon in his kitchen sink? And how could they decide what research fell into the proscribed categories? Kelly recalls visiting one laboratory where scientists were using fans to blow air currents across arcs and were photographing the arcs to obtain a picture of the wave fronts. "Was this aerodynamics or was it electronics, and should you stop it?" Kelly asks. "And how could you even find out where this was going on—it was just accidental that we found this."

The solution Kelly and his staff hit upon was to trust the Japanese to reveal what research they were doing. At first the Occupation rather naively asked the Japanese to submit periodic reports about the research they were doing or planning, but that resulted in such a mountain of paper that it was clear there would never be enough people to read all the reports and see if they violated any Occupation directives. So Kelly and his colleagues pushed the concept of trust a step farther by having the Japanese exercise what amounted to "self-censorship." The Japanese were asked to continue submitting the periodic reports but to draw particular attention to any research that might violate the Occupation directives against military research. As far as Kelly knows, there was only one case where a Japanese scientist failed to report his work properly. One scientist started building a small linear accelerator in violation of the directives against nuclear research, but he made no effort to hide his work and indeed eagerly explained the project to Kelly when Kelly happened to stumble across it on an inspection trip. Kelly is convinced that this scientist's failure to report his work was "not done maliciously or in order to hide anything."

The "self-censorship" policy—which some might have considered a risky concession to grant a vanquished foe—caused Kelly occasional pangs of worry, too. But he stuck to the policy because he had managed to build a feeling of trust with such Japanese scientists as Nishina, Kaya, and Kaneshige, and because both he and the Japanese recognized that it was in their mutual interest that Kelly retain the confidence of the American military authorities—something Kelly could do only if it were clear that he knew what was going on in the laboratories and that none of the Occupation's scientific directives were being violated. Kelly says his whole experience with scientific surveillance leads him to be "very skeptical" about the value of on-site inspection to enforce disarmament agreements "unless people want you to know." He believes it is "impossible" to keep tabs on what foreign scientists are doing "without the complete cooperation and trust" of the country involved.

Rebuilding the Base

In addition to the purely negative aspects of their mission, Kelly and the Occupation authorities undertook the more positive job of helping Japan rebuild its shattered scientific and technological base so that Japanese scientists could help solve the serious problems of food, clothing, shelter, and health that confronted their nation. Not all Japanese scientists were interested in such a mission, however. With that lack of social concern which seems to afflict some scientists in all nations, one Japanese specialist in line spectra actually suggested that the United States should give him and his colleagues an island, loaded with money, equipment, and food, so that they could carry on their research. "I asked him if he didn't feel any obligation to his fellow countrymen who were starving," Kelly recalls, "but we never did develop any understanding on that issue." Many other Japanese scientists were deeply discouraged at the scientific stagnation caused by the isolation and destruction imposed on Japan by war, and they despaired of making a contribution to recovery. The Occupation had no "foreign aid program" for science (food, after all, was the first essential), but Kelly and his colleagues did their best to get the laboratories functioning effectively.

One of Kelly's chief services was to save eminent scientists and laboratories from punitive action at the hands of the Occupation. Kelly had great respect for the military authorities in charge of the Occupation. ("We behaved like a great people," he says. "We took the attitude: now that we've won, how can we help Japan build itself

back up economically.") But Kelly notes that there was "tremendous confusion" at the end of the war. "People had their orders and they were good orders," he says, "but at each stage it required human judgment [on how to carry out the orders]." For his part, Kelly took an unusually liberal view concerning the need for Japanese science to be exempt from harassment.

Perhaps the most eminent scientist Kelly had a hand in "saving" was Yoshio Nishina, a distinguished atomic physicist who happened to be virtually the only Japanese scientist Kelly had heard of before arriving in Japan. One day American intelligence officials, who were trying to draw up a list of scientists to be "purged" for their military activities, asked Kelly for his opinion on prospective purge candidates. Kelly took the intelligence reports home for the weekend and discovered that one of the folders was Nishina's. "I ended up with a great respect for that man," Kelly recalls. "He was an international scholar, respected all over the world. And he had spoken out against the war. I said it was against everyone's interests to purge that man." Nishina was ultimately saved, and Kelly says he knows of no scientist who was purged for reasons relating to his scientific work, at least during the time Kelly was in Japan. (Some histories indicate that a few scientists were purged for their cooperation in the war, but the purge in science is said to have been much less severe than the purge in other professions.)

