

contract research in Japan. Professors at the national universities are forbidden by law to accept contracts from industry, and while there seem to be numerous ways to get around this prohibition, it seems safe to say that Japanese industry gets much less mileage out of the academic community than does American industry. Japanese industry pays almost entirely for its own research efforts, in sharp contrast to the situation in this country where roughly half of all industrial R & D is paid for with government funds. And there is relatively less "job hopping" by scientists in Japan than in this country. The usual practice is to go to one company and stay there until retirement.

Even the flow of ideas seems limited, not only between the industrial and academic sectors, but within them as well. One high-ranking industrial scientist told me he learns more about what Japanese companies are doing when he comes to the United States than he does in Japan. And an American scientist who spends most of his time visiting Japanese laboratories told me he is continually surprised to find that separate research groups on a single campus are often unaware of each other's work, even though they are physically close and are working in the same general area.

A third problem that has traditionally hampered Japanese science is the language barrier. Most Japanese scientists seem to read English well enough to keep up with the literature, and they can often understand spoken English fairly well, but they generally have difficulty speaking the language themselves. They are thus at a tremendous disadvantage at international conferences. I made the acquaintance of one Japanese scientist who delivered a paper at last fall's meeting of the American Chemical Society. He was barely able to ask directions to his hotel, and was clearly in no position to participate in sophisticated discussion. Japanese papers in some disciplines are published in English, but in other disciplines they are published primarily in Japanese, and thus their authors cannot benefit from the critical scrutiny of the world scientific community.

The Japanese are making numerous efforts to improve the effectiveness of their research establishment. Expenditures for R & D, though still relatively low, have been increasing rapidly; the government, through tax incentives and other policies, has been encouraging more industrial research; and the gov-

ernment is specifically pushing research in several high-priority areas, including atomic energy, high-performance computers, jet engines, ocean bottom digging machines, and olefin manufacture, among others. Moreover, some of Japan's organizational rigidities seem to be lessening. Joint research institutes have facilitated cooperation between scientists from different universities. And the traditional system of basing pay and promotions on seniority is slowly being supplemented by more emphasis on merit. Hitachi's Central Research Laboratory, for example, has a 38-year-old manager for its 80-man telecommunications department. "Ability counts most here," I was told. "He's the youngest manager in the whole Hitachi company."

Whether Japan will ultimately become a leading scientific power as well as a top-rank industrial power remains to be seen. But some Westerners with long experience in Japan profess an almost mystical belief in Japan's ability to do just about anything it sets out to do. One night I had dinner with Father Ballon, the university administrator and author mentioned earlier, who firmly believes that Japan will become a technological innovator. "I believe more in the spirit than in material resources," he said. "Japan has the will, but we in the West have lost our spirit." Ballon particularly noted that Japanese at all levels of society have a driving ambition to make their country great. "GE stands for GE and to hell with the United States," he said. "But Hitachi is primarily and fundamentally Japan. That makes all the difference."

Later that same night I was sitting in a coffee house, reading the notes I had scribbled while talking with Ballon, when I was accosted by a young man with beer on his breath who subsequently identified himself as a parking lot manager. What, the young man asked, did I think of Herman Kahn's prediction that Japan might be the leading nation in the world in the 21st century? I expressed some skepticism, pointing out that Japan was perched on a precarious physical base, with very little in the way of natural resources. But the young man countered: "We Japanese work hard and study hard because that's what our parents and our grandparents did." As I paid my bill and left for bed, I couldn't help thinking: My God, if the parking lot managers are working to make Japan number one, they just might do it.

—PHILIP M. BOFFEY

NEWS IN BRIEF

● INVESTIGATIONS OF THE PILL:

Oral contraceptives are under increasing scrutiny in Congress and in federal agencies. The subcommittee on monopoly of the Select Committee on Small Business began a series of hearings this week to examine whether users of the pill are warned adequately about possibly dangerous side effects. Senator Gaylord Nelson (D-Wis.) invited 18 doctors and researchers to testify. Also, scientists at the Food and Drug Administration will begin shortly to review data which convinced British medical authorities to ban certain oral contraceptives. The pills in question contain comparatively large amounts of estrogen; the British study found that women using them ran a greater risk of serious and sometimes fatal bloodclotting. If the FDA confirms the British findings, it may set new standards for the pill in this country.

● BIOSATELLITE PROGRAM:

The space agency should prepare for long-duration manned flights by a series of medical experiments conducted on orbiting animals, a House subcommittee urged recently. The biosatellite program, which cost \$150 million over 4 years, was scrapped last year when a monkey died after a 30-day flight in orbit. The Space Science and Applications Subcommittee of the House space committee urged the space agency to reinstate the program with the idea that man should not be used as a test animal. Emphasis should be put on bioscience programs which offer immediate return to the taxpayers; men and animals on flights should be tested more extensively than at present to determine the biological consequences of space flights.

● PEACEFUL USES OF THE SEABED:

The United Nations General Assembly passed several resolutions on international exploration of the ocean floor before adjourning for Christmas. One resolution declared that states and individuals should refrain from all exploitation of seabed resources beyond territorial lines, pending the establishment of an international regime for the seabed. The United States opposed this resolution. The Assembly also resolved to ask the Secretary-General to survey the views of member states on convening an ocean law conference with a view to redefining territorial limits.