than the elevator," he adds—a significant shift in tone from Mitterrand's first declarations (whose ambitions for the project were perhaps shared only by Italy), but one that has helped overcome initial resistance from other members of the group.

Several of the working groups have still to demonstrate their value. One is the group on fast breeder nuclear reactors, jointly led by France and the United States. It suffers from a relative imbalance in the strengths of these two countries—the French program is considerably more advanced—as well as growing uncertainty on both sides of the Atlantic over the future of fast breeders in a period of falling projections of demand for nuclear power.

Other working groups have been more fruitful. France and Japan, for example, are mapping out a substantial program of collaborative research and development into advanced robotics, to which both countries (as well as several others involved in the working group) are expected to make a substantial financial commitment. Britain and the United States have agreed on several joint projects in materials research. And the aquaculture group, headed by Canada, has provided its member countries with much information about research of which they were previously unaware.

The mutual exchange of information between national programs has, indeed, been one of the most productive outcomes so far, according to several of those involved in the working groups. Equally so have been various moves toward the standardization of techniques and practices, seen as an essential element in any attempt to harmonize technological strategies.

Thus a program on photovoltaics, which is headed by Japan and Italy, has made substantial progress towards the definition of a standard reference solar cell. While the effort in materials research, led by the United States and Britain, has resulted in an agreement for collaboration on methods and data for standards of wear testing and surface analysis.

In the long run, however, the main impact of the Versailles initiative is likely to lie in the role of political, as much as technical, factors in rationalizing international research, particularly in fields of big science where—despite much talk to the contrary—most research workers continue to think in nationalistic terms.

"If you left it to the technical people you would never get real collaboration," says one British official, claiming that the United States in particular tends to see international collaboration in terms of inviting foreign scientists to carry out experiments on American facilities.

George A. Keyworth, II, President Reagan's science adviser, puts it slightly differently. "We have seen enough cooperation occurring between scientists, and we have seen enough cooperation occurring between political leaders," he says. "It is now important to have synchronized actions between both of these sectors. In particular, we need to bring people into international programs, not just international projects."

One field where the need for top-level diplomacy is already being felt is high energy physics. Here the United States and western Europe would most like to build large new particle accelerators in the 1990's, but constraints of cost and brainpower are encouraging politicians to think in terms of closer collaboration (already being discussed in the area of superconducting magnets) rather than further competition.

Another is in fusion research. Here, again, politicians are arguing in favor of a jointly agreed strategy and an international division of labor designed to minimize the duplication of effort and maximize the use of limited scientific manpower, if not on a global basis (no one is currently talking seriously of giving the Soviet Union a major role), at least among the Western advanced nations.

In both cases, given the checkered history of international collaboration on

IBM's Bloch Named to Lead NSF

The National Science Foundation (NSF) will have its fourth director in four years when IBM executive Erich Bloch succeeds Edward A. Knapp, who resigned unexpectedly. President Reagan on 6 June, announced his intention to nominate Bloch, who was trained as an electrical engineer at the Federal Polytechnic Institute of Zurich and the University of Buffalo. Bloch, 58, joined IBM in 1953 and has been serving as vice president of technical personnel development since 1981.

In a statement commenting on Bloch's appointment, President Reagan's science adviser George A. Keyworth, II noted that Bloch's "long experience at IBM includes direction of R&D and large manufacturing programs and responsibility for the technical excellence of the personnel of one of the world's most technologically advanced companies. Those achievements are directly relevant to major issues that the Foundation is addressing today." Bloch will be the first director to come to the foundation from a career in industry and his selection could cause concern among some members of the scientific community who have begun to question whether the foundation may be putting increased emphasis on engineering and technology at the expense of its traditional support of basic research.

Knapp's departure came as a surprise to NSF rank and file, but close associates of Knapp at the foundation say that Knapp, a physicist, has for some time been considering a return to Los Alamos Scientific Laboratory (LASL) where he had been a researcher and administrator for a quarter century before coming to NSF. Knapp is said to feel that a longer absence might make it impossible for him to resume active work as a scientist. They say his departure is timed to permit the new director to participate in shaping the next NSF budget. Knapp is on a visit to Scandinavia, and NSF officials do not know when the changeover will occur.

The foundation in recent years has encountered difficulty in keeping its top management ranks filled. For most of Knapp's less-than-two-year tenure as director, the posts of NSF deputy director and four assistant directors that require presidential appointments were unfilled. The prompt announcement of Bloch's succession seems to be a result of his having been well along in the clearance process for appointment to the NSF deputy directorship. Senate confirmation is required for the director's post.

Knapp came to the foundation in September 1982 as assistant director for mathematical and physical sciences. He was named director two months later. He succeeded John B. Slaughter, who had spent less than 2 years in the job. Slaughter, who was tapped for the post by President Carter in July 1980, took over from Richard C. Atkinson, who served from the mid-1970's. The NSF director's statutory term is set at 6 years.—**JOHN WALSH**