Saving a Cyclotron

Kelly subsequently made it a point to visit Nishina in his laboratory, one of the places where American authorities had previously destroyed a cyclotron. "He showed no bitterness about our actions," Kelly recalls. "He knew damn well they (the Japanese) would have behaved even worse." Nishina revealed that the Occupation bloodhounds had actually missed a second cyclotron, which was on the premises but in a dismantled condition. Kelly dutifully reported the existence of this second cyclotron—but he buried the information so deep in a long, tedious report that no one, apparently, ever noticed the revelation. The Kellys and the Nishinas soon became close friends, and when Nishina was invited to visit his old teacher, Niels Bohr, Kelly was instrumental in getting him permission to leave the country despite a certain coolness to the idea on the part of U.S. diplomats. "Bohr sent a letter back to me saying that Nishina was not only one of the world's great scientists but one of the world's greatest humanists as well," Kelly recalls. "He advised us to trust him and he'd help us." Such letters of support gave confidence to the young and inexperienced Kelly that he was on the right track in encouraging Japanese science.

Kelly had arrived after Japan's military laboratories had been dismantled, but he helped to save several civilian laboratories from similar destruction. Since aeronautical research was forbidden by Occupation directives, Kelly, on one occasion, was obliged to destroy some wind tunnels at a big aeronautical science institute connected with the University of Tokyo. He discovered, however, that the institute had perhaps 100 or more wind tunnels, far too many to be maintained by the shaky Japanese economy, so he suggested that the institute's director decide which ones he would most like to get rid of for budgetary reasons and which ones he wanted to save. The "surplus" tunnels were promptly dismantled by the Occupation and the others were devoted to studies on such "civilian" phenomena as soil erosion and the upper atmosphere—a decision which received the blessing of Kelly's immediate superior, an Australian brigadier general.

Another big laboratory that Kelly helped hold together was RIKEN, the prestigious Institute for Physical and Chemical Research in Tokyo. The Occupation, as part of its trust-busting operations, separated RIKEN from its industrial ties, Kelly recalls, but when there was further talk about breaking up the laboratory itself because it had a strong concentration of nuclear physicists, Kelly argued, apparently persuasively, that it would be easier to keep tabs on the nuclear scientists if they were centrally located—so the laboratory was kept intact.

The incident which perhaps best illustrates Kelly's relationship with the Japanese occurred at Hokkaido University, on the northernmost of Japan's main islands, during his first winter of service. Kelly was looking into a "death ray" project which involved an effort to determine whether high-energy electromagnetic waves could be used to melt aircraft in the sky. Kelly visited the laboratories and said it looked to him as if some of the experimental appara-

NEWS IN BRIEF

● **MERCURY POLLUTION:** The Justice Department has authorized civil suits against eight companies named by the Interior Department for allegedly dumping mercury into waters of seven states. U.S. District Attorneys will seek injunctions against the continued discharge of mercury under provisions of the 1899 Refuse Act. The act forbids the dumping of refuse into navigable waters unless authorized by the Army Corps of Engineers. Civil injunction procedures will be used instead of criminal action, according to a Justice Department official, because the penalty under criminal action is relatively light. The suits will be filed against companies in Alabama, Delaware, Georgia, Kentucky, Maine, New York, and Washington. Mercury has recently been found in significant amounts in fish or waters of at least 13 additional states.

● **EUROPEAN PESTICIDE PROGRAM:** The Council of Europe has endorsed a four-point voluntary program for control of pesticides. Declaring that widespread and ill-considered use of pesticides "constitute a danger not only to man and domestic animals, but also to wildlife," the Council urged concerted legislation by member nations to avert the dangers. The resolution urged that pesticides be carefully studied for harmful side effects before being manufactured; that labels bear exact instructions and warnings; that qualified persons apply the pesticides; and that penalties accompany pesticide regulations. Switzerland and the Netherlands, which have large chemical industries, did not endorse the program, which has no punitive provisions, but the Council's other 15 members did.

● **CAMPUS DISORDERS:** Bills relating to campus upheavals were introduced in 40 states during the 1969–70 legislative sessions and passed in 32 states, according to an Associated Press survey. The laws most commonly provide for cutting off financial aid to students engaged in illegal demonstrations, dismissal of faculty members involved in protests, punishment of anyone who damages school property or interferes with campus activity, and barring outsiders from college campuses. The strongest bills came in states that had the most violent and prolonged demonstrations.

tus had been removed, but the Japanese remained silent. Then, as Kelly was about to leave the university several days later, the university president and several scientists called at his hotel and asked to talk to him as a scientist rather than as an official of the Occupation. They revealed that some of the apparatus (a large magnetron and other electronic gear) had indeed been moved before the end of the war to a small village about 30 miles away. The scientists were too frightened to tell anyone what had happened, but Kelly persuaded them it would be best for him to make a full report of the matter. The next day, Kelly, the Japanese scientists, and a military officer traveled to a village schoolhouse where the apparatus was stored. Kelly hung a big sign over the gear: "Property of Hokkaido University, Electronic Laboratory, Inspected by H. C. Kelly, General Headquarters," figuring that might get the anxious Japanese off the hook. "I told them to move it back when they had the chance," Kelly recalls. "They had wanted to melt airplanes, but the best they had done was kill a rabbit at 20 feet, or something like that." Kelly further won the gratitude of Hokkaido University when he helped persuade military authorities to withdraw troops from the university buildings. Thus it was not surprising when Hokkaido gave Kelly an honorary degree in 1965. Kelly believes it was only the fourth honorary degree ever awarded by the institution.

Occupation Policies

Kelly did his best to grant the Japanese wide latitude in scientific publication despite Occupation censorship policies. When he arrived, Kelly recalls, American educators were busily trying to censor Japanese textbooks, tearing out pictures of airplanes and having the texts translated into English so that they could be censored by the linguistically inept Americans and then translated back into Japanese for use in the Japanese schools. Kelly believes the whole exercise was "a complete waste of time—the so-called educators who tried to control what was taught in the schools made fools of themselves." When Occupation authorities raised the question of whether Japanese scientists should be allowed to publish some of their findings on the effects of the atomic bombings, Kelly's voice was among those that urged freedom of scientific publication, and ultimately the Occupation decided to issue no formal ban against such writings, Kelly recalls. The only instance in which Kelly personally stopped a publication involved an article by an American scientist on the aftereffects of radiation on corn, which the Japanese wished to translate into their own language. Kelly stopped it on the theory that the paper might "scare people" in Japan. "It still troubles my conscience," he says.

Kelly seems to have played only a minor role in the reorganization of Japanese science which led to the downgrading of the old Imperial Academy after the war and the formation of a new Science Council of Japan that was more democratic in nature. But he was instrumental in persuading the U.S. National Academy of Sciences to send two delegations to Japan to make recommendations on how best to revive and reorganize Japanese science. Kelly leaned heavily on the reports of these Academy groups to justify his efforts to help the Japanese, and the Academy groups in turn relied heavily on Kelly's knowledge of Japan. One group, in fact, allowed Kelly virtually to dictate its final recommendations after Kelly complained that the group's draft recommendations were naive in the extreme, calling, as they did, for mammoth expenditures on science in a country faced with starvation.

Kelly found the Academy groups "a tremendous help" but he notes that short-term visitors sometimes have difficulty grasping a foreign nation's achievements. One member of an Academy group, for example, was sent to Kyoto University to check out reports that there was some exciting theoretical physics going on down there. He reported back that there was nothing world-shaking enough to merit attention. A few years later Hideki Yukawa, theoretical physicist on the Kyoto faculty, was awarded the Nobel Prize.

Kelly finally left the Occupation in March 1950, slightly more than 4 years after he had arrived. On his return to this country, he first worked for the Office of Naval Research in Chicago, then joined the new National Science Foundation and ultimately became its associate director for educational and international activities. He left NSF in 1962 to become dean of the faculty—and eventually provost—at North Carolina State. Throughout the 1950's, though he did not return to Japan, he maintained contact with his friends there and performed occasional favors by cutting through international red tape for them. After the "Lucky Dragon" incident of 1954, in which fallout from an American hydrogen bomb test contaminated some Japanese fishermen, Kelly obtained for his Japanese friends a copy of a National Bureau of Standards report on radiation tolerance levels in seawater. The report was unclassified but obtaining it through normal channels would have delayed Japanese scientists in their studies of the incident. On another occasion, Kelly helped save an overeager Japanese scientist who had violated certain U.S. atomic energy regulations by sending fissionable material to this country for irradiation. In the late 1960's Kelly was still performing such favors for the scientists in Japan. After 3 years of persistent inquiries, he finally tracked down and obtained for them a copy of a Japanese film—then in U.S. hands—depicting the aftermath of the atomic bomb attacks on Hiroshima and Nagasaki.

Head of Delegation

In 1961 Kelly again became an official friend to Japan when he was appointed head of the American delegation participating in a new bilateral U.S.–Japan Committee on Scientific Cooperation. The committee was established after discussions between the late President Kennedy and the then Japanese Prime Minister Hayato Ikeda in June of 1961. Kelly headed the American delegation until he resigned after last year's meeting, while his close friend, Kaneshige, has headed the Japanese delegation from the start. A few eminent American scientists appointed to serve on the committee have chafed at the sometimes trivial and directionless discussions that dominate the week-long annual meetings, but Kelly says the Japanese scientists are willing to devote long hours to ceremonial affairs if only to serve as a symbol of scientific unity, and he is certainly willing to do as much. Kelly believes the committee has some substantive achievements to its credit, particularly in the sponsoring of joint research projects, the staging of seminars and the exchange of scientific personnel, but he believes that perhaps the most important function the committee can serve is as a forum for the exchange of ideas and the fostering of better understanding. So why did he resign? "I was a little worried the whole thing was being kept together by me," he says. "I thought I was influencing it too much and that we should have

fresh ideas and a real critical look."

Mere absence from the committee doesn't seem to have slowed Kelly much, however. The week after this year's committee meeting in Washington, D.C., Kelly was off at a retreat in the Blue Ridge Mountains with two of his old friends—Kaya and Kaneshige—discussing the role of a scholar and scientist in promoting world peace. They went sightseeing by day and talked long into the night, and afterward, Kelly, now 62, acknowledged that he was pleasantly tired. "You have to be so careful that what you say is understood," he said. "It's so important to have understanding."

—PHILIP M. BOFFEY

Westinghouse's Environment School: Combining Business with Ecology

Fort Collins, Colorado. Ever since the environment took the stage as a major public issue, corporations have been cast in the villain's role. Recently, however, many of America's largest companies have sought to shed the spoiler's image. Some of their efforts have provided little more than publicity for their products. Others have produced solid contributions to environmental improvement.

The Westinghouse School for Environmental Management, which completed its 4-week session on 10 July, provided a little of both. It offered a comprehensive course in environmental problems, with an emphasis on the relation of power production to the environment. It also produced favorable exposure for some Westinghouse products.

Ecology Viewed as Business

Enterprising Westinghouse executives have viewed the ecology movement as an opportunity for more business. The Westinghouse Environmental Systems Laboratories, created on 1 January to help bridge the gap between conflicting demands for low cost power and a cleaner environment, have developed a number of products designed to appeal, at least indirectly, to the ecology-minded consumer. Last month, for example, Westinghouse announced the development of a nuclear power plant which it claims is noiseless, odorless, clean, and safe.

The 4-week session of the Westinghouse School brought 28 executives of public and private power utilities to Colorado State University in Fort Collins, Colorado, at the base of the Rocky Mountains. The organizations they represented included the Atomic Energy Commission, Consolidated Edison Company of New York, and the Pacific Gas and Light Company of California. Two foreign students represented utilities of Italy and Puerto Rico. Each student's company paid $6000 for the extensive review course, which embraced such disciplines as geology, marine biology, public health, and radiology. Westinghouse paid an additional $3100 for each student.

The curriculum was designed by two Westinghouse employees, David B. Smith and A. Donald Watt, with the assistance of a six-man curriculum advisory council. Colorado State University was chosen as the site for the school on the recommendation of one of the members of the curriculum council, Dr. Herbert Riehl, professor of atmospheric science and chairman of the Environmental Engineering Committee at CSU. The University is located in the middle of the kind of unspoiled land that environmentalists are trying to protect. Colorado in fact has been the scene of several recent legal battles between environmental groups and government agencies (*Science*, 12 June). The University has extensive facilities for environmental research, including laboratories for studying the effects of pollution on animals.

The backbone of the course was a series of lectures. Crammed into 23 school days, each of which began at 8:30 a.m. and many of which lasted well into the night, were presentations by 66 lecturers, ranging from Michael McCloskey of the Sierra Club, to Representative Craig Hosmer (R–Calif.) to Chauncey Starr, Dean of the School of Engineering and Applied Science at UCLA and vice president of the National Academy of Engineering. Most of the lectures revolved around the relation of power production to the environment and touched on legal requirements, legislation at the federal and local levels, research methods for testing pollution of water, air, and land, and new developments in environmental engineering.

Discussions following the lectures were often lively. McCloskey, for example, underwent sharp questioning from the students, many of whose companies and agencies the Sierra Club had opposed in controversies around the country. "In general, I think the level of awareness and responsibility of industry in the environmental field has increased," McCloskey conceded, "but I know that we are locked into battle after battle with industry about the environment." He urged industry to play a part in the fight for the environment by ceasing to oppose environmental quality control bills in Congress.

The Enemy Is Us

Many of the students contended that the public will be willing to demand environmental quality only so long as their power supply is not limited. When it comes to choosing between air conditioners and clean water, said the students, Americans will chose the air conditioner. McCloskey agreed that the problem could be characterized by the phrase "We have met the enemy and he is us." But he called on industry to recognize that rapid industrial expansion cannot continue much longer. He cited figures which showed that, if power production continues to grow at its present rate, doubling every decade, the entire nation will be covered with power plants in 200 years.

In addition to the lectures, the course provided three field trips—to the University of Wisconsin's Environmental Awareness Center, to the Tennessee Valley Authority's service area in Huntsville, Alabama, and to the National Center for Atmospheric Research in Boulder, Colorado. Also fea-